

Does the World Bank Foster Business?

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Abstract

This study investigates the impact of World Bank development policy loans on the ease of doing business. It finds that the cumulative number of development policy loans enhances business climate, especially for less developed countries and when combined with an International Monetary Fund assistance program. The results are robust to several

specifications and sample restrictions, and controlling for possible endogeneity. When the cumulative number of loans and their cumulative value are included in the regression, the value is no longer significant. This finding suggests that overall engagement with the World Bank is more relevant than the amount of resources invested in the project.

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1 Introduction

The United Nations Sustainable Development Goals call for a new approach to development finance. The primary ambition of the goals is to mobilize resources commensurate with the scale of the challenge. The new consensus recognizes that the most effective solutions to development problems involve the interplay of private investment and public policy.¹ In developing countries, the private sector can invest in and implement solutions that spur productivity, create jobs, and foster income growth. However, in order to thrive, a vibrant private sector requires access to market opportunities. It also requires an environment that will efficiently allocate resources. This process is fostered by good regulation, trade openness, dynamic entrepreneurship and innovation, and sector-specific approaches to tackling market failures.

The World Bank has great expertise in helping countries enhance competitiveness by improving business regulations, facilitating access to finance, and protecting property rights. Among the Bank's lending instruments, Development Policy Loans (DPLs) most specifically target public policy and therefore have the highest chance of promoting a healthy business environment. The World Bank introduced its first general budget support instrument in 1980, with the aim of helping client countries achieve sustainable growth and poverty reduction through policy and institutional activities. In 2004 the approach to this policy-based financing was substantially modified. Since then, the World Bank has committed to about \$130 billion in DPLs, representing about 30 percent of total World Bank lending.² The sizable amount allocated to these operations and the scarcity of available resources for development call for a better understanding of how DPLs can achieve more effective results. This should be a matter of concern, especially if one strives for the most efficient allocation of these resources.

External research and various internal evaluations have assessed the impact of World Bank Development Policy Lending. The results obtained by these studies are mixed, partially due to

¹ See the Discussion Note "From Billions to Trillions: Transforming Development Finance - Post-2015 Financing for Development: Multilateral Development Finance", prepared jointly by the African Development Bank, the Asian Development Bank, the European Bank for Reconstruction and Development, the European Investment Bank, the Inter-American Development Bank, the International Monetary Fund, and the World Bank Group for the April 18, 2015 Development Committee meeting.

²For a rationale and description of the changes introduced in 2004 see Koeberle (2003) and World Bank (2004). For retrospective analyses of Development Policy Financing (DPF) see World Bank (2015), and previous editions.

differences in the dependent variable, time frame, and strategies adopted to address the important selection bias problems inherent in these analyses.

As for the dependent variable, many studies, especially those focusing on previous generations of policy-based support, have considered the impact of the World Bank DPLs on broad macroeconomic and public finance indicators.³ In a recent paper, Smets and Knack (2014) discuss the impact of DPLs on the quality of economic management, as measured by the World Bank’s Country Policy and Institutional Assessment. Like them, we focus on the most recent generation of policy-based support (i.e., all operations approved after the 2004 reform) and refrain from assessing DPLs’ effect on variables representing final outcomes, such as economic growth, macroeconomic stability or poverty reduction. Instead, we look at the impact of DPLs on the business environment.

The *Doing Business* survey, carried out by the World Bank’s Research Department, provides one of most widely used measures of the ease of doing business. It produces objective indicators of business regulations and the protection of property rights that can either enhance or constrain business activity for firms in about 190 economies going back to 2004. The measures are obtained by surveying experts in each country about the legally required time and costs of regulatory compliance for various aspects of private enterprise, such as starting a business, dealing with construction permits, getting credit, and enforcing contracts. According to these data, OECD high-income economies have on average the most business-friendly regulatory systems, followed by Europe and Central Asia. The Sub-Saharan Africa region continues to be home to the economies with the least business-friendly regulations on average, despite the relatively large improvement recorded for these economies in recent years.

The comparability of quantitative indicators across a large number of economies and over time makes the *Doing Business* survey a potentially ideal source of data for empirical work aiming to investigate the impact of business regulation both within and across countries. However, the ability of these indicators to capture the real investment climate that most firms actually experience has been questioned on several grounds. For example, Hallward-Driemeier and Pritchett (2015)

³ Previous generations of policy-based support addressed areas of macroeconomic stabilization, trade integration, privatization and tariff reforms, among others. Over the past decade DPF in a number of countries has evolved to sector-specific operations focusing on critical areas such as energy, governance or social protection.

argue that in developing countries, even if the legal environment creates complex and burdensome regulatory procedures, the state's weak capability and desire to implement regulations may allow firms to circumvent those regulations, through bribery for example. They find that the numerical estimates provided by the *Doing Business* survey of legally required time and costs to complete certain regulatory processes do not accurately square with the experience of firms as measured by the World Bank *Enterprise Survey*, which asks firms about how business is actually done. We recognize that the *Doing Business* indicators may be an imperfect measure of how conducive a country's regulation is for business. Indeed, the indicators do not cover important elements of the business climate, like security, corruption, market size, financial stability, or infrastructure. Furthermore, they do not consider important labor market features, such as workers' skills and the flexibility of working hours. Nonetheless, the indicators provide a timely, broad picture of institutional features that affect the business environment for all countries. Of course, countries can have good rules and bad practices: the difference between "the rule" and "the practice" is important, but this does not make the quality of the rules less relevant.

As mentioned above, analyzing the efficacy of World Bank financed policy interventions involves important methodological problems. This is because of the selection bias problems inherent in this kind of operation. The bias can go in two directions. On the one hand, countries receiving support are likely to be those that are most in need. Thus, a negative association between DPLs and outcomes does not necessarily imply that DPLs are counterproductive. On the other hand, the World Bank can choose to engage with countries more likely to achieve positive results, because, for example, they are more reform-prone. If this is the case, a positive association between the *Doing Business* score and the World Bank's operations may capture this reverse causality rather than the effectiveness of policy loans. These problems clearly call for robust identification strategies.

To address the first type of selection bias, following Easterly (2005) and Smets and Knack (2014), we focus on the cumulative number of policy loans, or alternatively their cumulative value, instead of considering policy loans as independent events. As Easterly (2005) points out, using cumulative policy loans changes the nature of the selection bias: if the "treatment" is repeated, this suggests that either it has not been effective or, more favorably, that the adjustment is a

multistage process and its completion requires multiple loans. In this latter case, we should observe an improvement in performance, either gradual or all at once after a certain number of loans. We also consider changes in the *Doing Business* score, instead of its level, in a cross-sectional estimation. To investigate whether our estimates are biased upward because loans tend to go to motivated governments, we try using instrumental variable regressions.

Finally, unlike other investment projects, DPLs finance reforms whose costs cannot be easily assessed. Therefore, the value of resources allocated to these projects is absolutely arbitrary. Unlike previous studies on this topic, our analysis considers both the number and the size of DPLs, and tries to answer the following empirical questions: is there an appropriate size for DPLs? Are large DPLs useful, or could the same results be achieved with a lower consumption of resources? We believe that in a resource-constrained environment, where opportunity costs are relevant, these are important issues to examine.

Our main result is that the World Bank's DPLs enhance business climate, especially for less developed countries and when combined with an IMF assistance program. Quantitatively, the size of the impact is inversely related to the level of the *Doing Business* indicator and to the number of DPLs the country has received. For example, in a country like Mali, which received 10 DPLs and is below the sample mean in terms of *Doing Business*, an additional DPL yields an increase in the *Doing Business* indicator of about 0.47 percent. Alternatively, in a country like Colombia, which received 20 DPLs and is above the mean of *Doing Business*, an additional DPL yields an increase in the *Doing Business* indicator of about 0.16 percent. The positive association between DPLs and *Doing Business* is robust to a number of different specifications and sample restrictions, and controlling for possible endogeneity. Importantly, when both the cumulative number of loans and their cumulative value are included in the regression, the value is no longer significant. This suggests that the overall engagement with the World Bank is more relevant than the amount of resources invested in the project.

The paper is organized as follows: Section 2 presents the data and some descriptive statistics of our sample; Section 3 describes the econometric specification and presents the empirical results from our benchmark model, as well as some robustness checks and corrections for endogeneity;

Section 4 concludes.

2 Data

Our dependent variable is the distance to frontier indicator taken from the World Bank *Doing Business* report series. Ease of doing business is measured in 10 areas of a firm's operations: starting a business, dealing with construction permits, getting electricity, registering property, getting credit, protecting minority investors, paying taxes, trading across borders, enforcing contracts and resolving insolvency. The distance to the frontier score shows the distance of each economy from the "frontier", which is the best performance observed on each of the indicators across all economies in the *Doing Business* sample. An economy's distance to frontier is reflected on a scale of 0 to 100, where 0 represents the lowest performance and 100 represents the frontier. As not all areas are measured as far back as 2004, we compute four scores, each obtained as the average, by country and year, of different subsets of indicators depending on their availability in various years. The longest time series contains averages of the distance to frontier scores in starting a business, enforcing contracts, and resolving insolvency, which are available from 2004 onwards. Another series is available from 2005 onwards and is obtained from the average score recorded from the three areas mentioned above and the two available from 2005 (registering property and getting credit). Data from 2006 dealing with construction permits, protecting minority investors, paying taxes and trading across borders became available and are included in a third series of the average score. Data for getting electricity is available from 2010 onward and is included in the overall measure of distance to the frontier. Our results are robust to changes in the definition of our dependent variable.

All the information regarding the lending projects is taken from the World Bank Projects and Operations database.⁴ Our analysis focuses on Development Policy Loans (DPLs). This lending instrument was launched by the World Bank in 1980 to provide conditional financing in support of specific policy changes in recipient countries. It was then reformed in 2004 to address some limitations and a mixed track record for the original policy-based support. Because of the availability of the *Doing Business* indicators and changes in the World Bank's approach toward policy-based lend-

⁴<http://data.worldbank.org/data-catalog/projects-portfolio>

ing, our data set includes all DPLs approved by the Board from 2004 to the first months of 2016, representing 690 operations and approximately \$130 billion worth of commitments. We consider all DPLs, irrespective of the sectors they specifically claim to target. As a matter of fact, basically all DPLs include elements that either directly or indirectly can improve the business environment, and choosing between them is not straightforward. However, as we believe that a well-functioning public sector administration is an essential prerequisite to foster business, we also present results only for those DPLs targeting reforms in the public administration area.⁵ Unlike the more traditional investment project financing, DPLs are approved under the condition that the government in the recipient country implement a set of policy reforms, called "prior actions". We can thus reasonably expect that the effect of a DPL on the *Doing Business* score, if any, occurs concurrently with its Board approval. Furthermore, following Easterly (2005) and Smets and Knack (2014), we focus on the cumulative number of policy loans, to assess the impact of repeated lending to the same country. We are also interested in investigating whether the size of these loans matters. We therefore compute the cumulative value (in current dollars) committed to each country.

As control variables, we include GDP per capita and total official aid received by each country in each year from all donors. These variables, as well as the population, which we use to normalize some explanatory variables and in our instrumental variables estimation, are taken from the *World Development Indicators* database. We also create a dummy variable capturing whether the country is under an IMF assistance program for the year that the ease of doing business is assessed. This information is taken from the IMF website.

In Table 1 we report some descriptive statistics of the main variables contained in our data set for the top 20 DPL recipients (countries that received 10 or more loans). All measures of performance, including the average *Doing Business* score, its change, and the growth rate of per capita GDP are computed over the period starting in the year the country received its first DPL

⁵ Linkages with the *Doing Business* score could be thought of as even tighter for those DPLs explicitly targeting private sector development. However, while about 420 DPLs, of the 690 operations in our data set, have their major sector classified as "General Public Administration", "Central Government Administration", and "Sub-national Government Administration", the theme "Infrastructure services for private sector development" appears for only 68 operations. Of these, 30 are in Africa, 15 in East Asia and Pacific, 8 in Europe and Central Asia, 6 in South Asia, 5 in Latin America and Caribbean and 4 in Middle-East and North Africa. In all regions the size of these DPLs varies significantly, from a few million to hundreds of millions.

until 2014. Per capita GDP refers to the year the country received its first DPL. The same summary statistics are also presented by region.

The statistics reported in Table 1 show mixed results. Indeed, intensive recipients of DPL tend to perform better than the sample average, but with several exceptions. Only 12 among the top 20 DPL recipient countries recorded a larger than average increase in the *Doing Business* score, and 13 performed better in terms of per capita GDP growth. In Africa, the region with the largest number of DPLs, smallest average loan size and weakest *Doing Business* performance, 6 of the 9 top recipients managed to achieve larger improvements in their business environment than the region's average. In contrast, only half of the intensive recipients in Latin America, Europe and Central Asia, and East Asia and Pacific exhibited better results than their respective regional averages.

Of course, this evidence does not say much about whether development policy lending has been effective in promoting better environments for business activity or good growth outcomes. We cannot observe counterfactual performances. Moreover, we do not control for additional factors that may well have affected the outcomes, nor for self-selection biases. This is what we try to do in the next section.

3 Estimation

We estimate the following equation at the country level using data from 2004:

$$DB_{i,t} = \beta_0 + \beta_1 DPLs_{i,t} + \beta_2 Z_{i,t} + \eta_i + \epsilon_{i,t} \quad (1)$$

where $DB_{i,t}$ is the average distance to frontier of *Doing Business* indicators in country i and year t .⁶ $DPLs_{i,t}$ represents the cumulative number (or cumulative value) of development policy loans for country i in year t . $Z_{i,t}$ is a vector of control variables, which includes the logarithm of GDP per capita to correct for the possibility that policy quality is inferred in part from performance. As a robustness exercise, we also control for total official aid received by the country in a given

⁶In our baseline specification we use the longest time series of the *Doing Business* indicator, which includes averages of three indicators available since 2004. As a robustness check, we also consider averages of wider subsets of indicators, which however became available only after 2004. See Section 2 for further details.

year over GDP, which may as well induce policy reforms. We also add a time trend to control for any tendency of the *Doing Business* ratings to increase over time. η_i is a set of country fixed effects, and $\epsilon_{i,t}$ the error term. A dummy variable, which takes the value one when there is an IMF program in place, is also included in the regression, either separately (in our baseline specification) or interacted with the DPL variable.⁷

We estimate the coefficients of this model by employing OLS on a comprehensive country-year panel of aid recipient countries that runs from 2004 to 2014. Standard errors are adjusted for country clustering of observations.

3.1 Effect of the cumulative number of DPLs

We first estimate a linear specification. To assess if there are diminishing returns to additional loans we add a quadratic term, and also estimate a logarithmic model.⁸ In Table 2 we present the results obtained for all three functional forms (linear, quadratic and logarithmic). We find strong evidence that Development Policy Financing enhances the business environment. In fact, the coefficient on the cumulative number of DPLs is positive and highly significant. The quadratic and the logarithmic specifications suggest that there are decreasing returns to additional loans. Therefore, in the remainder of our analysis we will focus on the logarithmic specification. Not surprisingly, the *Doing Business* score is positively correlated with the log GDP per capita, and is improving over time. It appears lower in the presence of an IMF assistance program (which may be explained by the fact that critical macroeconomic conditions may weigh on the business environment), even though the relationship is not statistically significant.

How large is the impact of DPLs on *Doing Business*? It is instructive to compute the elasticity

⁷ The IMF assessment in program reviews provides a key input into the World Bank team's assessment, but the Bank team should make its own assessment (OP 8.60, footnote 4). In cases where there are disagreements over technical or policy issues, Bank and IMF teams are expected to discuss and reach agreement over any differences of opinion and coordinate their policy dialogue. This is facilitated by regular consultations between the Bank and IMF teams and an explicit understanding on the thematic division of labor on macroeconomic and structural issues in each country. However, when there is no IMF program in place, the Bank team's independent assessment is central. In such cases, the IMF may be asked for a letter of comfort providing its own view of the macroeconomic policies, but such letters are typically much shorter and less detailed than IMF program reviews (IMF 2003). Hence the Bank team's assessment remains critical.

⁸To retain the zero observations when making the log transformation, we add 1 to the number of cumulative DPLs.

of *Doing Business* to the cumulative number of DPLs. Using the logarithmic specification, such elasticity is $\beta_1/DB_{i,t}$, that is, it is inversely related to the level of *Doing Business*. Yet, it also depends on how many DPLs the country has received. This elasticity measures the percentage change in *Doing Business* with respect to the percentage change in the cumulative number of DPLs. Take, for instance, a country like Mali, which received 10 DPLs and is below the sample mean in terms of *Doing Business*, having an average score of 42. An additional DPL in this country implies a 10 percent increase in the cumulative value of DPLs, which yields an increase of the *Doing Business* indicator of about 0.47 percent. Alternatively, take a country like Colombia, which received 20 DPLs and is above the mean of *Doing Business*, with an average score of 60. An additional DPL in this country implies a 5 percent increase in the cumulative number of DPLs, which yields an increase of *Doing Business* of about 0.16 percent.

In order to understand whether the positive impact of DPLs on the business environment is driven by any of the regions in which the World Bank operates, we run a series of estimations, excluding one region at a time from the sample. In Figure 1 we plot the point estimates of all the various estimates of β_1 . The point estimate obtained with the whole sample is depicted as a solid line and its two standard-error bands as dashed lines. The impact of the cumulative number of DPLs on the *Doing Business* indicator remains positive and strong. However, when the African region is excluded from the regression this impact somewhat weakens, suggesting that this is the region where DPLs are most effective.

In Table 3 we report the results of three robustness exercises. We first control for different definitions of our dependent variable. In particular, in the first column of Table 3 we present the estimates obtained using the overall distance to frontier: that is, the average of all 10 *Doing Business* indicators available since 2010. The impact of the cumulative number of DPLs remains strong when using this alternative definition. We also obtain qualitatively similar results (available upon request) when we use averages of different subsets of the *Doing Business* indicators (as described in Section 2).

In the second column we present the results obtained when restricting our variable of interest to a subset of DPLs, whose impact on the business environment could be reasonably assumed to

be more direct. More precisely, in this exercise the cumulative number of DPLs includes only those DPLs that have supported policy reforms in the public administration area, namely those classified in the "General Public Administration", "Central Government Administration", and "Sub-national Government Administration" sectors. The relationship between this subset of policy reform loans and our doing business indicator is still statistically significant and, perhaps unsurprisingly, quantitatively larger.

Our results are also robust to the inclusion of another control variable, as shown in the third column of Table 3. When we include among the regressors the ratio of total official aid over GDP received by the country in a given year, the results do not change much. We can thus rule out the possibility that we are capturing the impact of a joint development effort by all donors rather than the effect of World Bank DPLs.

Finally, in Table 4 we present separate estimates for the impact of the cumulative number of DPLs implemented with or without an IMF assistance program, as well as for relatively poor and rich countries (defined as the countries at the bottom 75th and top 25th percentile of the within-sample per capita income distribution). The impact of DPLs consistently turns out positive and highly significant, regardless of whether they are accompanied by an IMF arrangement. The presence of the IMF seems indeed to enhance this effect. However, a formal test rejects the hypothesis that the impact is statistically different when associated with an IMF program. If we allow the impact of DPLs to be different in relatively richer and poorer countries, the estimated coefficient for countries in the bottom 75 percent of the distribution of borrowers according to per capita GDP is larger and more precisely estimated with respect to those in the upper 25th percentile. However, in this case, a formal test cannot support the hypothesis that the two coefficients are statistically different.

3.2 Does the size of DPLs matter?

In this section we investigate whether the value of resources loaned to a country for policy reform matters for the results. Unlike standard investment projects, DPLs do not finance operations with an associated estimated cost. Thus, deciding the amount of dollars to commit for a DPL entails a

substantial degree of arbitrariness.

To this end, we estimate equation 1 with either the cumulative value of DPLs alone or both the cumulative number and the cumulative value of DPLs as our variables of interest. The results are reported in Table 5. As shown in Column 1, the total cumulative value of DPLs has a strong positive effect on the business environment. However, when both the number and the value are included in the regression, the value loses its explicative power, which is otherwise retained by the cumulative number (Column 2). As a robustness check, we also consider the total value of DPLs as a ratio to GDP or in per capita terms to take into account the size of the country. The results are reported in Columns 3-4 and 5-6, respectively. The results from an alternative specification, including the average size of DPLs (alone or in addition to the cumulative number of DPLs) are presented in the last two columns.

All these results point to the conclusion that DPLs are strongly effective, although their effectiveness does not seem to increase with size. The last column is particularly telling since if the coefficient of the cumulative number of DPLs and that of the average size were the same it would imply that only the cumulative value of DPLs matters.

Thus, our next step is to understand what drives the result that the impact of the number of DPLs dominates that of their size. To this end we investigate whether the previous findings hold for subsets of countries in our sample. In Table 6 we present the results obtained by splitting the sample into high and low income countries (defined as those at the top 25th and bottom 75th percentile of the within-sample per capita income distribution), and excluding one region at a time. We focus on the more compact specification, which includes both the cumulative number and average size of DPLs. The other specifications deliver the same qualitative results. The number effect clearly dominates that of the average value of DPLs in all regressions concerning less developed countries and all sub-groups of countries including Africa. On the contrary, for the countries at the top quartile and for the sub-group of countries excluding Africa, the effect of the cumulative number of DPLs is no longer prevailing.

The evidence suggests that what really affects the results in low income countries is the overall engagement with the World Bank, regardless of the amount of resources invested in each project.

By contrast, for countries in the upper quartile of the income distribution the size of the project may also matter. This argument is consistent with the finding that the impact of DPLs is largest for less developed countries, especially in Africa, where the average size of DPLs is smallest. Moreover, it is also broadly in line with the current practice adopted by the World Bank, which tends to award middle-income countries fewer but relatively sizable loans.

3.3 Controlling for endogeneity of policy lending

As we argue in the Introduction, endogeneity of policy lending can run in two directions. By using the cumulative number of policy loans (or the cumulative value committed), instead of considering them as independent events, we have already partially addressed one source of selection bias; that is, the one generated from the fact that countries receiving support are typically those with larger policy deficiencies. Here, we address the same concern by estimating the following cross-sectional equation:

$$\Delta DB_{i,T} = \gamma_0 + \gamma_1 DB_{i,0} + \gamma_2 DPLs_{i,T} + \gamma_3 Z_{i,t} + \epsilon_i \quad (2)$$

where $\Delta DB_{i,T}$ is the change in the average *Doing Business* indicator over the period 2004-2014, and $DB_{i,0}$ is its level in 2004. $DPLs_{i,T}$ represents the cumulative number of development policy loans for country i from 2004 to 2014. As a control variable, we also include the logarithm of initial GDP per capita. We estimate equation 2 using 109 observations, or the number of countries for which the relevant information is available.

The results seem robust to this endogeneity check as well (Table 7). There is a positive and strongly significant correlation between the cumulative number of DPLs granted over the years 2004-2014 and the change in their *Doing Business* score over the same period. Such an improvement appears larger for more developed economies (i.e. with higher GDP per capita) and those with larger initial distances to the *Doing Business* frontier.

One could object that the World Bank has chosen to engage only with motivated countries, and that the reforms we observe would have taken place even in the absence of the Bank's support.

If such a case, the positive relationship between the *Doing Business* score and the value of DPLs that we estimate would be upward biased or even non-existent. To address this concern we rely on instrumental variables estimations. We first estimate equation 1 using our panel data set with GMM following Arellano and Bover, 1995, Blundell and Bond, 1998, and Windmeijer, 2005.⁹ This implies differentiating the equation and using lagged levels as instruments for the DPLs variable. The results, reported in Table 8, still show a significant positive impact of the cumulative number of DPLs on the *Doing Business* score. The effect is larger in size, although statistically less significant. A Sargan test does not reject the null hypothesis that the overidentifying restrictions are valid.

Finally, as a second correction for possible selection bias we employ 2SLS, again using the cross-sectional version of our data set, equation 2. We do not perform this analysis using the panel data set as we could not find good instruments for DPLs with sufficient time series variation. In the first stage we instrument the number of DPLs with the logarithm of population in 2004 and the average number of years the country spent under an IMF program. We expect that DPLs, being relatively sophisticated lending instruments, are more likely to be awarded to large countries. Furthermore, given their budget support nature, they tend to be associated with IMF assistance programs. In fact, as shown in the first column of Table 9, both these variables are positively and significantly correlated with the number of loans. At the same time, there is no evident reason why more populous countries or countries frequently assisted by an IMF program should exhibit better performances in terms of ease of doing business. The results of the second stage, presented in the second column of Table 9, again point to a positive and statistically significant effect of policy loans on the business environment. A test of overidentifying restrictions also supports the choice of instruments. We find a strong negative relationship between the change in the *Doing Business* score and its initial level, implying a reversion toward the mean effect. Interestingly, once the initial quality of *Doing Business* is controlled for, countries with higher initial per capita income appear to be those with greater chances to take advantage of policy loans.

⁹The standard GMM robust two-step estimator of the variance-covariance matrix is known to be seriously biased. Windmeijer (2005) derived a bias-corrected robust estimator for two-step VCEs from GMM estimators, known as the WC-robust estimator.

4 Concluding remarks

In this paper we have investigated the impact of World Bank Development Policy Financing on the quality of the business environment, as measured by *Doing Business*, for a panel of more than 140 borrowing countries from 2004 to 2014. Our choice of the dependent variable recognizes the key role that private investments play for development.

Our results point to a strong positive relationship between policy loans and the performance of a country in *Doing Business*, even after controlling for endogeneity bias and other factors that could affect the health of the business environment. The effect is stronger for less developed countries, and remains statistically significant after splitting the sample of countries by region or income level.

When the cumulative number of loans and their cumulative value are both included in the regression, the latter loses its explicative power, especially if we restrict the sample to lower income countries. This suggests that, particularly in less developed countries, what matters more is the overall engagement with the World Bank rather than the amount of resources invested. For the countries in the upper quartile the size of the project also matters for results. This last finding supports the current practice by the World Bank of awarding middle-income countries with fewer but relatively sizable loans.

These results come with a caveat. The bias arising from the fact that the selection of loan recipient countries may be on the basis of unobservable characteristics (such as the willingness or ability of the country to introduce business-friendly reforms) represents the major methodological problem in our analysis. We tried to address this problem by running instrumental variable regression. However, we still believe that disentangling the truly exogenous component of policy lending and establishing a causal link between World Bank intervention and ease of doing business should be studied more. We expect the main qualitative results to hold even after fully addressing this potential bias. Even allowing for a potential upward bias in our estimates, there is no reason why it should be systematically higher for lower income countries. Further, there is no reason why the bias should be different when the number or the size of the loans is the covariate of interest. We leave these questions to future research.

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Figure 1: Sensitivity of the result to the exclusion of selected regions

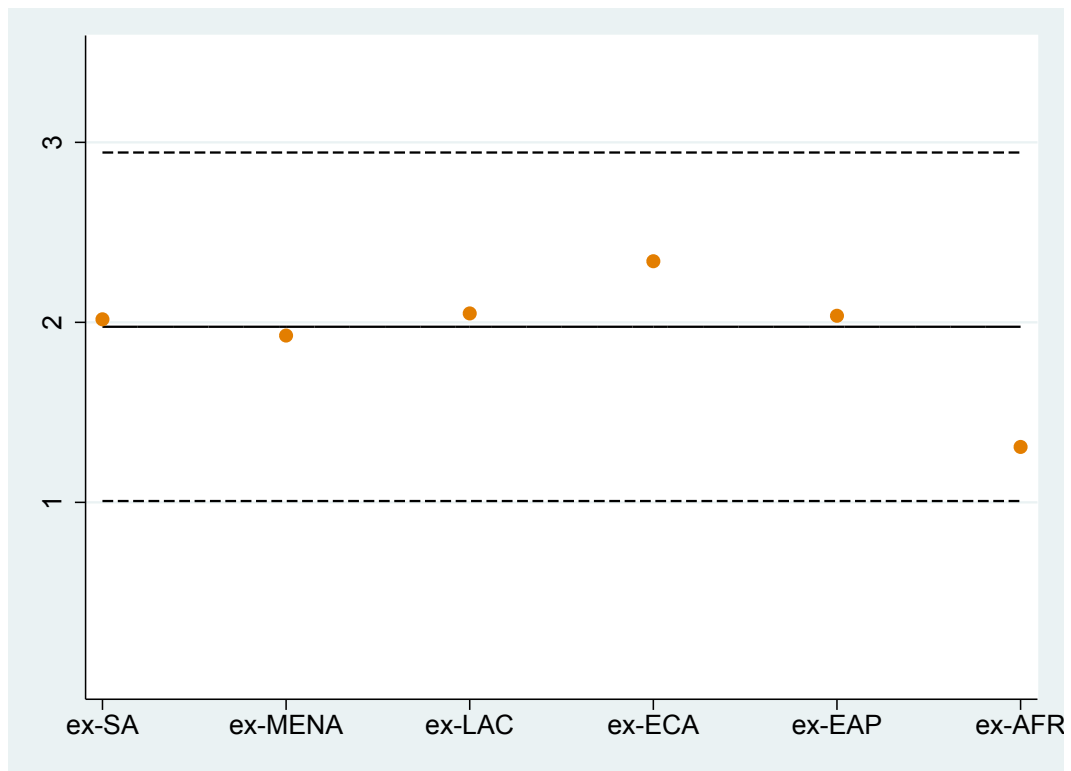


Table 1: Descriptive statistics for the top 20 of DPL recipients and by region

| | Number of loans | Total value (mln of \$) | Average size of loans (mln of \$) | Average DB score | Change in DB score | Per capita GDP (2005 \$) | Average per capita GDP growth (%) |
|-----------------------------|--------------------|-------------------------------|---|---------------------|-----------------------|--------------------------------|---|
| Morocco | 26 | 4,166 | 160 | 60.0 | 9.3 | 1,932 | 3.1 |
| Vietnam | 24 | 3,947 | 164 | 53.7 | 7.8 | 699 | 4.9 |
| Brazil | 24 | 11,569 | 482 | 43.8 | 27.6 | 4,733 | 2.4 |
| Indonesia | 22 | 11,650 | 530 | 39.8 | 21.2 | 1,211 | 4.3 |
| Colombia | 20 | 7,450 | 373 | 60.0 | 7.9 | 3,386 | 3.6 |
| Rwanda | 18 | 993 | 55 | 49.8 | 21.5 | 287 | 5.0 |
| Mexico | 18 | 9,120 | 507 | 73.2 | 6.9 | 7,894 | 0.9 |
| Peru | 18 | 5,430 | 302 | 54.1 | 16.5 | 2,586 | 4.8 |
| Pakistan | 18 | 4,370 | 243 | 54.8 | 2.7 | 714 | 1.5 |
| Mozambique | 16 | 1,185 | 74 | 44.6 | 20.1 | 366 | 4.3 |
| Ghana | 15 | 1,437 | 96 | 56.3 | -0.2 | 502 | 4.8 |
| Burkina Faso | 14 | 985 | 70 | 40.0 | 27.6 | 407 | 2.6 |
| Tanzania | 14 | 1,815 | 130 | 54.4 | 13.3 | 446 | 3.1 |
| Georgia | 13 | 630 | 48 | 64.5 | 17.8 | 1,470 | 5.0 |
| Sierra Leone | 11 | 171 | 16 | 41.6 | 23.9 | 321 | 5.5 |
| Turkey | 11 | 7,300 | 664 | 59.2 | 9.1 | 7,514 | 2.2 |
| Mali | 10 | 481 | 48 | 42.0 | 23.7 | 434 | 0.7 |
| Niger | 10 | 497 | 50 | 35.9 | 27.3 | 253 | 1.7 |
| Bangladesh | 10 | 1,265 | 127 | 40.8 | 5.7 | 486 | 4.9 |
| India | 10 | 3,482 | 348 | 36.0 | 19.1 | 784 | 5.8 |
| AFR | 241 | 14,457 | 62 | 43.8 | 14.5 | 1,315 | 2.4 |
| LAC | 150 | 41,203 | 161 | 53.8 | 9.2 | 3,724 | 2.7 |
| ECA | 105 | 32,407 | 322 | 62.7 | 12.4 | 4,460 | 2.6 |
| EAP | 86 | 20,396 | 183 | 46.6 | 8.9 | 1,507 | 3.2 |
| MENA | 55 | 11,737 | 246 | 50.2 | 8.7 | 2,481 | 2.5 |
| SA | 53 | 9,736 | 122 | 50.8 | 6.1 | 1,327 | 4.4 |
| Average (all recipients) | 6.3 | 1,192 | 165 | 50.7 | 11.3 | 2,516 | 2.7 |

Notes: All measures of performance are computed for period from first DPL to 2016 (or last available year). Per capita GDP refers to the year the country received its first DPL.

Table 2: Panel regression of *Doing Business* on cumulative number of DPLs: checking for potential scale effects

| | [1] | [2] | [3] |
|--------------------|---------------------|---------------------|---------------------|
| DPLs | 0.320*** (0.118) | 0.794*** (0.207) | |
| DPLs ² | | -0.026** (0.010) | |
| log DPLs | | | 1.976*** (0.490) |
| log GDP per capita | 4.979** (2.071) | 4.918** (2.045) | 5.027** (2.040) |
| year | 0.729*** (0.101) | 0.651*** (0.100) | 0.641*** (0.102) |
| IMF arrangement | -0.089 (0.504) | -0.400 (0.476) | -0.445 (0.490) |
| obs | 1,746 | 1,746 | 1,746 |
| countries | 142 | 142 | 142 |
| R^2 | 0.562 | 0.572 | 0.568 |

Notes: ***, **, and * denote 1%, 5%, and 10% significance level. In parentheses robust standard errors clustered at country level. The dependent variable is the average of three *Doing Business* indicators available since 2004.

Table 3: Panel regression of *Doing Business* on cumulative number of DPLs: robustness

| | [1] | [2] | [3] |
|--------------------|---------------------|---------------------|---------------------|
| log DPLs | 1.747*** (0.666) | 2.151*** (0.555) | 2.039*** (0.436) |
| log GDP per capita | 2.978 (3.071) | 5.659*** (2.054) | 6.560*** (1.899) |
| year | 0.299** (0.144) | 0.671*** (0.099) | 0.406*** (0.082) |
| IMF arrangement | -0.733 (0.488) | -0.371 (0.485) | 0.106 (0.465) |
| log Aid/GDP | | | -1.002 (2.142) |
| obs | 926 | 1,746 | 1,380 |
| countries | 133 | 142 | 140 |
| R^2 | 0.186 | 0.567 | 0.576 |

Notes: ***, **, and * denote 1%, 5%, and 10% significance level. In parentheses robust standard errors clustered at country level. The dependent variable in column [1] is the overall distance to frontier (average of all ten *Doing Business* indicators available since 2010). The cumulative number of DPLs in column [2] includes only the loans that supported policy reforms in the public administration area.

Table 4: Panel regression of *Doing Business* on cumulative number of DPLs: the impact with and without IMF assistance programs and in poor vs rich countries

| | [1] | [2] |
|-------------------------|---------------------|---------------------|
| log DPLs X (1-IMF arr.) | 1.727*** (0.501) | |
| log DPLs X IMF arr. | 2.484*** (0.636) | |
| log DPLs (bottom 75%) | | 2.068*** (0.524) |
| log DPLs (top 25%) | | 1.594* (0.881) |
| log GDP per capita | 5.185** (2.018) | 5.016** (2.039) |
| year | 0.646*** (0.101) | 0.642*** (0.102) |
| IMF arrangement | -1.315 (0.652**) | -0.473 (0.495) |
| obs | 1,746 | 1,746 |
| countries | 142 | 142 |
| test F(1, 141) p-value | 0.167 | 0.605 |
| R^2 | 0.570 | 0.568 |

Notes: ***, **, and * denote 1%, 5%, and 10% significance level. In parentheses robust standard errors clustered at country level. The dependent variable is the average of three *Doing Business* indicators available since 2004.

Table 5: Panel regression of *Doing Business* on cumulative number and value of DPLs

| | [1] | [2] | [3] | [4] | [5] | [6] | [7] | [8] |
|---------------------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|
| log total value DPLs | 0.337*** (0.106) | -0.148 (0.170) | | | | | | |
| log total value DPLs/GDP | | | 0.343*** (0.098) | -0.101 (0.159) | | | | |
| log total value DPLs per capita | | | | | 0.344*** (0.107) | -0.148 (0.170) | | |
| log average DPLs | | | | | | | 0.296** (0.126) | -0.148 (0.170) |
| log DPLs | | 2.399*** (0.784) | | 2.192*** (0.723) | | 2.395*** (0.770) | | 2.250*** (0.056) |
| log GDP per capita | 5.129** (2.035) | 5.129** (2.035) | 6.000*** (1.915) | 5.499*** (1.931) | 5.148** (2.028) | 5.232** (2.023) | 5.294** (2.052) | 5.129** (2.035) |
| year | 0.746*** (0.102) | 0.641*** (0.102) | 0.708*** (0.091) | 0.577*** (0.095) | 0.753*** (0.100) | 0.634*** (0.101) | 0.788*** (0.102) | 0.641*** (0.102) |
| IMF arrangement | -0.079 (0.509) | -0.430 (0.487) | -0.145 (0.420) | -0.326 (0.402) | -0.332 (0.470) | -0.527 (0.449) | 0.088 (0.519) | -0.430 (0.487) |
| obs | 1,746 | 1,746 | 1,746 | 1,746 | 1,745 | 1,745 | 1,746 | 1,746 |
| countries | 142 | 142 | 142 | 142 | 142 | 142 | 142 | 142 |
| R^2 | 0.556 | 0.569 | 0.552 | 0.565 | 0.556 | 0.569 | 0.552 | 0.569 |

Notes: ***, **, and * denote 1%, 5%, and 10% significance level. In parentheses robust standard errors clustered at country level. The dependent variable is the average of three *Doing Business* indicators available since 2004.

Table 6: Panel regression of *Doing Business* on cumulative number and value of DPLs: sample splits

| | top25% | bottom75% | ex-SA | ex-MENA | ex-LAC | ex-ECA | ex-EAP | ex-AFR |
|------------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|----------------------|
| log average value DPLs | 0.035 (0.285) | -0.190 (0.224) | -0.151 (0.174) | -0.262 (0.176) | -0.153 (0.183) | -0.225 (0.207) | -0.155 (0.180) | 0.102 (0.185) |
| log number DPLs | 1.455 (1.436) | 2.395*** (0.764) | 2.292*** (0.678) | 2.419*** (0.705) | 2.319*** (0.732) | 2.736*** (0.720) | 2.332*** (0.692) | 1.102 (0.740) |
| log GDP per capita | 7.499* (4.089) | 4.527* (2.377) | 5.439** (2.110) | 5.125** (2.141) | 3.843* (2.234) | 3.816 (2.375) | 3.071 (2.259) | 10.249*** (2.039) |
| year | 0.591*** (0.181) | 0.656*** (0.123) | 0.661*** (0.104) | 0.648*** (0.108) | 0.714*** (0.126) | 0.569*** (0.103) | 0.761*** (0.106) | 0.449*** (0.116) |
| IMF arrangement | -0.839 (1.228) | -0.405 (0.536) | -0.443 (0.523) | -0.119 (0.496) | -0.347 (0.572) | -0.541 (0.577) | -0.733 (0.481) | -0.652 (0.508) |
| obs | 461 | 1,285 | 1,643 | 1,610 | 1,384 | 1,419 | 1,487 | 1,187 |
| countries | 40 | 102 | 134 | 130 | 112 | 116 | 122 | 96 |
| R^2 | 0.558 | 0.573 | 0.579 | 0.574 | 0.574 | 0.540 | 0.594 | 0.568 |

Notes: ***, **, and * denote 1%, 5%, and 10% significance level. In parentheses robust standard errors clustered at country level. The dependent variable is the average of three *Doing Business* indicators available since 2004.

Table 7: Cross-sectional estimation on cumulative number of DPLs

| | |
|------------------------------------|----------------------|
| log DPLs | 3.147*** (0.590) |
| DB ₂₀₀₄ | -0.607*** (0.061) |
| log GDP per capita ₂₀₀₄ | 2.682*** (0.734) |
| obs | 109 |
| R^2 | 0.616 |

Notes: ***, **, and * denote 1%, 5%, and 10% significance level. In parentheses robust standard errors clustered at country level. The dependent variable is the change between 2015 and 2004 in the average of three *Doing Business* indicators available since 2004. Whole set of region dummies included.

Table 8: Arellano-Bond WC robust estimation of *Doing Business* on cumulative number of DPLs

| | |
|--------------------|--------------------|
| log DPLs | 2.952** (1.525) |
| log GDP per capita | 5.221 (3.236) |
| IMF arrangement | -.888 (.646) |
| obs | 1,746 |
| countries | 142 |
| No. of Instruments | 70 |
| Sargan (p-value) | 0.954 |

Notes: ***, **, and * denote 1%, 5%, and 10% significance level. Two-step results. Year dummies included. All differences are forward-orthogonal deviations; log DPLs instrumented in the differenced equation with levels lagged 2 to max.

Table 9: Cross-sectional estimation on cumulative number of DPLs: instrumental variables

| | 1 st stage | 2 nd stage |
|------------------------------------|-----------------------|-----------------------|
| log DPLs | | 2.751** (1.117) |
| DB ₂₀₀₄ | -.010 (0.008) | -.610*** (0.060) |
| log GDP per capita ₂₀₀₄ | -.006 (0.108) | 2.567*** (0.734) |
| log population ₂₀₀₄ | 0.108* (0.058) | |
| average years of IMF arr. | 8.801*** (1.397) | |
| obs | 109 | 109 |
| R^2 | 0.300 | 0.615 |
| Overid (p-value) | | 0.175 |

Notes: ***, **, and * denote 1%, 5%, and 10% significance level. In parentheses robust standard errors clustered at country level. The dependent variable is the change between 2015 and 2004 in the average of three *Doing Business* indicators available since 2004. Whole set of region dummies included.