

Investing in Human Capital: What Can We Learn from Bank’s Portfolio Data?¹

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Abstract

This paper compiles project-level data from the World Bank’s lending history to describe patterns and composition of its portfolio. It focuses particularly on the effect of countries’ transition from IDA to IBRD status, which marks the point when countries start borrowing at near market rates, on lending for human development (HD) sectors (education, health and social protection). Using country and year fixed effects, which account for unobservable country characteristics (for example, national priorities) and time effects (for example, market interest rates), the paper finds that HD lending decreases when countries graduate from IDA. The average difference in the binary indicator of any lending is 27 percent while it is 60 percent for HD lending. The share of HD lending (lending by HD GPs over total lending) is also 6.9 percentage points (30 percent) lower. This decline in HD lending in IBRD countries is accompanied by a greater use of budget support. Results are robust to controlling for non-Bank aid, as well as various alternative specifications and estimation samples.

1. Introduction

With the launch of the Human Capital Project (HCP), the World Bank has called on countries to accelerate progress in the human capital of their populations (World Bank, 2018). There are many reasons why human capital outcomes might fall short of expectations. For example, countries may underinvest in the skills, health, and resilience of their citizens because the returns on these investments can take a long time to materialize. In comparison, investments in physical capital – bridges and roads – could materialize more quickly. Moreover, differently from investment in human capital, they often generate financial returns (for example, tolls). These arguments led development practitioners to conjecture that countries borrow less for human development interventions in the face of increased borrowing costs. For instance, when countries graduate from IDA (International Development Association) status to IBRD (International Bank for Reconstruction and Development)⁴ status in their engagement with the World Bank, they also face an increase in borrowing costs. Countries with per capita income below \$1,215 have access to IDA funds at

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⁴ Interest rates for IBRD flexible loans with a variable spread were LIBOR + 0.99% as of October 1, 2018 (Group A countries, >18-20 years maturity). The USD LIBOR – 6 months average for 2018 was 2.487%. The interest rate on regular IDA loans was 3.125% with 38 years maturity, and 6 years grade period.

concessional terms, while richer countries have access to IBRD funds (which typically charge LIBOR plus a fixed spread).

The discrete change in financing terms when countries graduate from IDA to IBRD could discourage countries from borrowing for “soft sectors” like Education, Health and Social Protection (together grouped as the Human Development group in the World Bank) in favor of sectors where investments that have more immediate and tangible returns. However, other mechanisms might be at play. Take total Bank borrowing for example. On one hand, as interest rates go up when countries graduate IDA, the demand for Bank’s loans should decline. In addition, IDA graduation also operates as a signal of creditworthiness for other lenders (bilateral lenders as well as the market), thereby permitting crowding in other lenders, which could further lower borrowing from the Bank. On the other hand, IDA graduation alleviates borrowing limits imposed on the IDA pool and countries face fewer restrictions on how much they can borrow. Finally, the creditworthiness signal could work in the opposite direction as well – observing the signal, bilateral donors may reduce aid amounts, thus increasing governments’ demand for Bank’s loans.⁵ What is even less clear theoretically is how HD lending would respond to graduation vis-à-vis total lending.

In this work, we use the Bank’s portfolio data to understand and describe the patterns of total and HD lending at the World Bank. First, we describe the patterns of lending in IDA and IBRD countries. We then examine how total Bank lending and lending for HD sectors respond to countries’ transition from IDA to IBRD. To do this, we combine the Bank’s portfolio data with countries’ borrower status and analyze the effect of IDA graduation in regression framework. Although, in principle, countries graduate from IDA status exogenously when they cross a prespecified income threshold, in practice, there are exceptions and additional factors that affect graduation eligibility, which makes it impossible to treat graduation as an exogenous event. As a second-best approach, we use fixed-effects regressions (country and year) to isolate the effect of graduation. Year fixed effects capture economic climate and effect of graduating in different time periods thus subsuming the effect of market interest rates (which are assumed common to all countries, but which have differed markedly over the period covered by this study). Country fixed effects allow us to capture country-specific characteristics that may affect lending and ensure that the identifying variation comes solely from within those countries that transition from IDA to IBRD.

Our results lend broad support to the hypothesis that countries borrow less for HD sectors when they graduate from IDA. We find that although overall lending and the share of HD lending as a fraction of total lending increased between 1988-2016, IBRD countries (a) finance fewer projects, (b) are disproportionately less likely to finance an HD project, and (c) have a lower share of HD borrowing. Relative to IDA countries, IBRD countries, on average, finance 0.57-0.68 fewer projects (25-30 percent), and they finance 0.19-0.34 fewer HD projects (36-65 percent). The share of HD lending (as a fraction of total lending) is also 3.9-5.5 percentage points (17-24 percent) lower in IBRD countries relative to IDA countries. Note that the share variable is defined only when countries borrow at all, and since IBRD countries are less likely to borrow for HD, these estimates represent a lower bound on the true effect.

⁵ See Knack et al. (2014) for further discussion. The authors study how IDA graduation other donors’ allocation of aid, thereby generating direct evidence on the signaling effect.

Although our results support the popular hypotheses, they need to be interpreted with caution. First, while the fixed-effect analysis boosts confidence in our results, the estimates cannot be interpreted as causal. Ideally, we would find an instrument (a variable that is correlated with graduation but not the outcomes) and use an instrumental variable framework to identify causal effects. Second, our results assume no supply side constraints in borrowing, but this is not always the case. If the supply of funds declines when countries graduate, the observed decline in total lending would be simply explained by reduction in supply rather than IDA graduation.⁶ This, however, does not explain why lending for HD would decline disproportionately more than overall lending (which is what we observe, and which is the focus of this paper). To be sure, throughout the paper, we present results for overall Bank lending patterns and patterns for HD areas.

Our results are robust to the inclusion of various controls (population, GNI per capita, other aid flows, fiscal spending on HD, Polity Score) and a range of alternative specifications and samples (shorter sample period and exclusion of large countries like India and China). Taken together these results suggest that lending for HD is negatively correlated with IDA graduation. The rest of the paper proceeds as follows. Section 2 describes the institutional details surrounding IDA graduation, and why this matters for lending. Section 3 describes the data, the key variables of interest, and presents the descriptive statistics for lending patterns. Section 4 and Section 5 present the regression framework and results respectively. Section 6 reports the results from several robustness checks. Section 7 discusses potential explanations as well as the limitations of the research. Section 8 concludes the paper with further avenues for future research.

2. IDA graduation and institutional details

a. What is IDA?

IDA is one of the largest sources of assistance for the world's 77 poorest countries, 39 of which are in Africa, and is the single largest source of donor funds for basic social services in these countries. IDA lends money on concessional terms. This means that IDA credits have a zero or very low-interest charge and repayments are stretched over 25 to 40 years, including a 5- to 10-year grace period. IDA also provides grants to countries at a risk of debt distress. Eligibility for IDA support depends first and foremost on a country's relative poverty, defined as GNI per capita below an established threshold and is updated annually.⁷ Other parameters that are considered are the country's creditworthiness, and broader country characteristics.

In practice, graduation from IDA extends over several stages – countries move from (1) IDA non-gap to (2) IDA gap to (3) IDA blend, and eventually to (4) IBRD status.⁸ Countries that have been over the income threshold for two years but not creditworthy enough are categorized as IDA gap countries. With creditworthiness, they are passed on to IDA blend status. IDA blend countries are

⁶ While it is possible to obtain data on total supply of funds for IDA countries, we could not obtain this information for IBRD countries.

⁷ The threshold was originally set to \$580 and was intended to ration scarce IDA funds. Since 1987, the threshold has been adjusted only for inflation and is currently at \$1,215.

⁸ For a complete discussion, see "Review of IDA's Graduation Policy", DFIRM (2016)

eligible for both IDA and IBRD financing; the former is phased out and the latter is phased in over time. To graduate to IBRD status, countries need to have been over the threshold and maintained creditworthiness for at least three years.

The intention of this policy was to facilitate the transition and avoid any fiscal cliffs that may arise when countries graduate. Under each classification, countries pay different effective interest rates on loans. IDA non-gap countries receive IDA funds that are disbursed in the form of grants, bear no interest, and are of “regular” credits. As of April 2017, regular credits were available with a 38-year maturity and 2.63 percent effective interest rate (6-year grace period, 3.125 percent interest for years 7-38). “Blend” credits, which can be accessed by IDA gap countries and IDA blend countries, had a 25-year maturity, and 3.32 percent effective interest rate (5-year grace period, 3.3 percent interest for years 6-20, 6.7 percent for years 21-25). IBRD countries have different maturities on loans, and the interest rate is a function of the LIBOR and a country-specific spread.

The difference in interest rates between IDA non-gap and IDA gap countries as well as between IDA and IBRD countries can be substantial. For that reason, even though policies are in place to smoothen the transition from IDA, we might expect countries to make some adjustment in borrowing when they graduate. However, these adjustments can take different forms. As we discussed above, IDA funds are scarce, so a country that is willing to borrow may find graduation an advantage. Conversely, IDA funds are cheaper than IBRD funds, and other countries may reduce borrowing after graduation. Seventy-seven countries (plus India) are currently eligible to receive IDA resources. As of April 2016, 30 countries have graduated from IDA. Forty-one countries have graduated since IDA’s founding in 1960; 11 of these graduates have since “reverse graduated,” or re-entered IDA.

b. Is IDA graduation exogenous?

Since countries receive differential support to smoothly transition from IDA to IBRD, it is difficult to argue that graduation is exogenous. First, aside transition support, the Bank also has other policies in place to smoothen the impact of graduation. For example, “small island economies” like Cape Verde, Tonga and Maldives can access IDA grants and regular credits, even though they meet the criteria for graduation. These countries, with population less than 1.5 million people, are granted exceptions in maintaining IDA eligibility since they face significant vulnerability due to size and geography.

Second, another exception, not implemented by the World Bank itself, takes the form of “buy-downs”. Buy-downs decrease the cost of borrowing IBRD funds either through principal repayment or through interest repayment by a third party. To encourage China to maintain its successful collaboration with the World Bank in the health and education sectors, the Department for International Development (DfID) offered buy-downs of loans (RfD, 2013). These buy-downs prepaid a fixed percentage of the principal amount of IBRD loans at regular intervals to reduce the amount owed by China. DfID also implemented similar programs in Pakistan and Nigeria.

Finally, since 2014, the same year India graduated from IDA, the World Bank also created a separate pool of IDA funds called “transitional support.” Loans from this pool have the same 25-year maturity as blend credits but carry a higher effective interest rate – 4 percent (5-years grace period, 5 percent interest from years 6-25). Keeping in mind the criteria for IDA graduation and the exceptions, it is difficult to argue that IDA graduation is a truly exogenous event that occurs when countries cross a

pre-specified per capita income threshold. Unfortunately, the implication is that crossing of the threshold cannot be used as an instrument for graduation either.

c. List of country graduates

A total of 153 countries have a current engagement with the World Bank.⁹ Of these, 47 countries have always been an IDA borrower, that is, they joined the Bank as an IDA country and have retained the status until now. Forty-five countries have been IBRD only members. The remaining 60 countries transition between IDA and IBRD status – 33 countries graduated once and have maintained their IBRD status for the rest of the time. Three countries – Egypt, Indonesia, and the Philippines – graduated twice. That is, they graduate from IDA to IBRD, fall back into IDA status after a period, and then graduate again. The remaining 24 countries, surprisingly, moved from IBRD to IDA status.

⁹ The Bank has 189 countries as members.

These are primarily African countries, and the reverse graduation took place in the 1970s and 1980s.¹⁰ Table 1 below contains the list of countries and their borrowing status over the 1961-2015 period.

Table 1: List of countries and their graduation status

(1)	(2)	(3)	(4)	(5)
Countries that do not change status		Countries that change status		
Always IDA	Always IBRD	Graduated IDA	Graduated IDA twice	Moved from IBRD to IDA
Afghanistan; Bangladesh; Benin; Bhutan; Bolivia; Cabo Verde; Cambodia; Central African Republic; Chad; Comoros; Djibouti; Dominica; Eritrea; Gambia, The; Grenada; Guinea-Bissau; Kiribati; Kosovo; Kyrgyz Republic; Lao People's Democratic Republic; Lesotho; Madagascar; Malawi; Maldives; Mongolia; Mozambique; Nepal; Niger; Pakistan; Rwanda; Samoa; Solomon Islands; Somalia; South Sudan; St. Lucia; St. Vincent and the Grenadines; Sudan; São Tomé and Príncipe; Tajikistan; Tanzania; Timor-Leste; Togo; Tonga; Tuvalu; Vanuatu; Vietnam; Yemen, Rep.	Algeria; Antigua and Barbuda; Argentina; Bahamas, The; Barbados; Belarus; Belize; Brazil; Bulgaria; Chile; Colombia; Costa Rica; Croatia; Cyprus; Czech Republic; Estonia; Fiji; Gabon; Guatemala; Hungary; Iran, Islamic Rep.; Iraq; Jamaica; Kazakhstan; Latvia; Lebanon; Lithuania; Malaysia; Mexico; Namibia; Oman; Panama; Peru; Poland; Portugal; Romania; Russian Federation; Seychelles; Slovak Republic; Slovenia; South Africa; Trinidad and Tobago; Turkmenistan; Ukraine; Uruguay; Venezuela, RB	Albania; Angola; Armenia; Azerbaijan; Bosnia and Herzegovina; Botswana; Cameroon; China; Congo, Rep.; Dominican Republic; Ecuador; El Salvador; Equatorial Guinea; Georgia; Honduras; India; Jordan; Korea, Rep.; Macedonia, FYR; Mauritius; Montenegro; Morocco; Nicaragua; Papua New Guinea; Paraguay; Serbia; St. Kitts and Nevis; Swaziland; Syrian Arab Republic; Thailand; Tunisia; Turkey; Zimbabwe	Egypt, Arab Rep.; Indonesia; Philippines	Burkina Faso; Burundi; Congo, Dem. Rep.; Côte d'Ivoire; Ethiopia; Ghana; Guinea; Guyana; Haiti; Kenya; Liberia; Mali; Marshall Islands; Mauritania; Micronesia, Fed. Sts.; Moldova; Myanmar; Nigeria; Senegal; Sierra Leone; Sri Lanka; Uganda; Uzbekistan; Zambia
Total = 47	Total = 46	Total = 33	Total = 3	Total = 24

Source: Credit Risk Office, World Bank

¹⁰ The movement from IBRD to IDA or Blend status took place in the following years: Burkina Faso (1969), Burundi (1966), Congo Dem. Rep. (1969), Cote d'Ivoire (1992), Ethiopia (1963), Ghana (1968), Guinea (1975), Haiti (1963), Kenya (1965), Liberia (1972), Mali (1967), Marshall Islands (2012), Mauritania (1965), Micronesia Fed. Sts. (2012), Moldova (1997), Myanmar (1973), Nigeria (1989), Senegal (1967), Sierra Leone (1970), Sri Lanka (1968), Uganda (1967), Uzbekistan (2002), Zambia (1978). In practice, most of these countries went from IBRD to Blend status and eventually moved to IDA. For Moldova, Nigeria and Uzbekistan which, moved from IBRD to IDA in the period after 1987 (when

3. Data and descriptive statistics

a. Data and key variables

World Bank lending data comes from the Business Intelligence (BI) unit.¹¹ For each fiscal year 1961-2016, the data list all loans made by the Bank (including DPFs, IPFs and P4Rs). For each loan, the data also reports the borrowing country, the Global Practice (GP) that administered the loan, the loan amount (including if the loan is from IDA or IBRD funds), and the date the loan was committed. For this paper, we map the loans to fiscal years, and construct a yearly dataset where each observation is a country-year.

Although the organizational structure of Bank changed over time (with two major reorganizations in 1997 and 2013), the purview of three HD units – Education (EDU), Health, Nutrition and Population (HNP) and Social Protection (SPL) – has remained intact. For the remaining units, we could map current and historical units into current vice-presidencies (VPs – Human Development (HD), Sustainable Development (SD), and Economic and Financial Institutions (EFI)) with accuracy. We use the GP and VP mapping of loans to construct several variables. Our first variable of interest is if a country borrows at all in a given year and if it borrows for HD. Similarly, for both overall lending and lending by HD GPs, we compute the number of projects and total lending for each country-year. We also use the GP mapping to compute the “share of HD GPs” variable, which is defined as total lending for HD in a year divided by total lending for all GPs. Finally, we construct the “share the HD projects” variable, which is the ratio of number of HD projects to number of total projects. These variables are the key outcomes for our analysis.

Two issues warrant caution in the interpretation of the “share of HD GPs.” First, some fraction of HD loans might, in fact, be allocated to other areas. For example, if part of lending is used to improve the statistical capacity of the National Institutes of Statistics (with the goal of informing HD issues), we could overstate the true share of HD lending. Conversely, countries can finance DPFs through Macro-Fiscal Management (MFM) GP with the specific goal of supporting an HD sector.¹² Such instances would understate the share of HD lending. The data tag each project to (up to) five sectors and report the fraction of loan amount committed to each sector. We use this to compute the “share of HD sectors”, which captures lending for HD that may have happened through other GPs. So, for instance, if a rural roads project (delivered by Transport GP) allocates 20 percent of the loans to connecting rural clinics, we can capture those as HD investments.

It is also worth distinguishing the difference between these two share variables. The variable “share of HD GPs” captures total lending that occurs through HD GPs and the variable “share of HD sectors” captures the share of total Bank lending to HD sectors. Finally, note that interpretation of

IDA graduation criteria were established), the movement followed a period of marked decline in per capita GDP. For other countries this pattern is less clear.

¹¹ Internal users at the World Bank can access the data from: <http://reports.worldbank.org/BIPORTAL/>

¹² However, note that the Bank’s rules stipulate that DPF financing cannot be earmarked; and the amounts of financing are typically determined by the borrowing countries’ fiscal needs more than direct support for policy reforms. Sector tags in DPFs, thus, relate to the content of countries’ policy programs. Thus, it is possible that IPF and DPF funds are used in completely different ways.

share variables is also complicated by the fact that the values are undefined for years when a country did not borrow at all. As such, these should always be interpreted in conjunction with the likelihood of borrowing.

We combine the above lending data at the country-year level with countries' borrowing status across our sample period as reported by Credit Risk Officer (CROCR). In addition, we obtained several other covariates for the regressions – including population and GNI per capita – from the World Development Indicators (WDI). Finally, in our robustness checks, we also include several political variables, including the Polity IV data from the Center for Systemic Peace, which provides a measure of democracy, the number of years left in the executive's term, and the political orientation of the executive (left leaning or right leaning).

b. Descriptive statistics

Total bank lending (commitments) increased dramatically from 1961 to 1980 and generally continued to increase, although the rate of increase slowed down in the later years. Figure 1 summarizes the main trends in total lending over three-year IDA cycles. In the 1988-1990 IDA cycle, the bank lent \$40.1bn to IDA countries and \$54.3bn to IBRD countries.¹³ In the latest completed IDA cycle (2012-2014) the IDA portfolio was \$47.9bn and the IBRD portfolio was \$45.1bn. Notably, total lending spiked coinciding with the Asian Financial Crisis (1997-1999) and the Great Recession (2009-2011), driven by IBRD countries. In the post-Great Recession years (2008-2011), lending for IDA was \$56.5bn and \$87.8bn for IBRD. HD lending (practices) follows a similar pattern, with peaks for IBRD lending during these crises (Figure 2).

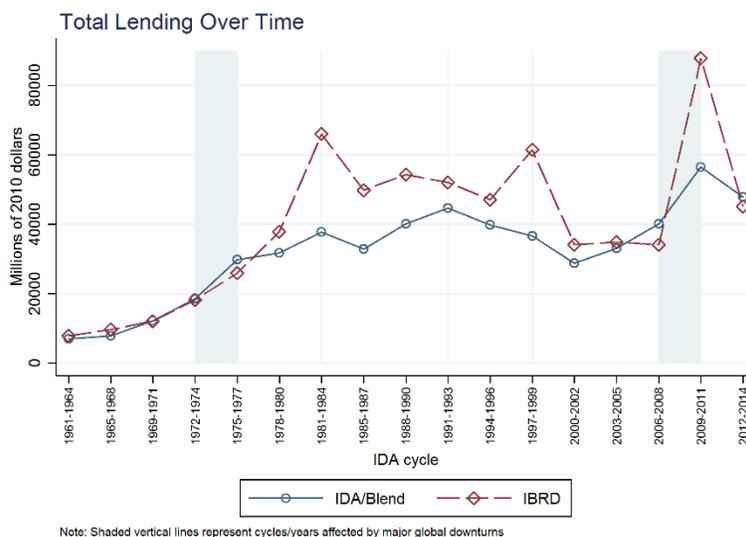


Figure 1a

¹³ Figures are in real 2010 US dollars

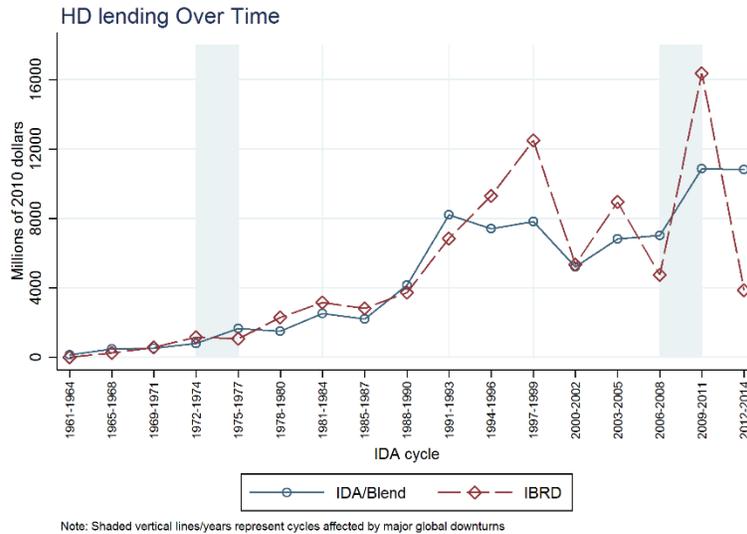


Figure 1b

A closer inspection of the pattern of the share of lending mapped to HD reveals that HD and total lending didn't always increase step-by-step. Specifically, starting with 2000, HD IBRD lending displayed a downward trend, while HD IDA showed a steady increase over the years. These patterns are reflected in the share of HD lending (lending to the three HD practices – EDU, HNP, and SPL relative to total) variable (Figure 3).

Back in 1981-1984 IDA cycle, the HD sector accounted for 6.7 percent of total lending in IDA countries and 4.8 percent in IBRD. By 2006-2008, these figures increased to 17 percent and 14 percent respectively. The main contributor is SPL lending, which in IDA countries increased from 0 to 10 percent in the same period. In IBRD countries, the increase was substantively similar – from 0 to 8 percent. The increase in HD lending share is broadly matched by a decrease in lending for Sustainable Development (SD) themes, including agriculture. However, note that SD commanded more than three-quarters of Bank's lending share in both IDA and IBRD countries in 1981-1990 (82 percent and 75 percent), and continues to command half of the lending share (53 percent and 52 percent).

Some of the key moments of the evolution of lending are captured in Table 2, including average project size. Over the past three decades, the average HD project has been smaller than the average Bank project (in 2015, \$115 million vs. \$121 million Bank-wide). However, this is an increase from less than one half in 1971 (\$29 million vs. \$78 million). Table 2 also shows that lending for SPL came into existence post-1985. Up until 1985, the share of SPL lending was zero percent, which increased to 5.8 percent in 2000 and 8.8 percent in 2015. The share of Education and HNP lending are relatively stable in recent years and have hovered between 5-7 percent and 4-6 percent respectively.

Table 2: Bank's portfolio over time and sector

	(1)	(2)	(3)	(4)	(5)
	Total lending (millions of 2010 dollars)	Per capita lending (2010 dollars)	Number of projects	Fraction of total lending	Average project size (millions of 2010 dollars)
Year: 1971					
All projects	8,796.5	10.7	112.0	100.0	78.5
HD practices	430.8	0.9	15.0	4.9	28.7
Education	397.8	0.7	13.0	4.5	30.6
Health, Nutrition & Population	33.0	0.2	2.0	0.4	16.5
Social Protection & Labor	0.0	0.0	0.0	0.0	
SD practices	7,126.9	8.7	89.0	81.0	80.1
EFI practices	1,238.8	0.5	8.0	14.1	154.8
HD sectors	287.1	0.8	9.0	3.3	31.9
Year: 1985					
All projects	24,836.0	14.9	235.0	100.0	105.7
HD practices	1,994.4	0.9	27.0	8.0	73.9
Education	1,656.6	0.6	20.0	6.7	82.8
Health, Nutrition & Population	337.8	0.2	7.0	1.4	48.3
Social Protection & Labor	0.0	0.0	0.0	0.0	
SD practices	20,307.1	10.0	176.0	81.8	115.4
EFI practices	2,534.6	3.4	32.0	10.2	79.2
HD sectors	1,834.1	1.1	24.0	7.4	76.4
Year: 2000					
All projects	18,883.3	8.0	232.0	100.0	81.4
HD practices	3,153.3	1.9	54.0	16.7	58.4
Education	845.5	0.8	21.0	4.5	40.3
Health, Nutrition & Population	1,220.0	0.5	21.0	6.5	58.1
Social Protection & Labor	1,087.8	0.5	12.0	5.8	90.6
SD practices	8,143.7	3.3	111.0	43.1	73.4
EFI practices	7,586.3	2.5	67.0	40.2	113.2
HD sectors	3,199.6	1.7	104.0	16.9	30.8
Year: 2015					
All projects	34,069.1	18.6	280.0	100.0	121.7
HD practices	6,796.3	1.6	59.0	19.9	115.2
Education	2,445.0	0.4	23.0	7.2	106.3
Health, Nutrition & Population	1,348.5	0.4	15.0	4.0	89.9
Social Protection & Labor	3,002.8	0.7	21.0	8.8	143.0
SD practices	18,302.6	11.1	151.0	53.7	121.2
EFI practices	8,970.3	5.3	70.0	26.3	128.1
HD sectors	6,861.0	1.7	111.0	20.1	61.8

Source: Own calculations from World Bank Portfolio data

In Figure 2, we plot the percentage change in lending in the 5 years after graduation relative to the 5 years before graduation by country (ordered by graduation year on the y-axis). The figure reveals some interesting patterns. Before the 1980s, we observe an increase in lending post-IDA graduation. In contrast, post-1980s, total lending appears to decrease after graduation. It is worth noting that the pool of IDA funds relative to IBRD was much smaller before the 1980s. Of late, IDA commitments have increased dramatically, with a record commitment of \$75bn for IDA18. Conversely, the total amount of IBRD capital has changed little over the past few decades. Nevertheless, these patterns highlight the need to control for time effects in addition to country characteristics. It is also worth noting that rules-based IDA graduation criteria were also put in effect starting from 1988. In the following tables, we describe the key patterns of borrowing, splitting the sample into two groups: years 1988-2015 and years 1961-1987.

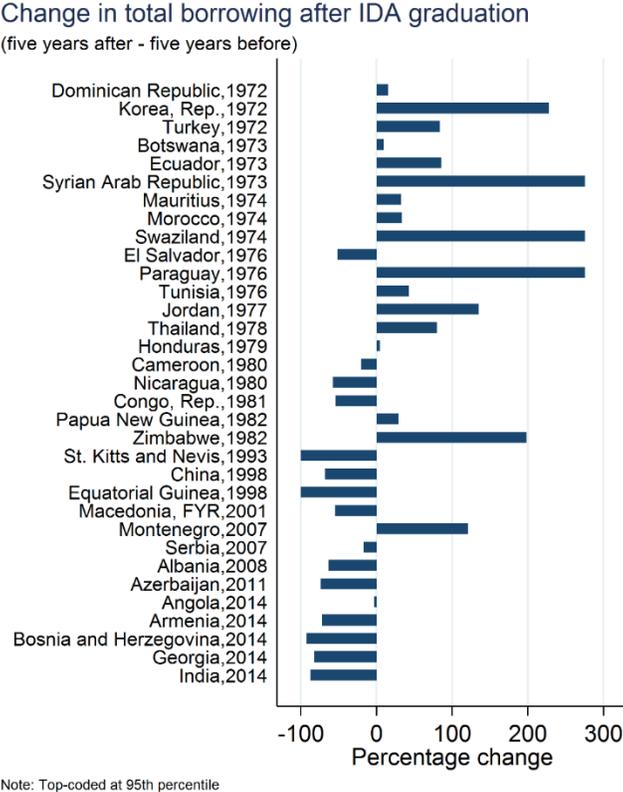


Figure 2

Table 3A and 3B report the main summary statistics for lending patterns in graduating countries in the years leading up to and the years after graduation, using a methodology akin to event studies. Table 3A isolates the sample to the 15 countries that graduated in or after 1988, and Table 3b looks at the 18 countries that graduated before 1988. Among the countries that graduated after 1988, the average number of projects per year declines from 4.64 in 0-5 years before graduation to 2.60 in 0-5 years after graduation, and this difference is statistically significant. The number of HD projects also declines significantly from 0.87 vs. 0.38. Analysis of a longer time frame (0-10 years before and 0-10 years after)

yields similar patterns (4.35 vs. 2.33 total projects, and 0.86 vs. 0.28 HD, and both differences are statistically significant).

Total lending per year also declines by 60.4 percent in the 5 years after graduation compared to the 5 years before graduation. Analysis of 10-year periods shows that the decline is similar at 59.7 percent, thus signaling that the declines are not only transitory. The decline in HD lending is even larger and statistically significant. Comparing the 5-year periods before and after graduation, average HD GP lending per country per year declines from \$87.91m to \$17.9m, representing a 79.6 percent change. The patterns for 10-year periods is similar – average HD lending declines from \$84.7m to \$12.5m, or 72 percent.

In contrast, results for the countries graduating in the pre-1988 period are quite the opposite (Table 3B). These countries increased borrowing in the years after IDA graduation although significantly less so for the HD areas (107 percent overall vs. 77 percent for HD before and after 5-year periods). Similarly, while an overall number of projects increased, the number of HD projects did not change. These patterns are consistent with the notion that countries borrow proportionately less for the HD when they graduate from IDA.

These differences, however, do not account for other explanatory variables, including country size, and could be driven by the behavior of a few countries. For instance, if big countries like India and China stop borrowing for HD, the difference in average borrowing could be large even if the average country did not change borrowing behavior after graduation. To check for this, we look at per capita borrowing before and after graduation. Looking at the 5-year before and after periods, we see that per capita total lending and per capita HD lending also decreased, although the results are not statistically significant. These results suggest that country size is an important variable to control for; however, the results are also consistent with a reallocation away from HD.

Table 3A: Summary statistics for graduating countries, 1988-2016

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	5 years before IDA graduation	5 years after IDA graduation	Difference (2)-(1)	Percentage Change	10 years before IDA graduation	10 years after IDA graduation	Difference (5)-(4)	Percentage change
All lending (2010 dollars)								
Total (millions)	784.36	310.55	-473.80*	-60.41	656.87	264.55	-392.32**	-59.73
Total per capita	25.05	17.31	-7.73	-30.87	19.42	21.53	2.12	10.90
HD lending (2010 dollars)								
Total (millions)	87.91	17.91	-69.99**	-79.62	84.72	12.45	-72.27***	-85.30
Sectors (millions)	90.74	22.60	-68.14*	-75.09	83.84	15.60	-68.24***	-81.39
Total per capita	3.07	2.16	-0.91	-29.65	2.95	1.92	-1.03	-35.01
Sectors per capita	2.12	2.38	0.26	12.22	1.91	3.12	1.22	63.93
HD Practice Areas (2010 dollars)								
Education (millions)	40.10	8.78	-31.32	-78.11	40.95	5.32	-35.62**	-87.00
Health, Nutrition and Population (millions)	34.51	6.35	-28.17*	-81.62	34.06	4.69	-29.36**	-86.22
Social Protection and Labor (millions)	13.29	2.79	-10.50	-79.01	9.72	2.44	-7.28*	-74.90
Number of projects								
All	4.64	2.60	-2.04**	-43.96	4.35	2.33	-2.02***	-46.45
HD	0.87	0.38	-0.49**	-56.26	0.86	0.28	-0.58***	-67.52
Education	0.25	0.12	-0.13	-51.20	0.25	0.08	-0.17***	-68.96
Health, Nutrition and Population	0.33	0.12	-0.21**	-63.40	0.34	0.11	-0.23***	-68.55
Social Protection and Labor	0.30	0.14	-0.16	-52.56	0.27	0.10	-0.18***	-64.95

Notes: Altogether 33 countries graduated IDA between 1988 and 2016. The data excludes the exact years in which countries graduate IDA. In columns (3) and (6), significance stars reports results from testing for statistical significance for difference in the two means. * Significant at 10%, ** Significant at 5%, *** Significant at 1%.

Table 3B: Summary statistics for graduating countries, 1961-1987

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	5 years before IDA graduation	5 years after IDA graduation	Difference (2)-(1)	Percentage Change	10 years before IDA graduation	10 years after IDA graduation	Difference (5)-(4)	Percentage change
All lending (2010 dollars)								
Total (millions)	99.47	206.33	106.86***	107.43	71.34	216.98	145.64***	204.16
Total per capita	14.30	22.87	8.57***	59.90	11.51	22.34	10.83***	94.16
HD lending (2010 dollars)								
Total (millions)	7.62	13.50	5.88	77.21	5.62	12.67	7.05**	125.28
Sectors (millions)	6.38	10.05	3.67	57.48	4.98	12.26	7.28***	145.99
Total per capita	1.35	2.71	1.36*	101.12	0.96	2.62	1.65***	171.88
Sectors per capita	1.16	2.55	1.39*	119.47	0.87	2.57	1.71***	197.32
HD Practice Areas (2010 dollars)								
Education (millions)	7.40	12.28	4.88	65.94	5.51	11.46	5.95**	107.89
Health, Nutrition and Population (millions)	0.22	1.22	1.00	459.42	0.11	1.21	1.10*	975.11
Social Protection and Labor (millions)	0.00	0.00	0.00		0.00	0.00	0.00	
Number of projects								
All	1.62	2.29	0.67***	41.14	1.23	2.29	1.06***	85.62
HD	0.23	0.23	0.01	3.33	0.16	0.23	0.07*	46.85
Education	0.22	0.20	-0.02	-7.00	0.15	0.20	0.05	31.98
Health, Nutrition and Population	0.01	0.03	0.02	210.00	0.01	0.03	0.02*	448.22
Social Protection and Labor	0.00	0.00	0.00		0.00	0.00	0.00	

Notes: Altogether 33 countries graduated IDA between 1961 and 1987. The data excludes the exact years in which countries graduate IDA. In columns (3) and (6), significance stars reports results from testing for statistical significance for difference in the two means. * Significant at 10%, ** Significant at 5%, *** Significant at 1%.

4. Regression framework and specifications

The before and after statistics reported in Tables 3A and 3B can reflect a variety of factors in addition to graduation, including structural differences across countries and the effects of graduating in different years or decades. To isolate the effect of IDA graduation, we use a country and year fixed effects approach and estimate the following regression specification:

$$y_{it} = \alpha + \beta \cdot \mathbb{1}\{IBRD\} + \Gamma X_{it} + \gamma_t + \tau_i + \epsilon_{it} \dots (1)$$

where, $\mathbb{1}\{IBRD\}$ is an indicator, which equals 1 if the country is an IBRD country; 0 if IDA or blend country. γ_t represents year fixed effects, and we include these in all specifications. X_{it} is a vector of controls, and we estimate regressions with and without these effects. We control for four main variables – log of population, GNI per capita, Net Aid Flow (non-Bank aid only), and Polity IV score.¹⁴ In separate regressions, we add Fiscal Spending in HD as another control. τ_i represents country fixed effects, and we estimate regressions with and without these effects. ϵ_{it} is the idiosyncratic error term that we cluster at the country-level. The main coefficient of interest is β , which represents the average difference between IDA and IBRD countries on the outcome of interest y .

The year fixed effects capture the effect of graduating in different years. Among these, they capture the effects of prevailing interest rates (that vary from year to year) as well as any effects due to graduating in different time periods (for example, in a boom vs. a recession). The country fixed effects capture any country-specific characteristics that may affect the outcomes of interest, including national priorities for the HD sectors and/or an appetite for HD lending. They also ensure that the identifying variation comes from countries that transition from IDA to IBRD (since the fixed effects will be collinear for countries that remain in the same status throughout).

Given the fact that IDA graduation policy based on GNI per capita cut-off came into existence in 1987, for our main results, we restrict the analysis to data from 1988-2015. In our robustness checks, we report the results from the full sample of years – 1961-2015. For the share variables, we estimate both unweighted and weighted (by loan size) regressions. Unweighted regressions assign equal weight to smaller borrowers (like Albania) and larger borrowers (like India). So, for example, if after graduation, Albania doubles HD lending and India halves it, the net effect will be zero. Weighted regressions assign greater weight to large borrowers relative to smaller borrowers.¹⁵ Thus, in the above Albania/India example, the net effect is likely to be negative (assuming India borrows more than Albania).

The unweighted and weighted regressions answer two related questions. First, if one were concerned about *average HD share in client countries* after graduation, the unweighted regressions shed light on this

¹⁴ In other versions of the results, we also included controls for other bilateral and multilateral net flows (DAC data from OECD) as well as countries' own spending levels in the HD sectors (data from IMF). We chose not include these covariates because the data are incomplete (resulting in a large loss of number of observations) and because these data did not have much explanatory power. Results are available upon request.

¹⁵ The weighted regressions are estimated by specifying the weight option in Stata 14. As an example, consider two country-year observations in an IDA country 'X'. In one year, 20 percent of total of \$100m loan was allocated for HD and in the second-year, 40 percent of total of \$50m was for HD. Similarly, in an IBRD country 'Y', in one-year, 20 percent of total of \$200m loan was allocated for HD and in the second-year, 10 percent of total of \$100m was for HD. The coefficient on IBRD in the unweighted regressions will be -15 percentage points $(0.2+0.1/2 - 0.2+0.4/2)$. Likewise, the weighted coefficient will be -10 percentage points $((0.2*200+0.1*100)/300 - (0.2*100+0.4*50)/150)$.

question. Conversely, if one were interested in understanding the difference in HD lending share in *overall Bank's portfolio*, the weighted regressions report these results. Second, coefficients comparisons from unweighted and weighted regressions inform separate questions. Assume that the share of HD lending decreases after graduation (i.e., the coefficient is negative). Then, if the unweighted coefficients equal weighted, the effects are likely similar for all countries, big and small. On the other hand, if unweighted coefficients are smaller than weighted, then the effects are likely driven by smaller countries, and vice versa.

5. Regression results

Table 4A reports the marginal effects of estimating Probit regressions of the likelihood of any project (Columns 1-4) and the likelihood of any HD project (Columns 5-8). For each outcome variable, the first column reports the results from estimating equation 1 without controls and without country fixed effects. The second column then adds the control variables. The third column then reports results including country fixed effects but no controls. The fourth column then adds the control variables. All regressions include fiscal year fixed effects. Results for other variables are reported in the same format. We primarily focus our discussion on the fourth column, which includes year and country fixed effects, as well as the control variables, but present all results for completeness.

Column 1 of Table 4A shows that IBRD countries are on average 14.1 percentage points less likely to borrow from the Bank relatively to IDA countries. The mean in IDA countries is 0.731 (last row) that represents a 19.3 percent decline. When country fixed effects are added so that the identifying variation only comes from the sample of graduating countries, the coefficient is even larger – 0.19 percentage points, which represents a 26.8 percent decline. The effect for HD projects are bigger – 13.1 percentage points or 34.9 percent decline without country fixed effects and 24.9 percentage points or 64.7 percent decline with country fixed effects. The coefficients are qualitatively similar and statistically significant across the four specifications. Although in the regressions without country fixed effects, the coefficient increases significantly when controls are added (Column 1 to Column 2), the increase is trivial in the regressions with country fixed effects (Column 3 to Column 4). This is because country fixed effects already capture much of the variation that occurs in the control variables. Overall, these results suggest that IBRD countries are indeed less likely to finance projects from the Bank and the decline is greater for HD projects.

Table 4B reports the results for the total number of projects (Columns 1-4), number of HD projects (Columns 5-8) and the share of HD projects (Columns 9-12). The results are similar for any project. While the number of total projects declines by 25 percent, HD projects decrease by 26 percent in IBRD countries. The share of HD projects also declines by roughly one-third (7.4 percentage points). Here too, the estimated results are similar across specifications. The results from Table 4A and 4B, taken together, strongly suggests that the likelihood of borrowing and the number of projects financed are negatively correlated with IDA graduation, and the correlation is much strong for the HD practices.

In Table 4C, we turn to lending amounts – total lending, HD GP lending, and HD sector lending. Because the lending variables have a wide spread, we use the natural logarithm of the variables as the

dependent variable.¹⁶ But notice that, since the main independent variable of interest is a binary indicator (dummy for an IBRD country), the OLS coefficient cannot be interpreted as percentage differences, as is standard in log-linear models. Instead to obtain percentage differences, one needs to compute $100 * \{\exp(\beta) - 1\}$.¹⁷

The coefficient on log of total lending is -0.651 and is statistically significant (Column 4) which represents a 47.9 percent decline from a baseline of \$210m when countries graduate from IDA to IBRD. The decline in HD loans is greater – the coefficient is -0.868 and is statistically significant (Column 8) and translates into a 58.0 percent reduction. Results for HD sector loans are similar (Column 12). For completeness, we present regression results with the levels of loans as the dependent variable in Appendix Table A1. First, notice that the coefficient on total lending is positive in the base specification (Column 1) while the coefficient is negative in the specification with controls (Column 2). This is because country population and GNI per capita are evidently strongly correlated with total lending and controlling for these variables, thus, yields more precise estimates. Although the coefficient of total lending (Columns 2-4) are negative, they are not statistically significant. For HD GP lending (Columns 5-8) and HD sector lending (Columns 9-12), the patterns are similar.

Finally, in Table 4D, we report regression results with the share of HD lending as outcome variables. In Columns 1-4, we first present unweighted results for HD GP share. Focusing our attention on the specifications with country fixed effects and controls, we find that IDA graduation is correlated with 6.9 percentage points (30.9 percent) decrease the share of HD lending. Results for the HD sectors yield smaller and statistically insignificant coefficients.

Overall, our results are consistent with the hypothesis that HD lending declines disproportionately more when countries graduate from IDA to IBRD. The Probit results of regressions of any HD lending as outcome provide strong evidence that the likelihood of an HD project is halved in IBRD country. Although the likelihood of the Bank lending also declines, the effect on HD lending is much stronger. Similarly, results from the share variables suggest that HD GP share declines between 5-7 percentage points. Note that, as we discussed above, the share variable is censored, and since the likelihood of HD projects decreases disproportionately, the coefficient on the share variable represents a lower bound on the true estimate. Taken together, these results suggest that IDA graduation is indeed correlated with declining HD lending.

¹⁶ We present regression results with the dependent variables in levels in Appendix Table A1 for completeness.

¹⁷ To see this, notice that exponentiating both sides, we have $y = \exp(\alpha + \beta \cdot x)$. Now, since x is binary, $\frac{dy}{dx} = Y_1 - Y_0 = \exp(\alpha + \beta) - \exp(\alpha)$. To obtain percentage difference, dividing the equation by Y_0 and multiplying by 100, we have $100 * [\exp(\beta) - 1]$. For example, the coefficient in Column 4 of Table 4C is -0.651, which amounts to a -47.8 percent change.

Table 4A: Regression results from the full sample of 153 countries and all years 1988-2015

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
		Any project (dy/dx)				HD project (dy/dx)		
IBRD country (1=yes)	-0.141*** (0.044)	-0.232*** (0.049)	-0.187** (0.076)	-0.196*** (0.073)	-0.131*** (0.032)	-0.226*** (0.033)	-0.249*** (0.047)	-0.244*** (0.053)
Log population		0.079*** (0.010)		0.148 (0.173)		0.080*** (0.007)		0.120 (0.133)
Log GNI per capita		0.019 (0.023)		0.061 (0.049)		0.036** (0.015)		0.054* (0.032)
Net aid flow (millions of 2010 dollars)		0.010* (0.006)		0.012** (0.006)		0.002 (0.003)		-0.002 (0.004)
Number of observations	3,894	3,402	3,391	2,844	3,894	3,402	3,660	3,140
R2	0.023	0.433	0.616	0.646	0.024	0.159	0.262	0.268
Country fixed effects	no	no	yes	yes	no	no	yes	yes
Fiscal year fixed effects	yes	yes	yes	yes	yes	yes	yes	yes
Mean of IDA/Blend	0.731	0.766	0.696	0.723	0.731	0.766	0.742	0.779

Notes: Each observation is a country year, thus the coefficients can be interpreted as the average differences between IDA/Blend and IBRD country. Standard errors are clustered at the country level. * Significant at 10%, ** Significant at 5%, *** Significant at 95%.

Table 4B: Regression results from the full sample of 153 countries and all years 1988-2015

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	
		Number of projects				Number of HD projects				Share of HD projects			
IBRD country (1=yes)	-0.571** (0.274)	-1.634*** (0.286)	-0.680** (0.347)	-0.852** (0.398)	-0.189*** (0.059)	-0.423*** (0.070)	-0.342*** (0.089)	-0.360*** (0.097)	-0.040*** (0.015)	-0.043** (0.021)	-0.071** (0.032)	-0.068** (0.034)	
Log population		0.619*** (0.085)		1.431** (0.618)		0.142*** (0.019)		0.474** (0.198)		-0.004 (0.004)		-0.063 (0.078)	
Log GNI per capita		0.298** (0.129)		0.387* (0.207)		0.097*** (0.032)		0.109** (0.055)		0.014 (0.010)		0.040 (0.025)	
Net aid flow (millions of 2010 dollars)		0.178*** (0.024)		0.072*** (0.021)		0.015* (0.008)		0.002 (0.009)		-0.001 (0.001)		-0.001 (0.002)	
Number of observations	3,894	3,402	3,894	3,402	3,894	3,402	3,894	3,402	2,602	2,365	2,602	2,365	
R2	0.023	0.433	0.616	0.646	0.024	0.159	0.262	0.268	0.024	0.027	0.131	0.130	
Country fixed effects	no	no	yes	yes	no	no	yes	yes	no	no	yes	yes	
Fiscal year fixed effects	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	
Mean of IDA/Blend	2.282	2.443	2.282	2.443	0.526	0.558	0.526	0.558	0.238	0.235	0.238	0.235	

Notes: Each observation is a country year, thus the coefficients can be interpreted as the average differences between IDA/Blend and IBRD country. Standard errors are clustered at the country level. * Significant at 10%, ** Significant at 5%, *** Significant at 95%.

Table 4C: Regression results from the full sample of 153 countries and all years 1988-2015

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
	Log of total loans (millions of 2010 \$)				Log of HD loans (millions of 2010 \$)				Log of HD sector loans (millions of 2010 \$)			
IBRD country (1=yes)	-0.124 (0.311)	-1.053*** (0.239)	-0.508* (0.275)	-0.651*** (0.249)	-0.270 (0.172)	-0.916*** (0.154)	-0.774*** (0.239)	-0.868*** (0.245)	-0.297 (0.184)	-0.933*** (0.164)	-0.587*** (0.212)	-0.691*** (0.219)
Log population		0.767*** (0.058)		1.324* (0.741)		0.437*** (0.046)		0.764 (0.529)		0.456*** (0.049)		1.164** (0.512)
Log GNI per capita		0.276** (0.121)		0.441* (0.233)		0.258*** (0.080)		0.290** (0.130)		0.222** (0.087)		0.298** (0.143)
Net aid flow (millions of 2010 dollars)		0.053*** (0.020)		0.017 (0.015)		0.032 (0.020)		-0.009 (0.022)		0.052*** (0.016)		0.006 (0.017)
Number of observations	3,753	3,402	3,753	3,402	3,753	3,402	3,753	3,402	3,753	3,402	3,753	3,402
R2	0.010	0.399	0.566	0.597	0.013	0.202	0.308	0.317	0.013	0.261	0.382	0.394
Country fixed effects	no	no	yes	yes	no	no	yes	yes	no	no	yes	yes
Fiscal year fixed effects	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
Mean of IDA/Blend	3.185	3.376	3.185	3.376	1.372	1.458	1.372	1.458	1.454	1.546	1.454	1.546

Notes: Each observation is a country year, thus the coefficients can be interpreted as the average differences between IDA/Blend and IBRD country. Standard errors are clustered at the country level. * Significant at 10%, ** Significant at 5%, *** Significant at 95%.

Table 4D: Regression results from the full sample of 153 countries and all years 1988-2015

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	HD GP share				HD sectors share			
IBRD country (1=yes)	-0.039** (0.017)	-0.049** (0.023)	-0.055 (0.037)	-0.069* (0.035)	-0.048*** (0.013)	-0.049** (0.021)	-0.031 (0.031)	-0.035 (0.030)
Log population		-0.005 (0.005)		-0.083 (0.081)		-0.003 (0.004)		-0.005 (0.074)
Log GNI per capita		0.017 (0.011)		0.064** (0.027)		0.009 (0.011)		0.047** (0.024)
Net aid flow (millions of 2010 dollars)		-0.001 (0.001)		-0.001 (0.002)		-0.001 (0.001)		-0.002 (0.001)
Number of observations	2,509	2,365	2,509	2,365	2,509	2,365	2,509	2,365
R2	0.027	0.031	0.141	0.142	0.029	0.029	0.127	0.126
Country fixed effects	no	no	yes	yes	no	no	yes	yes
Fiscal year fixed effects	yes	yes	yes	yes	yes	yes	yes	yes
Mean of IDA/Blend	0.226	0.222	0.226	0.222	0.207	0.203	0.207	0.203

Notes: Each observation is a country year, thus the coefficients can be interpreted as the average differences between IDA/Blend and IBRD country. Standard errors are clustered at the country level. * Significant at 10%, ** Significant at 5%, *** Significant at 95%.

6. Robustness checks

We perform a variety of robustness checks to ensure that the results are not driven by our choice of the specification or idiosyncrasies in the data. In Tables 7A-7D, we replicate the results from Tables 4A-4D, but with different sample periods and estimations samples. First, we replicate results using the full-time frame – 1961-2015 – as opposed to 1988-2015. Second, we exclude the reverse graduates (countries that moved from IBRD to IDA) from the sample and re-estimate all regressions. Third, to ensure that our results are not driven by very small or very big countries, we exclude countries below the bottom 5th percentile and above the 99th percentile of the population distribution and re-estimate the results. Crucially, this check excludes China and India – two very large borrowers that also received differential treatment surrounding graduation (buy-downs in the case of China and transitional support in the case of India). Finally, we also present results from a set of regressions including additional controls for political variables.

Tables 7A-7D follow the same format as in Tables 4A-4B with the following exception. For the sake of brevity, we only report coefficient on the IBRD dummy, so each cell in the table is from a separate regression. The rows list the robustness check applied, and for ease of exposition and comparison, we report the coefficients from the base specification (Tables 4A-4B) in the first row. Compared to the base specification, results are qualitatively unchanged when we consider a longer sample period. The Probit marginal effect on the likelihood of any project declines from -0.196 to 0.103 and on the likelihood of any HD project declines from -0.244 to -0.150. However, both remain statistically significant. For a number of projects, the results are similar. The average difference in the number of HD projects is 0.208 with the longer time frame relative to 0.360 with the base specification. Finally, the results on the share variables are similar and statistically significant (-0.069 vs. -0.042).

Although there are 24 countries in Table 1 that reverse graduated, i.e., moved from IDA to IBRD, during our sample period (1988-2015), only 5 countries did so. These countries are - Côte d'Ivoire, Federated States of Micronesia, Moldova, Nigeria, and Uzbekistan. The remaining countries transitioned from IBRD to IDA prior to 1988. Excluding the reverse graduates does not alter the results. The coefficients on likelihood of projects as well as the number of projects are similar. We lose statistical significance in the HD GP share variable, but the results are qualitatively similar (-0.069 vs. -0.042). Similarly, the exclusion of very small and large countries does not alter the results dramatically either. The coefficients are generally smaller but are still statistically significant. The marginal effect on the likelihood of any project and the likelihood of any HD project declines marginally (from -0.196 to -0.161 and from -0.244 to -0.220 respectively). The coefficient on the number of HD projects drops from -0.360 to -0.307 but continues to be statistically significant. Similar results are obtained on the share variables. Finally, inclusion of additional controls for political variables does not change the results either.

Table 5A: Robustness checks (Coefficient on IBRD country)

	(1)	(2)	(3)	(4)
	Any project (dy/dx)		Any HD project (dy/dx)	
Base specification	-0.187**	-0.196***	-0.249***	-0.244***
(all countries, 1988-2016)	(0.076)	(0.073)	(0.047)	(0.053)
Longer time frame	-0.160***	-0.124***	-0.140***	-0.150***
(all countries, 1961-2016)	(0.037)	(0.040)	(0.028)	(0.035)
Exclude reverse graduates	-0.174**	-0.181**	-0.245***	-0.235***
(1988-2016, 5 excluded)	(0.085)	(0.082)	(0.045)	(0.050)
Exclude small and large countries	-0.202**	-0.210**	-0.236***	-0.220***
(1988-2016, 11 excluded)	(0.094)	(0.092)	(0.051)	(0.057)
Additional control variables	-0.137	-0.144*	-0.263***	-0.272***
(all countries, 1988-2016)	(0.088)	(0.085)	(0.064)	(0.067)
Controls	no	yes	no	yes
Country fixed effects	yes	yes	yes	yes
Fiscal year fixed effects	yes	yes	yes	yes

Notes: Each observation is a country year, thus the coefficients can be interpreted as the average differences between IDA/Blend and IBRD country. Control variables in the even numbered columns are (a) log of GNI per capita, (b) log of population, and (c) Net aid flow. The rows with additional control variables include (a) Polity Index (-10 to 10), (b) Number of years left in current term of the executive, (3) If executive has finite terms in office, and (4) Indicators for left and right leaning executive. Standard errors are clustered at the country level. * Significant at 10%, ** Significant at 5%, *** Significant at 1%.

Table 5B: Robustness checks (Coefficient on IBRD country)

	(1)	(2)	(3)	(4)	(5)	(6)
	Number of projects		Number of HD projects		Share of HD projects	
Base specification	-0.680**	-0.852**	-0.342***	-0.360***	-0.071**	-0.068**
(all countries, 1988-2016)	(0.347)	(0.398)	(0.089)	(0.097)	(0.032)	(0.034)
Longer time frame	-0.533***	-0.494**	-0.167***	-0.208***	-0.034**	-0.043**
(all countries, 1961-2016)	(0.148)	(0.215)	(0.050)	(0.065)	(0.017)	(0.019)
Exclude reverse graduates	-0.711*	-0.853*	-0.338***	-0.338***	-0.046	-0.043
(1988-2016, 5 excluded)	(0.408)	(0.474)	(0.102)	(0.113)	(0.032)	(0.036)
Exclude small and large countries	-0.563	-0.690*	-0.305***	-0.307***	-0.069*	-0.068*
(1988-2016, 11 excluded)	(0.392)	(0.409)	(0.075)	(0.083)	(0.036)	(0.036)
Additional control variables	-0.412	-0.667	-0.327***	-0.357***	-0.089**	-0.100**
(all countries, 1988-2016)	(0.413)	(0.470)	(0.110)	(0.117)	(0.042)	(0.039)
Controls	no	yes	no	yes	no	yes
Country fixed effects	yes	yes	yes	yes	yes	yes
Fiscal year fixed effects	yes	yes	yes	yes	yes	yes

Notes: Each observation is a country year, thus the coefficients can be interpreted as the average differences between IDA/Blend and IBRD country. Control variables in the even numbered columns are (a) log of GNI per capita, (b) log of population, and (c) Net aid flow. The rows with additional control variables include (a) Polity Index (-10 to 10), (b) Number of years left in current term of the executive, (3) If executive has finite terms in office, and (4) Indicators for left and right leaning executive. Standard errors are clustered at the country level. * Significant at 10%, ** Significant at 5%, *** Significant at 1%.

Table 5C: Robustness checks (Coefficient on IBRD country)

	(1)	(2)	(3)	(4)	(5)	(6)
	Log of total loans		Log of HD loans		Log of HD sector loans	
Base specification	-0.508*	-0.651***	-0.774***	-0.868***	-0.587***	-0.691***
(all countries, 1988-2016)	(0.275)	(0.249)	(0.239)	(0.245)	(0.212)	(0.219)
Longer time frame	-0.549***	-0.395**	-0.346***	-0.485***	-0.267**	-0.376**
(all countries, 1961-2016)	(0.172)	(0.196)	(0.121)	(0.160)	(0.126)	(0.161)
Exclude reverse graduates	-0.517	-0.629**	-0.748***	-0.797***	-0.562**	-0.621**
(1988-2016, 5 excluded)	(0.319)	(0.293)	(0.276)	(0.283)	(0.245)	(0.248)
Exclude small and large countries	-0.502	-0.636**	-0.668***	-0.775***	-0.482**	-0.593***
(1988-2016, 11 excluded)	(0.329)	(0.285)	(0.208)	(0.217)	(0.194)	(0.199)
Additional control variables	-0.281	-0.489*	-0.816***	-0.925***	-0.552**	-0.710***
(all countries, 1988-2016)	(0.277)	(0.281)	(0.283)	(0.292)	(0.241)	(0.246)
Controls	no	yes	no	yes	no	yes
Country fixed effects	yes	yes	yes	yes	yes	yes
Fiscal year fixed effects	yes	yes	yes	yes	yes	yes

Notes: Each observation is a country year, thus the coefficients can be interpreted as the average differences between IDA/Blend and IBRD country. Control variables in the even numbered columns are (a) log of GNI per capita, (b) log of population, and (c) Net aid flow. The rows with additional control variables include (a) Polity Index (-10 to 10), (b) Number of years left in current term of the executive, (3) If executive has finite terms in office, and (4) Indicators for left and right leaning executive. Standard errors are clustered at the country level. * Significant at 10%, ** Significant at 5%, *** Significant at 1%.

Table 5D: Robustness checks (Coefficient on IBRD country)

	(1)	(2)	(3)	(4)
	HD share		HD sectors share	
Base specification	-0.055	-0.069*	-0.031	-0.035
(all countries, 1988-2016)	(0.037)	(0.035)	(0.031)	(0.030)
Longer time frame	-0.023	-0.042**	-0.013	-0.028
(all countries, 1961-2016)	(0.018)	(0.020)	(0.018)	(0.020)
Exclude reverse graduates	-0.026	-0.042	-0.007	-0.011
(1988-2016, 5 excluded)	(0.038)	(0.037)	(0.032)	(0.032)
Exclude small and large countries	-0.053	-0.070*	-0.025	-0.034
(1988-2016, 11 excluded)	(0.042)	(0.038)	(0.034)	(0.032)
Additional control variables	-0.070	-0.091**	-0.045	-0.061*
(all countries, 1988-2016)	(0.044)	(0.042)	(0.036)	(0.035)
Controls	no	yes	yes	no
Country fixed effects	yes	yes	no	yes
Fiscal year fixed effects	yes	yes	yes	yes

Notes: Each observation is a country year, thus the coefficients can be interpreted as the average differences between IDA/Blend and IBRD country. Control variables in the even numbered columns are (a) log of GNI per capita, (b) log of population, and (c) Net aid flow. The rows with additional control variables include (a) Polity Index (-10 to 10), (b) Number of years left in current term of the executive, (3) If executive has finite terms in office, and (4) Indicators for left and right leaning executive. Standard errors are clustered at the country level. * Significant at 10%, ** Significant at 5%, *** Significant at 1%.

7. Potential explanations and limitations

a. Increased DPF lending as one potential explanation

What explains the decline in HD lending (likelihood of a project and share of HD GPs) when countries graduate from IDA to IBRD? As one potential explanation, we explore countries' choice of lending instrument (IPFs vs. DPFs) under different borrower status. We begin by noting that the difference between HD GP share and HD sectors' share is higher in IBRD countries than IDA countries. This is expected if IDA countries finance more of their HD loans through DPFs (that are administered by other GPs but have HD sector tags) than IPFs. These patterns suggest that in IBRD countries, a larger portion of HD lending is through other GPs, which is more likely to take the form of DPFs (or budget support). To further support this claim, Figure 4 below plots DPF shares in IDA and IBRD countries. Here, IBRD countries indeed borrow more through DPFs rather than IPFs – one-fifth of all lending in IDA vs. over half of all lending in IBRD. Finally, in Figure 5, we plot the difference in share of HD GPs and share of HD sectors for DPF loans. The figure suggests that most of the difference in HD GP lending and HD sector lending is accounted for by DPF lending.

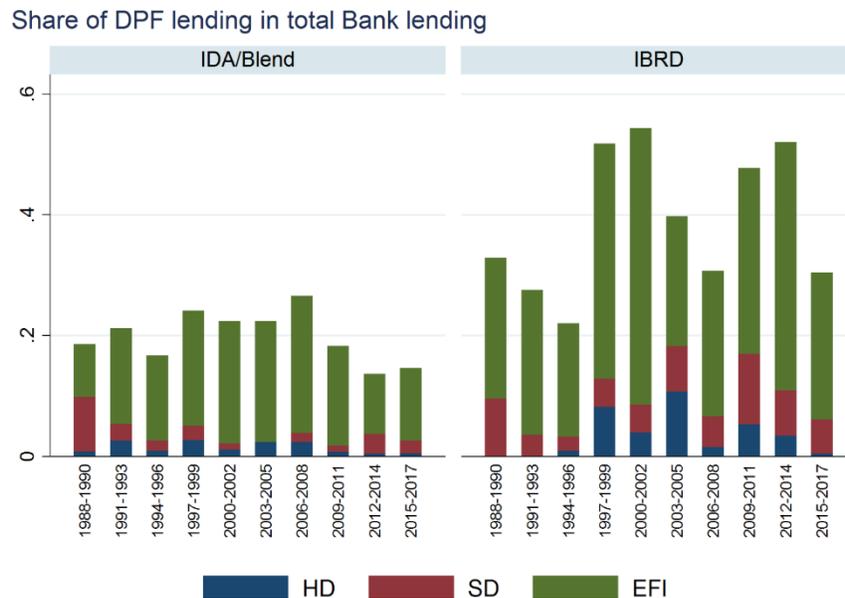


Figure 4

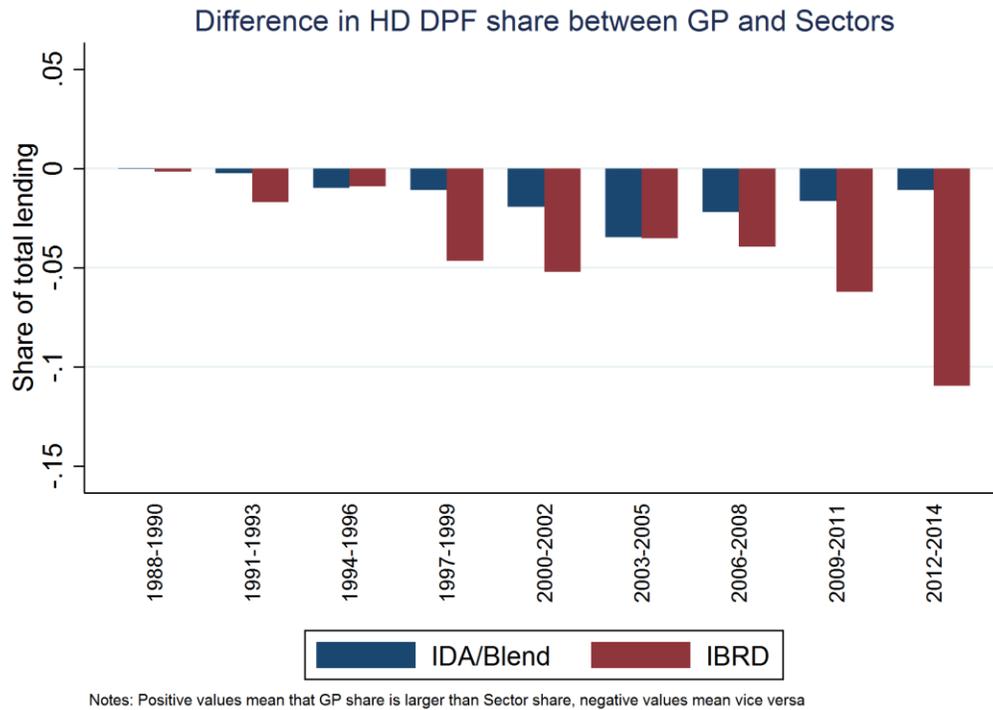


Figure 7

b. Limitations and caveats

Although the results suggest that IDA graduation is strongly correlated with a decline in HD lending, it is important to note that our results represent correlations rather than causal estimates of IDA graduation. To identify the causal estimates, we would ideally use an instrument that is correlated with graduation (valid first stage) but not HD lending (satisfies the exclusion restriction). In practice, such an instrument is hard to come by. One potential candidate is the binary indicator of crossing the income threshold for graduation, and this is something we intend to use in future work. However, as we discussed above, IDA graduation is only partly determined by income. Other factors such as creditworthiness and size of the economy also play a role in determining graduation.

Similarly, to accurately identify the point estimate on the share of HD lending variable, we would ideally use a two-stage Heckman selection correction model to account for the censoring of the share variable. The first stage here is to predict the likelihood of any project. This requires an instrument as well that is correlated with the likelihood of borrowing but not sectoral allocations of borrowing.

Finally, our results do not account for any supply-side considerations – that is, the total envelope available for a country to borrow from the Bank. If countries are unconstrained in the total amount they can borrow from the Bank, we should not see any difference in total lending, but we may still be able to observe differences in sectoral allocation of lending. While data for the size of the envelope for countries is hard to come by, our discussions with colleagues from Development Finance (DFI) and Country-Management Units (CMUs) suggest most countries borrow to the limit. But countries’

borrowing limits might still change at graduation and any sectoral reallocation may be a response to reduced supply as opposed to IDA graduation.

8. Discussion, conclusion and avenues for further research

In this paper, we set out to test the often-heard assertion in the Bank that lending for “soft sectors” like HD declines when countries graduate from IDA to IBRD. Relative to IDA countries, IBRD countries face harder terms, and, thus, we would expect a decline in borrowing. However, it is theoretically unclear why borrowing for HD sectors would decline disproportionately and as such, we turn to empirics.

We use a fixed-effects approach to isolate the effect of IDA graduation on HD lending. Our results strongly suggest that IBRD countries finance fewer projects relative to IDA countries and the effect is higher for HD projects. While the likelihood of financing any project declines by 20 percent, the likelihood of financing an HD project declines by 50 percent. The results for a number of projects are similar. In the meantime, there is no statistically significant difference in the total amount of lending between IDA and IBRD countries. This is in part because the average projects are much bigger in IBRD countries than IDA countries - \$289 million vs. \$179 million overall, and \$34 million vs. \$46 million for the HD sectors.

These differences in lending patterns also translate into differences in the share of HD lending. The average difference in the share of total lending that is to HD GPs is 7.4 percentage points, which represents a one-third decline (the IDA/blend base average is 22 percent). Taken together, these results suggest that graduation from IDA is strongly correlated with a decrease in HD borrowing. What explains this difference? As one potential explanation, we begin by noting that the difference in HD GP share is larger between IDA and IBRD countries than HD sectors share. We then further show that IBRD countries finance more of their lending from DPFs (which are more likely to be administered by other GPs). Therefore, while HD lending through HD GPs is lower in IBRD countries relative to IDA, some of the gaps are made up for by DPF lending.

While our country- and year-fixed effects estimations ameliorate several concerns, including, for example, market interest rates and national priorities, our results suffer several limitations described above. First, without an instrument that predicts IDA graduation, our results are best interpreted as correlations rather than causal effects of graduation. Second, our results also do not consider supply-side factors in total lending. In future work, we aim to address some of these concerns.

This work also opens several avenues of research for future consideration. We have shown that IBRD countries borrow less for the Education, HNP and SPL areas relative to their IDA counterparts, but we do not tackle what determines the level of HD lending. Both demand and supply side factors may affect HD lending. On the demand side, several areas are worth considering – national priorities, prior experience with the World Bank in the sectors, as well as the role of other multilateral and bilateral agencies. On the supply side, we might expect the expertise of Bank staff (for example, the background of Country Directors) affecting the sectoral allocations of loans. In future work, we plan to treat these issues in more detail.

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Appendix

Table A1: Regression results from the full sample of 153 countries and all years 1988-2016

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
	Total loans (millions of 2010 \$)				HD loans (millions of 2010 \$)				HD sector loans (millions of 2010 \$)			
IBRD country	109.865*	-148.364**	-23.823	-45.918	7.909	-33.703***	-17.672	-20.498	21.448	-34.054**	-9.706	-13.263
	(61.208)	(73.953)	(97.047)	(112.516)	(11.017)	(13.068)	(14.618)	(17.079)	(14.569)	(15.213)	(14.906)	(17.504)
Log population		173.520***		254.369**		29.810***		54.944		35.250***		44.085
		(31.648)		(114.218)		(5.451)		(35.178)		(6.503)		(33.409)
Log GNI per capita		83.903**		41.245		13.262**		8.830		16.970**		7.110
		(35.350)		(37.902)		(5.862)		(8.958)		(7.666)		(9.366)
Net aid flow		0.033***		0.005		0.003		-0.001		0.006**		0.001
		(0.006)		(0.007)		(0.002)		(0.001)		(0.003)		(0.001)
Polity score (-10 to 10)		3.710		-1.556		1.691**		-0.526		2.276**		-0.490
		(3.818)		(3.088)		(0.811)		(0.902)		(0.982)		(0.722)
Number of observations	3,753	2,988	3,753	2,988	3,753	2,988	3,753	2,988	3,753	2,988	3,753	2,988
R2	0.024	0.486	0.689	0.712	0.012	0.255	0.440	0.450	0.020	0.311	0.519	0.540
Country fixed effects	no	no	yes	yes	no	no	yes	yes	no	no	yes	yes
Fiscal year fixed effects	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
Mean of IDA/Blend	169.789	210.380	169.789	210.380	31.933	39.466	31.933	39.466	36.061	44.541	36.061	44.541

Notes: Each observation is a country year, thus the coefficients can be interpreted as the average differences between IDA/Blend and IBRD country. Standard errors are clustered at the country level. * Significant at 10%, ** Significant at 5%, *** Significant at 95%.