

Determinants Of Project Outcomes in World Bank Investments

Policy Analysis Exercise (17 April 2015)

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EXECUTIVE SUMMARY

This paper investigates which factors – country- or project-level – are predictive of the World Bank’s project outcomes ex-ante of actual investment. Using a subset of 582 relevant projects out of 15,775 projects appraised by the Independent Evaluation Group, we find significant positive correlation between project outcome and project-level variables, especially for implementing agency performance. Specifically, a notch improvement in implementing agency performance increase project outcome by 0.41 points. When implementing agency performance increases from Moderately Satisfactory (4) to Highly Satisfactory (6), project outcome increases approximately from Moderately Satisfactory (4) to Satisfactory (4.82). However, other project level details such as project value, project duration, focus of sectors, focus of themes, proportion of staff weeks in initial lending phase, per capita GDP growth, CPIA ratings, and Freedom House ratings, are consistently miniscule and insignificant.

The result suggests the presence of idiosyncratic risk that are not captured by the observable country-level and project-level variables tested. The above findings contribute to the debate on success drivers of development projects and conclude that quality of implementing agency is important to subsequent success. Further research is needed to broaden the common understanding of project success drivers.

Authors of the research have also considered investigating the possibility of operationalizing a newly emerging Development Impact Bonds (DIBs) financing tool to allow the World Bank improve the efficacy of its development projects. However, the results of quantitative and qualitative analysis suggest that there are certain unfavourable factors, which currently make DIBs less feasible to be operationalized as a tool for World Bank.

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LIST OF ABBREVIATIONS

CPIA	Country Policy and Institutional Assessment
DIB	Development Impact Bond
ESW	Economic and Sector Work
IEG	Independent Evaluation Group
ICR	Implementation Completion Report
ISR	Implementation Status Report
PAE	Policy Analysis Exercise
PPAR	Project Performance Audit Reports

ACKNOWLEDGEMENTS

The yearlong Policy Analysis Exercise (PAE) has been a rite of passage for all Master in Public Policy candidates in the Lee Kuan Yew School of Public Policy. This educational odyssey has been a wonderful exploratory journey beyond classroom environment. The team is indebted to Assistant Professor Naomi Aoki for her patient mentorship and professional instruction. She has been our beacon of direction and clarity.

Our special thanks extend to the World Bank staff in Singapore, specifically Bert Hofman, Andrew Beath and Yumeka Hirano for their wholehearted support of this project. We could not have asked for a better client.

We also extend our gratitude and love to our friends and families, who remained supportive of our learning journey especially during impending deadlines. Thank you for your patience.

We hope our academic discovery will add a meaningful difference to the future of the development sector and also to our future endeavours!

- Achsah Ang Xiaohui, Lilia Saetova, Han Dong

1. OVERVIEW

1.1. POLICY CONTEXT

What are determinants of a successful development project? If there are, will success be predictable ex-ante from empirical clues? Answers to these simple questions are increasingly necessary due to World Bank's internal resource constraints amidst mounting external pressure for result. World Bank's internal evaluation of over 10,000 projects indicated that more than 25% of these endeavour outcomes are rated unsatisfactory or worse.¹ The need for answer is all the more urgent given that the World Bank is planning to increase its development funding by 40% to \$70 billion a year by 2025.² At the same time, the organization is aggressively reducing budget expenses by \$400 million in the next three years. Given that so much money is at stake, this Policy Analysis Exercise (PAE) hopes to unearth the determinants behind World Bank project success and in the process, provides the client with important reference to improve future intervention effectiveness, maximize development impact and minimize idiosyncratic risks. Analysing and understanding the success drivers will empower the World Bank to be more sophisticated with pre-project planning, execution and post-project handover.

Using ordinary-least-square and probit regressions, we find that many project level characteristics such as project value, project duration, focus of sectors, focus of themes, and proportion of staff weeks in initial lending phase are inconsequential to eventual project outcome. Contrary to popular expectation, country-level factors such as the per capita GDP growth, Country Policy and Institutional Assessment (CPIA) and Freedom Housing ratings are equally negligible.

Unsatisfactory project outcome can be segmented into two broad categories: project and macro factors. On one hand, project level factors, which on hindsight, are not inevitable but avertible, or at least mendable. The usual suspects include poor communication, weak funding, insufficient planning and inadequate due diligence. The implicit thought process is that had policymakers been more knowledgeable on key success drivers unique to their project before implementation, risk could have been better mitigated and project outcome would have been more desirable. On the other hand, the macro category comprises thematic factors that are either unknowable beforehand or otherwise beyond reasonableness for a preventive action. These causes include political shock, ineffective bureaucracy, natural catastrophe, war and unexpected economic shocks. Moreover, project and macro factors may interact in complex relationship, thus reinforcing each other and ultimately result in project failure. For instance, negative economic shock may tip a poorly funded project into disaster despite adopting a frugal

¹ Data supplied by World Bank Independent Evaluation Group. Projects which outcome are rated "unavailable", "unrated" and "not applicable" are removed from the sample, leaving a total of 10,232 projects.

² Yukhananov, Anna. "UPDATE 1-World Bank to boost funding to help poorest countries." Reuters. Last modified on 1st April 2014. <http://www.reuters.com/article/2014/04/01/worldbank-strategy-idUSL1N0MTO320140401>.

approach to the constrained budget. Consequently, success determinants must be studied at both project and macro level.

1.2. DEFINING PROJECT SUCCESS IN A MULTI-FACETED ENVIRONMENT

Defining success is problematic due to a proliferation of incompatible success measurements which makes cross project comparison difficult. The former is disserved by a slew of fragmented matrixes with little connection among each other. Currently, there are “Implementation Status Report” (ISR) which records progress over a project’s lifespan, “Implementation Completion Report” (ICR) for an ex-post comprehensive review, “Evaluation Memoranda” for post 1995 project as an additional layer of validation by the World Bank’s Independent Evaluation Group (IEG) and lastly, “Project Performance Audit Reports (PPAR) for 25% of completed project per year since 1972 for further evaluation. As a result, the same project could be scored differently depending on the methodology used. Even within a single scoring framework, contrasting success between different projects is tricky. Benefits and costs among education, sanitation, poverty reduction and gender equality are neither accumulative nor comparable on equal terms. For instance, attempts to weigh relative merit between a profitable dam in the Amazon rainforest and loss-making micro-financing initiative for underprivileged women are akin to comparing apple to orange. Compounding the difficulty is the time effect at play: some projects will continue to deliver incremental benefits after official closure while other projects lag and lack result in years to come. In other words, the same project might produce different outcomes depending on the timing of its evaluation. Consequently, there might not be a perfect one-size-fits-all success matrix that applies to all World Bank projects. Details of the chosen databases are elaborated in Section 3 Data Definition.

1.3. DEVELOPMENT IMPACT BONDS

In addition, we aim to operationalize success drivers by applying our analysis to a hypothetical Development Impact Bond (DIB) project. Details of such application are discussed in detail in Section 4.5 Implications.

Like its better known peer Social Impact Bond (SIB), DIB is a combination of pay-for-result and impact investment that typically involves the public, private and non-profit organizations.³ The system works by turning developmental problems into “investible” opportunities. A common DIB structure is illustrated by the Figure 1 below. The mechanism is as follows. Private investors inject funding into a development related proposal which is initiated by service providers. Different service providers bid for investors’ funding with their unique value propositions or execution abilities on diverse developmental challenges. These service providers are uniquely positioned to deliver superior development result which is traditionally a purview of public

³ SIB has been enjoying a growing publicity since its inception four years ago. Such scheme was first tested in UK with a £5m Social Finance UK at Peterborough Prison which houses 3,000 inmates. Private investors who back Social Finance UK will receive a performance payout from the UK government. The payout is conditional of predefined recidivism reduction over a six years trial. The amount is a share of the estimated cost savings for the government.

agencies. In exchange, outcome funders, normally the public agencies, will reward private investors with principal and bonus if and only if certain performance thresholds are achieved by the service providers. Unique to DIB, an international development agency, will usually act as an intermediary to offer unbiased performance assessment and coordinate payment and communication among private investors, service providers and outcome funders. Collectively, DIB enables the tripartite to achieve desired social and financial targets effectively which otherwise might not be feasible had each party acted alone. Together, DIB bridges the gap between financial returns and social rewards.

Of particular interest is DIB's payment structure that links performance with payout. Strictly speaking, DIB is not a conventional bond. The distinguishing feature is that there is no fixed income. DIB investors will only receive payout according to a predetermined performance matrix which is mutually agreed between investors and outcome funders. Secondly, investors face both operational risk from the service provider and credit risk from the outcome funders. The former exists given the uncertain nature of project execution. Even the most credible proposal may flop due to unforeseeable circumstance. The latter is contributed by outcome funders' financial credibility. Outcome funders may not pay up due to dispute in performance measurement, term of agreement or poor fiscal standing. In all scenarios, private investors may not receive their fair share of payout. Thirdly, there is no principal repayment. Unlike a conventional bond that can be redeemed at end of maturity, DIB has no such redemption. Hence, it is possible for private investors to lose part or all their investment at DIB's maturity. However, international development agency may provide a minimal level of principal guarantee so as to reduce credit risks for private investors.

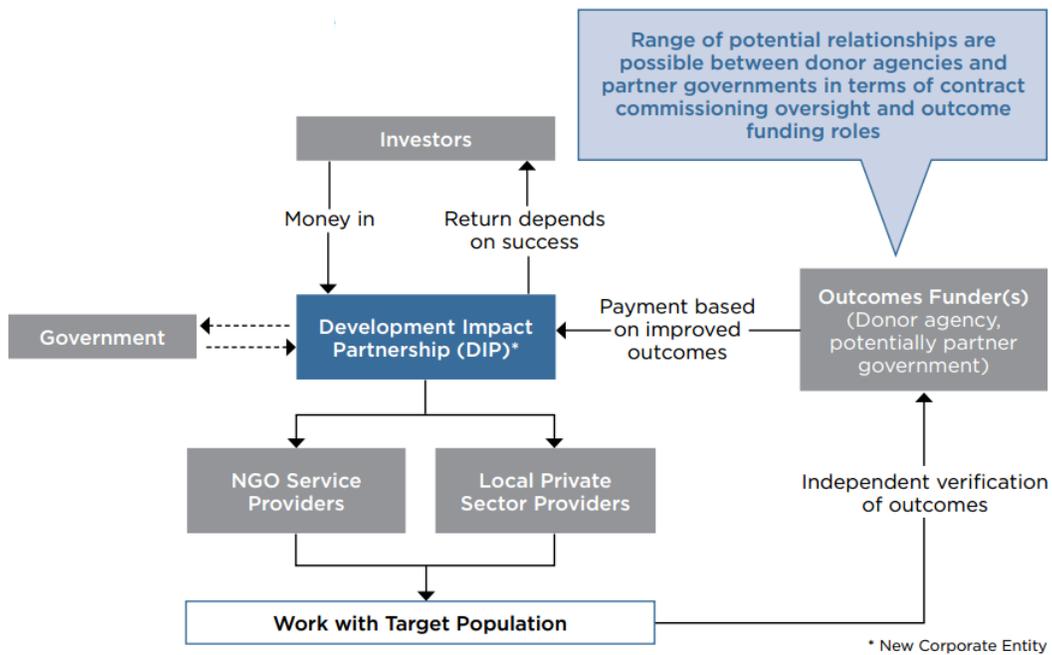


Figure 1: Potential DIB structure and stakeholder map.⁴

⁴ Taken from page 21, “Investing in Social Outcomes: Development Impact Bonds” by Center for Global Development and Social Finance. Published on Oct 2013

1.4. POLICY QUESTION

The paper's key policy question:

What observable determinants at project and country level will affect the project outcome ratings of the World Bank's projects?

This project first seeks to understand the key determinants to the success of World Bank projects. In particular, we are interested in a subset of World Bank projects which have financial return as a critical element of success definition. This targeted approach contrasts with "boiling the ocean" strategy from previous studies which regress all projects to discover correlations. The authors hypothesize that profit motivated projects will share a narrow base of common success determinants vis-a-vis the whole universe of projects. In this way, the determinants could result in higher R-square and statistical significance. For instance, contractual enforcement, ease of credit access, project size and accounting standard could matter prominently given that they are typically associated with cost of running businesses and hence, profitability. In this way, a fraction of 15,775 projects will be filtered for the above criteria in our study. Next, practical results from the regressions will be integrated into DIB recommendations. This is to operationalize our study into practical policy recommendations.

1.5. CLIENT INFORMATION

The client of this PAE is the World Bank Group Singapore, represented by:



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2. LITERATURE REVIEW

2.1. RESEARCH QUESTION

What are determinants of a successful development project?

2.2. LITERATURE REVIEW

Following the call by Denizer, Kaufmann, and Kraay (2011; 2013), this report aims to fine-tune and explore the observable determinants at project and country level, which will affect the project outcome ratings of the World Bank's projects.

A majority of studies showed how country-level characteristics determine outcomes of World Bank projects. Earlier contributions by Isham, Kaufmann and Pritchett (1997) and Isham and Kaufmann (1999) used cross-national data sets on the performance of government investment projects financed by the World Bank. It examined how country-level factors, such as civil liberties⁷ and macroeconomic policies⁸, affect project-level ex-post economic rates of return. The study found that the success of government investment projects financed by the World Bank is substantially influenced by the extent of country's civil liberties. The impact of civil liberties is suggested to be as large as the impact of economic distortions on project returns. The authors explain the importance of civil liberties by the fact that the right to express citizen voice leads to greater public accountability and greater efficacy in government action.

Burnside and Dollar (2000; 2004) argued that aid has a positive impact on growth in developing countries with good fiscal, monetary, and trade policies but has little effect in the presence of poor policies. Furthermore, findings of the study suggested that making foreign aid more systematically conditional on the quality of policies would have a positive effect on country growth. Their analysis also produced encouraging evidence: there is a trend among poor countries shifting toward better policies. In a later study, Dollar and Levin (2005) revisited the relationship between aid and economic growth. They reconfirmed a strong relationship between institutional quality and project success and brought up an important point of incentive effects of aid. In particular, the study concluded that systematic allocation of aid to low-income countries with relatively good institutions increases the probability of reforms to be successful and politically sustainable.

Other studies by Guillaumont and Laajaj (2006) accounted for country-level volatility⁹ in explaining project-level success. The study reaffirmed previous studies that aid has a stabilizing effect and reduces negative effects of economic instability. The authors also note that while the vulnerability of a country affects project success; however, it is less so when the amount of the aid disbursed is high. Chauvet, Collier, and Duponchel (2010) explored the effect of the peace

⁷ Represented by four indices including Freedom House, Humana, media pluralism, and freedom to organise.

⁸ Black market premium, fiscal deficit, index of trade restrictiveness, index of pricing distortions in tradable goods, and real interest rate.

⁹ The authors computed an annual index of instability by calculating the standard deviation of the growth rate of exports during the four last years plus the year in question. In order to obtain the index of instability of each project, the average of the index for each year during which the project was carried out was obtained and multiplied by the logarithm of the average share of exports on GDP during the same period in order to take into account the exposure to shocks.

status (dummy variable) of a post-conflict country.¹⁰ The authors suggested that the probability of the project success increases if a country is in a post-conflict stage of development when the project starts. However, this effect is not sustainable and gradually diminishes. The study also emphasizes that supervision is crucial for the project's success in post-conflict countries. If supervision is not effective enough, post-conflict environment may have an adverse effect on the project's success. The study also notes that implementation capacity is also a determining factor in measuring project's success. In another work, Dreher, Klasen, Vreeland and Werker (2010) looked at how politically-motivated projects affect the project-level ratings, concluding that political motivations only hurt the performance of World Bank projects if a high-status country already faces economic difficulties. The study proxied political motivation by countries' membership on the UN Security Council or the World Bank Board of Executive Directors. However, as Denizer, Kaufmann, and Kraay (2011; 2013) have pointed out that "roughly 80 percent of the variation in project outcomes in our sample occurs across projects within countries, rather than between countries", omitted project-level variables are likely to provide a better explanation. In sum, country-level factors certainly have an effect on development outcomes but the extent of such effect is debatable.

In contrast, project level variables are less studied. A small but growing number of econometric studies analysed success of World Bank projects by linking project characteristics to the project outcome ratings of World Bank projects as their dependent variable. Deininger, Squire, and Basu (1998) studied a broad allocation of resources through the number of staff weeks between lending services, and Economic and Sector Work (ESW)¹¹ by a country manager. The study finds that ESW improves the quality of the projects. Next, the authors linked it to the project-specific decisions with respect to the allocation of resources between preparation and supervision by the task manager. Key findings include higher levels of staff weeks spent on supervision and preparations were, surprisingly, negatively related to project success. The authors postulated that such a phenomenon could arise from either selection bias or omitted variables that were associated with lower project performance (for example, an Africa dummy).

Dollar and Svensson (2000) explained that the success, and the lack of it, among structural adjustment programs using domestic political-economy forces¹² and project-specific variables. Project specific variables include the time spent by World Bank staff in preparation and supervision, number of loan conditions, loan size, and amount of analytical work done. The study concluded that domestic political-economy factors influence strongly the success or failure of reform programmes supported by adjustment loans. Second, resources devoted to preparation and supervision or number of conditions had no relationship with outcome. The finding related to the preparation and supervision in this study did not agree with that of Deininger, Squire, and Basu (1998). A possible explanation is that ESW, when considered in the quantitative study in Deininger, Squire, and Basu (1998), is a better predictor of project success given that ESW helps staff to identify and support new investment options. ESW might also expands the set of feasible projects, design better projects ex ante or improves the quality

¹⁰ Project outcome ratings from the Independent Evaluation Group (previously, Operation Evaluation Department) were considered a common success measurement as demonstrated in the studies mentioned above – Guillaumont and Laajaj (2006) and Dreher, Klasen, Vreeland and Werker (2010).

¹¹ These could include a Country Economic Memorandum, a comprehensive account of economic performance and prospects, and/or more topic-focussed reports such as Poverty Assessments, Public Expenditure Reviews, Labor Market Studies, as well as a wide range of sectoral studies.

¹² These are democratically elected leaders, political instability (average no. of government crises during reform period), ethnolinguistic fractionalisation, length of time the incumbent has been in power prior to the reform.

of projects already in the investment program while preparation and supervision can only improve the quality of a project (whether good or bad) ex post.

Drawing on data from 1,426 World Bank-funded projects completed between 1981 and 1991, and representing 10 major types of projects¹³, Kilby (2000) focused on how supervision, including monitoring and advising, impacted the development project performance (measured by a change in performance ratings). The reported specification in the study divides early and late supervision and supervision with loan amount, including the use of quadratic variables. The impact of supervision is significant and positive. Specifically, she concluded that early supervision and small projects were most effective, and that the impact of supervision is relatively homogeneous across regions, sectors, and macroeconomic environments. Additionally, the expected change in performance is relatively uniform across regions with other factors held constant indicating that regional differences likely are due to initial conditions or systematic differences in other covariates. Also, there is somewhat more variation in the expected change in performance across sectors, with projects in the Agriculture sector being the least likely to perform.

Using a principal-agent approach, Chauvet, Collier, and Fuster (2006) also concluded that donor supervision of projects was effective in improving project performance. The result is especially prominent in cases where interests of the donor (the principal) and the recipient government (the agent) were widely divergent. Contrary to the use of the number of staff weeks spent on supervisory activities in other studies, this study used expenditure incurred by those activities. Consistent with the theory, supervision is an effective substitute for congruent interests.

In addition, recent work by Denizer, Kaufmann, and Kraay (2011; 2013) employed a large sample of World Bank-supported projects across sectors to identify “macro- [that is, country context] and micro- [that is, project management] correlates of World Bank project performance” (p.3), linking the country- and project-level correlates. The findings from this paper are particularly revealing. Firstly, the longer the time elapsed between project completion and evaluation, the less likely the project will be rated as satisfactory. Second, there is a robust partial correlation between higher preparation costs and eventual low project outcome ratings. Next, project size, which indicates the complexity, affects project outcome ratings and matters to the project outcome. More importantly, even after accounting for a wide range of micro and macro variables, 88% of the variation in project performance remains unexplained. Exploring a further variable – quality at entry – Smets, Knack and Molenaers (2013) found that ensuring a high quality at entry increases supervision, borrower compliance and overall outcome.

In a closely related and more recent work, Blum (2014), concerned with the alignment of project design with political context, used regression analysis to identify which country context, reform content, process, and project management variables predict the performance of public sector

¹³ Agriculture, Development Finance Corporations, Education, Energy, Health, Industry, Structural Adjustment Loan, Technical Assistance, Transportation and Tourism, Urban, and Other.

management projects. The study concluded, firstly, that public sector management projects perform better in countries with democratic regimes than autocratic ones. They fare better in the presence of programmatic political parties and in more aid-dependent countries. Secondly, project managers' subjective risk assessments predict performance in public sector management operations better than objective risk indicators.

In summary, the literature on World Bank projects have surveyed a variation of country-level indicators to predict project performance. A few project-level indicators, most often, supervision by World Bank staff, proxy in various ways such as the number staff weeks, the dollar amount spent, and the specific team lead in the project. Therefore, in a bid to further explain project performance, a gap exists for other project-level indicators to be investigated.

The table below provides the summary of the country- and project-level variables analysed by the previous studies and lists out the variables to be tested in the current research.

Table 1: Summary of literature review: country-, project-level outcomes

Country-level variables studied in literature	Project-level variables studied in literature	Project-level characteristics to be tested in the current research
Civil Liberties (Freedom House Rating) (+)	Project Duration (+)	Focus of sectors
Macroeconomic Performance (+)	Economic Sector Work (+/-)	Focus of themes
Institutional Quality (+)	Time Elapsed between Project Completion and Evaluation (+)	Proportion of staff weeks in lending phase
Volatility (+)	Project Size (+)	
Peace/Political Stability (+)	Quality at Entry (+)	
Country Policy and Institutional Assessment (CPIA) ratings (+)	Supervision (+)	
Political Motivation (-)	Implementation Capacity (+)	
	Number of Loan Conditions (-)	
	Loan size (-)	
	WB Staff Weeks per Project Cycle (+/-)	
	Project Cost (+/-)	

	Reform Content (+/-)	
Note: (+) strong predictor of project outcome, (-) weak predictor of project outcome, (+/-) partial correlation with project outcome/mixed result from different studies		

2.3. IDENTIFYING SUCCESS DRIVERS VIA MACRO AND MICRO PROXIES

Past researches have focused heavily on how macro indicators impacted foreign aid's effectiveness. Such indicators cover a combination of political stability, macroeconomic performance, national competitiveness index and ease of doing business. Ranking such as the World Bank's doing business index, World Economic Forum's competitiveness index and Transparency International's corruption index offer a ready pool of nationally aggregated database. Scholars and practitioners who have investigated using such train of thought include Burnside and Dollar (2000), Duponchel and Chauvet (2010) and Clemens, Radelet and Bhavani (2004). In particular, the first two studies examined per capita GDP against country's economic policies and foreign aid. They found that aid has a positive impact on economic growth in developing countries only with good fiscal, monetary, and trade policies. While Clemens, Radelet and Bhavani (2004) studied foreign aid receipts and economic growth. The study revisited the findings of earlier studies and confirmed that aid has a modest positive effect on economic growth. However, a key challenge to national level analysis is to explain why many projects fail or succeed not across political boundaries but within it. A performance correlation study by Denizer, Kaufmann and Kray in 2010 used 6,253 projects since 1970s reviewed specific breakdown. 19% of project outcome variation is explained by cross country differences. That leaves 81% of project differences unexplained by national macro factors. In other words, country level analysis could be too broad a stroke in determining if projects will fail or succeed. A smaller subset of determinants, possibly at regional, city or project level might hold answer to better determinants. In the same study, the authors discovered that the World Bank's Country Policy and Institutional Assessment (CPIA), project size, project length and early project warnings as important correlates of project level success. However, these regressors only explain less than 6% of within-country project outcome variations. Therefore, there is still much room for research fine-tuning and improvement.

2.4. HYPOTHESES

This paper focuses on four hypotheses that will direct our subsequent research. The following subsection details the data and variables used.

Hypothesis 1: The initial set of project conditions (proxy by duration, quality-at-entry, implementing agency performance, committed amount) positively correlates with IEG Outcome.

Hypothesis 2: A focused project (proxy by focus of sectors and themes)¹⁴ positively correlates with IEG outcome.

Hypothesis 3: Favourable macro level factors (per capita GDP growth, quality of institutions, level of civil liberties and political rights) positively correlate with IEG outcome.

Hypothesis 4: A more diligently designed project (proxy by number of staff-weeks proportion in lending phase) positively correlates with IEG outcome.

Table 2: Hypotheses, relationships and explanations for variables used in regressions

Proposition 1		
Variable	Relationship	Remark
Quality at Entry	+	Strong preparation, planning and commitment at the start herald greater chance of project success.
Implementing Agency Performance	+	Strong implementation capacity and resource at disposal may promise greater chance of project success.
Duration	+	The longer the project duration, the greater the likelihood of delays, cost overruns and hence poorer project outcome.
Committed amount	- (loan size)	Large committed amount makes resource management harder and hence greater leeway for mishandling
Proposition 2		
Focus of themes	-	A greater number of themes in a project suggests over diversification and a lack of technical and practical focus.
Focus of sectors	-	Similar as above
Proposition 3		
Per capita GDP growth	+	High GDP growth signals vibrant economy, associated market mechanism and lack of market distortion. This may contribute to better probability of success for investment related projects.
Quality of country's policies and institutional arrangements ¹⁵	+	Institutional quality and effective governance exercised through efficient policies reduce the risk of corruption, appropriation, red tape and vested interest. This may result in better project success.

¹⁴ Each World Bank project may cover up to 5 sectors. A percentage is allocated to each sector. For instance, Project ABC may be involved in 2 sectors: governance (40%) and environment (60%).

¹⁵ Governance will be proxied by CPIA data.

Freedom House rating	+	Observance of political rights and civil liberties ensures adherence to check and balances, i.e. accountability to public and transparency of policy processes. Thus, these factors may be predictive of project success.
Proposition 4		
Proportion of staff-weeks spent on Lending phase	+	More staff-weeks allocated to preparation suggests better pre-project planning and cautiousness. This may predict better project outcome.

2.5. RESEARCH METHODOLOGY

To ensure research robustness, the authors will obtain information from various sources: literature review, World Bank database of projects, Impact Evaluation Group (IEG) project-level evaluations, and interviews. Following the findings from the literature review, the authors will proceed with collating all measures of project outcomes on the World Bank database. A set of project-level indicators available for public use are shortlisted for their data completeness, relevance and measurability. The universe of World Bank’s projects will then be sieved according to the indicators gleaned from the literature review. These projects will make up the research focus. The shortlisted projects will then be regressed against hypothesized variables. In addition, the regressors will be checked for statistical significance. If necessary, multiple regressions will be run to test for geographical, political, economic, and other fixed effects.

Beyond quantitative results, we also sent out seven email surveys to World Bank staff to better elicit qualitative feedback for our assessment.

3. DATA DEFINITION

Our regression data is compiled from three data sources. The first is the World Bank project repository that contains project level characteristics since 1947. The second source is the IEG evaluation repository that tracks project outcome and various implementation ratings. As of 12th January 2015, the IEG database has 15,775 projects.¹⁶ Lastly, to complement the IEG data, a

¹⁶ Our primary project-level outcome variable is the IEG assessment of the extent to which a project met its stated “development objective” (the objective, that project was intended to achieve), i.e. project outcome rating. This research will rely on IEG project evaluation due to its depth, scope of coverage, and impartiality. IEG follows a consistent measurement framework and contains qualitative results for over 10,000 out of nearly 12,000 completed projects. The comprehensiveness of IEG evaluation permits different hypotheses to be tested in multiple ways. In addition, IEG qualitative indicators include overall bank performance, borrower preparation, borrower implementation, borrower compliance and ICR quality. In particular, project outcome is defined as “extent to which the operation's major relevant objectives were achieved, or are expected to be achieved, efficiently.” (IEG Harmonized Evaluation Criteria for ICR and OED, p.1) The use of IEG outcome indicator also represents a summary index for both financial (i.e. efficiency in terms of returns with respect to opportunity cost of capital or least cost alternative criteria) and social (i.e. relevance in terms of the consistency with the country's current development priorities and with current Bank country and sectoral assistance strategies and corporate goals) indicators. However, the limitation is that it is not possible to pinpoint whether the project success is in specifically referring to either of this aspect due to aggregation. These project outcome assessments are available for

number of project-level variables are manually extracted from the World Banks' Implementation Completion Reports (ICRs), which are prepared within six months' time following project completion by the World Bank staff not involved into the project implementation. ICRs provide a comprehensive review of various dimensions of project outcomes. In our core regression sample we have 582 project outcomes based on ICR reviews. The complete list of variables used for the research is given in Section 3.1 and 3.2. Key raw Stata results in log format are appended in Appendix 1. The definition of each variable is explained in the following two sub-sections.¹⁷

the projects implemented and completed from 1984-2013., Unlike techniques used by Denizer, Kaufmann, and Kraay (2011; 2013) We do not transform the project outcome into a binary variable of satisfactory/unsatisfactory rating.

¹⁷ Full explanation is available on IEG website. Please see Bibliography for more detail. Explanation for certain variables is lifted from official source without amendment. Source: <http://ieg.worldbank.org/Data/HarmonizeEvalCriteria.pdf>

3.1. COUNTRY-LEVEL VARIABLES

Table 3: Country-level variables, rating mechanism and explanations for regressions

Variable	Explanation	Source
GDP per capita growth (average % over length of project period)	<p>Percentage growth rate of GDP (average over length of project period) at market prices based on constant local currency at project's approval.</p> <p>Empirical research suggests that the level of economic development in a country measured by GDP per capita growth may impact development project success, as such Dollar and Levin (2005) assume that very poor countries may have limited supporting resources to make development projects succeed as well as macroeconomic shocks may hinder the project implementation.</p> <p>Actual Variable Name: pcGDPgrowth_Ave</p>	<p>Authors' own calculations World Development Indicators</p>
CPIA Rating (average over length of project period)	<p>A summary index (i.e. IDA Resource Allocation Index) is obtained by calculating the average score for each cluster and then by averaging those scores. For each of the 16 criteria countries¹⁸ are rated on a scale of 1 (low) to 6 (high). This index was averaged over the length of the project period.</p> <p>The CPIA exercise is intended to capture the quality of a country's policies and institutional arrangements, focusing on key elements that are within the country's control, rather than on outcomes (such as economic growth rates) that are influenced by events beyond the country's control. More specifically, the CPIA measures the extent to which a country's policy and institutional framework supports sustainable growth and poverty reduction and, consequently, the effective use of development assistance.</p> <p>The variable measures growth and policy performance. Previous research (Denizer, Kaufman and Kraay 2011; 2013) finds that CPIA rating is a strong predictor of project performance.</p> <p>Actual variable name: CPIA_Ave</p>	<p>Authors' own calculations World Bank Group, CPIA database (http://www.worldbank.org/ida).</p>

¹⁸ The 16 criteria grouped in four clusters: economic management, structural policies, policies for social inclusion and equity, and public sector management and institutions.

<p>Freedom House Ratings (average over length of project period)</p>	<p>Annual rating representing the levels of political rights and civil liberties in a country. The aggregate score is calculated as a sum of political rights (40) and civil liberties (60), totalling 100 points¹⁹. The variable was averaged over length of project period.</p> <p>The variable was included in the analysis to test the role of civil liberties and political rights as macro-level correlates of project performance for the particular economic rate of return outcome measure. We test these using the sum of the Freedom House scores of civil liberties and political rights at approval year. The relevance of the variable is validated with the research done by Denizer, Kaufman and Kraay (2011).</p> <p>Actual variable name: FH_Ave</p>	<p>Authors' own calculations Freedom House data²⁰</p>
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3.2. PROJECT LEVEL CHARACTERISTICS

Table 4: Project-level variables, rating mechanism and explanations for regressions

Variable	Explanation	Source
<p>IEG Outcome (Dependent Variable)</p>	<p>The extent to which the operation's major relevant objectives were achieved, or are expected to be achieved, efficiently.</p> <p>Highly Satisfactory There were no shortcomings in the operation's achievement of its objectives, in its efficiency, or in its relevance.</p> <p>Satisfactory There were minor shortcomings in the operation's achievement of its objectives, in its efficiency, or in its relevance.</p> <p>Moderately Satisfactory There were moderate shortcomings in the operation's achievement of its objectives, in its efficiency, or in its relevance.</p>	<p>IEG</p>

¹⁹ The rating explanation is sourced from <https://freedomhouse.org/report/freedom-world-2014/freedom-world-faq#.VOnJFPmUcw8>

²⁰ Source: Freedom House Report <https://freedomhouse.org/report/freedom-world-aggregate-and-subcategory-scores#.VOZ9vfmUe1c>

	<p>Moderately Unsatisfactory There were significant shortcomings in the operation's achievement of its objectives, in its efficiency, or in its relevance.</p> <p>Unsatisfactory There were major shortcomings in the operation's achievement of its objectives, in its efficiency, or in its relevance.</p> <p>Highly Unsatisfactory There were severe shortcomings in the operation's achievement of its objectives, in its efficiency, or in its relevance.</p> <p>Each variable is allocated a point system that corresponds to its qualitative description as follows:</p> <p>Highly Satisfactory: 6 Satisfactory: 5 Moderately Satisfactory: 4 Moderately Unsatisfactory: 3 Unsatisfactory: 2 Highly Unsatisfactory: 1</p> <p>For probit regression models, the variable is further transformed:</p> <p>IEG Outcome 2 = 1 if IEG Outcome is 4 to 6, 0 otherwise</p>	
Log of committed amount	<p>The amount (in US\$ million) committed to the project by the Bank and non-bank resources is available for the World Bank projects. Due to the large range, the variable was first multiplied by a factor of 1000 (therefore unit of US\$ thousand) before taking the natural logarithm. This is prevent the case where a negative number is obtained when taking the logarithm of a number less than US\$1 million, as in the original dataset provided.</p> <p>Based on Denizer, Kaufmann and Kraay's (2013) assumption we test the committed amount (a presumable proxy of project complexity) as a predictor of project success.</p>	Authors' own calculations Implementation Completion Report (ICR)
Duration of project (years)	<p>Refers to years between approval date (the date that the board of directors voted to approve the loan or credit) and closing date (the date all financial activities related to the project stopped).</p> <p>Years were chosen as the unit rather than months or days for ease of interpretation of the coefficient of the</p>	Authors' own calculations ICR

	<p>regression model.</p> <p>We control for the above factor to avoid omitted variable bias. Earlier research by Denizer, Kaufmann and Kraay (2011) suggests that there is strong correlation between project length and its outcomes.</p>	
Focus of sectors	<p>We test the assumption that focus of sectors can be an additional dimension of project complexity, which can correlate with the project outcome. The variable represents the percentage of top 2 sectors.</p> <p>Sectoral classification of projects is based on data which assigns a percentage of each project to up to five major sectors. The list of possible sectors includes:</p> <ol style="list-style-type: none"> 1. Agriculture, fishing and forestry 2. Public administration, law and justice 3. Information and communications 4. Education 5. Finance 6. Health and other social services 7. Energy and mining 8. Transportation 9. Water, sanitation and flood protection 10. Industry and trade <p>Following the assessment done by Denizer, Kaufmann and Kraay (2013) this variable is used to measure the (lack of) complexity as the largest share of the project assigned to a single sector, i.e. higher values indicate less dispersion of the project across sectors, and presumably also less complexity.</p>	Authors' own calculations ICR
Focus of themes	<p>To investigate all possible dimensions of complexity, we explore the extent to which a project spans multiple themes within the sectors; thus, testing whether projects covering more themes are more (less) complex and (more) less successful.</p> <p>We test the assumption that focus of themes can be an additional dimension of project complexity, which can correlate with the project outcome. The variable represents the percentage of top 2 themes²¹.</p>	Authors' own calculations ICR
Proportion of staff-weeks spent on	<p>We break down the staff time by the project cycles and test whether devoting more (less) staff-weeks during the lending phase, which comprises of four project cycles as</p>	ICR

²¹ The full listing of themes can be found on <http://www.worldbank.org/projects/theme?lang=>.

Lending phase	<p>identified by the World Bank, namely Pre-Pipeline, Identification, Preparation and Appraisal²², results in better project outcomes.</p> <p>Specifically, we reasoned that staff-weeks spent on the initial phases of the project is a better explanatory variable of project outcome than total staff-weeks, as the former variable is “before the event”.</p>	
Quality at Entry (ICR)	<p>While IEG rating assesses bank performance as a combined indicator of quality at entry and quality of supervision, we test whether quality at entry alone is a predictor of project’s positive outcome. We test this hypothesis based on previous research done by Smets, Knack and Molenaers (2013).</p> <p>The gradation follows from the common spectrum from highly satisfactory to highly unsatisfactory.</p>	ICR
Implementing Agency performance	<p>Earlier researches did not examine implementing agency performance separate from overall borrower performance indicator constructed based on borrower preparation, government performance and implementing agency performance. In this report we test whether implementing agency performance (professionalism of staff, commitment to the project) on its own contributes to the higher (lower) project outcome.</p> <p>The gradation follows from the common spectrum from highly satisfactory to highly unsatisfactory.</p>	ICR

3.3. DATA FILTERING FOR REGRESSION

Stage 1: Retain Projects with Investment Loans as Lending Instrument

The list of 15,775 projects is filtered according to the following criteria to obtain a set of relevant projects:

1. Lending instrument type → investment loans²³ (Projects remaining: 13,808)

Only projects with investment loans were included in the sample in order to mirror the need for both financial and social returns as in a typical DIB structure. Due to the unavailability of

²² For a detailed explanation of World Bank project cycle please visit: <http://web.worldbank.org/WBSITE/EXTERNAL/PROJECTS/PROCUREMENT/0,,contentMDK:20109658~menuPK:63001537~pagePK:84269~piPK:60001558~print:Y~theSitePK:84266~isCURL:Y~isCURL:Y,00.html>

²³ World Bank has 2 types of lending instrument type:
Investment loans have a long-term focus (5 to 10 years), and finance goods, works and services in support of economic and social development projects in a broad range of sectors.
Development policy loans provide quick-disbursing external financing to support a government's policy and institutional reforms.

substantial performance indicators of DIBs, this dataset was the closest representation of DIBs that the World Bank could be managing.

2. Project Status → closed²⁴ (Projects remaining: 10,397)

Only closed projects were included as the disbursement of funds had been terminated and a final report on project operations, if required, had been completed. This is to ensure that assessments of performance were based on stable conditions. Pipeline and active projects are still work-in-progress. Dropped projects are cancelled.

3. Countries (Projects remaining: 10,172)

Certain World Bank projects are multinational in nature. Highest unit of analysis in this report was pegged at national level.

Further, we removed 4 projects with closing dates in 2015 and 2017, arriving at 10,168 projects.

Stage 2: Remove Projects with Missing Key Variables

Following, projects with missing key variables are removed:

4. IEG outcomes²⁵ (Projects remaining: 8,996)
 - a. Excluded “not available”, “not rated”, “#NA”, “not applicable”
5. Project Duration (Projects remaining: 8,619)
 - a. Excluded projects with missing approval or closing dates

Stage 3: Retain Projects from 2006 onwards

6. Approval Year → 2006-2014 (Projects remaining: 582)

Analysis was restricted to projects from 2006 onwards for the purpose of this paper due to resource constraint in completing the data sourcing process²⁶. Moreover, the quality of country-level variables deteriorates quickly with time. The earlier the project, the poorer the quality and

²⁴ World Bank has 4 project status classifications:

Pipeline: The Project Information Document (PID) has been received by the InfoShop but the project has not yet been approved by the Board of Directors.

Active: The project has been approved by the World Bank's Board of Directors. The project remains in active status while the associated loans or credits are being disbursed and implementation of the planned deliverables is in progress.

Closed: The disbursement of funds has terminated and a final report on project operations, if required, has been completed.

Dropped: The project is marked as dropped. This may happen during the pipeline stage.

²⁵ IEG outcomes ranges from highly satisfactory to high unsatisfactory

²⁶ Project-level variables required for the analysis were only obtainable by manual entry from individual project Implementation Completion Reports. Within the constraints of the Policy Analysis Exercise, the authors were unable to obtain more resources to achieve the most ideal spread of data. Therefore, it had been decided based on pragmatic reasons to focus on more recent projects.

availability. For instance, per capita GDP growth rate in many developing countries is absent from the main World Bank database before 1990s.

The final project count is 582.

Table 5 below shows how the regions and types of lending instruments were represented during each phase of data filtering:

Table 5: Summary statistics on each stage of data filtering

Stage	n	Africa	East Asia and Pacific	Europe and Central Asia	Latin America and Caribbean	Middle East and North Africa	South Asia
1	10168	29%	17%	13%	20%	9%	12%
2	8996	29%	17%	13%	20%	9%	12%
	8619	28%	17%	13%	20%	9%	12%
3	582	36%	16%	13%	14%	10%	10%

Stage	n	Adaptable Program Loan	Financial Intermediary Loan	Emergency Recovery Loan	Sector Investment and Maintenance Loan	Specific Investment Loan	Learning and Innovation Loan	Technical Assistance Loan
1	10168	3%	7%	5%	12%	60%	1%	11%
2	8996	3%	8%	4%	12%	61%	1%	10%
	8619	3%	8%	4%	13%	60%	2%	10%
3	582	5%	1%	21%	2%	38%	2%	32%

3.4. STRUCTURE OF REGRESSION

Working with 582 projects in the regression, we have followed Denizer, Kaufman and Kraay (2011; 2013) in using two models of regression – ordinary least squares and probit. The table below summarizes the full set of variables, which are considered in various combinations, as laid out in Section 5: Discussion of Findings.

<i>Table 6: Summary of variables</i>	
DEPENDENT VARIABLE	
IEG Outcome (ordinal and binary)	
INDEPENDENT VARIABLES	
<i>Country-Level Variables</i>	<i>Project-Level Variables</i>
<ol style="list-style-type: none"> 1. GDP per capita growth (average % over length of project period) 2. CPIA Rating (average over length of project period) 3. Freedom House Ratings (average over length of project period) 	<ol style="list-style-type: none"> 1. Log of committed amount 2. Duration of project (years) 3. Focus of sectors 4. Focus of themes 5. Proportion of staff-weeks spent on Lending phase 6. Quality at Entry (ICR) 7. Implementing Agency performance

4. QUALITATIVE ANALYSIS

We have conducted qualitative analysis to get greater detail and insight into what World Bank staff consider critical success factors. As our study also attempts to utilize the results of the analysis to operationalize the DIBs scheme, we have asked the respondents to elaborate on the feasibility of this mechanism as compared to the existing financing mechanisms. The survey was developed in the form of structural exchanges in which all interviewees were asked the same set of questions. The list of questions included in the survey is as follows:

1. Based on your experience, what do you think are the critical success drivers of WB projects?
2. What makes performance based financing project (PBF) successful (only if you have relevant experience dealing with PBF projects)?
3. Do you see that any of the success drivers of WB projects as critical to the success of Development Impact Bonds (DIBs)?

The survey was disseminated via email to seven World Bank staff the authors of this study had access to. Candidate profile of the potential survey respondents is described in the Table below.

Table 7: Candidate profile for qualitative analysis

Region	Country	Designation	Sector
Europe and Central Asia	Kyrgyz Republic	Country Economist	Disaster Risk Management
Middle East and North Africa	Moldova	Country Manager	Gender
	Russia	Economist	Poverty
	West Bank and Gaza	Operations Officer	Public Sector Institutional Reform
		Public Sector Specialist	Transport

5. DISCUSSION OF FINDINGS

5.1. SUMMARY STATISTICS

Table 8: Summary statistics for country-level variables

	n	Mean	SD	Min	Max
Per Capita GDP Growth (%)	564	3.56	3.43	-28.52	12.17
CPIA Ratings (1-7)	374	3.31	0.47	2.01	4.43
Freedom House Ratings (0-100)	574	49.1	22.7	1	97

Table 8 summarizes the country-level variables of the projects used in the sample.

The per capita GDP growth of the projects over the project period ranges from -28% to 12%, representing both expanding and contracting economies. The extreme observation value of -28% appears to be an anomalous value (See appendix 2 for the scatter plots), the next lowest value being -13%. We decided to keep the observation as it was tested that the results (not reported due to space constraint) of all the reported regression models does not change.

The CPIA ratings ranges from 2.01 to 4.43, with a mean value of 3.31, out of a maximum possible range of 1 to 7. The slightly lower than average CPIA ratings makes logical sense as the set of projects were from countries that needed the loans from World Bank to strengthen the institutions from their countries.

The Freedom House ratings is well-spread across the full possible range of ratings, with a mean of 49.1. It suggests that the various levels of political rights and civil liberties that were possible are well-represented.

Table 9 Summary statistics for project-level variables

	n	Mean	SD	Min	Max
Committed Amount (\$US thousand)	222	88,704	165,763	1,000	1,250,000
Duration (Years)	582	4.7	1.8	1	9
Focus of Sectors (%)	582	90.7	14.5	40	100
Focus of Themes (%)	575	81.3	21.1	17	100
Proportion of Staff Weeks in Lending Phase	119	0.35	0.21	0	1
Quality at Entry (ICR) (1-6)	269	4.06	1.04	1	6
Implementing Agency Performance (ICR) (1-6)	261	4.23	0.99	1	6

Table 9 summarizes the project-level variables of the projects used in the sample.

The projects size varies from about US\$1 million to US\$1.25 billion, with an average size of about US\$89 million. Project duration ranges from 1 to 9 years, averaging 4.7 years. With an average focus of 91% and 81% on sectors and themes, the projects in the sample appear to be relatively directed at specific development goals. It is found that World Bank staff spends about 35% of staff-weeks on the initial phases of the project. Both quality at entry and implementing agency performance of the projects received a rating of at least “Moderately Satisfactory”.

5.2. KEY FINDINGS OF REGRESSION

Table 10: Summary of regression results of IEG Outcome against country-level variables

	(1)	(2)	(3)	(4)	(5)
	OLS	OLS	OLS	OLS	Probit
Per Capita GDP Growth (%)	0.00 (0.01)			-0.00 (0.02)	-0.01 (0.03)
CPIA Ratings (1-7)		0.17 (0.12)		0.21 (0.14)	0.24 (0.23)
Freedom House Ratings (0-100)			-0.00 (0.00)	-0.00 (0.00)	-0.00 (0.01)
Constant	1.42*** (0.14)	0.85** (0.40)	1.43*** (0.16)	0.81** (0.41)	-2.11 (0.70)
Regional control	Yes	Yes	Yes	Yes	No
<i>Summary Statistics</i>					
Observations	564	374	574	373	373
R-squared	0.00	0.02	0.00	0.02	-
Standard error of regression	0.97	0.97	0.96	0.97	-
These regressions were estimated using the data from the IEG database. Standard errors are given in parentheses under coefficients. Individual coefficients are statistically significant at the *10%, **5%, or ***1% significance level.					

Table 10 summarizes the findings of the regression results of IEG Outcome against the country-level variables. None of the variables – per capita GDP growth (%), CPIA ratings (1-7), and Freedom House ratings (0-100) – were significant. Not surprisingly, these country-level variables were not able to explain the variation in the IEG outcomes, with R-squared values of all models being near 0.

These results are surprising to the authors as they stand contradictory to the literature as discussed in Section 2.2. However, one possible, but untested, reason is that the projects used in the sample does not share similar characteristics as those tested by other researchers, notably Denizer, Kaufman and Kraay (2011; 2013). This is because the projects in the sample specified that the lending instrument type must be an investment loan, of which about seven out of ten projects were Specific Investment Loan (38%) and Technical Assistance Loan (32%).

If we follow this line of thought, perhaps the nature of this class of projects is such that the lending of these loans do not need to consider the macro-level factors as critically as development policy loans. In the case of development policy loans (vis-à-vis investment loans), the conditions attached to the loans may require governments to commit to changes in, for instance, fiscal

policies. Then, factors such as level of economic growth, quality of institutions, or level of civil liberties and political rights would weigh in much more in the decision for World Bank to lend. Whereas in the case of investment loans, it relies on factors that are of a more local nature, such as “pre-identified equipment, materials, civil works, technical and consulting services, studies, and incremental recurrent costs”²⁷. Therefore, this might explain the non-significance of the variables used in explaining the variation of IEG Outcomes.

²⁷ <http://digitalmedia.worldbank.org/projectsandops/lendingtools.htm>

Table 11: Summary of regression results of IEG Outcome against project-level variables

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
	OLS	OLS	Probit						
Committed Amount (log)	-0.04 (0.06)							-0.04 (0.11)	-0.15 (0.16)
Duration (Years)		0.01 (0.02)						-0.16 (0.11)	-0.20 (0.17)
Focus of Sectors (%)			-0.00 (0.00)					-0.00 (0.01)	-0.01 (0.02)
Focus of Themes (%)				-0.00 (0.00)				-0.00 (0.01)	0.00 (0.01)
Proportion of Staff Weeks in Lending Phase					-0.09 (0.61)			0.46 (1.08)	0.50 (1.50)
Quality at Entry (ICR) (1-6)						0.21*** (0.07)		-0.02 (0.21)	-0.10 (0.38)
Implementing Agency Performance (ICR) (1-6)							0.18** (0.08)	0.41** (0.19)	1.19** (0.50)
Constant	2.07*** (0.70)	1.37*** (0.16)	1.55*** (0.28)	1.61*** (0.20)	2.47*** (0.49)	0.84** (0.35)	1.02*** (0.39)	1.57 (1.96)	-2.39 (2.97)
Regional control	Yes	Yes	No						
<i>Summary Statistics</i>									
Observations	222	582	582	575	119	269	261	79	79
R-squared	0.02	0.00	0.00	0.01	0.06	0.05	0.05	0.17	-
Standard error of regression	1.24	0.95	0.95	0.96	1.30	1.21	1.21	1.22	-
These regressions were estimated using the data from the IEG database. Standard errors are given in parentheses under coefficients. Individual coefficients are statistically significant at the *10%, **5%, or ***1% significance level.									

Table 11 summarizes the findings of the regression results of IEG Outcome against the project-level variables. Again, the results were not agreeable with what literature has told us. Of all the variables used in models (1) to (7), only quality at entry and implementing agency performance are significant at the 1% and 5% level significance respectively. However, when regressed with other variables in models (8) and (9), only implementing agency performance was consistently significant at a 5% significance level. It remains a robust observation as the correlation between implementing agency performance and IEG Outcome remained positive.

From the results, it seems that project characteristics does not matter to IEG Outcomes. Rather, it is the “ability” of the implementing agency that can drive favourable project outcomes. Perhaps, as mentioned above, that the nature of the projects is considerably different that the project-level variables that were tested cannot predict IEG Outcomes. However, as much as it seems like an appealing reason to accept, it can only be concluded that there is still unknown factors – many perhaps – beyond those tested in the above regression models drive good project outcomes. Further studies need to be done to broaden the common understanding of project success drivers, as R-square of all regression models remained startlingly low.

Relating to the 4 hypotheses set out in Section 2.4, we have partially proven Hypothesis 1 true, while we were unable to do so for Hypotheses 2 to 4.

5.3. IMPLICATIONS

The research aimed to analyze critical success factors of the World Bank projects and explore a possibility for the World Bank to utilize DIBs tool to improve underperforming factors revealed by the analysis. By understanding what drives project outcome, investors are better informed to price their risk-return assessment before committing their money. In addition, better information flow could also lower the information acquisition costs as investors have a reliably long history as reference for future performance. Unfortunately, our result echoes a longstanding concept on predictability by Niels Bohr: “prediction is very difficult, especially if it’s about the future.” Despite regressing outcome against a list of commonly associated macro and project level variables, there are scant evidence that outcomes are significantly predictable ex-ante of commitment. That said, our result do emphasize the influential role of the World Bank in shaping eventual outcome.

Result from the quantitative analysis (See Table 11) suggest that correlation between IEG Outcome and Implementing Agency performance is high. It is worth investigating the possibility of testing a new project implementation structure in the form of DIB. In particular, the performance-based contracts issued to private investors, which are the core of DIBs, would serve as a quality-control measure to ensure the project outcome is successful in meeting its development objective. Furthermore, it would be essential to ensure high quality at entry so as to attract a private investor to invest in and implement the project. This tool could serve as an additional measure to ensure project effectiveness.

However, results of the analysis also pose certain constraints to the successful introduction of the new DIB structure. In particularly, we see that CPIA rating of the typical country in the sample represents lower than average level of performance in its policy and institutional framework. The low rating of performance in policy and implementation framework could be a restraining factor for the private investor to invest in the project which is under the risk of being unsuccessful aiming to the reasons out of the implementing agency’s (private investor’s) control.

We further aid our discussion on the feasibility of operationalizing the results of our analysis into the DIB structure with the survey results. While we note that the survey response rate is very low (one out of seven) and, therefore, it is not valid to extrapolate these findings to the population, we consider it to be insightful to complement our quantitative analysis findings and give a space for future research on the topic.

The survey result shows that the World Bank staff is rather critical about financial sustainability and value that DIB could add to the existing financing tools. For instance, the World Bank currently employs Performance Based Financing model where a donor agency signs a contract with a service provider and pays the provider when the service is provided. In particularly, the respondent notes that

“the involvement of the private investors creates additional transaction costs and a higher risk premium than what the donor would require. It also discourages higher-risk activities or activities where performance indicators are not 100% objectively measurable”.

In other words, the DIB tool would not be cost effective for the donor and also restrict project implementation to certain sectors only and, hence, make other important sectors underinvested. Instead of crowding-in private investment into hitherto unpopular or high-risk fields, risk-adverse private investors may crowd-out already crowded fields that have low-risk profiles.

The respondent goes further by saying that

“for a DIB approach to be successful, one requires that the development outcome should be highly predictable and responsive to the intervention, which is often not the case in complex development situations”.

This reinforces our earlier discussion of the unpredictability of risk events. In sum, there are idiosyncratic risk at the project level which escape common observable indicators at both the project and national level.

6. LIMITATION AND CONCLUSION

Resource constraint remains a key challenge in this research. As a result, we are unable to solicit more project level evidence in our regression or rerun our regression with different set of samples. Consequently, our sub-set of 582 projects may not be sufficiently representative of the universe of World Bank project. Hence, we urge caution when interpreting our sub-set data and result.

In addition, the qualitative analysis targeted at seven potential respondents drew only one feedback due to the authors' limited access to the targeted population. This posed a major limitation to the validity of the qualitative analysis results. Thus, this research used survey results solely for an informative purpose.

Thirdly, our model assumed a linear relationship between the variables. The reality could be complicated with interaction terms and non-linear parameters. That said, the economic theory behind non-linear relationships are not firmly established.

Lastly, proving causation is a tricky issue. This paper has deliberately not speculated why certain characteristics enjoy higher project success. Our findings may be a coincidental result of data snooping so readers must remain cautious when extrapolating the findings to other development projects. That said, the variables' predictability, and the lack of them, in this paper is a constructive value-add to the on-going debate around critical success factors and their effectiveness.

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8. APPENDIX

Appendix 1. Key Stata Output

```

.
. ** MACRO **
. sum pcgdpgrowth_ave cpia_ave fh_ave

```

Variable	Obs	Mean	Std. Dev.	Min	Max
pcgdpgrowth_ave	564	3.559167	3.425324	-28.51831	12.17099
cpia_ave	374	3.305087	.4701914	2.008333	4.429167
fh_ave	574	49.11674	22.74565	1	97

```

. sum africa eap eca lamc mena sa

```

Variable	Obs	Mean	Std. Dev.	Min	Max
africa	582	.3608247	.4806529	0	1
eap	582	.161512	.3683191	0	1
eca	582	.1305842	.3372349	0	1
lamc	582	.1426117	.3499772	0	1
mena	582	.0996564	.2997989	0	1
sa	582	.104811	.3065732	0	1

```

. sum apl fil erl sim sil lil tal

```

Variable	Obs	Mean	Std. Dev.	Min	Max
apl	582	.0515464	.2212996	0	1
fil	582	.0068729	.0826884	0	1
erl	582	.2113402	.4086103	0	1
sim	582	.0189003	.1362903	0	1
sil	582	.3780069	.4853065	0	1
lil	582	.0171821	.1300614	0	1
tal	582	.3161512	.4653727	0	1

```
. reg ieg_outcome pcgdpgrowth_ave cpia_ave fh_ave africa eap eca lamc mena
```

Source	SS	df	MS	Number of obs =	373
Model	5.79560859	8	.724451074	F(8, 364) =	0.76
Residual	345.952381	364	.950418628	Prob > F =	0.6364
				R-squared =	0.0165
				Adj R-squared =	-0.0051
Total	351.747989	372	.945559111	Root MSE =	.97489

ieg_outcome	Coef.	Std. Err.	t	P> t	[95% Conf. Interval]	
pcgdpgrowth_ave	-.0012169	.0158614	-0.08	0.939	-.0324084	.0299746
cpia_ave	.2088914	.1363277	1.53	0.126	-.0591973	.4769801
fh_ave	-.0014956	.0029953	-0.50	0.618	-.0073859	.0043947
africa	-.0874637	.1496309	-0.58	0.559	-.3817132	.2067858
eap	-.2656545	.1991658	-1.33	0.183	-.6573145	.1260056
eca	-.3146527	.2085854	-1.51	0.132	-.7248364	.0955309
lamc	.1341599	.2485435	0.54	0.590	-.3546016	.6229214
mena	-.0845871	.3270518	-0.26	0.796	-.7277352	.5585611
_cons	.812352	.4138874	1.96	0.050	-.0015587	1.626263

```
. ** MICRO **
```

```
. sum committedamt2 duration focusofsectors focusofthemes lending_percent qualiti  
> yatentryicr implementingagencyperformance
```

Variable	Obs	Mean	Std. Dev.	Min	Max
committedamt2	222	88704.14	165762.5	1000	1250000
duration	582	4.706186	1.801108	1	9
focusofsectors	582	90.65464	14.51497	40	100
focusofthemes	575	81.26783	21.11223	17	100
lending_percent	119	.3528571	.2067306	0	1
qualityatentryicr	269	4.055762	1.044109	1	6
implementingagencyperformance	261	4.226054	.987738	1	6

```
. reg ieg_outcome logcommittedamt2 duration focusofsectors focusofthemes lending
> _percent qualityatentryicr implementingagencyperformance africa eap eca lamc m
> ena
```

Source	SS	df	MS	Number of obs =	79
Model	20.1578355	12	1.67981962	F(12, 66) =	1.14
Residual	97.589	66	1.47862121	Prob > F =	0.3475
				R-squared =	0.1712
				Adj R-squared =	0.0205
Total	117.746835	78	1.50957481	Root MSE =	1.216

ieg_outcome	Coef.	Std. Err.	t	P> t	[95% Conf. Interval]	
logcommitte~2	-.0357532	.1077183	-0.33	0.741	-.2508196	.1793132
duration	-.1638217	.1113785	-1.47	0.146	-.386196	.0585527
focusofsect~s	-.0048066	.0102952	-0.47	0.642	-.0253616	.0157484
focusofthemes	-.000248	.0078449	-0.03	0.975	-.0159109	.0154149
lending_per~t	.4613663	1.084134	0.43	0.672	-1.703176	2.625909
qualityaten~r	-.0196366	.21459	-0.09	0.927	-.4480793	.4088061
implementin~e	.4073559	.1877268	2.17	0.034	.0325473	.7821645
africa	.0418405	.6199533	0.07	0.946	-1.195936	1.279617
eap	-.1291873	.644122	-0.20	0.842	-1.415218	1.156844
eca	-.3251822	.6367275	-0.51	0.611	-1.59645	.9460854
lamc	-.0308247	.6459116	-0.05	0.962	-1.320429	1.258779
mena	1.072204	.9300189	1.15	0.253	-.7846388	2.929047
_cons	1.57259	1.962576	0.80	0.426	-2.345819	5.490999

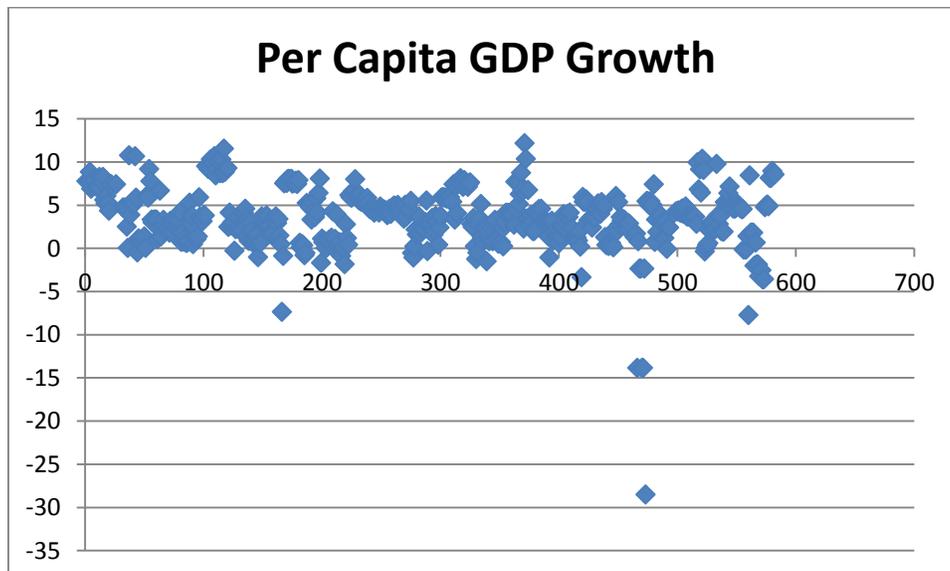
```
. probit ieg_outcome2 logcommittedamt2 duration focusofsectors focusofthemes len
> ding_percent qualityatentryicr implementingagencyperformance
```

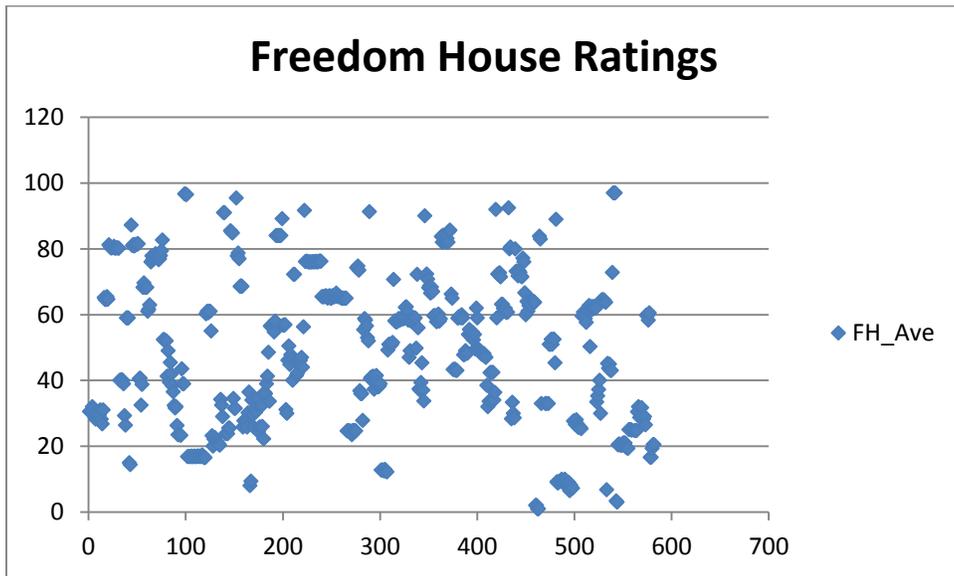
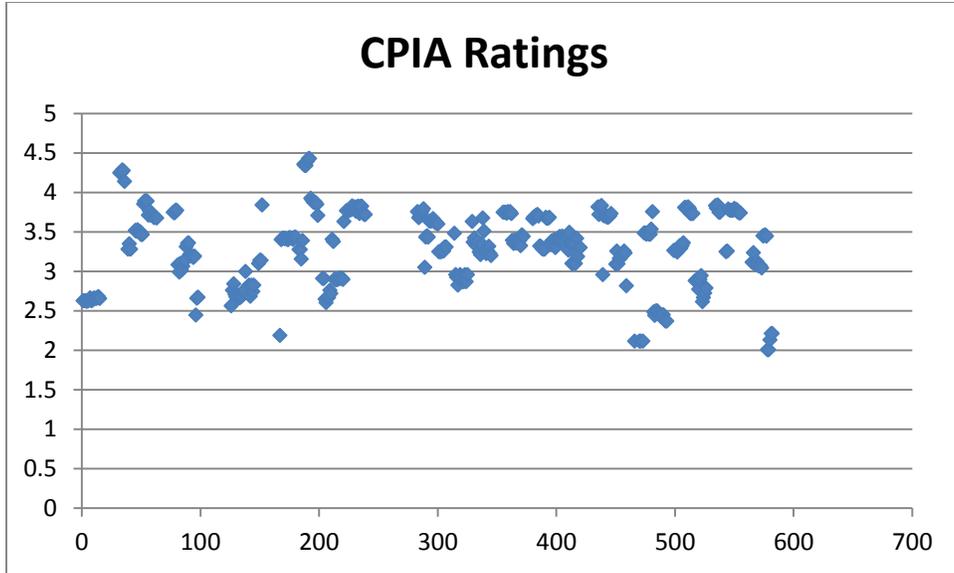
```
Iteration 0: log likelihood = -30.007181
Iteration 1: log likelihood = -23.624251
Iteration 2: log likelihood = -22.287805
Iteration 3: log likelihood = -22.267259
Iteration 4: log likelihood = -22.267226
Iteration 5: log likelihood = -22.267226
```

```
Probit regression                                Number of obs =          79
                                                LR chi2(7) =          15.48
                                                Prob > chi2 =          0.0303
Log likelihood = -22.267226                    Pseudo R2 =          0.2579
```

ieg_outcome2	Coef.	Std. Err.	z	P> z	[95% Conf. Interval]
logcommitte~2	-.1488574	.1614292	-0.92	0.356	-.4652529 .1675381
duration	-.1984823	.172182	-1.15	0.249	-.5359528 .1389882
focusofsect~s	-.0144835	.0157305	-0.92	0.357	-.0453148 .0163478
focusofthemes	.0005332	.0122721	0.04	0.965	-.0235197 .0245862
lending_per~t	.5020847	1.496759	0.34	0.737	-2.43151 3.435679
qualityaten~r	-.0973821	.383563	-0.25	0.800	-.8491517 .6543875
implementin~e	1.187036	.5022655	2.36	0.018	.2026133 2.171458
_cons	-2.392776	2.968761	-0.81	0.420	-8.211441 3.425889

Appendix 2. Scatter plots of variables used





Appendix 3.

Interview Response (Anonymous)

Q1. Based on your experience, what do you think are the critical success drivers of WB projects?

- The project design should be simple and flexible;
- The success indicator(s) should be clear and measurable;
- The project decision-makers should understand and personally benefit from the project activities in material, reputational, career or political terms. The fewer the institutions involved, the easier this is.
- There should be strong leadership from Ministerial level for any required reforms and against corruption/favouritism in contracting and hiring.

Q2. What makes performance based financing project (PBF) successful (only if you have relevant experience dealing with PBF projects)?

- All of the above, plus the performance indicator should be objectively measurable and should be a genuine development objective, not just chosen to facilitate project implementation and disbursement.

Q3. Do you see that any of the success drivers of WB projects as critical to the success of Development Impact Bonds (DIBs)?

I am not convinced that DIBs add value compared with the more traditional PBF model where the donor agency signs a contract with a service-provider. The involvement of the private investors creates additional transaction costs and a higher risk premium than what the donor would require. It also discourages higher-risk activities or activities where performance indicators are not 100% objectively measurable. For a DIB approach to be successful, one requires that the development outcome should be highly predictable and responsive to the intervention, which is often not the case in complex development situations.