# Manager Assignment and Project Returns: Evidence from the World Bank*

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**Abstract**

I study the impact of World Bank managers on project success through the value-added method. Manager effects are interpretable as performance indices and are more volatile than country effects. Both correlate positively with determinants of productivity (i.e., schooling and institutions respectively) and provide evidence of a negative assortative matching, with high-performing managers assigned to low-performing countries. Exploiting a novel variation for World Bank board access, I find a significant manager premium for countries in the board. All of these results are consistent with the World Bank behaving as a planner which assigns its managers as project inputs to client countries.

**Keywords**: Development Lending, Personnel Economics, International Organizations, Cost–Benefit Analysis

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# 1 Introduction

There are two salient features of development lending that make this different from commercial lending: a policy-reform objective and a financial subsidy. As Besley et al. (2015) and Deaton et al. (2006) discuss, the World Bank has been capable of generating a much stronger policy impact than its actual financial size and, in line with this view, Clemens and Kremer (2016) show how small the financial subsidy compares with the set of achieved reforms. Ultimately, the World Bank's leadership in development lending and agenda influence (Custer et al., 2015) comes from pro-actively engaging with local governments and bundling financial resources with technical assistance in its projects (Ravallion, 2016).

However, given its small and shrinking relative size in international capital markets, the *raison d'etre* of the World Bank resides in its informational functions (Rodrik, 1995) and knowledge generation (Chioda, De La Torre, and Maloney, 2013), which are operationalized through its technical assistance activities. These are organized and delivered by the project managers of the World Bank, that have a vital role in adding value to projects through their human capital and, in so doing, influencing development outcomes. They are responsible for delivering innovative ideas through technical assistance, setting up the loan specifics, and make projects happen by negotiating both with governments and the World Bank administration.

In this paper, I study whether, and to what extent, World Bank managers affect project success, and I consider what determines the assignment of a high-performing manager to a specific country. This is relevant because there is little evidence that the organization and resource allocation of development lenders affects their performance; in contrast, there is a consensus that the recipient countries' own institutions and country-level differences affect results (Isham, Kaufmann, and Pritchett, 1997; Isham and Kaufmann, 1999; Casey et al., 2012; Olken et al., 2012). Project managers are the only resource I focus on: their ability and skills are probably the most important inputs available to, and used by, the World Bank, which can assign a manager to particular countries over certain periods through various means (promotions, lateral moves, incentives). On the receiving end, countries have an intrinsic interest in high-performing managers, both because they channel innovative ideas (Gavin and Rodrik, 1995) and, especially, because this makes it more likely that a loan will pass the World Bank's internal checks and will be approved. Conceptually, this paper links the literature on bureaucrats/political selection (Besley, 2005, 2006; Dal Bó, Dal Bó, and Snyder, 2009; Galasso and Nannicini, 2011) with the mounting evidence for the positive role of management (Bertrand and Schoar, 2003; Bloom and Van Reenen, 2007, 2010).

In order to measure the performance of World Bank managers and to understand what determines their assignment to a country, I regress an indicator of project success collected by the World Bank[1] on several covariates, including manager and country fixed effects (FE). These are then extracted to define the vector of manager effects (MEs) and of country effects (CEs), which are the core

[1]The key measure of project performance is available for most projects and for over more than 30 years – it is called the "project outcome rating". It represents a qualitative evaluation of the success of each project against its ex-ante stated objective. This is explained in greater detail in Section 3.

of this work and are methodologically borrowed from the teacher–pupil literature.[2] Inquiring into these effects gives rise to a surprising element: the variance of MEs is higher than that of CEs. This is surprising because while country performance is a given element of World Bank operations, and having high- and low-performing countries is an unchangeable issue, manager performance is ultimately a choice variable through hiring operations. An implication of this result states that the World Bank presents manager performance with a gap analogous to that existing between Somalia (among the lowest-performing countries) and Latvia (among the highest-performing countries). In order to verify the plausible interpretation of MEs and CEs as respective indices of performance in delivering successful projects, I note the relation between predetermined manager curricula and MEs[3] and between countries' institutional variables and CEs.[4]

After the positive analysis to measure MEs and CEs, I move to a normative part and propose a reform to boost the World Bank's effectiveness in the spirit of Hanushek (2009): I reassign managers who are among the 10% worst-performing to non-project bureaucratic tasks and I replace them with average managers. Unlike some of the teacher literature, all economic indicators are available for this exercise and, therefore, I can directly estimate that such a reform leads to the creation of an additional 800 million US dollars (USD) of returns generated by the World Bank over the sample in analysis, in a confidence interval of [414, 1,189], corresponding to a 3.7% increase. Furthermore, using World Bank documentation, I evaluate the viability of this reform and conclude that this delivers net gains of 624 (426) million USD under a moderate (extreme) cost scenario, with a wide range included between 38 and 1,011 million USD.

With reference to the rule through which managers are assigned to countries, I inquire into this by correlating Manager with Country Effects. Conceptually this exercise parallels the worker-firm wage-determination literature, following the study of Abowd, Kramarz and Margolis (1999), and the management and organization field, in line with Bandiera et al (2015). A theoretical framework predicts that the World Bank's attitude to risk guides its assignment rule of managers to countries. I also allow some countries to put pressure on the World Bank to receive high-performing managers by sitting in its board, as the "value of the seat literature" suggests (e.g., Kuziemko and Werker, 2006; Kaja and Werker, 2010). This model gives rise to a proposition, which is brought to the data, and I verify that the empirical results are consistent with the World Bank behaving as a risk-averse planner, assigning high-performing managers to low-performing countries and with countries sitting on the World Bank board receiving higher-performing managers during their board terms[5]. Because

[2]In this work, I establish a parallel between "teachers affecting student outcome in certain schools" and "managers affecting projects in certain countries". As a result, I apply the teacher–pupil framework to the World Bank project setting.

[3]As shown in a later section, the ME is correlated positively with managers holding a Master of Business Administration (MBA), completing a degree in their own country, and the number of their publications, and negatively with having work experience at the International Monetary Fund (IMF), experiencing a downgrading (i.e., a demotion from a higher hierarchical position to a lower position), and having graduated in natural sciences (i.e., medicine, mathematics, etc.). I also verify that MEs do not correlate with gender, experience, promotions, and spoken languages. These regressions and others can be found in Appendix C.

[4]As shown in a later section, the CE is correlated positively with "good" institutional measures such as parliamentary democracy, constraints on the executive, and an index of public infrastructure management, and negatively with ethnic fractionalization, slave trade, and legal origins.

[5]The presence of a negative assortative matching between managers and countries differs substantially from the

this last point might be a result of reverse causality or third factors, exploit a unique feature of the World Bank's board elections to provide some plausibly exogenous source of board access, which reinforces my results.

Among the possible settings in development economics in which to extend the teacher–pupil work, the World Bank is ideal for at least three reasons. (1) The World Bank is one of the largest and oldest development institutions, with methodologically consistent databases dating back for more than 40 years. To exploit this feature, I join the World Bank Project Ratings database with information on project managers and other financial details and, in so doing, I have access to 10,000 projects over a long span of time (from 1970 onward), comprising more than 15 sectors, 140 countries, and 2,000 managers. (2) World Bank project managers can be considered inputs to project success and in order to verify the plausibility of the manager effects correlations, I collect their corresponding curriculum vitae (CVs) and information using a variety of online sources (e.g., report biography, résumé, LinkedIn profile). (3) Last, but not least, the World Bank's institutional design and its governing board can be exploited to provide some plausibly exogenous source of board access, as shown at a later stage.

This paper contributes to various debates. First, it advances the debate on the economics and organization of not-for-profit and mission-oriented institutions (Besley and Ghatak, 2005; Besley, 2006; Ashraf, Bandiera, and Lee, 2014), especially for what concerns development lenders[6] and the presence of political equilibria in resource allocation (Grossman and Helpman, 1994; Coate and Morris, 1995; Krishna, 1998; Besley, 2006; Dreher, Sturm, and Vreeland, 2009). In this respect, my work joins a sizable body of literature on World Bank projects, which has already explored these data and provided useful insights into public policy and development lending (Chauvet, Collier, and Duponchel, 2010; Kilby, 2013, 2015). In particular, Denizer, Kaufmann, and Kraay (2013) are the closest in spirit and aim to my work. They carefully explore macro- and micro-determinants of project success, establishing that within-country variation exceeds the between-country component, and they were the first to explore the role of project managers as the key to project success. Furthermore, these results contribute to the extensive body of research using the teacher value-added framework

results of the literature on the worker-firm wage determination, which finds evidence of positive assortative matching between high-wage workers and high-wage firms using analogous fixed-effects method (Abowd, Kramarz, and Margolis (1999), Andersson et al. (2012), Bagger, Sorensen, and Vejlin (2012)), Card, Heining and Kline (2013).

[6]Development lenders have been experiencing unprecedented growth and relevance in the aftermath of the Great Recession, both multilaterally with the founding of new players (AIIB in 2015, and BRICS Bank in 2012), and domestically as national development banks have stepped up in their asset growth. In the UK, the Growth Report elaborated at the London School of Economics (LSE; Aghion et al., 2013) proposes the creation of an Infrastructure Bank with all duties of a proper development bank to "to facilitate the provision of stable, long-term, predictable, mostly private sector finance for infrastructure". However, in emerging economies, development banks are on the rise: the China Development Bank (CDB), the Brazilian Development Bank (BNDES), and the Development Bank of Southern Africa (DBSA) have all been growing rates exceeding 20% in the last few years. For Brazil, refer to the article "A ripple begets a flood", *The Economist*, October 19, 2013, available at `http://www.economist.com/news/finance-and-economics/21588133-politically-inspired-surge-lending-weakening-state-owned-banks-latin`; for China, refer to the article "Massive Capital Injection to Chinese Banks is Credit Positive – Moody's", by M. North at Digital Finance Analytics Blog, August 24, 2015, available at `http://www.digitalfinanceanalytics.com/blog/massive-capital-injection-to-chinese-banks-is-credit-positive-moodys/`; for South Africa, refer to the DBSA's selection of publications, available at `http://www.dbsa.org/EN/About-Us/Publications/Pages/default.aspx`.

(Hanushek, 1971; Gordon, Kane, and Staiger, 2006; Kane and Staiger, 2008; Chetty, Friedmand, and Rockoff, 2013) and applying it to a management perspective. Particularly, this work recalls the results on management and its performance-enhancing effects, and is in line with the findings of Bloom et al. (2013) in Indian firms, Bandiera, Barankay, and Rasul (2013) for team incentives, and Bennedsen, Pérez-González, and Wolfenzon (2012) for chief executive officers (CEOs). Last, but not least, this work adds to another body of literature on the provision of public goods, the role of incentives, and selection of bureaucrats (Besley and Ghatak, 2003; Besley, 2005; Cruz and Keefer, 2013; Keefer, 2013; Rasul and Rogger, 2016).

In the following section, I present the measurement of the MEs and CEs, including an analysis of their main correlations and a few robustness checks. In Section 3, I present the core results of this paper on MEs and CEs. In Section 4, I study the assignment of managers to countries, illustrating with a theoretical model the problem faced by the World Bank as a planner and the instrumental variables (IVs) used for the analysis. In Section 5, I offer some concluding remarks.

# 2 Measurement and Data

## 2.1 Conceptual Framework

In this paper, I focus on deriving a fixed measure of managerial performance, and I interpret this as an input into project success. The idea of a ME is that there exists a set of individual-specific abilities and acquired skills that contribute to the success of each project, regardless of context-specific components. Because talents and skills are not observable, in the context of my analysis I extract an index of managerial performance by regressing an indicator of project success on manager fixed effects. I can then extract such effects and "rate" each manager based on how many "success points" they bring to a project. Statistically, I interpret this fixed effect as the conditional average performance of a manager, while conceptually the manager effect embodies a richer set of ability and acquired skills.

Under the assumption that such inputs are time-invariant, or that their time-changes are negligible, then the following framework, based on a general cumulative model of student achievement used in labor economics (Todd and Wolpin, 2003), can be used. I indicate with $y_{imcst}$ the success of project $i$, led by manager $m$, in country $c$, of sector $s$, at year $t$, and model it through the following function

$$y_{imcst} = y_{imcst}[M_i(t), C_i(t), S_i(t), \Psi_i, \varepsilon_{imcst}].$$

Here, $M_i(t)$, $C_i(t)$, and $S_i(t)$ represent the entire histories of manager-, country-, and sector-specific inputs into project $i$, respectively, whereas $\Psi_i$ embeds time-invariant characteristics of an individual project, and $\varepsilon_{imcst}$ is an independent and identically distributed (i.i.d.) mean zero error.

While this model is difficult to estimate because of the high-dimensionality problem, it can be simplified and brought to a simpler expression through five assumptions.

**Assumption 1** *The project success function is additive and separable in its arguments.*

This leads to the following expression

$$\begin{aligned} y_{imcst} &= \alpha_1 M_{mt} + \alpha_2 M_{mt-1} + \ldots + \alpha_t M_{m1} + \beta_1 C_{ct} + \beta_2 C_{ct-1} + \ldots + \beta_t C_{c1} \\ &\quad + \gamma_1 S_{st} + \gamma_2 S_{st-1} + \ldots + \gamma_t S_{s1} + \delta \Psi_i + \varepsilon_{imcst}, \end{aligned}$$

where the success of project $i$ depends not only on the contribution of manager $m$ on $i$ at time $t$, but also on its past history, and a similar story applies to country and sector inputs. This model could not be plausibly estimated unless information on past manager $m$ inputs on project $i$ were available, which leads to the following assumption.

**Assumption 2** *Manager's inputs into the success of project $i$ are constant over time and captured by a manager-specific effect $\iota_m$.*

This assumption is fundamental and shuts down any possibility of managers compensating for poor country or sector inputs. Therefore, the project success model can now be rewritten as

$$\begin{aligned} y_{imcst} &= \alpha \iota_m + \beta_1 C_{ct} + \beta_2 C_{ct-1} + \ldots + \beta_t C_{c1} \\ &\quad + \gamma_1 S_{st} + \gamma_2 S_{st-1} + \ldots + \gamma_t S_{s1} + \delta \Psi_i + \varepsilon_{imcst}. \end{aligned}$$

However, this model relies on as yet unavailable information, and therefore, in order to reach a more compact expression, the following assumption is made.

**Assumption 3** *Past inputs of country $c$ and sector $s$ into the project $i$ decay at a geometric rate $\lambda$.*

Such simplification permits us to summarize the model as follows:

$$\begin{aligned} y_{imcst} &= \alpha \iota_m + \beta C_{ct} + \beta \lambda C_{ct-1} + \ldots + \beta \lambda^{t-1} C_{c1} \\ &\quad + \gamma_1 S_{st} + \gamma_2 S_{st-1} + \ldots + \gamma_t S_{s1} + \delta \Psi_i + \varepsilon_{imcst}. \end{aligned} \tag{1}$$

At this stage, I can define the success of a project $j$ by manager $n$ in country $c$ in period $t-1$ as

$$\begin{aligned} y_{jncst-1} &= \alpha \iota_n + \beta C_{ct-1} + \beta \lambda C_{ct-2} + \ldots + \beta \lambda^{t-2} C_{c1} \\ &\quad + \gamma S_{st-1} + \gamma \lambda S_{st-2} + \ldots + \gamma \lambda^{t-2} S_{s1} + \delta \Psi_j + \varepsilon_{jncst-1}, \end{aligned}$$

and I describe the average project success in country $c$ at time $t-1$ by summing over all $N_{t-1}$ projects $j$:

$$\begin{aligned} \sum_j \frac{y_{jmcst-1}}{N_{t-1}} &= \sum_j \frac{\alpha}{N_{t-1}} \Big( \sum_h \iota_{nh} \Big) + \beta C_{ct-1} + \beta \lambda C_{ct-2} + \ldots + \beta \lambda^{t-2} C_{c1} \\ &\quad + \gamma S_{st-1} + \gamma \lambda S_{st-2} + \ldots + \gamma \lambda^{t-2} S_{s1} + \sum_j \frac{1}{N_{t-1}} (\delta \Psi_j + \varepsilon_{jmcst-1}). \end{aligned}$$

This expression can be simplified by recalling that the project-specific characteristics average a constant

$$\sum_j \frac{\delta \Psi_j}{N_{t-1}} = P,$$

while, relying on a weak law of large numbers, the previous period's error-term mean converges to the population mean of zero

$$\sum_j \frac{\varepsilon_{jmcst-1}}{N_{t-1}} = 0.$$

Finally, if the numbers of managers operating in country $c$ at time $t-1$ are sufficiently large, described via $N_{ht-1}$, then we can normalize the average manager performance input to zero. Therefore, if the country experienced a sufficiently high number of managers, then by the weak law of large numbers

$$\sum_h \frac{\iota_{nh}}{N_{ht-1}} = 0.$$

Therefore, the previous period's average project success can be rewritten as

$$\begin{aligned} \overline{y}_{ct-1} &= \beta C_{ct-1} + \beta\lambda C_{ct-2} + \ldots + \beta\lambda^{t-2} C_{c1} \\ &\quad + \gamma S_{st-1} + \gamma\lambda S_{st-2} + \ldots + \gamma\lambda^{t-2} S_{s1} + \sum_j \frac{1}{N_{t-1}} (\delta\Psi_j + \varepsilon_{jmcst-1}). \end{aligned}$$

If we pre-multiply by $\lambda$ and subtract this expression from equation (1), then

$$y_{imcst} = \lambda \overline{y}_{ct-1} + \alpha\iota_m + \beta C_{ct} + \gamma_1 S_{st} + \delta\Psi_i + P + \varepsilon_{imcst}.$$

**Assumption 4** *Inputs by country c and sector s into the project i at time t can be expressed through three additive components (i.e., a country-specific component, a sector-specific component, and a time-varying component):*

$$\beta C_c + \gamma S_s = \beta\iota_c + \gamma\iota_s + \zeta\iota_t.$$

All of these assumptions lead to the following empirical model:

$$y_{imcst} = \lambda \overline{y}_{ct-1} + \alpha\iota_m + \beta\iota_c + \gamma\iota_s + \zeta\iota_t + \delta\Psi_{i0} + \varepsilon_{imcst}. \tag{2}$$

This compact model offers two central advantages: it is possible to estimate it using the available data, and it presents an intuitive interpretation for most of its parameters.

## 2.2 Data

Here, I describe the various datasets used for this analysis. First, I define the indicator of project success. This is measured by the "Project Outcome" indicator from the World Bank Project Rating database (from the "IEG historical project evaluations"), which is a collection of ratings assigned by World Bank evaluation teams to all financed projects since the early 1970s. This is the key database

used in this analysis, and represents the starting point of this project. In order to characterize MEs and CEs, I have integrated each project in this database with the respective financial information and manager identity, by consulting all project archival documentation.

The project evaluations are organized by the corresponding World Bank regional office, which, in consultation with the project manager, appoints a team of evaluators. These work with other internal World Bank units and local authorities (i.e., borrower, implementing agency, etc.), all of whom provide comments and participate in shaping the evaluation. This results in a document, the "Implementation Completion Report", which assesses the project and provides the synthetic ratings in a six-scale measure ranging from highly satisfactory (6) to highly unsatisfactory (1).[7] Project outcome is defined as "the extent to which the operation's major relevant objectives were achieved", a synthetic measure of project success.[8]

The following additional databases are also collected and used for various tasks.

1. *Individual Manager Characteristics.* This is a collection of manager characteristics, mostly based on individual CVs, which were collected using all available online resources (i.e., individual's web sites, LinkedIn profiles, book biographies, etc.). In this way, I can observe for 210 managers (among the 694 in analysis) a few predetermined characteristics (nationality, gender, experience, joining year, number of promotions/downgradings, advanced degrees, previous work experience, spoken languages and country of study, number of publications, discipline studied) and characteristics during their job at the World Bank (number of country changes, sector changes, total number of projects, average size of a project). This database allows me to verify the correlations between MEs and manager's individual characteristics.

2. *Countries Institutional Measures.* I group some of the most common variables, capturing countries' institutional features: parliamentary democracy and constraints on the executive (Besley and Persson, 2011), ethnic fractionalization (Easterly and Levine, 1997; Alesina et al., 2003), legal origins (Acemoglu et al., 2001), slave trade (Nunn, 2008), and a public infrastructure management (PIM) index (Dabla-Norris et al., 2012). Using this database, I can verify whether the CEs correlate with measures of institutions, which would be a natural predictor of the high performance in public good delivery.

3. *World Bank Board Composition.* Using all World Bank annual reports since 1980, I digitize the composition of the board for all years, and I verify the evolution of the electoral groups voting for a board seat (constituency groups in World Bank jargon), the number of countries belonging to each in each year, and how new countries are assigned to constituencies. This database is used in Section 4 to study the assignment of managers to countries.

[7] More information can be found in Denizer, Kaufmann, and Kraay (2013) or at the following web site `http://web.worldbank.org/WBSITE/EXTERNAL/PROJECTS/EXTPOLICIES/EXTOPMANUAL/0,,contentMDK:23071941~menuPK:4564187~pagePK:64709096~piPK:64709108~theSitePK:502184,00.html`.

[8] According to the Independent Evaluation Group (IEG) Guidelines for Project Evaluation (see `http://ieg.worldbank.org/Data/HarmonizeEvalCriteria.pdf`), project outcome includes an assessment for the relevance of the project to the mission of the World Bank and the need of the country, the efficiency with which resources are used for the realization of the project, and the efficacy of the project in achieving the stated objectives.

## 2.3 Empirical Method

In terms of methodology, the most recent literature has proposed two alternatives: an empirical Bayes procedure, following Kane and Staiger (2008) and Chetty, Friedman, and Rockoff (2013), and a fixed effect estimation, in the spirit of Bertrand and Schoar (2003) and Gordon, Kane, and Staiger (2006). Because of the relatively short manager panel, I estimate the MEs using a fixed effect model[9] as described by equation (2).

The conceptual framework introduced in equation (2) can be brought to the data through the following regression:

$$y_{imcst} = \alpha + \iota_m + \iota_c + \iota_s + \iota_t + \beta_1 \bar{y}_{ct-1} + X_{1imcst}\beta_2 + X_{2ct}\beta_3 + \varepsilon_{imcst}. \tag{3}$$

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 $t$; $\iota_m$, $\iota_c$, $\iota_s$, and $\iota_t$ are the fixed effects of manager, country, sector, and time, respectively, $X_{1imcst}$ and $X_{2ct}$ are project- and country-level controls, while $\bar{y}_{ct-1}$ is the average project success of country $c$ in period $t-1$, and emerges from the project success model as a catch-all term of country time-varying heterogeneity.

In order to be able to give a level interpretation to the fixed effects, I introduce four normalizations

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

These impose that the average manager, country, sector, and year fixed effects (i.e., $\bar{\iota}_m$, $\bar{\iota}_c$, $\bar{\iota}_s$, and $\bar{\iota}_t$) are equal to zero. Imposing these normalizations is useful because in this way the estimated fixed effects only provide a notion of how productive a manager is compared to the mean (a comparison across managers). These normalizations remove all elements of manager/country quantitative comparison: it would have little value to state that a manager contributes as much as a country to a project. Instead, I evaluate a manager by benchmarking against an average manager (normalized to zero for simplicity) and, analogously, I benchmark countries against a given zero-mean reference.

## 2.4 Sample Selection

At this stage, two fundamental features of the dataset need to be discussed. First, the identification of the MEs and CEs demands managers changing countries, countries changing managers, and multiple

[9]The fixed effect estimation is more tractable and has a clear interpretation. In addition to this, as I show in Appendix A, where I provide estimates using the empirical Bayes approach, there is high correlation (0.63–0.76) between the estimates of these two models when possible. Furthermore, as shown in the next section, by looking at the standard errors of the MEs, there is no systematic evidence of good or bad managers presenting higher variability. However employing this method has obvious drawbacks because I cannot remove the measurement error component from the MEs. The empirical Bayes approach has the advantage of disentangling the estimate of the ME, using a minimum variance unbiased estimator (MVUE), from the reliability of the information, expressed through a "shrinkage" parameter accounting for the signal-to-noise ratio. However, this procedure is extremely data-intensive and relies on observing a very large number of projects per manager, over countries and time. Unfortunately, my sample is not large enough to support this estimation and a value-added figure would be available for less than 15% of the total.

managers operating at any point in time. If this was indeed absent, the two effects would be perfectly collinear and their information indistinguishable. Secondly, because I am also interested in studying the allocation of managers to countries and the effect of a country sitting on the World Bank board on manager allocation, I exclude from my sample all projects during which a country sits on the board (out-of-sample estimation). In this way, I measure the MEs and CEs only for the years in which none of them operates through the board. Otherwise, this might lead mechanically to the discovery of a correlation between these two variables, if the presence of the board alters the technology of project returns.

For these two reasons, from the initial universe of 10,000 World Bank projects, I extract a sample such that each country and manager presents at least three projects, which offers support for the FE estimation: this restriction catches 3,385 projects from the initial 10,000, and from this I observe that a manager changes, on average, 3.19 countries and 2.11 sectors, while a country experiences 25.03 managers and 10.26 sectors. This is the main sample that I use for the analysis. However, in estimating MEs and CEs, I further restrict the sample to exclude projects performed while a country sits on the World Bank board.

This additional restriction leads me to exclude countries that always sit on the board and are more geo-politically relevant (i.e., China, India, Russia, Bangladesh, and Argentina) and this implies a further reduction, with the final sample shrinking to 2,240 projects.

Therefore I proceed in the following way.

1. I use the restricted sample of 2,240 projects to calculate each ME and CE.
2. I match each ME and CE to the corresponding manager and country in the sample of 3,385 projects, which also contains the same countries while sitting on the World Bank board.
3. I aggregate the project-level data to country-year level, and investigate the manager-country allocation.

# 3 Results

## 3.1 Descriptive Results

Table 1 reports the results of the empirical model described in equation (3). It is useful to note that both the CEs and MEs are jointly statistically different from zero, while this is not the case for the sector fixed effects. For this reason, no policy experiment is conducted by varying the number of sectors. It is also interesting to note that the lag of mean project outcome of country $c$ correlates negatively with the current project outcome, but is not significantly different from zero and is very close to zero in point estimate. This may seem surprising; however, in alternative regressions, this changes as CEs are suppressed. Therefore, the information content of this variable seems to be country-specific, time-invariant, and absorbed by the CEs.

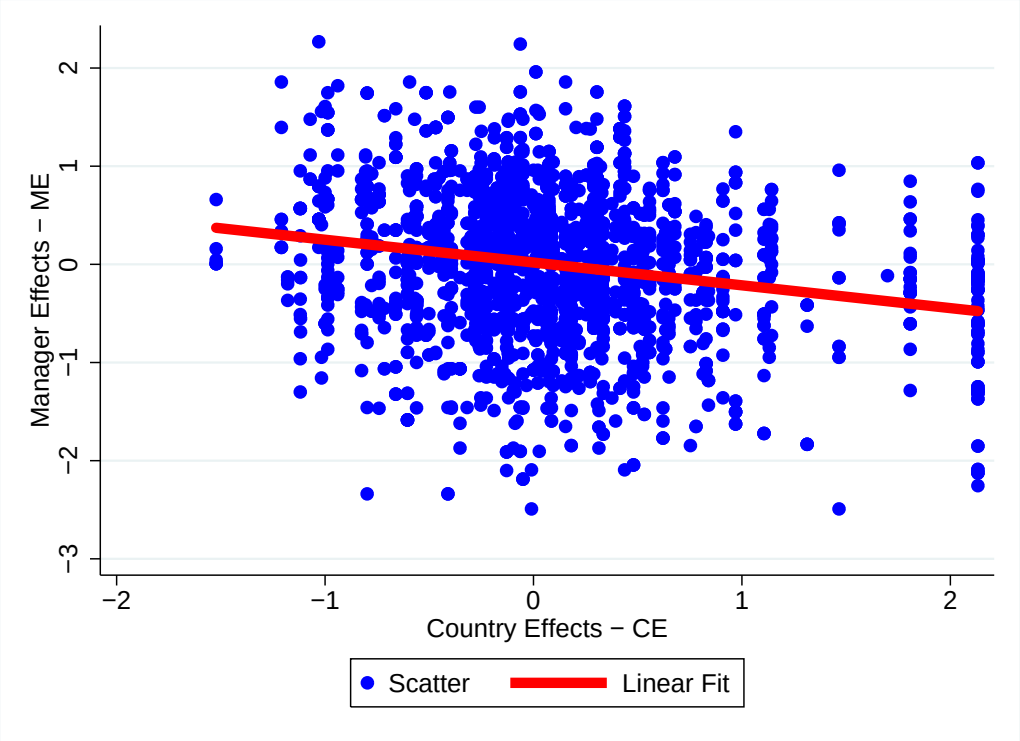
An immediate concern from this estimation might be the relation between managers and countries: I might artificially find that a manager operating in a highly performing country receives a high fixed

Table 1: Estimating the MEs and CEs from World Bank Project Performance

| Variables | Project outcome |
|---|---|
| Lag project outcome | −0.005 (0.042) |
| Constant | 4.213*** (0.387) |
| FE country | Yes |
| Number of countries | 125 |
| FE sector | Yes |
| Number of sectors | 15 |
| FE manager | Yes |
| Number of managers | 642 |
| FE year | Yes |
| Number of years | 31 |
| Controls | Yes |
| Number of controls | 24 |
| Observations | 2,240 |
| $p$-value of $F$-test on CEs | 0.000*** |
| $p$-value of $F$-test on sector FE | 0.655 |
| $p$-value of $F$-test on manager FE | 0.000*** |
| $p$-value of $F$-test on controls | 0.000*** |
| $R^2$ | 0.462 |
| Mean dependent variable | 4.124 |
| SD dependent variable | 1.199 |

*Note:* 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 country level, with 125 units. 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 level 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 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 country, sector, and manager level, and also a test on controls. The included controls are: (1) at country level, population, exchange rate, real GDP per capita at constant prices; (2) at project level, the size of the project in constant USD, the interest rate on the loan, the month of approval, two lending type dummies, and 15 lending instrument dummies. The two mentioned lending types are, specifically, "Investment", for projects characterized by funding for governments to cover specific expenditures related to economic and social development projects, and "Development Policy operations", which are types of projects aimed at the provision of direct budget support to governments for policy and institutional reforms aimed at achieving a set of specific development results. There are 15 mentioned lending instruments, which characterize different financial packages in which the projects are designed and delivered to countries, for example the Adaptable Program Loan (APL), the Financial Intermediary Loan (FIL) or the Structural Adjustment Loan (SAL). All the country-level controls, the size of the project, and the interest rate are measured in continuous units, with approval month ranges in integers between 1 and 12, while the remaining are dummy variables. ***, **, and * indicate significance at the 1%, 5%, and 10% levels, respectively.

Figure 1: Scatter of MEs and CEs: Project Level




*Note:* This figure shows a scatterplot, in which each dot is a project. It reports the associated MEs and CEs estimated in Table 1. The MEs and CEs are the fixed effects extracted from a regression of Project Outcome over country, sector, manager, and time FE, indicated in equation (2).

effect estimate. However, this is not the case – indeed, there are large within-country variations in MEs. Figure 1 provides graphical evidence, where the $y$-axis reports MEs, the $x$-axis shows the CEs, and each dot is a project. Therefore, the negative correlation and the substantial spreading out of managers for a country address possible concerns about whether the ME might be indistinguishable from the CE.

Another argument against my estimates could highlight the high standard deviation of MEs, 0.807, and my estimates might be considered to be a mere consequence of sampling error caused by the short manager panel. Though I cannot fully rule this out, I believe this to be a minor part of the story. In order to counter this, the upper panel of Table 2 reports the summary statistics of MEs for the whole sample and, in the lower panel, only for those managers with more than eight, six, or four projects. By comparing the standard deviations in these different samples (0.448, 0.468, and 0.571), it is clear that 0.807 might contain some noise due to managers with few projects. However, there seems also to be some relevant information.

Finally, it could be claimed that two sources of bias might affect my estimates. The first is the Hurwicz–Nickell bias (Hurwicz, 1950; Nickell, 1981), provoked by the presence in model (1) of a lagged dependent variable combined with fixed effects. Two arguments can assist in addressing these claims. First, the Hurwicz–Nickell bias shrinks the fixed effects toward zero, analogously to an attenuation bias, and therefore pushes against the results that I present. Secondly, because the panel is relatively large both in $N = 125$ and in $T = 31$, it is known that such bias converges to a process

Table 2: Summary Statistics on MEs and CEs

| Variable | Obs. | Mean | Std Dev. | Median | Max | Min |
|---|---|---|---|---|---|---|
| (1) Manager Effects | 642 | 0 | 0.807 | 0.062 | 2.268 | −2.491 |
| (2) Country Effects | 125 | 0 | 0.651 | −0.033 | 2.132 | −1.522 |
| (3) Project Outcome | 2,240 | 4.124 | 1.199 | 5 | 1 | 6 |
| Manager Level: Different Number of Projects | | | | | | |
| (4) MEs: Number of Projects > 8 | 16 | 0.142 | 0.448 | 0.173 | 0.868 | −1.063 |
| (5) MEs: Number of Projects > 6 | 46 | 0.033 | 0.468 | 0.130 | 0.868 | −1.063 |
| (6) MEs: Number of Projects > 4 | 162 | −0.006 | 0.571 | 0.030 | 1.394 | −1.595 |

*Note:* This table reports the summary statistics of MEs estimated in Table 1, and the project outcome. MEs are the fixed effects extracted from a regression of Project Outcome presented in Table 1. 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" of Table 1.

$O(1/T)$, and is bound not to be larger than relatively few percentage points.

The second source of bias might be the result of the omission of a dynamic manager–country allocation rule. The conceptual framework in Section 2.1 implies that a manager–country allocation is a repetition of static problems, and therefore the fixed effect estimation catches this aspect if MEs are constant and CEs present an additive idiosyncratic component. However, a dynamic manager–country allocation rule might bias the fixed effects, as the error component would be correlated with the estimated MEs and CEs. In Appendix B, I explore the existence of a dynamic manager–country allocation rule exploring the time-series dimension of manager assignments, where I use country and manager performances at time $t-1$ to predict their assignment at time $t$. I do not find evidence of dynamic matching.

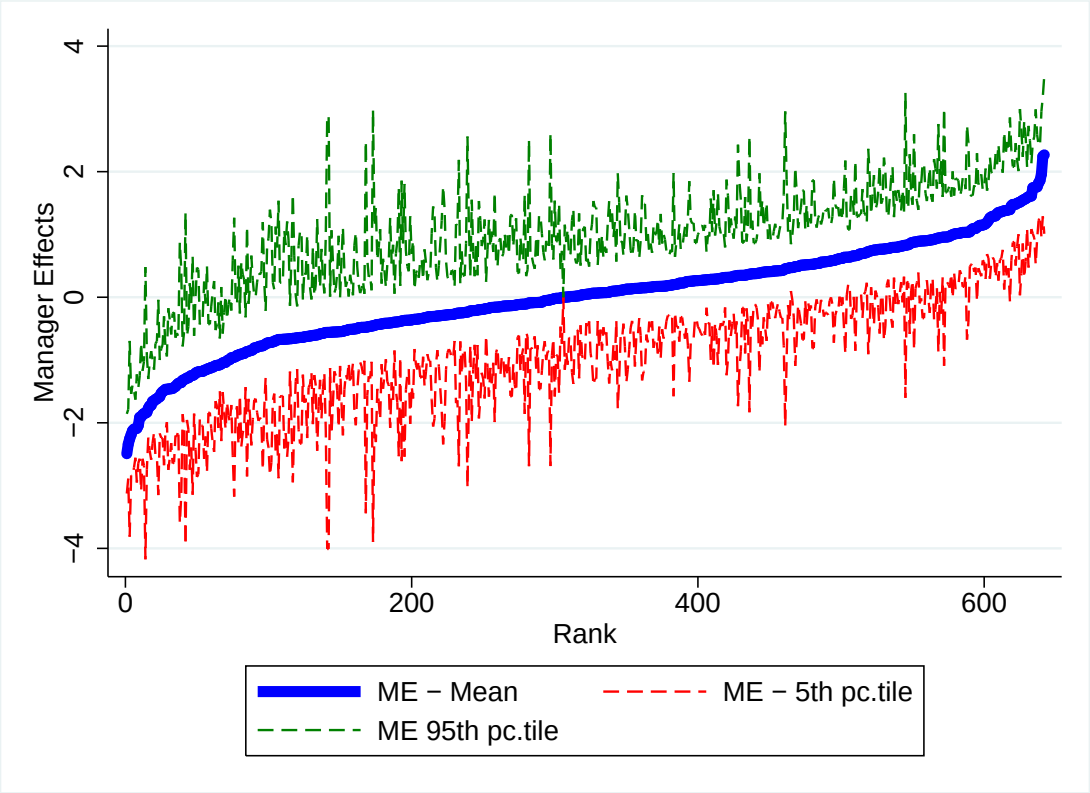
## 3.2 A Validation of Manager and Country Effects

### 3.2.1 Inspecting Manager Effects

Here, I explore MEs and verify their correlation with project and individual characteristics. Before this exercise, it is interesting to provide a descriptive assessment of the MEs by studying Figure 2, which shows a blue line representing the MEs, with the upper and lower bounds of the estimates shown in green and red, respectively. Because of the short manager panel, manager standard errors are not small; however, both the bottom 10% and top 10% of MEs are statistically different from zero in their 5th or 95th percentiles. A graphical example of the existence of several "exceptionally bad managers" is clear in Figure 3, which reports the density of MEs and shows a noticeable left-tail of low-performing managers.

In Tables 3 and 4, I present some findings that support the interpretation of MEs consistent with the conceptual framework introduced in Section 2.1. Table 3 correlates the MEs to the manager's project characteristics: the length of a project in years (column 1), the number of countries changed

Figure 2: 95% Confidence Intervals of MEs



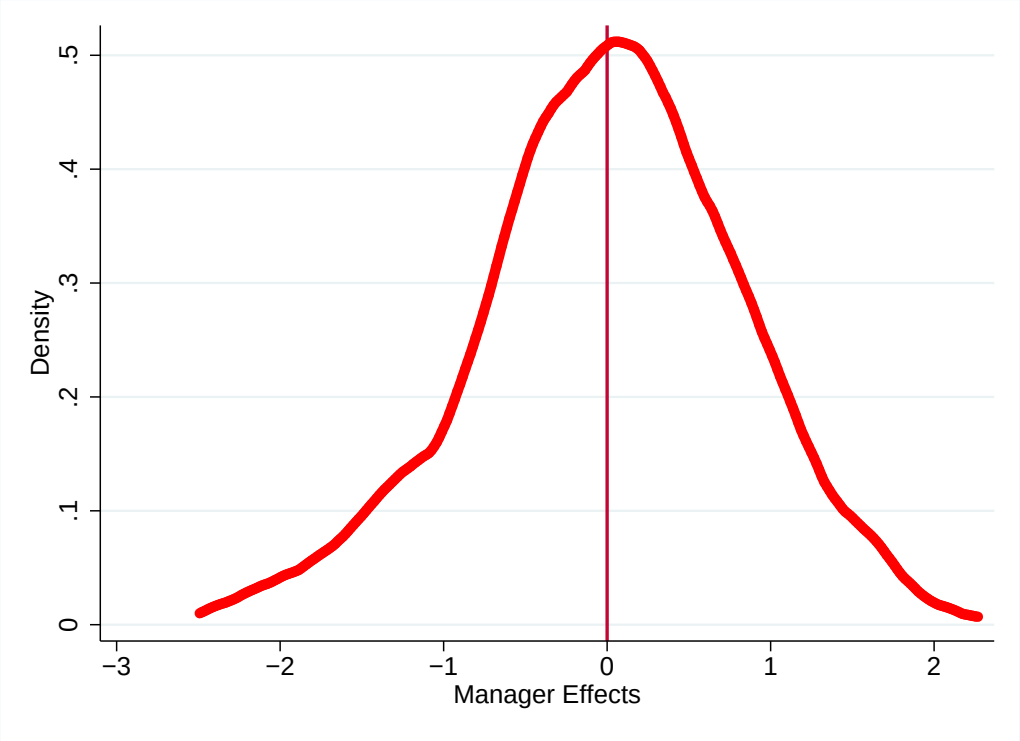

*Note:* This figure shows the full sample of MEs. The $y$-axis reports the point estimate of the MEs from Table 1, and the $x$-axis the rank of the manager. The thick blue line reports the point estimates. The upper green dashed line and the lower red dashed line represent the 95% confidence intervals of the point estimates.

over the career (column 2), the number of sectors (column 3), the number of managed projects (column 4), the average initial year in which a manager worked on projects (column 5), and the average financial size of projects (column 6). It is interesting to note that, with the exception of column (1), there is almost no action across the other margins; hence, this correlation states that more successful managers tend to complete projects more quickly than others. In this setting, given this relatively comparable set of projects, time to completion can be considered an alternative measure of success.

The next step is to relate MEs to individual characteristics, as presented in Section 2.2. Because not all the CVs of the 642 managers are publicly available, I am only able to analyze a subsample of 210 managers for whom I can observe all the variables reported in Table 4 and Appendix C. From this analysis, I find that MEs do not correlate with gender, number of promotions, year of joining the World Bank, years of experience, and number of spoken languages; all of these results are shown in Appendix C. In Table 4, I report only the characteristics that are significant. Thus, high MEs are for managers who do not hold a degree in natural sciences (i.e., medicine, mathematics, biology, chemistry), took an MBA, studied in their home countries (rather than abroad), did not work for the IMF, have a higher number of publications, and did not experience a downgrade in their career (from a hierarchically high position to a lower position).

The first four variables can be considered relatively pre-determined. For column (1), it might be

Figure 3: Density of MEs




*Note:* This figure shows the density of MEs. The $y$-axis reports the density of the distribution, and it is clearly noticeable that there is a thick left-tail of lower-performing managers.

possible that the World Bank is unable to attract the best candidates from natural sciences (especially medicine or mathematics) compared to other subjects, given that it offers a relatively uniform benefit package. Concerning the MBA variable, there might be other reasons for this, especially in terms of motivation. MBA students have access to higher salaries and fast careers, and hence those choosing to work for the World Bank might hold a particularly strong motivation for working in the development field. The third variable is particularly interesting and counter-intuitive, given that among the 210 managers, there are more than 70 represented nationalities, on average those achieving degrees in their own countries (rather than abroad) tend to present a higher fixed effect. One explanation for this result may be due to cultural assimilation: managers from particular regions (i.e., Africa) may be better equipped at working in those regions the stronger is their regional exposure. Indeed, in the last decade the World Bank has been re-directing its hiring toward local workers. However, this explanation is only one of possible co-existent ones. Finally, work experience at the IMF is associated with lower MEs. The remaining two variables are less pre-determined and might be a consequence of being successful: higher MEs are positively associated with the number of publications and negatively to a downgrade (being demoted from a hierarchically high position to a lower position).

### 3.2.2 Inspecting Country Effects

In this section, I inquire into the determinants of CEs and their main correlates at institutional level. The argument behind these robustness checks is that while MEs are thought to embed managerial

Table 3: MEs and Project-Level Correlations

| Variables | (1) MEs | (2) MEs | (3) MEs | (4) MEs | (5) MEs | (6) MEs |
|---|---|---|---|---|---|---|
| Project Length | −0.0370** | | | | | |
| | (0.0163) | | | | | |
| Number of Countries | | −0.0353 | | | | |
| | | (0.0314) | | | | |
| Number of Sectors | | | −0.0300 | | | |
| | | | (0.0338) | | | |
| Number of Projects | | | | −0.00954 | | |
| | | | | (0.0138) | | |
| Average Year | | | | | −0.00867 | |
| | | | | | (0.00542) | |
| Average Project Size | | | | | | 0.000445 |
| | | | | | | (0.000368) |
| Observations | 642 | 642 | 642 | 642 | 642 | 642 |
| Mean Dep. Var. | 0 | 0 | 0 | 0 | 0 | 0 |
| Std Dev. Dep. Var. | 0.807 | 0.807 | 0.807 | 0.807 | 0.807 | 0.807 |

*Note:* This table reports OLS estimates. The unit of observation is manager level and robust 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 FE, including 24 controls and the mean lag project outcome, as presented in Table 1, column (1). Its mean and standard deviation are reported in the final two rows. Project Length measures the average number of years a project takes for each manager. Number of Countries is a continuous discreet variable, reporting the number of countries over which a manager has shifted during a career. Number of Sectors is a continuous discreet 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 Year is a continuous variable measuring the average year in which the projects of a manager took place. Average Loans is a continuous variable, reporting the average loan in constant USD held by a manager during an entire career. ***, **, and * indicate significance at the 1%, 5%, and 10% levels, respectively.

performance, CEs can be considered a measure of public good provision. In fact, given that the World Bank funds the construction of public goods and that governments are active part of the implementation, then CEs can be interpreted as a measure of success in public good provision. Therefore, in the cross-section, they should be correlated with institutional variables at country level.

First, it is interesting to provide a descriptive assessment of CEs. Figure 4 reports a bar chart, where I include the countries classified in the top five and the bottom five, and the five countries around the mean. Figure 5 reports the whole rankings including the 95% confidence interval around each estimate, and Figure 6 shows the density.

Figure 4 shows in green that countries characterized by high CEs are generally considered development successes (i.e., Indonesia, Vietnam, Algeria, Latvia, Myanmar, and Korea). The bottom five countries, indicated in red, are countries with severe conflict problems, and still with large poverty gaps (i.e., Central African Republic, Somalia, Timor-Leste, The Gambia, Republic of the Congo, and Dominica). The group of countries around the mean are mainly low-middle income countries (i.e., Panama, Lithuania, Zimbabwe, Turkey, and Guinea). From Figure 5, it is possible to verify that

Table 4: MEs and Individual Correlations

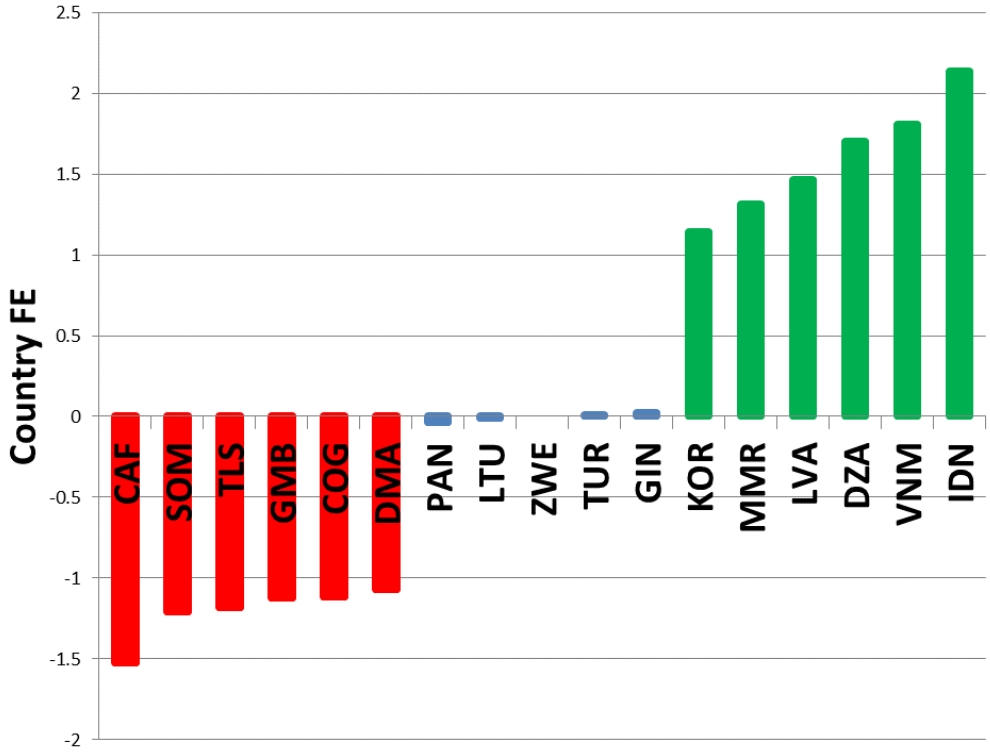
| Variables | (1) MEs | (2) MEs | (3) MEs | (4) MEs | (5) MEs | (6) MEs |
|---|---|---|---|---|---|---|
| Natural Sciences | −0.317* | | | | | |
| | (0.172) | | | | | |
| MBA | | 0.257* | | | | |
| | | (0.145) | | | | |
| Degree in Home Country | | | 0.0978* | | | |
| | | | (0.0501) | | | |
| Former IMF | | | | −0.316* | | |
| | | | | (0.197) | | |
| Publications | | | | | 0.00534* | |
| | | | | | (0.00327) | |
| Downgrade | | | | | | −0.353*** |
| | | | | | | (0.132) |
| Observations | 210 | 210 | 210 | 210 | 210 | 210 |
| Mean Dep. Var. | 0.03 | 0.03 | 0.03 | 0.03 | 0.03 | 0.03 |
| Std Dev. Dep. Var. | 0.745 | 0.745 | 0.745 | 0.745 | 0.745 | 0.745 |

*Note:* This table reports OLS estimates. The unit of observation is manager level and the standard errors in brackets are clustered at nationality level. MEs 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). Its mean and standard deviation are reported in the final two rows. The right-hand side variables are collected from managers' CVs. Natural Sciences is a dummy taking unit value if a manager studied for a bachelor degree in medicine, mathematics, biology, and chemistry. MBA is a dummy taking unit value if a manager completed a Master in Business Administration. Degree in Home Country is a count variable that counts the number of degrees a manager took in their own country. Former IMF takes unit value if a manager has past work experience with the International Monetary Fund. Publications is a count variable for the number of publications. Downgrade is a dummy variable, and takes unit value if a manager has been downgraded to a hierarchically lower position within their career. ***, **, and * indicate significance at the 1%, 5%, and 10% levels, respectively.

even if the confidence intervals are not small, the top 20% and bottom 20% (with few exceptions) can exclude a zero in their 5th or 95th percentile. Figure 6 shows the distribution of CEs, highlighting a substantial group of top performing countries, corresponding to a fat right-tail.

At this point, I inspect the long-run determinants of CEs. In Table 5, I regress the CE estimates over some of the most common institutional variables: a parliamentary democracy and high executive constraint dummy (Besley and Persson, 2011); slave trade (Nunn, 2008); ethnic fractionalization (Easterly and Levine, 1997; Alesina et al., 2003), legal origins (Acemoglu et al., 2001); the PIM index (Dabla-Norris et al., 2012). It is interesting to note that the CEs correlate as expected with all these variables: positively with parliamentary democracy in column (1), with high executive constraints in column (2), and with the PIM index in column (4), and negatively with slave trade in column (3), with ethnic fractionalization in column (4), and with legal origins in column (5). These results are in line with the expectation that countries with a high effect (productivity in public projects) have better institutions in the broad sense.

Figure 4: Bar Chart of Selected CEs




*Note:* This figure shows a bar chart of a selected sample of the CE distribution. The $y$-axis reports the point estimate of the CE from Table 1, column (1). The $x$-axis gives the rank of the country. The rightmost countries, coloured green, are classified in the top five countries (i.e., Indonesia, Vietnam, Algeria, Latvia, Myanmar, and Korea). The middle countries, coloured blue, are the five countries around the mean (i.e., Panama, Lithuania, Zimbabwe, Turkey, and Guinea). The leftmost countries, coloured red, represent the bottom five countries (i.e., Central African Republic, Somalia, Timor-Leste, The Gambia, Republic of the Congo, and Dominica).

### 3.2.3 Robustness Checks

In this section I provide additional evidence on the estimated MEs, by proposing an exercise analogous to that in Kane and Staiger (2008). By extracting the manager fixed effects from equation (1), I define a "manager effects" vector, $ME_m = \widehat{\iota_m}$, which I now use as a regressor in my analysis. Recalling the original model, equation (1),

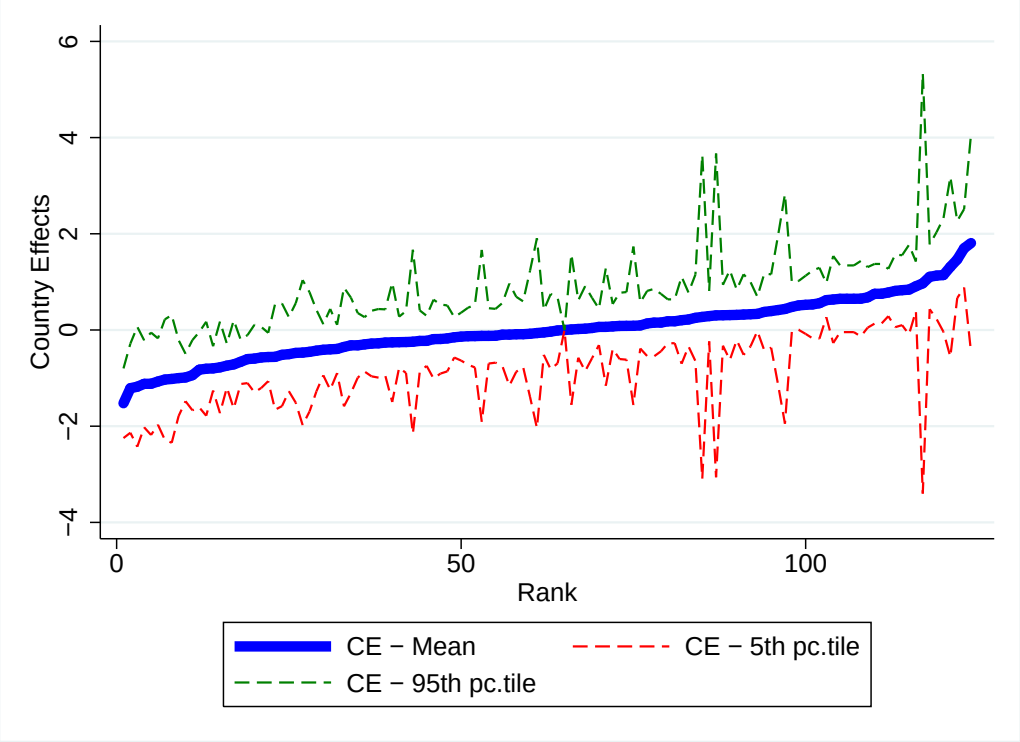
$$y_{imcst} = \alpha + \iota_m + \iota_c + \iota_s + \iota_t + \beta_1 \bar{y}_{ct-1} + X_{1imcst}\beta_2 + X_{2ct}\beta_3 + \varepsilon_{imcst}, \tag{4}$$

I define the ME vector $\widehat{\iota_m}$, which assigns to each manager a rating emerging from equation (4) and I define this as $ME_m$. In the following checks, I use this as a regressor, verifying how it changes at different levels of variation and introducing different controls. Therefore, the model employed for robustness checks follows

$$y_{imcst} = \theta ME_m + C_{imcst}\eta + u_{imcst}, \tag{5}$$

where the project success indicator, $y_{imcst}$, is run over the $ME$ estimates, $ME_m$, and a vector of controls, $C_{imcst}$, which includes all the previous variables $(\overline{y}_{ct-1}, \iota_c, \iota_s, \iota_t, \Psi_{i0})$ as well as new variables. Under the hypothesis that MEs estimated in Table 1, column (1), are consistent, then my null

Figure 5: 95% Confidence Intervals of CEs




*Note:* This figure reports a bar chart of the 95% confidence intervals for CEs. The $y$-axis shows the point estimate of the CEs from Table 1, 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; the upper green dashed line and the lower red dashed line represent the 95% confidence intervals of the point estimates. The two countries with a spike in their standard errors are Iran and Ivory Coast, which have a respective FE (and standard error of FE) of −0.310 (1.379) and 0.213 (1.792); their standard errors are twice as large as those of the other countries with the largest standard errors.

hypothesis is $\theta = 1$ for a vector $C_{imcst}$ and deviations of $\theta$ from the unit value can provide some insights on the direction of this bias.

Conceptually, 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 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 run equation (5) and test the null hypothesis $\theta = 1$ for the following cases.

1. Country–sector–year specifics. The MEs might be contaminated by an assignment that means that good managers are exposed to good countries/sectors in good years or good countries for good sectors. This selection would bias my estimates, because I would confound the ME with a dynamic matching effect. 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. Suppose that a manager's effort in a project depends on the past project performance of a country (e.g., there might be arguments

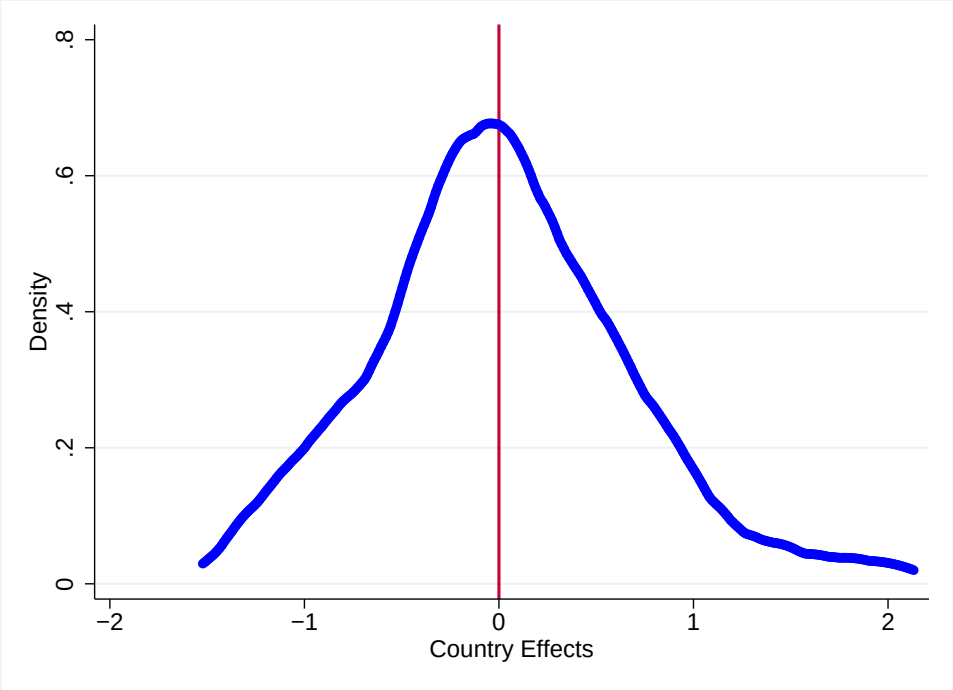
concerning political pressure or career concerns for which a manager would vary their contribution to a project as a best response to previous failing projects). For example, by exerting higher effort than usual after a failing project, a manager might increase their probability of receiving a promotion; or, after a failing project, a country might put pressure on the World Bank to provide a better manager. To address these claims, I control for an interaction between the ME and lag project outcome, because a standard omitted variable bias would arise. For this reason, I propose a set of regressions where I control for manager × lag project outcome and then introduce successive interactions (sector × project outcome, year × project outcome).

3. Control for country–manager and sector–manager pairwise FE. As a further robustness check, I run the standard regression, replacing CEs with country × manager and, in another form, with sector FE × ME. For the pairwise country–manager FE, I am verifying the within-country-manager cross-sector average contribution of a manager, while in the pairwise sector–manager FE, I verify the within-sector-manager cross-country variation.

The tests are applied to the following databases.

- The original sample comprises 3,385 projects executed in 127 countries, in 15 sectors, over 31 years, and with 697 managers. In this database, I can apply checks 1 and 2,but I do not have sufficient observations to apply check 3 for all countries. The standard errors are clustered at country level.
- For a large-country sample, I select the 10 largest recipients of World Bank operations, who

Figure 6: Density of CEs




*Note:* This figure shows the distribution of CEs. The $y$-axis describes the density of CEs, and it is noticeable that there is a fat right tail of high-performing countries.

Table 5: CEs and Institutional Correlations

| Variables | (1) CEs | (2) CEs | (3) CEs | (4) CEs | (5) CEs | (6) CEs |
|---|---|---|---|---|---|---|
| Parliamentary Democracy | 0.0803 | | | | | |
| | (0.181) | | | | | |
| High Executive Constraint | | 0.246* | | | | |
| | | (0.153) | | | | |
| Slave Trade | | | −0.0285*** | | | |
| | | | (0.0107) | | | |
| Ethnic Fractionization | | | | −0.467* | | |
| | | | | (0.255) | | |
| English Legal Origins | | | | | −0.605*** | |
| | | | | | (0.162) | |
| French Legal Origins | | | | | −0.399** | |
| | | | | | (0.159) | |
| PIM Index | | | | | | 0.414*** |
| | | | | | | (0.103) |
| Observations | 125 | 125 | 125 | 107 | 118 | 56 |
| Mean Dep. Var. | 0 | 0 | 0 | 0 | 0 | 0 |
| Std Dev. Dep. Var. | 0.651 | 0.651 | 0.651 | 0.651 | 0.651 | 0.651 |

*Note:* This table reports OLS estimates. The unit of observation is country level and robust 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 FE, including 24 controls and the mean lag project outcome, as presented in Table 1, column (1). 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 in a given year or if it presents high constraints on the executive (taken from Besley and Persson, 2011). These dummies are averaged over the time period of this analysis (1980–2012). Ethnic Fractionalization is a continuous variable between zero and one, defined as one minus the Herfindahl index of ethnic group shares, as in Alesina et al. (2003). The legal origin variables (English, French, Socialist, and German) are dummies taking unit value if a country's legal and judicial system are based on one of the countries in brackets, as in Acemoglu et al. (2001); the omitted dummy is English Legal Origins. 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 (as in Nunn, 2012), 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 elaborated by Dabla-Norris et al. (2012). ***, **, and * indicate significance at the 1%, 5%, and 10% levels, respectively.

register 743 of all projects overall. This allows me to apply tests 1, 2, and 3 through a country–manager pairwise FE, which is non-empty for 413 cases. The selected countries (and the number of their World Bank projects) are Brazil (123), Indonesia (121), Mexico (82), Pakistan (78), Colombia (74), Ghana (62), Morocco (60), Yemen (49), Philippines (47), and Tunisia (47). In this case, I do not cluster at country level, because of the low number of clusters, but rather at country–manager level.

In all three 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 plausible biases that I presented in tests 1–3 are likely to be in place, although their magnitudes might be small enough not to invalidate the previous findings. All

the tables can be found in Appendix F.

## 3.3 Evaluating a Reform

In this subsection, I explore the first-order gains that the World Bank would achieve by replacing the 10% worst-performing managers with average managers, and moving them to other administrative tasks. Before discussing any reform that might affect project success, I need to present the benchmark against which any alternative can be compared. For this purpose, I use the results from Table 1 and construct the predicted outcome of a project, $\hat{y}_{imcst}$:

$$\hat{y}_{imcst} = \hat{\alpha} + \hat{\iota}_m + \hat{\iota}_c + \hat{\iota}_s + \hat{\iota}_t + \hat{\beta}_1 \bar{y}_{ct-1} + X_{1imcst}\hat{\beta}_2 + X_{2ct}\hat{\beta}_3. \tag{6}$$

This indicates the success of project $i$ predicted in the presence of a manager $m$, in country $c$, in sector $s$, at time $t$, and by all project and country observables. In equation (6), the vector of MEs, $\hat{\iota}_m$, is key because it embeds the average manager contribution to a project. Therefore, a reform that affects the success of project $i$ by replacing manager $m$ with an alternative $m^*$ results only in a change of the ME vector $\hat{\iota}_m$ only for the row with project $i$. In this specific case, the row $i$ of the ME vector $\hat{\iota}_m$ is replaced with the FE of the new manager $m^*$.

In this way, I can construct alternative project success measures by introducing different manager rules. Here I focus only on one reform, $CR$, meant to increase the average rate of project success. This assigns all managers with an ME in the bottom 10% to a generic non-project bureaucratic task, and imposes in those projects the hiring of new managers with an average ME. Managers in the bottom 10% of the ME distribution add to the success rating of a project between $-1.08$ and $-2.49$ points: considering that the project outcome average is 4.1, then a manager in the bottom 10% reduces success by roughly 25%–60%.

The reform treatment group is composed only of those projects that are given a manager from the bottom 10%: in the counterfactual analysis, only these projects are passed on to an average manager, who presents a normalized ME of zero. Such a reform affects just 190 projects out of 2,240 (8.4%). All projects with a manager in the remaining part of the ME distribution are unaffected, and I am implicitly assuming that there are no general equilibrium effects of hiring new managers and moving old managers to other departments, and that there are no externalities in effort and motivation for existing managers. Therefore, the predicted outcome of a project in the presence of a reform, $\hat{y}^{CR}_{imcst}$, is given by

$$\hat{y}^{CR}_{imcst} = \hat{\alpha} + \hat{\iota}^{CR}_m + \hat{\iota}_c + \hat{\iota}_s + \hat{\iota}_t + \hat{\beta}_1 \bar{y}_{ct-1} + X_{1imcst}\hat{\beta}_2 + X_{2ct}\hat{\beta}_3 \tag{7}$$

where equation (7) differs from equation (6) only for the vector $\hat{\iota}^{CR}_m$, which equals its estimated counterpart $\hat{\iota}_m$. The sole exception is that I am substituting the lowest 10% values (between the 10th percentile, $-1.08$, and the lower end of the support, $-2.49$) with a zero, the average. Using this method, the gains in project outcome for those projects $i$ under the reform, $CR$, are

$$\Delta\hat{y}^{CR}_{imcst} = \hat{y}^{CR}_{imcst} - \hat{y}_{imcst}. \tag{8}$$

Table 6 provides the summary statistics of such a gain for the treated projects only, keeping in mind that the untreated projects record no change. Rows (1) and (2) present the summary statistics of these projects before and after the reform, respectively, and row (3) presents the difference between the two (i.e., the gain). The most important result is given by the substantial extent of the increase: on average, a project increases its success score by 1.476 points out of a pre-reform mean of 3.073, which is almost a 50% boost.

Table 6: Summary Statistics of a Reform ($CR$)

| Variables | Obs. | Mean | Std Dev. | Median | Min | Max |
|---|---|---|---|---|---|---|
| (1) Project Outcome: Predicted | 190 | 3.073 | 1.582 | 2.960 | −0.249 | 6.727 |
| (2) Project Outcome: $CR$ | 190 | 4.550 | 1.584 | 4.416 | 1.305 | 8.161 |
| (3) Project Outcome Gain: $CR$ | 190 | 1.476 | 0.340 | 1.407 | 1.075 | 2.491 |

*Note:* This table reports the summary statistics of gains in the outcome of those projects involved in the reform, $CR$. The Project Outcome Gain is defined as the difference between the new counterfactual project outcome minus the project outcome predicted by model (3). The reform, $CR$, simulates what would happen if the World Bank were to reassign the 10% worst-performing managers to non-project tasks and were to replace them with average managers. A description of the experiment can be found in the text.

### 3.3.1 Calculating the Economic Gains of a Reform

Here, I propose a calculation for the economic gains of the reform. Until this point, I have focused my attention on the project rating measure, $y_{imcst}$, as an ordinal measure of success, and have estimated the extent to which this variable would vary with the reassignment of managers/countries. Now, I go a step further and exploit information from the economic rate of return (ERR) of the project. These two variables are conceptually and intimately related. Table 7 highlights the fact that each additional point in the project outcome rating, which indicates a more successful project, does translate to roughly four extra points of ERR. Therefore, once the ERR definition is taken seriously, I can evaluate the economic gains of the two reforms and provide some million-dollar measure estimates. As Duvigneau and Prasad (1984) have formalized in a World Bank technical publication (for more details, also refer to Squire and Van der Tak, 1975), the 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.[10]

[10]Specifically, Duvigneau and Prasad (1984) indicate that the ERR "treats import duties, sales taxes, profit taxes, and other government levies (or subsidies) as internal transfers within the country and disregards them, since they do not affect the overall wealth of that economy. It also uses 'shadow prices' (see para 6.03 below) instead of domestic input and output prices, in case they do not adequately reflect the opportunity costs to the economy. For traded goods, shadow prices (or economic prices) are international (or world) prices at the border of the country (border prices) [...]. For non-traded goods (for example, land), the economic cost is defined as the value of net output foregone (when using that good in the best alternative use) as a result of using that good in the project. Use of shadow prices enables one to see beyond the effects of tariffs, exchange rates, interest rates, and wage rates, as well as administered prices, subsidies, and surcharges that distort a product's true scarcity value. It enables one to measure an investment's efficiency of using the resources of an economy, priced at border prices." The ERR differs from the financial rate of return (FRR) because this supposedly reflects the general equilibrium effects of a project. For this reason, the ERR of a project can largely exceed its FRR, if it alleviates some binding development constraints.

Table 7: ERR and Project Outcome

| Variables | Ex-post ERR | | |
|---|---|---|---|
| | (1) | (2) | (3) |
| Project Outcome | 4.803*** | 4.776*** | 3.706*** |
| | (0.841) | (0.846) | (0.913) |
| Country FE | Yes | Yes | Yes |
| Sector FE | Yes | Yes | Yes |
| Year FE | Yes | Yes | Yes |
| Manager FE | | Yes | Yes |
| Controls | | | Yes |
| Mean Dep. Var. | 23.6 | 23.6 | 23.6 |
| Observations | 840 | 840 | 840 |
| Adjusted $R^2$ | 0.361 | 0.369 | 0.873 |

*Note:* 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 country level. The ERR at the end of a project (i.e., ex-post ERR) is a continuous variable, defined in a World Bank technical paper by Duvigneau and Prasad (1984) as the economic merit of a project by accounting for the gains and costs caused by the project. Its mean is reported in the "Mean Dep. Var." row. Columns (1), (2), and (3) report the results of a regression of the ERR over country, sector, manager, and year fixed effects, including all the 24 previously used controls. The included controls are: at country level, the population, exchange rate, GDP per capita, the GDP share of consumption, government spending and investment, and population density; at project level, the size of the project in constant USD, the interest rate on the loan, the month of approval, two lending type dummies, and 15 lending instrument dummies. The two mentioned lending types are, specifically, "Investment", for projects characterized by funding for governments to cover specific expenditures related to economic and social development projects, and "Development Policy operations", which are types of projects aimed at the provision of direct budget support to governments for policy and institutional reforms aimed at achieving a set of specific development results. There are 15 mentioned lending instruments, which characterize different financial packages in which the projects are designed and delivered to countries (e.g., APL, FIL, and SAL). ***, **, and * indicate significance at the 1%, 5%, and 10% levels, respectively.

Using the results presented in Table 6, I can calculate how the reform affects the generation of the ERR. Recalling that the replacement of managers (i.e., the reform, $CR$) resulted in an increase in the project success rating for each project (on average, 1.476 points), then the average increase in ERR for the 190 projects $j$ treated by this core reform is

$$\triangle\overline{ERR}^{CRj} = \triangle\overline{ERR} \times \triangle\overline{Success}^{CR}.$$

By exploiting the results of Table 7, I can construct this counterfactual ERR gain as the product of the marginal effect of an increase in project success on ERR (3.706 from column (3) of Table 7), $\triangle\overline{ERR}$, times the average gain in project success generated by the reform, $\triangle Success^{Tj}$. This leads to the following:

$$\triangle\overline{ERR}^{CR} = 3.706 \times 1.476 = 5.470 \in [2.829, 8.111].$$

Therefore, the reform increases the average ERR of treated projects by 5.470 points, with a 95% confidence interval shown in brackets (which accounts for the standard errors of the impact of project outcome on ERR). Recalling that the average ERR of a project is 23.6 percentage points, this implies a 23% increase.

I can also define the economic gains of project $i$ led by manager $m$ in country $c$ in sector $s$ at time $t$, $Gain_{imcst}$ ,

$$Gain_{imcst} = (ERR_{imcst} - Int.Rate_{imcst}) \times Amount_{imcst},$$

as the product of its economic rate of return, $ERR_{imcst}$, minus the interest rate of the project, $Int.Rate_{imcst}$, times the constant million-dollar amount of the project, $Amount_{imcst}$. It is important to highlight that because in the definition of ERR given by Duvigneau and Prasad "interest charges are excluded", I subtract these from the definition of gains.

Unfortunately, ERRs are only available for 840 of the projects in my sample (37.5%), and for this reason I cannot extend the previous calculation without further work. Under the assumption that the projects with an available ERR are a representative sample, I can construct a predicted ex-post ERR using the coefficients of Table 7, column (3). Hence, I have an empirical analogue available for all projects, $\widehat{ERR}_{imcst}$.

Because all the required information is available, I can calculate the overall economic gains of the reform $CR$ by summing the economic gains of each individual project

$$Gain^{CR} = \sum_i (\widehat{ERR}^T_{imcst} - Int.Rate_{imcst}) \times Amount_{imcst}, \tag{9}$$

where the ERR of project $i$ varies for those projects that are treated by the reform $CR$. This calculation gives rise to the figures reported in Table 8. Row (1) reports the aggregate economic gains by using the observed interest rates, project amounts, and predicted ERRs, while Row (2) shows the aggregate gains once the 10% worst-performing managers are replaced with their means. The "Total Gain" column indicates a figure in billion constant dollars of the economic returns generated by World Bank projects in my sample, with its 95% confidence interval presented in the next column. In order to have some quantitative interpretation of these reforms, the column "% Increase" shows the percentage increase in the total gains by introducing the reform (i.e., 3.7%). As a reference, I also present the column "Total Spending", which shows an aggregate figure of the whole resource spent by the World Bank. Comparing the gains with the spending, we can define the ratio as how many dollars the World Bank produces by lending one dollar to a country. In this case, we can see from my sample that the World Bank produces 12.8 constant dollars of net returns for every 100 dollars lent to a country, which increases to 13.3 after the reform[11].

[11]One possible concern might be that by using the predicted ERR for projects without a published rate, I might be treating analogously very different projects. Indeed, looking at Figure E1 in Appendix E, it is noticeable that most of the projects with unpublished figures tend to record negative rates of return. For this reason, I perform the same exercise in Table E1, under two alternative assumptions for projects with a missing ERR. In the upper panel, I replace all projects with a negative ERR with a zero; in the lower panel, I replace all negative figures with the mean ERR. These produce the obvious effect of inflating the figure of the total gains produced by the World Bank by three and five times, respectively. Correspondingly, this reduces the percentage extent of the reform, from a 4% increase in Table 8 to an increase between 3% and 0.2% in Appendix E. Clearly, the absolute estimate of the increase in the gains generated by the World Bank does not change, whichever accounting device is used (i.e., 0.8 billion USD).

Table 8: Economic Gains of a Reform

| Variables | Projects | Total Gain | 95% Interval | % Increase | Total Spending |
|---|---|---|---|---|---|
| (1) Economic Gains: Predicted | 2,240 | 21.895 | | | 170.216 |
| (2) Economic Gains: Reform | 2,240 | 22.697 | [22.309, 23.084] | 3.7% | 170.216 |

*Note:* This table reports the economic gains generated by the World Bank, using equations (7) and (9). Row (1) reports the observed economic gains, while row (2) reports the counterfactual gains by respectively replacing the 10% worst-performing managers and countries with their respective means. The column "Total Gain" (expressed in billions of constant USD) reports the aggregate sum of economic gains in all World Bank projects. The column "95% Interval" reports the 95% confidence interval of the Total Gain, where instead of multiplying the project outcome gain by the point estimate of Table 7, column (3), I use the 95% confidence interval of this estimate. The column "% Increase" reports the percentage increase in economic gains by applying the reform of manager reassignment. "Total Spending" accounts for the aggregate World Bank spending on all projects, in billions of constant USD.

### 3.3.2 Cost–Benefit Analysis

Here, I report a cost–benefit analysis of this intervention, comparing the gains of the core reform with its cost. While the gains have already been explained, the costs comprise two components: the hiring and search costs for 66 additional average managers. From the 2013 World Bank Annual Remuneration Disclosure Note,[12] it can be seen that a manager costs roughly 300,000 USD per fiscal year, composed of a tax-free average salary of 188,958 USD, and other benefits (e.g., health insurance, termination benefits, family allowances) amounting to 108,027 USD.

In order to provide a lower-bound (and upper-bound, in brackets) estimate of hiring costs, I consider for all managers a payment period of 8 (16) years, which means that they are hired at the age of 54 (46) and paid until the mandatory World Bank retirement age of 62. This leads to a lower-bound (upper-bound) scenario of hiring costs for all 66 managers totaling 178 (376) million USD.

Regarding the search costs, I assume that in the lower-bound (upper-bound) case the search for an average manager costs one (three) full yearly manager salary. This means that 19.8 (59.4) million USD are dedicated only to search costs. In Table 9, I report a synthetic summary of the overall cost–benefit analysis of this reform, considering the 95% confidence interval bounds (in the upper- and lower-bound columns). On average, this reform delivers 624 million USD under a moderate scenario, and 426 under an extreme scenario; under no circumstances is the reform not viable, and the gains are always strictly positive and included in a range between 38 and 1,011 million constant USD.

### 3.3.3 The Results of a Reform

In this section I take stock of the results of the reform in analysis. The objective of this exercise is to improve the results achieved by the World Bank by assigning the 10% worst-performing managers to

[12]Refer to the following World Bank document, `http://siteresources.worldbank.org/EXTANNREP2013/Resources/9304887-1377201212378/9305896-1377544753431/Remuneration.pdf`.

Table 9: A Cost–Benefit Analysis of a Reform

| Variables | Projects | Average | Upper Bound | Lower Bound |
|---|---|---|---|---|
| Panel A: Lower-Bound Scenario of Hiring Cost | | | | |
| (1) Gains of the Reform | 2,240 | 802 | 1189 | 414 |
| (2) Costs of the Reform | 2,240 | 178 | 178 | 178 |
| (3) Total | | 624 | 1,011 | 236 |
| Panel B: Upper-Bound Scenario of Hiring Cost | | | | |
| (4) Gains of the Reform | 2,240 | 802 | 1189 | 414 |
| (5) Costs of the Reform | 2,240 | 376 | 376 | 376 |
| (6) Total | | 426 | 813 | 38 |

*Note:* This table reports the cost–benefit analysis gains of the reform affecting the World Bank. Panels A and B report different scenarios on the costs of the reform, under moderate and extreme scenarios, respectively. Rows (1) and (4) report the gains of the reform, as calculated in the previous sections, rows (2) and (5) report the costs of the reform including both the hiring and search costs, while rows (3) and (6) report the sum of these two. The Average column expresses the average costs and benefits of the reform. In the Upper Bound and Lower Bound columns, I introduce the 95% confidence interval bound estimates for the gains. All figures are expressed in constant international 2005 million USD.

non-project bureaucratic tasks, and replacing them with average managers. Because several economic indicators are available at project level (the USD amount of each project, its interest rate, the ERR, etc.), I can account for the benefits and the costs of such reform.

It is important to notice that given the available sample, such reform affects relatively few under-performing managers and projects, respectively only 66 and 190. I find the following results.

First, projects in which an under-performing manager is replaced by an average manager experience on average a 50% increase in their success rating (as measured by the project outcome variable, from 1.476 points out of a pre-reform mean of 3.073). Secondly, such increase in project performance maps into an average increase in the economic rate of return of treated projects by 23% (the reform leads to 5.470 average points added to treated projects, compared to a mean of 23.6 points). Thirdly, higher returns on projects translate in the creation of an additional 800 million USD of returns generated by the World Bank, corresponding to a 3.7% increase. Finally, by consulting World Bank documentation, I am able to provide plausible cost scenarios to evaluate the viability of the reform, which would deliver net gains of 624 (426) million USD under a moderate (extreme) cost scenario, with the range included between 38 and 1,011 million USD[13].

[13]Given that my sample spans across several countries and years, these results are to be considered a counterfactual aggregated lump-sum generation. An appropriate interpretation of these results could be the following: "the World Bank would have generated additional 624 million USD between 1980 and 2010 by replacing the bottom 10% under-performing managers with average managers, caeteris paribus".

# 4 Manager and Country Assignment

## 4.1 Theoretical Framework

In this section I study the assignment of managers to countries, and I focus on the role of institutional risk aversion. My approach captures a first-order feature of the manager allocation problem and ample official documentation and articles point to this feature being central in the institutional culture at the World Bank[14].

### 4.1.1 Environment

A planner (i.e., the World Bank) has access to $N$ managers and decides their assignment to $N$ countries. All of these are endowed with a given measure of performance in generating project returns, which is constant, fixed per individual and does not respond to the performance of the assigned country. This is conceptually equivalent to the ME described in the previous sections, and this is perfectly observable to the planner. Manager performance is described by $m_i$, and ordered so that the $N$th manager presents a higher performance than the $N-1$th manager, the $N-1$th presents a higher performance than the $N-2$th, and so on. Hence, $m_N > m_{N-1} > \ldots > m_1$. Analogously, country performances are described by $c_j$, are fixed and unchangeable and the same normalization follows $c_N > c_{N-1} > \ldots > c_1$. However, the planner observes in every period a noisy performance for countries, and therefore $c_{jt} = \widetilde{c}_j + \varepsilon_{jt}$ and $\varepsilon_{jt} \sim$ i.i.d.$(0, \sigma^2)$. I simplify the dynamic allocation as a repetition of static problems, and therefore in the remaining sections I omit the subscript $t$. In addition to this, I normalize both performances so that the average manager and country performance equals zero:

$$\overline{m} = \sum_i \frac{m_i}{N} = 0 \qquad \text{and} \qquad \overline{c} = \sum_j \frac{c_j}{N} = 0.$$

This assumption simplifies the modeling and allows an interpretation of MEs and CEs in the following sections.

There are two stages in this game. First, the planner assigns manager $i$ to country $j$, indicated as $m_{i,j}$. Secondly, the project is successful with probability $\pi$, and hence they generate returns in a project with a linear technology $y_{i,j} = m_{i,j} + c_j$; otherwise, the project fails, and with probability $1-\pi$ such returns are zero.

Planner preferences are described by a quadratic Bernoulli with risk parameter $\beta$ over total returns, $Y = \sum_j y_{i,j}$, $U(Y) = Y - \beta Y^2$. Because manager and country performances are normalized to zero, this expression simplifies only to the variance component of project returns; in Appendix A,

[14]For example, the World Development Report 2014 (World Bank, 2014) specifically addresses the issue. In fact, "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". This is indeed consistent with anecdotal evidence on the internal bureaucratic practices that encourage risk aversion from an institutional perspective: "as the (project approval) process has evolved over time, it has accrued layers of bureaucracy that require staff to 'bullet-proof' their projects before these even make it to the approval stage" (Stephens, 2014). However, this is not the only possible explanation in line with the empirical results. Other explanations are admissible and possibly co-existent. For example, the results could be rationalized through a purely technological story: a submodularity in the project return production function with respect to MEs and CEs.

I show that this is described by $V(Y) = (1/N)\sum_j \pi y_j^2$. Therefore, the optimal allocation of manager $i$ to country $j$ emerges from

$$\max_{m_i} -\beta\,\pi\,\frac{1}{N}\sum_j (m_{i,j} + c_j)^2.$$

In this setting, the planner risk attitude, $\beta$, governs the assortative matching of the allocation:

$$\{m_{i,j}, c_j\} : i, j = \begin{cases} lli, N+1-i & \text{if} \quad \beta > 0 \quad \text{(negative assortative match)} \\ i, \forall j & \text{if} \quad \beta = 0 \quad \text{(undetermined match)} \\ i, i & \text{if} \quad \beta < 0 \quad \text{(positive assortative match).} \end{cases}$$

Thus, the couple $\{m_{i,j}, c_j\}$ is assigned through a negative assortative matching rule if the planner is risk averse ($\beta > 0$), through an undetermined rule if the planner is risk neutral ($\beta = 0$), and through a positive assortative matching if risk loving ($\beta < 0$). In this context, I proceed under the assumption that the planner is risk averse and verify this prediction empirically.

The board is introduced as a set $B$ of $N/2$ countries, which are randomly assigned to oversee the planner (Adams and Ferreira, 2007). Access to the board changes the incentives for the planner, and I model this in a reduced form through a lump-sum transfer, $\tau$, going from countries not on the board $B^C$, to countries in $B$. The parameter $\tau$ can have two interpretations, as follows.

1. Rent-seeking – a planner needs to purchase board support to implement actions, and this generates a menu-auction problem (Bernheim and Whinston, 1986; Grossman and Helpman, 1994), which leads to transfer resources toward countries sitting on the board.

2. Technology – countries sitting on the board might be more open to work with the planner, and such increases in communication might lead to a change in returns, justifying the alteration in the optimal allocation.

Given this transfer, whichever justification is taken, the problem presents an important change: the new overall returns are still equal to the previous returns because of linearity, $\widetilde{Y} = Y$. However, the variance of project returns differs and the new problem can be written as

$$\max_{m_i} -\beta\,\pi\,\frac{2}{N}\sum_{j\notin B}(m_{i,j} + c_j + \tau)^2 - \beta\,\pi\,\frac{2}{N}\sum_{j\in B}(m_{i,j} + c_j - \tau)^2.$$

This makes the new allocation dependent on whether a country sits on the board. Therefore, under the risk-aversion assumption, the new allocation is described by

$$\{m_{i,j}, c_j\} \;:\; i, j = \begin{cases} lli, f(\tau, N+1-i) & \text{if} \quad c_j \in B \\ i, f(-\tau, N+1-i) & \text{if} \quad c_j \notin B \end{cases}.$$

This is still negative assortative, but the transfer $\tau$ generates a board premium in the manager's assignment, described by the parameter $\tau$ and the function $f(.)$. To clarify the intuition behind this result, the main proposition is given here, and Appendix D reports a short example.

**Proposition 1** *The optimal allocation of a planner assigning manager $i$ to country $j$ results in: (a) a negative assortative matching rule if risk averse ($\beta > 0$); (b) a manager board premium for countries sitting on the board ($j \in B$), (c) such a premium increasing in the extent of the transfer, $\tau$.*

## 4.2 Empirical Model

At this point, given that the manager and country performances are estimated through MEs and CEs, I can bring the proposition to the data. To do so, I join the MEs and CEs from the 2,240 sample to the 3,385 sample, which includes projects for countries sitting on the World Bank board. I aggregate the MEs at country–year level and analyze the following expression:

$$ME_{cgt} = a_1 + b_1\, Board_{cgt} + c_1\, CE_{cg} + X_{2cgt} d_1 + \iota_g + \iota_t + \varepsilon_{cgt}. \tag{10}$$

Here, the average ME of country $c$, belonging to constituency group $g$ in year $t$, $ME_{cgt}$, is regressed over a board dummy taking unit value when a country $c$ in constituency $g$ in year $t$ sits on the board, $Board_{cgt}$. The level of analysis is at constituency level, and this is embodied by the use of a constituency and year fixed effect, $\iota_g$ and $\iota_t$, respectively. The country heterogeneity is caught through two components: the country effect, $CE_{cg}$, which is constant per country over time and is supposed to catch the direction of manager–country matching, and a few country time-varying controls (GDP per capita, population, exchange rate) $X_{2cgt}$. The core coefficients are $b_1$ (to explore whether board access matters) and $c_1$ (to understand the direction of the assignment).

## 4.3 Board Election and Exogenous Variation

Before continuing to the empirical results, I need to mention a key institutional feature. World Bank countries, both donors (i.e., high income) and clients (i.e., middle and low income), are allowed to supervise the operations of the World Bank President and senior management. For this purpose, they are joined in relatively small groups, called constituencies, which meet every two years, hold a simple-majority election, and vote two countries for a board seat: one as Executive Director and another as Alternate Executive Director.[15] By looking at the composition of constituencies, it is clear that the allocation of a country to a group is not random, because there are some clear determinants of constituency selection (e.g., geography, World Bank access year, international status). As is clear from the previous section, in this analysis I exploit only variation at the level of a country within a constituency. Indeed, there is no country fixed effect in equation (8), because this absorbs the estimated CEs, preventing an understanding of the assignment rule.

[15] At least one of these participates in board meetings, with the Alternate Executive Director enjoying voting power only if the Executive Director is absent. In this work, I do not distinguish between the two, as both can supervise and provide their input into a variety of World Bank internal affairs. It is also possible that one country enjoys both positions, although this is generally unlikely. For more details on the procedure, refer to the World Bank's information on "Election or Appointment of Executive Directors" at `http://web.worldbank.org/WBSITE/EXTERNAL/EXTABOUTUS/ORGANIZATION/BODEXT/0,,contentMDK:20124813~pagePK:64020054~piPK:64020408~theSitePK:278036,00.html`.

As mentioned in the introduction, I exploit board election procedures to provide some plausibly exogenous variation in board access. Constituencies are characterized by a differing number of countries and different long-term agreements governing the rotations in the World Bank board (Martinez-Diaz, 2008). While all countries belonging to the 17 voting constituency groups can competitively campaign to reach a board seat, a completely different scenario emerges once a country that has served on the board in the past term tries to be re-elected.

While, in principle, a country serving on the World Bank board should exercise control also on behalf of all other countries in its electoral constituency, this is seldom the case, and there is ample evidence of conflict of interest in this respect.[16] In particular, if a country manages to obtain a board seat for a second term, this can be particularly valuable both because it is possible to influence decision-making and because procedural knowledge of board functioning can provide a strong comparative advantage over newcomers to the board. For example, it is explicitly acknowledged that the longest serving executive director enjoys the title and duties of Dean of the board.[17] In such a capacity, the Dean enjoys strong ties with the President (e.g., the Dean is responsible for negotiating the terms of the Dean's contract), and has strong agenda-setting power in central board committees.

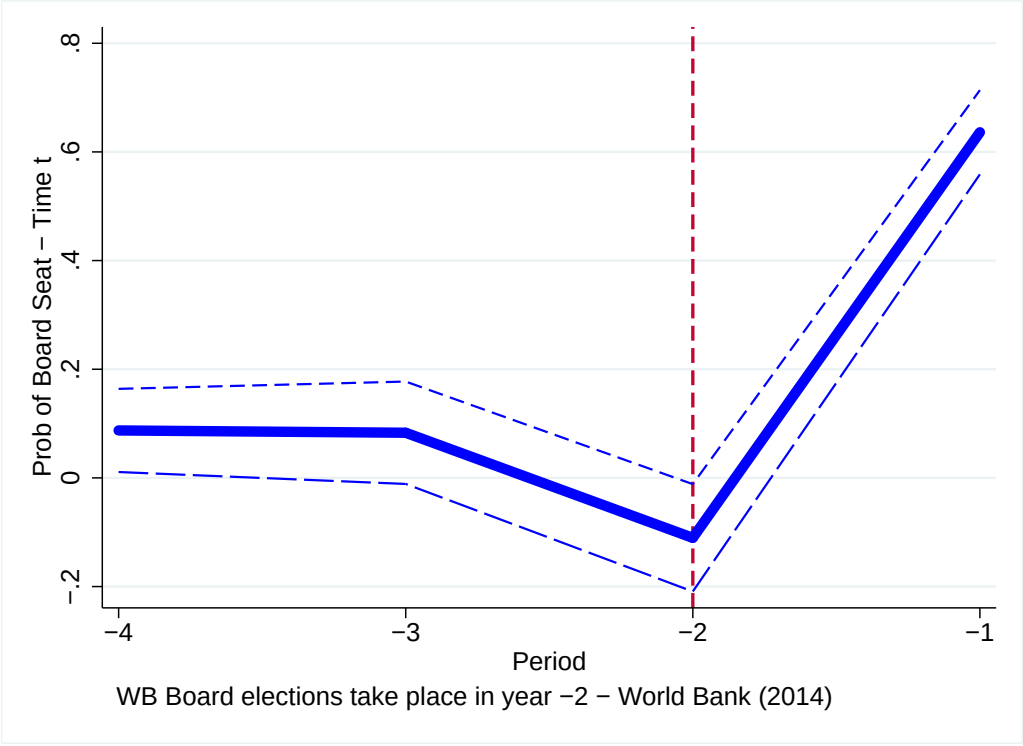
Given the important role emerging from re-election, constituency groups have established some diplomatic norms through long-term agreements on the extent that countries are allowed to run for a second consecutive term. Figure 7 shows the probability that country $c$ belonging to constituency $g$ sits on the board at time $t$, given that it was sitting on the board during the previous year $(-1)$, two years before $(-2)$, and so on. Because of the two-year board mandate, it is clear that sitting on the board at time $t-1$ predicts period $t$ well.[18] It is also expected that being on the board four and three years ago has a negligible effect on current sitting. However, it is less obvious that if a country was actually sitting on the board in the previous term (i.e., time $t-2$), then it is 10% less likely to

[16]For instance, the Zedillo Report (Zedillo et al., 2006) highlighted that "the current (World Bank) governance arrangements create strong incentives for (board) Directors to prioritize only their duties as the representatives of governments" (Zedillo et al., 2006, p. 32), and especially, concerning the possible transfer of resources aimed at securing for the World Bank President and Senior Management a strong support in the board, "senior Management has a strong incentive to ensure that the board approves Management proposals quickly and with few changes" (Zedillo et al., 2006, p. 31). Analogous incentives seem to be in place at the IMF, where a 2008 survey (not taken at the World Bank) showed that 68% of former board members admit a conflict of interest in decisions between government interest and the IMF's institutional mission. However, in this work, I take a normative-free stance on the role of boards, and only explore the allocation change that might arise when a country is simultaneously a client and a controller of the lender.

[17]Further information from the Dean of the Board is provided through the page of the current Dean, Kuwait Executive Director, Mr Merza Hussain Hasan. "Our Executive Director is the Dean of the board of Executive Directors. The Dean of the board of Executive Directors is by practice the longest serving, full-time Executive Director. The responsibilities of the Dean include the negotiation of the terms and conditions of the contract of the President along with the Co-Dean. In addition, the Corporate Secretary consults with the Dean during the process of informal consultations to select members of the board Ethics and Standing board Committees. The Dean also chairs the meetings of the Steering Committee, which is the meeting of Executive Directors with Senior Management to set the board's work program and organizes meetings for Executive Directors among themselves or with Management, the UN or other high level experts to exchange views informally. The Dean and Co-Dean of the board also coordinate with the Dean of the Fund's board on matters of mutual interest such as the Annual Meetings, the remuneration of the heads of the two institutions, and corporate governance issues." This information was accessed on October 2, 2015, and is available at `http://www.worldbank.org/en/about/leadership/directors/eds11`.

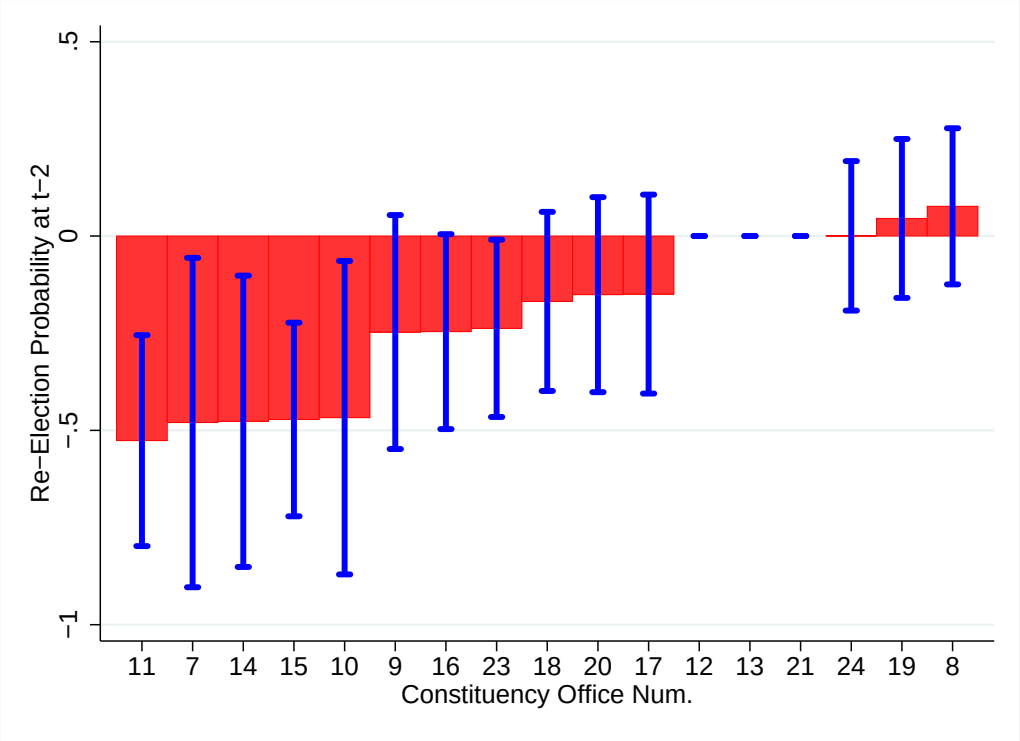
[18]The point estimate of this probability is 0.6, rather than 1, because there are cases in which a board member may step down – some members are recalled to join their own countries' governments or other organizations, and some voluntarily quit.

Figure 7: Probability of Board Election given Previous Board Experience




*Note:* This figure reports the probability that a country $c$ belonging to constituency group $g$ sits on the board at time $t$, given that it served on board in the previous year ($-1$), two years before ($-2$), and three and four years earlier ($-3$ and $-4$). These probabilities emerge from a regression where I control for a constituency and year fixed effect and country–year controls (GDP per capita, population, exchange rate).

Figure 8: Board Re-Election and Constituency Heterogeneity




*Note:* This figure reports the probability of election for a country $c$ belonging to constituency group $g$ that sat on the board at time $t-2$. This emerges by regressing the country board dummy at time $t$ over the corresponding dummies at $t-1$, $t-2$, $t-3$, and $t-4$, and an interaction between the $t-2$ dummy and constituency group fixed effects, plus constituency and time fixed effects. As clear from the text, the probability of re-election is partitioned into three groups: in the left-most group (constituencies numbered 11, 7, 14, 15, and 10), a country who sat on the board at $t-2$ is 50% less likely of sitting on the board at time $t$; in the central group (numbers 9, 16, 23, 18, 20, 17, and 12), this probability drops to 20%; for the remaining group, there is no statistically detectable difference between countries who sat on board at $t-2$ and those who did not.

sit on the board compared to other countries belonging to the constituency group.

I argue that such negative correlation is due to the different diplomatic norms at constituency level. Indeed, once I control for the heterogeneity of re-election norms at time $t-2$, the negative effect becomes positive in the point estimate but not statistically different from zero, as shown in columns (3) and (4) of Table 10. The heterogeneity in board re-election is displayed in Figure 8, showing that the negative effect is fully given by a few constituencies that present lower probabilities of re-election for their countries: there are five constituencies in which a country previously sitting on the board is 50% less likely than others to be elected; in the other six, this probability is 20%, while for the remaining six, the election is open and competitive at all times.

Therefore, my first stage to instrument board access is given by the following equation,

$$Board_{cgt} = \alpha + \beta\, Board_{cgt-2} + \sum_{g} \gamma_g Board_{cgt-2} \times \iota_g + X_{2cgt} d + \iota_g + \iota_t + \varepsilon_{cgt},$$

in which the probability that a country $c$ in constituency group $g$ sits on the World Bank board at time $t$, $Board_{cgt}$, is regressed over a dummy for board access in the previous term, $Board_{cgt-2}$, and an interaction between this variable and the constituency group fixed effect, $Board_{cgt-2} \times \iota_g$, the set of

Table 10: Board Access and First Stage: OLS

| Variables | Board ($t$) | | | |
|---|---|---|---|---|
| | (1) | (2) | (3) | (4) |
| Board $t-1$ | 0.647*** | 0.617*** | 0.604*** | 0.569*** |
| | (0.0380) | (0.0394) | (0.0403) | (0.0417) |
| Board $t-2$ | −0.113** | −0.130*** | 0.145 | 0.189 |
| | (0.0484) | (0.0474) | (0.124) | (0.121) |
| Board $t-3$ | 0.0975* | 0.0774 | 0.0639 | 0.0423 |
| | (0.0504) | (0.0498) | (0.0510) | (0.0495) |
| Board $t-4$ | 0.105*** | 0.0751** | 0.0695* | 0.0356 |
| | (0.0391) | (0.0382) | (0.0390) | (0.0379) |
| Board $t-2$ × Constituency FE | | | Yes | Yes |
| Constituency FE | Yes | Yes | Yes | Yes |
| Year FE | Yes | Yes | Yes | Yes |
| Controls | | Yes | | Yes |
| Observations | 1,347 | 1,347 | 1,347 | 1,347 |
| Test | | | 0.000*** | 0.000*** |
| Adjusted $R^2$ | 0.426 | 0.441 | 0.442 | 0.459 |
| Mean Dep. Var. | 0.182 | 0.182 | 0.182 | 0.182 |
| Std Dev. Dep. Var. | 0.386 | 0.386 | 0.386 | 0.386 |

*Note:* This table reports OLS estimates. The unit of observation is country–year level and standard errors in brackets are clustered by country × year. Columns (1) and (3) report unconditional results, while in columns (2) and (4) I control for population, GDP per capita, and exchange rate. Board $t$ takes unit value if country $c$ in constituency $g$ sits on the World Bank board in year $t$, and analogously board $t-1$, $t-2$, $t-3$, and $t-4$. In all regressions I control for constituency and year fixed effects. In columns (3) and (4), I include an interaction between board $t-2$ and the constituency fixed effect in order to measure the heterogeneous probability in board re-election, established by diplomatic norms. The estimates of column (4) of such interactive fixed effects are reported in Figure 8. ***, **, and * indicate significance at the 1%, 5%, and 10% levels, respectively.

country time-varying controls, a constituency group and year dummies, $\iota_g$ and $\iota_t$. The fundamental driver for identification is given by $Board_{cgt-2} \times \iota_g$ because it accounts for the heterogeneity in re-election norms.

My exclusion restriction rests on the assumption that conditional on a country's assignment to a constituency and other controls, the heterogeneous diplomatic norms in a constituency have no effect on the current manager's assignment to a country, except through the re-election probability this country enjoys in the constituency. A major concern here would be that the heterogeneous re-election probabilities in a constituency are correlated with its bargaining power with the World Bank and, hence, I am simply capturing its impact on a manager's assignment. I believe this is unlikely for at least three reasons. First, constituencies do not have other formal ways of voicing their opinion to the World Bank administrative bodies, except through their board members. Second, among the 25 constituency groups, those holding elections enjoy, generally, less bargaining power with the World Bank. In fact, the strongest constituencies in terms of voting power are the eight single-country constituencies, which appoint their board members directly – they enjoy a total vote share

of 46.59%,[19] equivalent to an average share of 5.8% per country. In contrast, the remaining 17 constituencies enjoy a substantially lower vote share (i.e., 3.1% per constituency group), which then is further diluted in single-country vote shares. Third, because in the computation of the CEs I am excluding all countries that permanently sit on the World Bank board, this analysis excludes countries that may have strong bargaining power with the World Bank (China, India, Russia, Bangladesh, and Argentina).

## 4.4 Results

Table 11 presents the core results, with columns (1) and (2) reporting the OLS estimates, while columns (3) and (4) report IVs; columns (1) and (3) report unconditional results, while in columns (2) and (4) I also report controls. First, it is evident that a country sitting on the World Bank board seems to enjoy managers with a higher effect in all cases. Secondly, there emerges evidence of negative assortative matching, with the sign of the CE variable being unambiguously negative and statistically different from zero.

Concerning the difference between the OLS and IV estimates, the latter are 40%–70% larger than the OLS, which might be entirely due to a local average treatment effect (LATE): this IV captures variation in assigned managers for countries that enjoy a seat on the board for a second period. Because institutional experience might give a stronger leverage for countries in manager assignment, this coefficient is expected to be larger. The board and CE magnitudes highlight that a country with a full point of FE above the average can eliminate the negative assortative matching by sitting on the World Bank board. As a relatively secondary point, it is important to highlight that because the CE is a generated regressor, I use the Murphy and Topel (1985) correction for the standard errors through a bootstrapping procedure.[20]

### 4.4.1 An Additional Prediction of the Model

While Proposition 1(a) and (b) are brought to the data through Table 11, here I extend Proposition 1(c) to the data. Conceptually, I assume that the transfer decreases in the number of countries belonging to the constituency, $\tau(n_g)$. This is based on the fact that the leverage of a board member

[19] These countries are the United States of America (16.12%), Japan (7.47%), China (4.82%), Germany (4.37%), France (3.92%), United Kingdom (3.92%), Saudi Arabia (3.02%), and Russia (2.95%). For data regarding International Bank for Reconstruction and Development (IBRD) vote share in 2013, refer to `http://siteresources.worldbank.org/BODINT/Resources/278027-1215524804501/IBRDEDsVotingTable.pdf`.

[20] The generated regressor problem emerges when a right-hand side variable is generated through a previous regression. Because this regressor includes a point estimate and a standard error, the OLS estimator yields consistent estimates but invalid standard errors, as highlighted by Pagan (1984) and Murphy and Topel (1985). Statistical inference based on such standard errors tends to reject the null hypothesis. For this reason, I follow the approach proposed by Murphy and Topel, using a two-step bootstrapping algorithm to compute the standard errors of this regression; this is also in line with the work of Ashraf and Galor (2013). The bootstrap procedure is as follows. (1) In the first stage, a random sample with replacement is extracted, containing 90% of the observations. (2) This sample is used to derive a vector for MEs and CEs, as shown in Table 1. (3) Points 1 and 2 are repeated 1,000 times, leading to 1,000 vectors of MEs and CEs. (4) For each ME and CE vector, the second-stage regression presented in Tables 10 and 11 is run on a random sample, containing 90% of the observations, and these coefficients are stored. (5) This procedure is repeated 1,000 times also in the second stage. (6) The standard deviation of each coefficient from the second-stage stored distribution is used as the bootstrapped standard error for each variable.

Table 11: Manager–Country Assignment: Country-Level Evidence

| Variables | Manager Effects | | | |
|---|---|---|---|---|
| | OLS | | IV | |
| | (1) | (2) | (3) | (4) |
| Board | 0.182*** | 0.152*** | 0.317*** | 0.215* |
| | (0.033) | (0.031) | (0.083) | (0.094) |
| CEs | −0.238*** | −0.261*** | −0.252*** | −0.262*** |
| | (0.037) | (0.037) | (0.037) | (0.036) |
| Constituency FE | Yes | Yes | Yes | Yes |
| Year FE | Yes | Yes | Yes | Yes |
| Controls | | Yes | | Yes |
| Observations | 1,347 | 1,347 | 1,347 | 1,347 |
| First-Stage AP $F$ | | | 45.63*** | 23.11*** |
| Adjusted $R^2$ | 0.0721 | 0.0764 | 0.0663 | 0.0753 |
| Mean Dep. Var. | 0.0107 | 0.0107 | 0.0107 | 0.0107 |
| Std Dev. Dep. Var. | 0.661 | 0.661 | 0.661 | 0.661 |

*Note:* This table reports OLS estimates in columns (1) and (2) and IV estimates in columns (3) and (4). The unit of observation is country level and standard errors in brackets are corrected using the Murphy and Topel (1985) procedure through bootstraps. Columns (1) and (3) report unconditional results, while in columns (2) and (4) I control for population, GDP per capita, exchange rate, interest rate, IBRD projects, and approval month. Manager Effects denotes the vector of fixed effects (FE) extracted from a regression of Project Outcome as presented in Table 1, column (1). The MEs are then aggregated at country–year level, while the CEs are country-specific and time-invariant. The mean and standard deviation of the left-hand side variables are reported in the final two rows. Board is a dummy variable taking unit value if a country $c$ belonging to constituency group $g$ sits on the board in year $t$, and zero otherwise. In the IV estimates, this is instrumented through the probability of re-election in the previous term, $t-2$, interacted with the constituency fixed effects as presented in Section 4.3. Constituency group fixed effects and year fixed effects are included throughout this analysis. The row First-Stage AP $F$ reports the results of the First-Stage Angrist–Pischke $F$-test on the relevance of the instrument; in both cases, the IV equation presents an $F$ above 20, considered to be a benchmark case for a strong instrument. ***, **, and * indicate significance at the 1%, 5%, and 10% levels, respectively.

in extracting better managers might increase with voting power, which is a positive function of the number of constituents. At the same time, this implies that constituents who are not on the board have more to lose, and therefore might implement a stronger monitoring of their board member.

Therefore, the slightly richer equation reported here embodies this scenario, and presents an interaction between board access with the number of countries present in a constituency group, $Num.Countries_{gt}$:

$$\begin{aligned} ME_{cgt} &= a_2 + b_2\, Board_{cgt} + c_2\, FE_{cg} + d_2\, Board_{cgt} \times Num.Countries_{gt} \\ &\quad + e_2\, Num.Countries_{gt} + X_{2cgt}d + \iota_g + \iota_t + \varepsilon_{cgt}. \end{aligned}$$

The increasing nature of the manager premium in the extent of the transfer is caught by the term $d_2$, which I expect to be negative and statistically different from zero given the previous argument. As is clear from Table 12, this is indeed the case and the interaction is negative and statistically different from zero. The main coefficient on the board increases substantially, while the number of countries,

Table 12: Manager–Country Assignment: Country-Level Evidence

| Variables | Manager Effects | | | |
|---|---|---|---|---|
| | OLS | | IV | |
| | (1) | (2) | (3) | (4) |
| Board | 0.430*** | 0.383*** | 1.038*** | 0.938*** |
| | (0.075) | (0.072) | (0.176) | (0.199) |
| Board × Num. Countries | −0.0210** | −0.0191** | −0.0697*** | −0.0655*** |
| | (0.005) | (0.005) | (0.013) | (0.015) |
| Number of Countries | 0.00873 | 0.0111 | 0.0240 | 0.0240 |
| | (0.010) | (0.011) | (0.010) | (0.011) |
| CEs | −0.245*** | −0.265*** | −0.266*** | −0.274*** |
| | (0.037) | (0.037) | (0.035) | (0.035) |
| Constituency FE | Yes | Yes | Yes | Yes |
| Year FE | Yes | Yes | Yes | Yes |
| Controls | | Yes | | Yes |
| Observations | 1,347 | 1,347 | 1,347 | 1,347 |
| Mean Dep. Var. | 0.0107 | 0.0107 | 0.0107 | 0.0107 |
| Std Dev. Dep. Var. | 0.661 | 0.661 | 0.661 | 0.661 |

*Note:* This table reports OLS estimates in columns (1) and (2), and IV estimates in columns (3) and (4). The unit of observation is country level and standard errors in brackets are corrected using the Murphy and Topel (1985) procedure through bootstraps. Columns (1) and (3) report unconditional results, while in columns (2) and (4) I control for population, GDP per capita, exchange rate, interest rate, IBRD projects, and approval month. Manager Effects denotes the vector of fixed effects (FE) extracted from a regression of Project Outcome as presented in Table 1, column (1). The MEs are then aggregated at country–year level, while the CEs are country-specific and time-invariant. The mean and standard deviation of the left-hand side variables are reported in the final two rows. Board is a dummy variable taking unit value if a country $c$ belonging to constituency group $g$ sits on the board in year $t$, and zero otherwise. In the IV estimates, this is instrumented through the probability of re-election in the previous term, $t-2$, interacted with the constituency fixed effects as presented in Section 4.3. Number of Countries reports the number of countries belonging to constituency group $g$ at time $t$. Constituency group fixed effects and year fixed effects are included throughout this analysis. ***, **, and * indicate significance at the 1%, 5%, and 10% levels, respectively.

per se, does not affect manager assignment. Conceptually, Tables 11 and 12 are not very different, which is also the case in terms of magnitude: if the interactive coefficient is multiplied by the average number of countries in a constituency (13.67), then it is clearly seen that the average point estimate on the board dummy is indeed unchanged. However, it is interesting to note that countries sitting on the board in small constituencies tend to receive managers with a substantially higher effect than other countries, while countries in large constituencies (the historical maximum is 25) tend to receive no statistically different increase in their management assignment.

# 5 Concluding Remarks

In this paper, I study the role of managers in World Bank project success and explore the resource allocation problem faced by the World Bank in assigning its project managers to countries. With this objective in mind, I borrow a few methodological concepts from other fields to study these issues. First, I adapt the teacher value-added empirical framework to identify manager effects (MEs)

as managerial performance and country effects (CEs) as an index public good provision. Secondly, on the data side, I join the World Bank Project Rating Database with information on manager identities and their corresponding CV characteristics. In this part I find that manager effects have a variance higher than country effects. This is a surprising result, because it implies that the World Bank systematically hires individuals with a dispersion in managerial performance exceeding the dispersion in recipient countries' public good provision.

In order to show that such manager and country effects contain information content in line with the interpretations of managerial performance and country's public good provision, I verify that MEs correlate with some individual predetermined characteristics, which can be considered predictors of high productivity (e.g., study field, advanced degrees, work experience). Similarly, I verify that CEs are correlated with institutional measures (e.g., parliamentary democracy, constraints on the executive, ethnic fractionalization, slave trade, legal origins, and PIM index).

Having focused on a positive analysis, I suggest a reform to improve the World Bank effectiveness by assigning the 10% worst-performing managers to non-project bureaucratic tasks, and replacing them with average managers. This exercise is made possible by the availability of several economic indicators at project level: the USD amount of each project, its interest rate, the ERR, among others. By combining the ME information with these indicators, I can estimate the gains achievable by replacing a few (66) under-performing managers without an explicit firing operation, which might induce general equilibrium effects. Overall, my results suggest that such a reform leads to the creation of an additional 800 million USD of returns generated by the World Bank over the sample under analysis, corresponding to a 3.7% increase. At the same time, by consulting World Bank documentation, I am able to provide plausible cost scenarios to evaluate the viability of the reform, which would deliver net gains of 624 (426) million USD under a moderate (extreme) cost scenario, with the range included between 38 and 1,011 million USD.

At this point, I study the manager–country allocation through a theoretical framework, which highlights two components as key to affecting resource allocation: the planner's risk attitude and the presence of countries on the World Bank board. I show that a risk-averse planner intends to minimize the variance of project returns, and hence adopts a negative assortative matching and allocates higher productivity managers to lower productivity countries. At the same time, countries sitting on the World Bank board might receive better managers than otherwise, for which there can be two explanations: (1) countries on the board are more capable of extracting rents from the planner; (2) countries on the board can improve their communications/relations with the planner. At this point, I present a plausibly exogenous source of variation for access to the World Bank board. This is given by the diplomatic norms governing the re-election of countries, and shows that different constituency groups are characterized by heterogeneous rules that prevent or allow a country to run for re-election. Finally, I present the main results and find evidence of negative assortative matching and of a manager premium emerging for those countries sitting on the World Bank board.

All in all, this work contributes to the development literature with a clear message: understanding public organization can provide valuable policy lessons and their organizational reform may be as powerful as countries' own institutions. Although development lending is hard to assimilate with the

aid debate, both bodies of literature have often highlighted that the poor institutions of recipient countries should be blamed for the inability of countries to take advantage of aid and development lending resources. Numerous academics, policy makers, and commentators have suggested radical reforms for the institutional setting of countries, regardless of these being largely top-down, possibly undemocratic, and probably destined to fail. In this work, I revert the focus of this debate and argue for the need to reform the organization of development lenders, and possibly aid donors. Through a cost–benefit analysis, I show that this seems to be an obvious, readily achievable target.

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# Appendix A: Empirical Bayes and Fixed Effect Estimates

**For Online Publication**

In this appendix, I derive an alternative measure of MEs following closely the work of Kane and Staiger (2008). Instead of equation (3), I estimate an analogous regression without MEs, focusing on the residuals of this expression:

$$y_{imcst} = a + b\bar{y}_{ct-1} + d\iota_c + e\iota_s + f\iota_t + X_{1imcst}g + X_{2ct}h + v_{imcst}; \tag{A1}$$

$$v_{imcst} = \mu_m + \theta_{mc} + \epsilon_{imcst}. \tag{A2}$$

Equation (7) is identical to equation (3) with the sole exception that MEs are missing. Instead of providing an explicit modeling, I focus on the residual of this expression, $v_{imcst}$, and implicitly consider it in equation (A2) as composed by three components: a time-invariant manager effect, $\mu_m$; an idiosyncratic manager–country component, $\theta_{mc}$; and a project idiosyncratic component, $\epsilon_{imcst}$. In developing these estimates, I follow the three steps recommended in the literature.

1. Variance–covariance estimation. By using the residuals of equation (7), I am able to estimate the variances of all elements in equation (8). The within-country within-year in $v_{imcst}$ is used as an estimate of project variance:

   $$\widehat{\sigma}^2_\epsilon = \text{Var}(v_{imcst} - \overline{v}_{mc}).$$

   The covariance between the average residual in manager projects in year $t$ and $t-1$ estimates the manager–country covariance component:

   $$\widehat{\sigma}^2_m = \text{Cov}(\overline{v}_{mct}, \overline{v}_{mct-1}).$$

   This covariance is weighted by the number of projects per country–manager slot, $n_{mct}$, while the variance of the manager–country component is simply the remainder of this expression:

   $$\widehat{\sigma}^2_\theta = \text{Var}(v_{imcs}) - \widehat{\sigma}^2_\epsilon - \widehat{\sigma}^2_m.$$

2. Project residual. I report a weighted average of the manager–country residual per manager, $\overline{v}_{mct}$, as a MVUE of $\mu_m$ for each manager. Data from each manager–country bin are weighted by their precision (inverse of the variance), with bins containing more projects receiving more weight:

   $$\overline{v}_m = \sum_c w_{mc}\overline{v}_{mc} \quad \text{with} \quad w_{mct} = \frac{h_{mc}}{\sum_t h_{mc}} \quad \text{and} \quad h_{mct} = \frac{1}{\widehat{\sigma}^2_\theta + (\widehat{\sigma}^2_\epsilon / n_{mc})}.$$

3. Manager effects estimate. The empirical Bayes estimator of the MEs emerges by multiplying

Table A1: Summary Statistics of Value-Added Estimates (Projects =212; Managers = 48)

| | Mean | Std Dev. | Min | Max |
|---|---|---|---|---|
| FE estimate | 0.136 | 0.543 | −1.162 | 1.291 |
| MVUE estimate | 0.299 | 0.706 | −1.856 | 1.493 |
| Empirical Bayes estimate | 0.051 | 0.320 | −1.054 | 0.918 |

*Note:* This table reports the summary statistics of the value-added estimates using different methods across all 212 projects for which the empirical Bayes estimates are available: fixed effects (indicated by FE estimate), minimum variance unbiased estimator (MVUE estimate), and empirical Bayes estimate.

Table A2: Correlations of Value-Added Estimates (Projects =212; Managers = 48)

| | FE estimate | MVUE estimate | Empirical Bayes estimate |
|---|---|---|---|
| FE estimate | 1 | | |
| MVUE estimate | 0.567 | 1 | |
| Empirical Bayes estimate | 0.338 | 0.843 | 1 |

*Note:* This table reports the correlations between the value-added estimates using different methods across all 212 projects for which the empirical Bayes estimates are available: fixed effects (indicated by FE estimate), minimum variance unbiased estimator (MVUE estimate), and empirical Bayes estimate.

the weighted average of manager residuals, $\overline{v}_m$, with the estimate of its reliability,

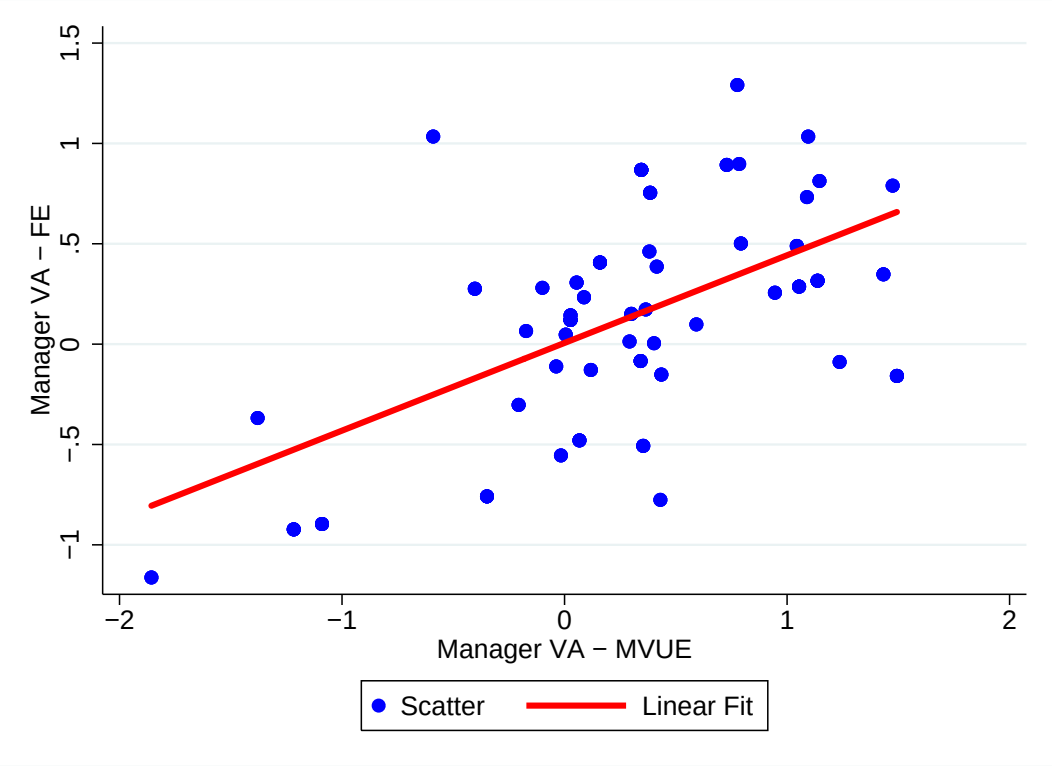
$$VA_m = \overline{v}_m \frac{\widehat{\sigma}^2_m}{\text{Var}(\overline{v}_m)} \quad \text{with} \quad \text{Var}(\overline{v}_m) = \widehat{\sigma}^2_m + \Big( \sum_t h_{mct} \Big)^{-1},$$

where the term multiplying $\overline{v}_m$ reports the reliability of the estimate and the estimation of the variance of $\overline{v}_m$ can be shown to equal the last term. These permit us not only to compute an average ME, analogous to the FE, but also to correct for a Bayesian reliability parameter, which weights such estimates given the weight of the signal (MEs) and the measurement error (noise).

Unfortunately, this exercise is very data-intensive, because I would need multiple country–manager changes per manager with a sizeable amount of projects in each case. This is not the case and, for this reason, in many cases it is impossible to calculate the variance for a manager in a country if that manager only had one project in the country. Therefore, of all 3,412 projects, only 508 permit us to estimate MEs using the empirical Bayes approach. The results of this exercise are shown in Tables A1 and A2. The point estimates of the value-added approach (MVUE estimates) replicate the FE results in terms of standard deviations, as is evident from Table A1 (i.e., 0.515 for FE versus 0.580 for MVUE). These are also highly correlated as Table A2 shows. The correlation of these two elements is 0.67 if all observations are considered, with this figure rising to 0.76 if I only focus on those negative value-added estimates (which are used in the policy experiment).

However, the shrinkage parameter, $\widehat{\sigma}^2_m/\text{Var}(\overline{v}_m)$, represents the problem here. Because of the low number of projects per manager, this term is very small, and this pushes down significantly the final value-added estimates: their standard deviation collapses from 0.580, MVUE, to 0.228. Also, the

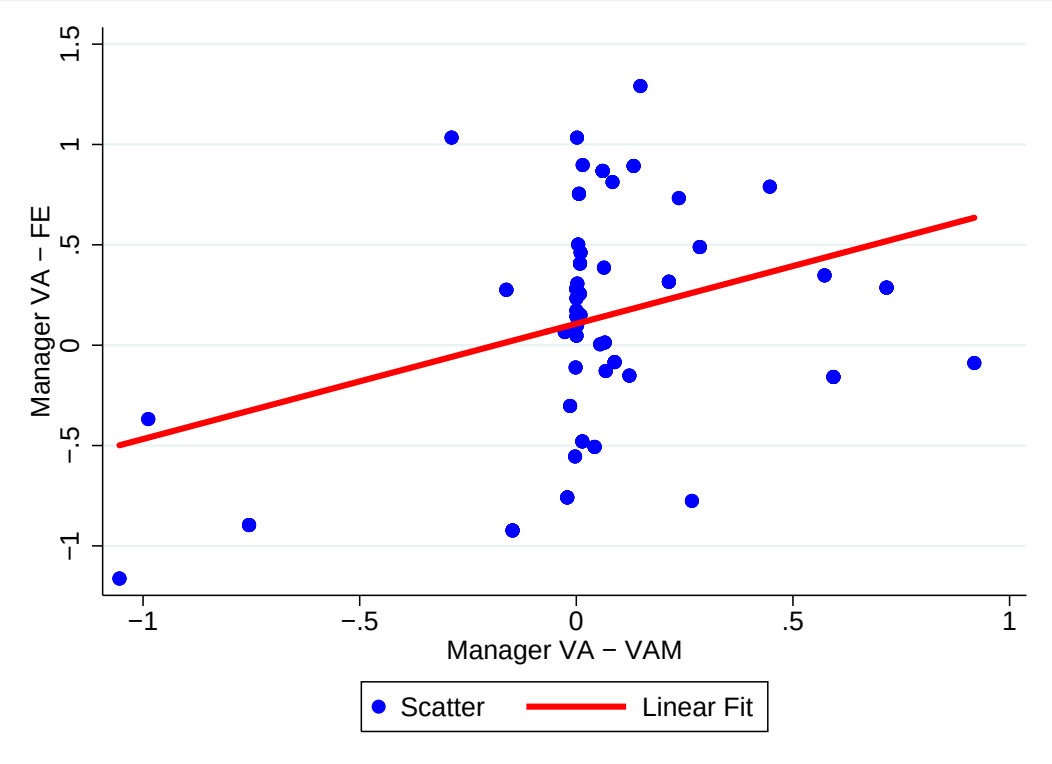
Figure A1: Correlations of Value-Added Estimates: FE versus MVUE




*Note:* This figure shows a scatterplot and linear fit between the value-added estimates using different methods: the fixed effect (MEs – FE) and the minimum variance unbiased estimator (MEs – MVUE) estimates.

correlations drop remarkably, from 0.62 to 0.33 and from 0.76 to 0.31. The reason behind this is evident in Figures A1 and A2. In Figure A1, it is clear that the MVUE and FE ME estimates are almost placed on a 45 degree line, whereas this is not the case in Figure A2, where the MVUE and the empirical Bayes estimates are shrunk to around zero.

Figure A2: Correlations of Value-Added Estimates: FE versus Emp. Bayes



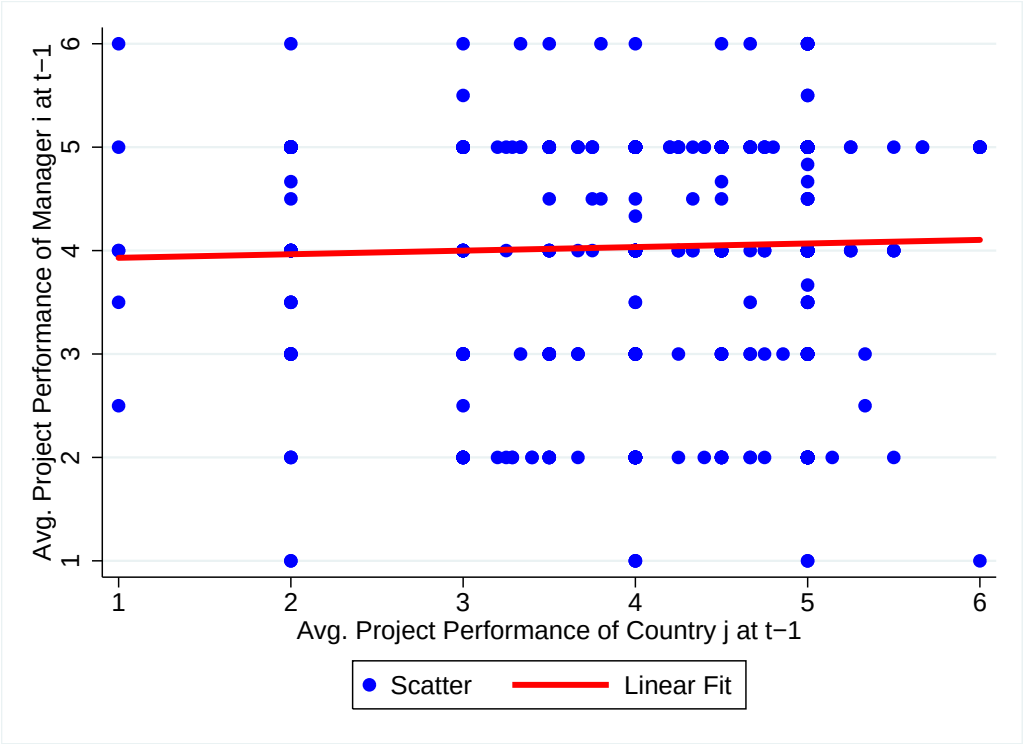

*Note:* This figure shows a scatterplot and linear fit between the value-added estimates using different methods: the fixed effect (MEs – FE) and the empirical Bayes estimates (MEs – Emp. Bayes) estimates.

# Appendix B: Manager–Country Allocation

When considering the ME vector emerging from equation (1) as a consistent measure of managers' contributions to project performance, I am relying on the assumption that the manager–country allocation rule is a repetition of static problems and that there is no dynamic adjustment for managers' and countries' past performances. If such a dynamic allocation were to exist, then this would bring higher performing managers to higher (lower) performing countries. This fact would confound the manager and country fixed effects, invalidating this analysis. In this work, I argue that the static problem is the most important and that the dynamic allocation is secondary, if it exists.

In order to provide some statistical evidence for the fact that the allocation of managers to countries does not respond to dynamic performance, in Figure B1, I report the correlation between the average performance of a manager in country $i$ at time $t-1$ with the average performance of country $j$, where the manager actually operates, at time $t-1$. The null hypothesis is that such a correlation is not statistically different from zero, implying that the performance of the country where the manager is currently operating is uncorrelated with the performance of the same manager in another country in the previous period. As is clear from Figure B1, such a correlation is positive, very small (0.02), but not statistically different from zero.

Figure B1: Assignment of Managers to Countries




*Note:* This figure reports a scatterplot and linear fit between the average performance of a manager at time $t-1$ and the average performance of the country, where the manager is assigned at time $t$. Each point is a current project, where a manager is matched to a country. This shows that the past performance of the country where the manager is assigned at time $t$ is not correlated to the past performance of the manager. This scatterplot is conditional on a manager changing country from time $t-1$ to time $t$.

# Appendix C: Manager Effects and Other Covariates

Table C1: Manager Effects and Careers

| Variables | Manager Effects | | | | |
|---|---|---|---|---|---|
| | (1) | (2) | (3) | (4) | (5) |
| Female | −0.0722 | | | | |
| | (0.125) | | | | |
| Promotions | | −0.00178 | | | |
| | | (0.0527) | | | |
| Joining Year | | | −0.00998 | | |
| | | | (0.00943) | | |
| Experience in Years | | | | 0.00824 | |
| | | | | (0.00960) | |
| Languages | | | | | −0.0165 |
| | | | | | (0.0435) |
| Observations | 210 | 210 | 210 | 210 | 210 |

*Note:* This table reports OLS estimates. The unit of observation is manager level and the standard errors in brackets are clustered at nationality level. 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. Female takes unit value if the manager is female. Promotions counts the number of promotions received by a manager. Joining Year is the year in which a manager joined the World Bank. Experience in Years measures the number of years a manager has been at the World Bank. Languages measures the number of spoken languages as declared by the manager's CV. ***, **, and * indicate significance at the 1%, 5%, and 10% levels, respectively.

# Appendix D: Optimal Manager Allocation Problem and Example

**For Online Publication**

From Section 2, it is known that planner preferences are described by a quadratic Bernoulli with risk parameter $\beta$ over total returns $Y = \sum_j y_j$, $U(Y) = Y - \beta Y^2$. This leads to the classical expected utility result

$$EU(Y) = E(Y) - \beta\, E(Y)^2 - \beta\, V(Y).$$

Recalling that, by linearity, $E(Y) = E(m_i) + E(c_j) = 0$, this simplifies to $EU(Y) = -\beta\, V(Y)$. Now I derive the variance of projects for this type of distribution. As mentioned in Section 2, projects have Bernoulli returns; in fact, $y_{i,j} = m_{i,j} + c_j$ is realized with probability $\pi$ and zero with probability $1 - \pi$. The probability of success is Bernoulli, and all projects are identically and independently distributed.

Therefore, the variance of $Y$ can be described as

$$V(Y) = \sum_j E\{(y_j - E[y_j)]^2\} = \frac{1}{N}\sum_j [y_j - E(y_j)]^2 \cdot prob(y_j)$$

and

$$V(Y) = \sum_j [(y_j - \pi\overline{y})^2 \cdot \pi + (0 - \pi\overline{y})^2 \cdot (1 - \pi)].$$

This expression does not have a closed form. Let me first describe a typical Bernoulli textbook example before deriving the main measure.

## Bernoulli Example

In the textbook Bernoulli distribution, the event/project takes unit value when it is realized successfully and is constant, and hence $y_j = 1$ is constant and $E(y) = \pi$. Therefore, we replace the terms:

$$V(y_j) = \sum_j [(1 - \pi)^2 \cdot \pi + (0 - \pi)^2 \cdot (1 - \pi)] = \pi(1 - \pi).$$

## Derivation of Section 2

The only difference between this case and that of Section 2 is given by the returns of the project, which are not constant but given by $y_{ij} = m_{i,j} + c_j$ when there is success. However, given that $E(Y) = 0$, then

$$V(Y) = \sum_j [(y_j - 0)^2 \cdot \pi + 0 \cdot (1 - \pi)] = \frac{1}{N}\sum_j y_j^2 \pi = \frac{1}{N}\pi \sum_j (m_{i,j} + c_j)^2,$$

which is indeed the object of maximization presented in Section 2.

## Manager Assignment and Board: An Example

There are four managers and countries with productivities $2 > 1 > -1 > -2$. These satisfy our assumptions as both have a zero mean, and therefore the expected returns are exactly zero. In the benchmark case, with no country being on the board, the risk-averse planner solves

$$\max_{m_i} -\beta\,\pi\,\frac{1}{4}\sum_j (m_{i,j}+c_j)^2,$$

which leads to the following negative assortative matching maximizing the objective function, $\{m_{i,j},c_j\}\forall j$ : $(\{2,-2\},\{1,-1\},\{-1,1\},\{-2,2\})$, as $V(Y)=0$.

Now, suppose that two countries sit on the board, with productivities $-1$ and 2, which enjoy a transfer $\tau=1$. The new problem is

$$\max_{m_i} -\beta\,\pi\,\frac{1}{2}\sum_{j\notin B}(m_{i,j}+c_j+1)^2-\beta\,\pi\,\frac{1}{2}\sum_{j\in B}(m_{i,j}+c_j-1)^2,$$

and because of linearity, the new allocation leads to returns not changing, $\widetilde{Y}=Y$. However, both the variance and allocations are affected:

$$\{m_{i,j},c_j\}\forall j: \quad (\{2,-1\},\{1,-2\},\{-1,2\},\{-2,1\}).$$

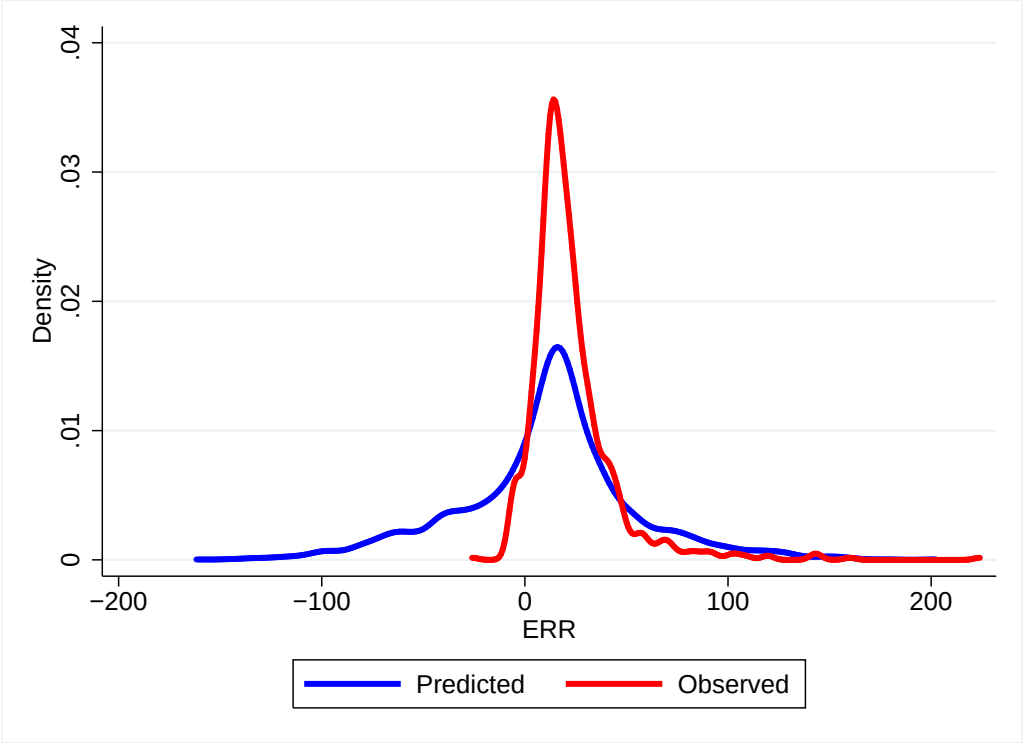
By definition, the countries sitting on the board, $-1$ and 2, are receiving more productive managers than they would otherwise, respectively one unit more productive. The planner is indeed maximizing the modified objective function, as the "transfer-adjusted" variance is indeed zero; when excluding the transfer, this is positive and higher than one.

Concerning the relation between the main model and this example, inclusion of the board does not change the sign of the assortative matching – it simply creates a wedge $\tau$, which does not make it perfect. In the first case, the correlation between managers and countries is $-1$, while in this second case, it drops to $-0.8$.

# Appendix E: Alternative Setting of Missing ERR

**For Online Publication**

Figure E1: Observed and Predicted ERR




*Note:* This figure reports the densities of observed ERR (in red) and predicted ERR (in blue). There is a notable fat left-tail of projects with a negative predicted ERR, which might mean either that a project with a negative ERR is published with an ERR of zero or that the ERR may not be published at all.

Table E1: The Economic Gains of a Reform, Two Alternatives

| Variables | Projects | Total Gain | 95% Interval | % Increase | Total Spending |
|---|---|---|---|---|---|
| Alternative 1: Negative Predicted ERR Set to Zero | | | | | |
| (1) Economic Gains: Predicted | 2,240 | 35.35 | | | 170.216 |
| (2) Economic Gains: Reform | 2,240 | 36.16 | [ 35.77, 36.54] | 2.3% | |
| Alternative 2: Negative Predicted ERR Set to Mean ERR | | | | | |
| (3) Economic Gains: Predicted | 2,240 | 40.22 | | | 170.216 |
| (4) Economic Gains: Reform | 2,240 | 41.02 | [40.64, 41.41] | 1.9% | |

*Note:* This table reports the economic gains generated by the World Bank, using equations (7) and (9). Rows (1) and (3) report the observed economic gains setting the missing ERR values to zero and to the mean ERR, respectively. Rows (2) and (4) report the counterfactual gains by replacing the 10% worst-performing managers and countries with their respective means. The column "Total Gain", expressed in billions of constant USD, reports the aggregate sum of economic gains in all World Bank projects. The column "95% Interval" reports the 95% confidence interval of the Total Gain, where instead of multiplying the project outcome gain by the point estimate of Table 7, row (3), I use the 95% confidence interval of this estimate. The column "% Increase" reports the percentage increase in economic gains by applying the reform of manager reassignment. "Total Spending" accounts for the aggregate World Bank spending on all projects, in billions of constant USD.

# Appendix F: Tables of Robustness Checks

**For Online Publication**

## Manager Effects: Original Sample

In this appendix, I validate the model expressed in equation (3) for the original sample, by adding several fixed effects interactions. In Table F1, 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 F2 and F3, I explore a test to account for compensating effort at manager–country level. The point estimates jump above one, indicating that this might be in place, but the estimate is still not statistically different from one. Therefore, this first check provides some support to the previous exercise.

## 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 FE interactions. The advantage of this smaller sample is the possibility to propose more detailed tests. Table F4 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. Also, in Table F6, I propose a test for compensating effort at manager–country level, without finding statistically relevant differences. In addition, in Table F6, I can introduce manager–country pairwise fixed effects and check within-time within-country-manager cross-sector variation. Again, this does not reject the one coefficient on the ME variable. Therefore, this second check also supports the previous findings.

Table F1: MEs and Country, Sector, and Year Interactions: Original Sample

| Variables | Project Outcome | | | | | |
|---|---|---|---|---|---|---|
| | (1) | (2) | (3) | (4) | (5) | (6) |
| MEs | 0.655*** | 0.555*** | 0.574*** | 0.574*** | 0.568*** | 0.568*** |
| | (0.0733) | (0.135) | (0.114) | (0.114) | (0.127) | (0.127) |
| Lag Project Outcome | Yes | Yes | Yes | Yes | Yes | Yes |
| Country Controls | Yes | Yes | Yes | Yes | Yes | Yes |
| Project Controls | Yes | Yes | Yes | Yes | Yes | Yes |
| CEs | 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 |
| Observations | 3,379 | 3,379 | 3,379 | 3,379 | 3,379 | 3,379 |
| $R^2$ | 0.300 | 0.646 | 0.483 | 0.483 | 0.547 | 0.547 |

*Note:* 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 24 controls and the mean lag project outcome, as shown in Table 1, column (1). Column (1) reports the result of a regression of project outcome over the MEs and all controls used in Table 1, column (1). Column (2) also adds a Country × Year FE interaction. Column (3) adds a Country × Sector FE interaction. Column (4) adds both a Country × Year and a Sector × Year FE interaction. Column (5) adds both a Country × Sector and a Sector × Year FE interaction. Column (6) adds a Country × Year, a Country × Sector, and a Sector × Year FE interaction. Lag Project Outcome is the mean project outcome in country $c$ at time $t-1$ across all executed projects. The included controls are: at country level, population, exchange rate, GDP per capita, the GDP share of consumption, government spending and investment, population density; at project level, the size of the project in constant USD, the interest rate on the loan, the month of approval, two lending type dummies, and 15 lending instrument dummies. The two mentioned lending types are, specifically, "Investment", for projects characterized by funding for governments to cover specific expenditures related to economic and social development projects, and "Development Policy operations", which are types of projects aimed at the provision of direct budget support to governments for policy and institutional reforms aimed at achieving a set of specific development results. There are 15 mentioned lending instruments, which characterize different financial packages in which the projects are designed and delivered to countries (e.g., APL, FIL, and SAL). All the country-level controls, the size of the project, and interest rate are measured in continuous units, with approval month ranges in integers between 1 and 12, while the remaining are dummy variables. ***, **, and * indicate significance at the 1%, 5%, and 10% levels, respectively.

Table F2: MEs and Country Lag Project Outcome Interactions: Original Sample

| Variables | Project Outcome | | | | | |
|---|---|---|---|---|---|---|
| | (1) | (2) | (3) | (4) | (5) | (6) |
| MEs | 0.807*** | 0.835*** | 0.843*** | 0.848*** | 0.877*** | 0.870*** |
| | (0.174) | (0.175) | (0.174) | (0.173) | (0.181) | (0.171) |
| Lag Project Outcome | Yes | Yes | Yes | Yes | Yes | Yes |
| Country Controls | Yes | Yes | Yes | Yes | Yes | Yes |
| Project Controls | Yes | Yes | Yes | Yes | Yes | Yes |
| CEs | | Yes | Yes | Yes | Yes | Yes |
| Sector FE | | | Yes | Yes | Yes | Yes |
| Year FE | | | | Yes | Yes | Yes |
| Manager FE × LPO | Yes | Yes | Yes | Yes | Yes | Yes |
| Sector FE × LPO | | | | | Yes | Yes |
| Year FE × LPO | | | | | | Yes |
| Observations | 3,379 | 3,379 | 3,379 | 3,379 | 3,379 | 3,379 |
| $R^2$ | 0.337 | 0.401 | 0.404 | 0.410 | 0.414 | 0.424 |

*Note:* 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 24 controls and the mean lag project outcome, as shown in Table 1, column (1). Column (1) reports the result of a regression of project outcome over the MEs and all controls used in Table 1, column (1), with no fixed effects but an interaction between ME and the lag of project outcome. Column (2) adds a CE, Column (3) a sector FE, Column (4) a year FE, Column (5) an interaction between sector FE and the lag of project outcome, and Column (6) an interaction between year FE and the lag of project outcome. Lag Project Outcome (LPO) is the mean project outcome in country $c$ at time $t-1$ across all executed projects. The included controls are: at country level, population, exchange rate, GDP per capita, the GDP share of consumption, government spending and investment, population density; at project level, the size of the project in constant USD, the interest rate on the loan, the month of approval, two lending type dummies, and 15 lending instrument dummies. The two mentioned lending types are, specifically, "Investment", for projects characterized by funding for governments to cover specific expenditures related to economic and social development projects, and "Development Policy operations", which are types of projects aimed at the provision of direct budget support to governments for policy and institutional reforms aimed at achieving a set of specific development results. There are 15 mentioned lending instruments, which characterize different financial packages in which the projects are designed and delivered to countries (e.g., APL, FIL, and SAL). All the country-level controls, the size of the project, and interest rate are measured in continuous units, with approval month ranges in integers between 1 and 12, while the remaining are dummy variables. ***, **, and * indicate significance at the 1%, 5%, and 10% levels, respectively.

Table F3: MEs and Manager Lag Project Outcome Interactions: Original Sample

| Variables | Project Outcome | | | | | |
|---|---|---|---|---|---|---|
| | (1) | (2) | (3) | (4) | (5) | (6) |
| MEs | 0.847*** | 1.094*** | 1.100*** | 1.112*** | 1.101*** | 1.102*** |
| | (0.0432) | (0.0424) | (0.0419) | (0.0425) | (0.0467) | (0.0477) |
| Lag Project Outcome | Yes | Yes | Yes | Yes | Yes | Yes |
| Country Controls | Yes | Yes | Yes | Yes | Yes | Yes |
| Project Controls | Yes | Yes | Yes | Yes | Yes | Yes |
| CEs | | Yes | Yes | Yes | Yes | Yes |
| Sector FE | | | Yes | Yes | Yes | Yes |
| Year FE | | | | Yes | Yes | Yes |
| Manager Mean LPO | Yes | Yes | Yes | Yes | Yes | Yes |
| CEs × Manager Mean LPO | | | | | Yes | Yes |
| Sector FE × Manager Mean LPO | | | | | | Yes |
| Observations | 2,693 | 2,693 | 2,693 | 2,693 | 2,693 | 2,693 |
| $R^2$ | 0.270 | 0.399 | 0.407 | 0.415 | 0.445 | 0.448 |

*Note:* 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 24 controls and the mean lag project outcome, as shown in Table 1, column (1). Column (1) reports the result of a regression of project outcome over the MEs and all controls used in Table 1, column (1), with no fixed effects but the lag of mean project outcome at manager level. Column (2) adds a CE, Column (3) a sector FE, Column (4) a year FE, Column (5) an interaction between CE and the manager mean lag project outcome, and Column (6) an interaction between sector FE and manager mean lag project outcome. The Manager Mean Lag Project Outcome (LPO) is the mean project outcome for manager $m$ at time $t-1$ across all executed projects. The included controls are: at country level, the population, exchange rate, GDP per capita, the GDP share of consumption, government spending and investment, population density; at project level, the size of the project in constant USD, the interest rate on the loan, the month of approval, two lending type dummies, and 15 lending instrument dummies. The two mentioned lending types are, specifically, "Investment", for projects characterized by funding for governments to cover specific expenditures related to economic and social development projects, and "Development Policy operations", which are types of projects aimed at the provision of direct budget support to governments for policy and institutional reforms aimed at achieving a set of specific development results. There are 15 mentioned lending instruments, which characterize different financial packages in which the projects are designed and delivered to countries (e.g., APL, FIL and SAL). All the country-level controls, the size of the project, and interest rate are measured in continuous units, with approval month ranges in integers between 1 and 12, while the remaining are dummy variables. ***, **, and * indicate significance at the 1%, 5%, and 10% levels, respectively.

Table F4: MEs and Country, Sector, and Year Interactions: Large-Country Sample

| Variables | Project Outcome | | | | | |
|---|---|---|---|---|---|---|
| | (1) | (2) | (3) | (4) | (5) | (6) |
| MEs | 0.732*** | 0.635*** | 0.709*** | 0.632*** | 0.743*** | 0.656* |
| | (0.0801) | (0.113) | (0.100) | (0.178) | (0.125) | (0.297) |
| Lag Project Outcome | Yes | Yes | Yes | Yes | Yes | Yes |
| Country Controls | Yes | Yes | Yes | Yes | Yes | Yes |
| Project Controls | Yes | Yes | Yes | Yes | Yes | Yes |
| CEs | 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 |
| Observations | 743 | 743 | 743 | 743 | 743 | 743 |
| $R^2$ | 0.349 | 0.538 | 0.418 | 0.636 | 0.632 | 0.812 |

*Note:* 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 at country–manager clusters. This large-country sample is restricted to the 10 largest recipient countries of World Bank projects, whose names (and number of projects) are Brazil (123), Indonesia (121), Mexico (82), Pakistan (78), Colombia (74), Ghana (62), Morocco (60), Yemen (49), Philippines (47), and Tunisia (47). 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 24 controls and the mean lag project outcome, as shown in Table 1, column (1). Column (1) reports the result of a regression of project outcome over the MEs and all controls used in Table 1, column (1). Column (2) adds a Country × Year FE interaction. Column (3) adds a Country × Sector FE interaction. Column (4) adds both a Country × Year and a Sector × Year FE interaction. Column (5) adds both a Country × Sector and a Sector × Year FE interaction. Column (6) adds a Country × Year, a Country × Sector, and a Sector × Year FE interaction. Lag Project Outcome is the mean project outcome in country $c$ at time $t-1$ across all executed projects. The included controls are: at country level, population, exchange rate, GDP per capita, the GDP share of consumption, government spending and investment, population density; at project level, the size of the project in constant USD, the interest rate on the loan, the month of approval, two lending type dummies, and 15 lending instrument dummies. The two mentioned lending types are, specifically, "Investment", for projects characterized by funding for governments to cover specific expenditures related to economic and social development projects, and "Development Policy operations", which are types of projects aimed at the provision of direct budget support to governments for policy and institutional reforms aimed at achieving a set of specific development results. There are 15 mentioned lending instruments, which characterize different financial packages in which the projects are designed and delivered to countries (e.g., APL, FIL, and SAL). All the country-level controls, the size of the project, and interest rate are measured in continuous units, with approval month ranges in integers between 1 and 12, while the remaining are dummy variables. ***, **, and * indicate significance at the 1%, 5%, and 10% levels, respectively.

Table F5: MEs and Manager Lag Project Outcome Interactions: Original Sample

| Variables | Project Outcome | | | | | |
|---|---|---|---|---|---|---|
| | (1) | (2) | (3) | (4) | (5) | (6) |
| MEs | 1.089*** | 1.074*** | 0.625** | 1.020*** | 0.755** | 1.077*** |
| | (0.0205) | (0.230) | (0.274) | (0.309) | (0.308) | (0.307) |
| Lag Project Outcome | Yes | Yes | Yes | Yes | Yes | Yes |
| Country Controls | Yes | Yes | Yes | Yes | Yes | Yes |
| Project Controls | Yes | Yes | Yes | Yes | Yes | Yes |
| CEs | | Yes | Yes | Yes | Yes | Yes |
| Sector FE | | | Yes | Yes | Yes | Yes |
| Year FE | | | | Yes | Yes | Yes |
| Manager Mean Lag Project Outcome | Yes | Yes | Yes | Yes | Yes | Yes |
| CEs × Manager Mean LPO | | | | | Yes | Yes |
| Sector FE × Manager Mean LPO | | | | | | Yes |
| Observations | 851 | 851 | 851 | 851 | 851 | 851 |
| $R^2$ | 0.312 | 0.349 | 0.374 | 0.398 | 0.405 | 0.415 |

*Note:* 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 24 controls and the mean lag project outcome, as shown in Table 1, column (1). Column (1) reports the result of a regression of project outcome over the MEs and all controls used in Table 1, column (1), with no fixed effects but the lag of mean project outcome at manager level, Column (2) adds a CE, Column (3) a sector FE, Column (4) a year FE, Column (5) an interaction between CE and the lag of mean manager project outcome, and Column (6) an interaction between sector FE and the lag of mean manager project outcome. The Manager Mean Lag Project Outcome (LPO) is the mean project outcome for manager $m$ at time $t-1$ across all executed projects. The included controls are: at country level, population, exchange rate, GDP per capita, the GDP share of consumption, government spending and investment, population density; at project level, the size of the project in constant USD, the interest rate on the loan, the month of approval, two lending type dummies, and 15 lending instrument dummies. The two mentioned lending types are, specifically, "Investment", for projects characterized by funding for governments to cover specific expenditures related to economic and social development projects, and "Development Policy operations", which are types of projects aimed at the provision of direct budget support to governments for policy and institutional reforms aimed at achieving a set of specific development results. There are 15 mentioned lending instruments, which characterize different financial packages in which the projects are designed and delivered to countries (e.g., APL, FIL, and SAL). All the country-level controls, the size of the project, and interest rate are measured in continuous units, with approval month ranges in integers between 1 and 12, while the remaining are dummy variables. ***, **, and * indicate significance at the 1%, 5%, and 10% levels, respectively.

Table F6: MEs and Sector–Manager Interactions: Large-Country Sample

| Variables | Project Outcome | | | | | |
|---|---|---|---|---|---|---|
| | (1) | (2) | (3) | (4) | (5) | (6) |
| MEs | 0.732*** | 0.635*** | 0.709*** | 0.632*** | 0.743*** | 0.656*** |
| | (0.0513) | (0.0692) | (0.0638) | (0.0952) | (0.0888) | (0.163) |
| Lag Project Outcome | Yes | Yes | Yes | Yes | Yes | Yes |
| Project Controls | | Yes | Yes | Yes | Yes | Yes |
| Country Controls | | | Yes | Yes | Yes | Yes |
| CEs | | | | Yes | Yes | Yes |
| Year FE | | | | | Yes | Yes |
| Country × Sector FE | | | | | | Yes |
| ME × Sector FE | Yes | Yes | Yes | Yes | Yes | Yes |
| Observations | 1,037 | 1,037 | 1,037 | 1,037 | 1,037 | 1,037 |
| $R^2$ | 0.533 | 0.537 | 0.555 | 0.567 | 0.586 | 0.610 |

*Note:* 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 at country–manager clusters. This large-country sample is restricted to the 10 largest recipient countries of World Bank projects, whose names (and number of projects) are Brazil (123), Indonesia (121), Mexico (82), Pakistan (78), Colombia (74), Ghana (62), Morocco (60), Yemen (49), Philippines (47), and Tunisia (47). 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 24 controls and the mean lag project outcome, as shown in Table 1, column (1). Column (1) reports the result of a regression of project outcome over the MEs and all controls used in Table 1, column (1), with no fixed effects but an interaction between ME and the lag of project outcome. Column (2) adds a CE, Column (3) a sector FE, Column (4) a year FE, Column (5) an interaction between sector FE and the lag of project outcome, and Column (6) an interaction between year FE and the lag of project outcome. Lag Project Outcome is the mean project outcome in country $c$ at time $t-1$ across all executed projects. The included controls are: at country level, population, exchange rate, GDP per capita, the GDP share of consumption, government spending and investment, population density; at project level, the size of the project in constant USD, the interest rate on the loan, the month of approval, two lending type dummies, and 15 lending instrument dummies. The two mentioned lending types are, specifically, "Investment", for projects characterized by funding for governments to cover specific expenditures related to economic and social development projects, and "Development Policy operations", which are types of projects aimed at the provision of direct budget support to governments for policy and institutional reforms aimed at achieving a set of specific development results. There are 15 mentioned lending instruments, which characterize different financial packages in which the projects are designed and delivered to countries (e.g., APL, FIL, and SAL). All the country-level controls, the size of the project, and interest rate are measured in continuous units, with approval month ranges in integers between 1 and 12, while the remaining are dummy variables. ***, **, and * indicate significance at the 1%, 5%, and 10% levels, respectively.