

Investing in Human Capital

What can we learn from the Bank's portfolio data?

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WORLD BANK GROUP
Human Development

Background

- Between 1961-2015, 153 countries borrowed from the World Bank
 - Total of 12,492 lending projects
- In this period, countries also transition between IDA and IBRD statuses
 - 47 countries remain in IDA status throughout and 46 countries in IBRD status
 - 60 countries transition between IDA and IBRD
- **Popular Conjecture:** Lending for “soft sectors” like Human Development (HD) declines disproportionately when countries transition
- **Theory:** as countries graduate, World Bank lending may *increase or decrease*
 - Increased borrowing costs \Rightarrow World Bank lending should decrease
 - Graduation signal creditworthiness and crowds in flow of funds \Rightarrow World Bank lending should decrease
 - World Bank lending may also respond to how bilateral and other multilateral donors change lending after graduation
 - Signaling effect dominates and other donors decrease lending \Rightarrow World Bank lending could increase
 - Other lenders expect World Bank lending to decrease and crowd in own funds \Rightarrow World Bank lending could decrease
 - Not constrained by IDA borrowing limits \Rightarrow World Bank lending could increase

What we do

- Provide empirical evidence to test the competing hypotheses and conjectures
 - Specifically, we test if lending for HD sectors decline disproportionately at IDA graduation
- 1. Construct a data set combining the World Bank's portfolio data from Business Intelligence (BI) and data on IDA/IBRD status from Development Finance (DFi)
 - In the data set, each observation is a **country-year**, and for each observation we compute
 - Lending amounts: Total, lending by vice presidencies (HD, SD, EFI) and global practices (14 in total)
 - Number of projects: Total, by VPs and GPs
 - Lending shares: by VPs and GPs
- 2. Summarize the broad patterns in the data and examine IDA-IBRD differences in a regression framework
 - The regression framework allows us to control for additional covariates that may affect borrowing
 - Population and GNI per capita (from World Development Indicators), Official Development Assistance (ODA, from OECD database), Domestic Spending, Polity Score, LIBOR etc.

Description of the Data

- Two categorizations of loans in the data
 - If a loan was administered by a HD GP
 - If a loan was tagged to any HD sector (and the fraction of loan tagged)
- From these data we can analyze
 - Total lending, HD lending, likelihood and number of projects
 - Two ways of computing share of HD lending
 - Share of total lending that was administered by HD GPs (HD share)
 - Share of total lending that was for HDs sectors (HD sector share)
- Notes:
 - All figures are in 2015 US dollars
 - Not all countries borrow in all years and some countries either joined the WB after 1961 or graduated from IBRD – the full sample has 6,030 observations

International Development Association (IDA)

- One of the largest sources of assistance for the world's 77 poorest countries, 39 of which are in Africa
 - Lends money on concessional terms
 - Eligibility depends on GNI per capita, creditworthiness, other broader country characteristics
 - Threshold originally set to \$580 in 1987, adjusted only for inflation since, currently \$1,145
- In practice, graduation occurs in several stages:
 - IDA non-gap \Rightarrow "Pure" IDA
 - IDA gap \Rightarrow Over the income threshold, but not creditworthy
 - IDA blend \Rightarrow Over the income threshold and creditworthy
 - IBRD \Rightarrow Over the threshold and creditworthy for at least three years
- Loan terms (as of April 2017)
 - Grants \Rightarrow interest free
 - Regular credits \Rightarrow 38-year maturity, 6-year grace period, 2.63% interest from years 7-38
 - Blend credits \Rightarrow 25-year maturity, 5-year grace period, 3.32% effective interest rate
 - IBRD \Rightarrow different maturities, interest rate = LIBOR + spread

Borrowing status of member countries (1961-2016)

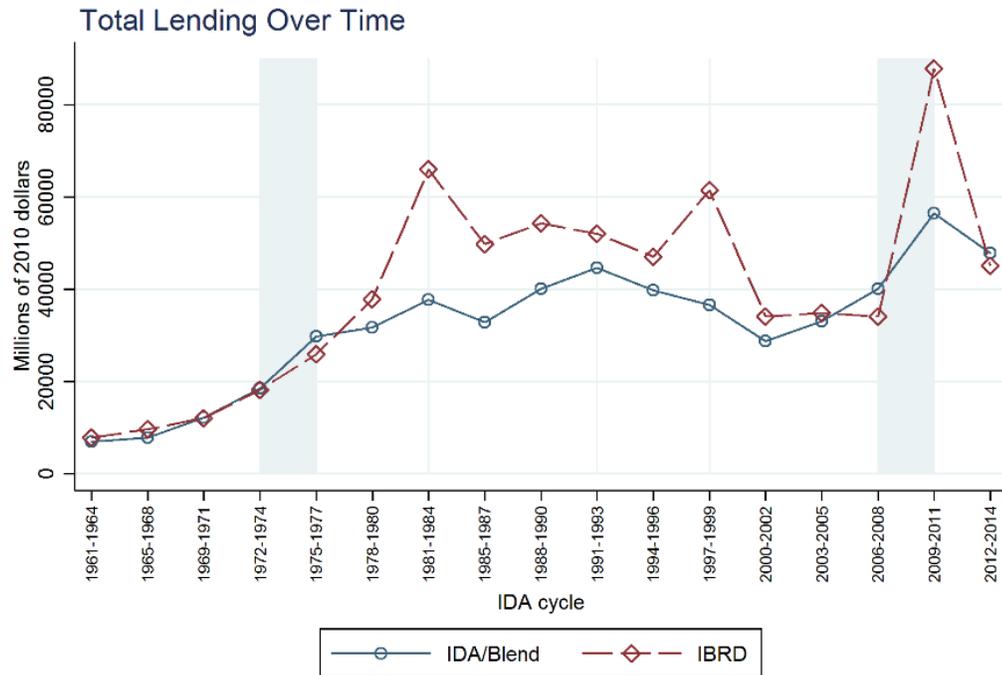
| (1) | | (2) | | (3) | | (4) | | (5) | |
|--|--|--|--|--|--|--|--|--|--|
| Countries that do not change status | | | | Countries that change status | | | | | |
| Always IDA | | Always IBRD | | Graduated IDA | | Graduated IDA twice | | Moved from IBRD to IDA | |
| Afghanistan; Bangladesh; Benin; Bhutan; 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 | |

Notes: Sample consists of 153 countries that borrow from the WBG in the 1961-2016 period

- IDA graduation is a “smooth” rather than a “discrete” process
 - Countries receive differential support to smoothly transition from IDA to IBRD
 - Small island economies exception
 - Buy-downs, for example, by DfID in China
 - Present results for the full sample (with and without country fixed effects) and 33 graduating countries sample; sample excluding very small and very large countries
- Level of analysis: “country-year” vs. “country-IDA cycle” observations
 - Analyze data both ways, find that results are quantitatively similar
 - Favor country-year analysis for two reasons:
 - IBRD allocations can change year to year and are independent of the three-year IDA cycles
 - Country-year analysis allows us to look at patterns before and after graduation

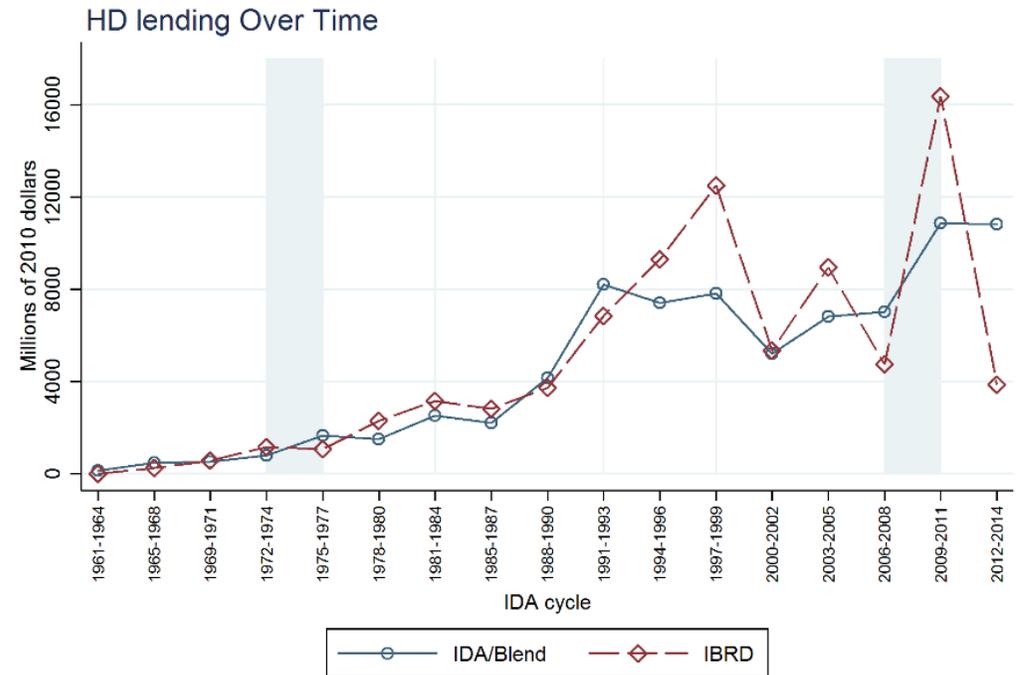
Total lending across the bank has increased over time

Total bank lending has increased over time and lending to IBRD countries dominates lending to IDA



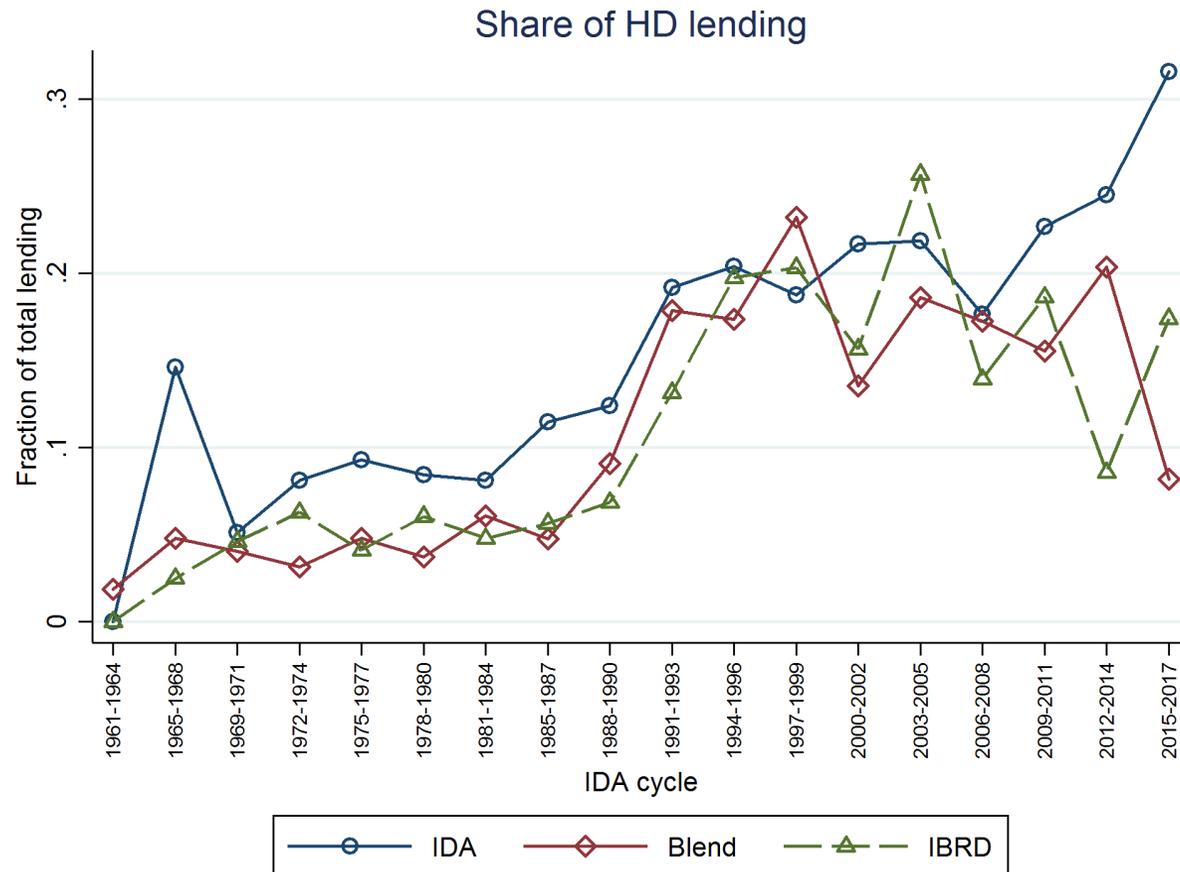
Note: Shaded vertical lines represent cycles/years affected by major global downturns

Lending by HD GPs has also increased, and lending to IBRD countries dominates lending to IDA countries



Note: Shaded vertical lines/years represent cycles affected by major global downturns

Share of lending by HD GPs have also increased over time

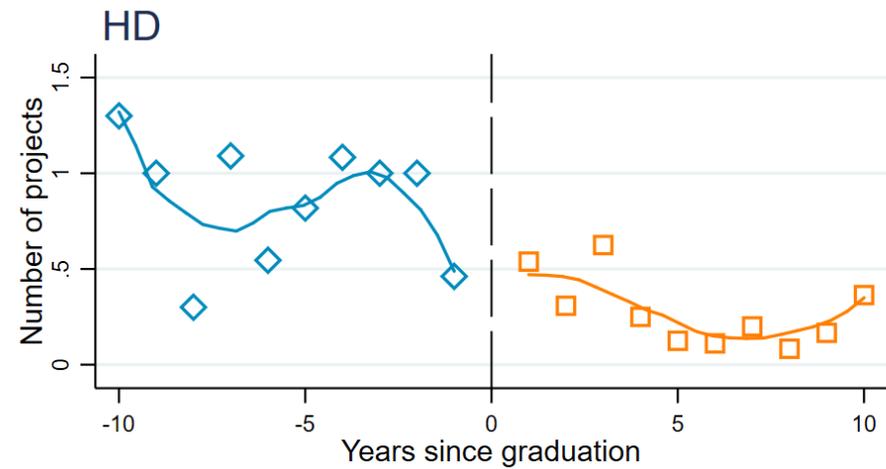
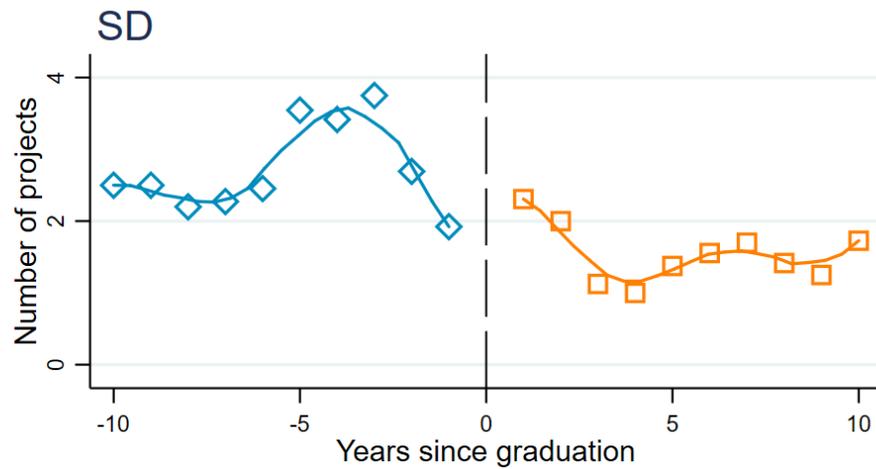
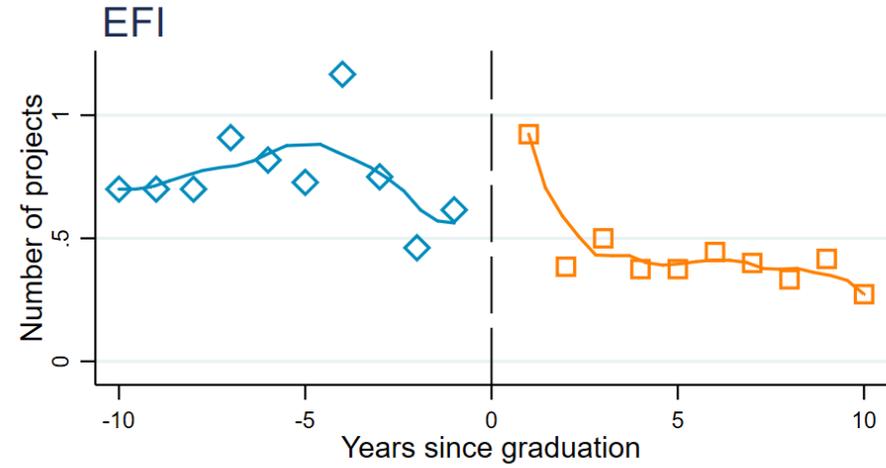
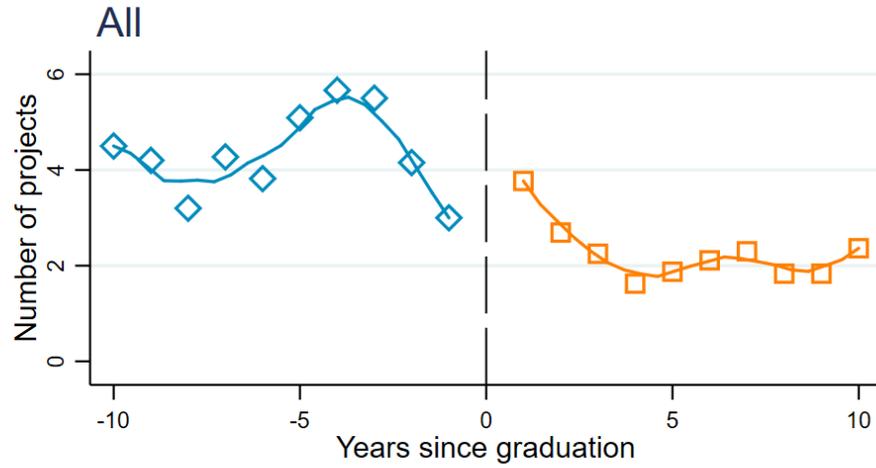


HD share increased steadily in IDA countries

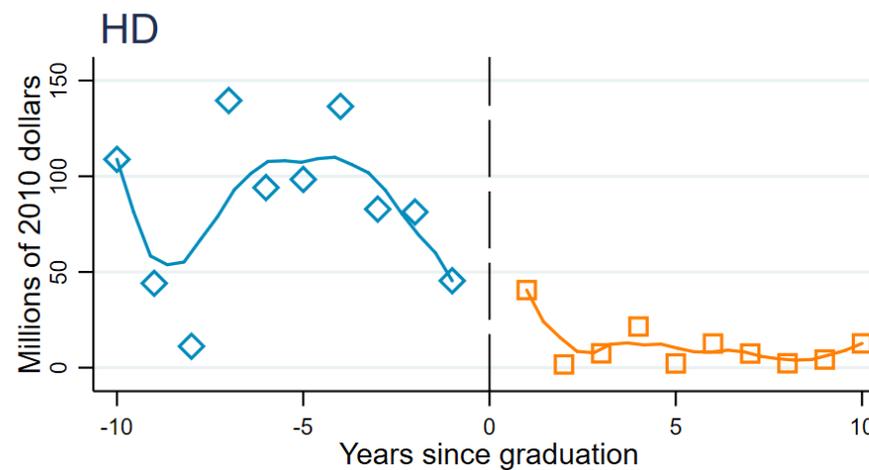
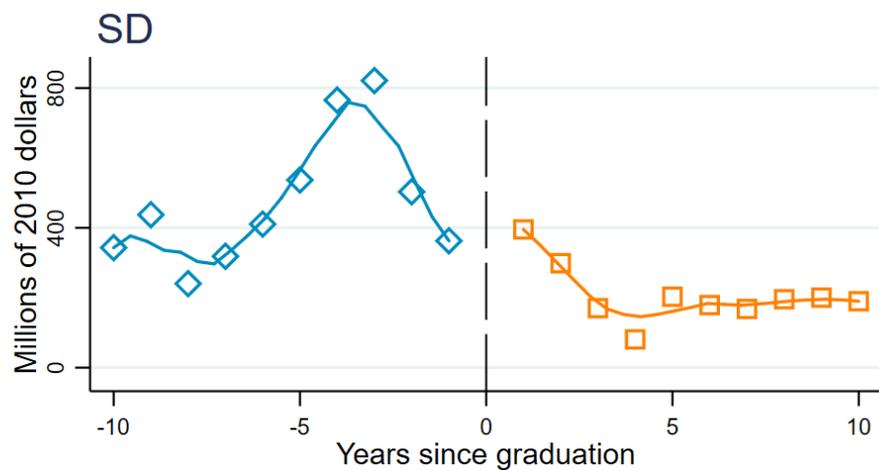
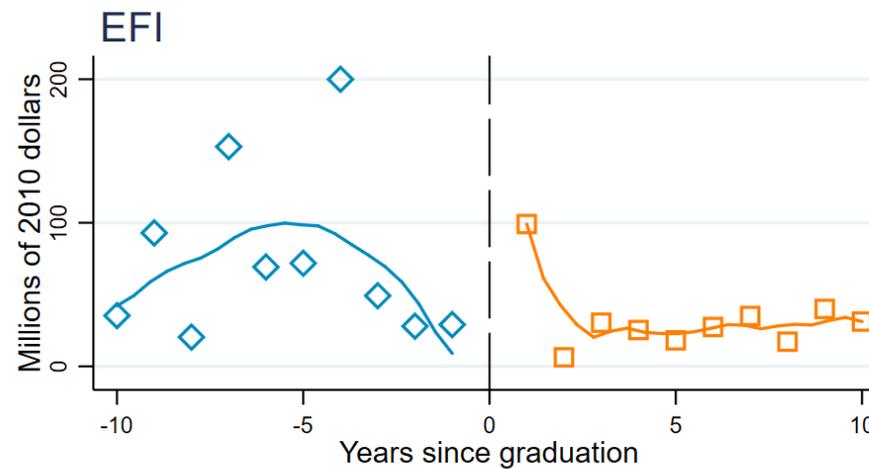
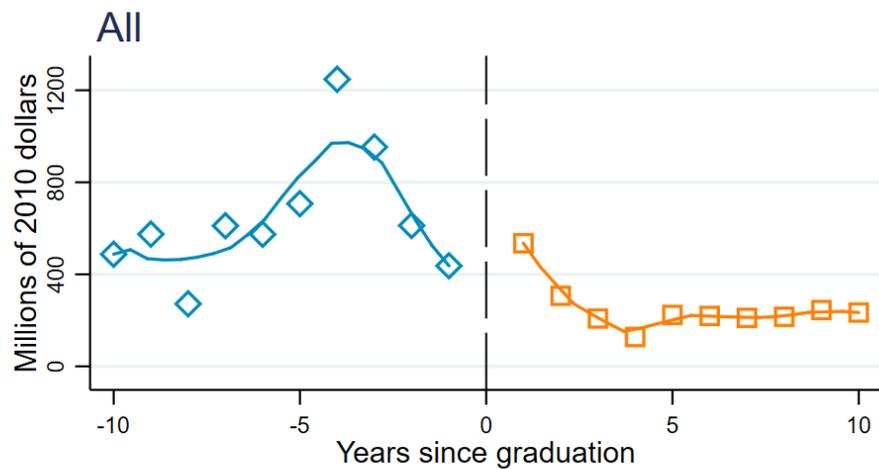
By contrast, HD share in IBRD countries have stagnated and declined in the last decade

The largest increase comes from SPL (which is accompanied by a simultaneous decline in share of SD)

Number of projects before and after IDA graduation

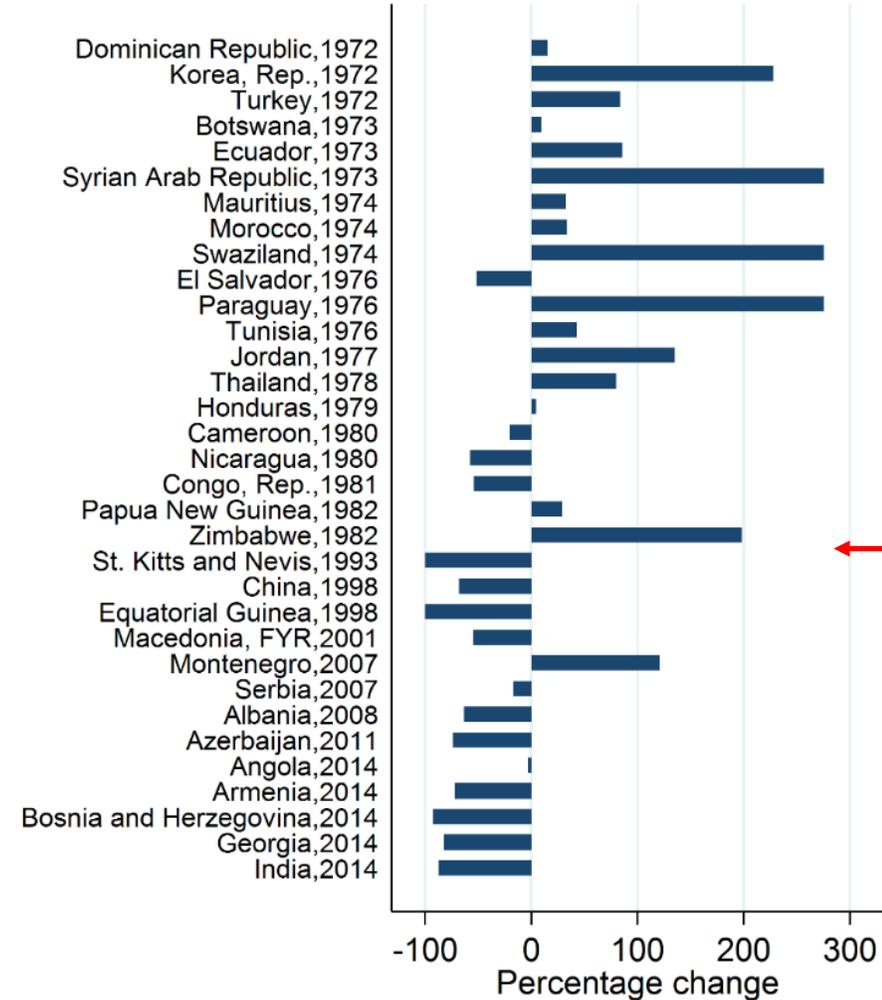


Lending before and after IDA graduation



Total lending before and after IDA graduation

Change in total borrowing after IDA graduation
(five years after - five years before)



Rules based IDA graduation implemented in 1987

Note: Top-coded at 95th percentile

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%.

Regression specification

We use the following regression specification:

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

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 regression with and without these
 - We use log of population, GNI per capita, Polity IV score as controls, Net Aid Flow
- τ_i represents country fixed effects, and estimate regressions with and without these
- 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 .

- Country fixed effects: capture any country specific characteristics that may affect the outcomes of interest; and ensure that the identifying variation is coming from countries that transition between IDA and IBRD
- Year fixed effects: capture the effect of graduating in different years; and the effects of prevailing interest rates (which vary from year to year)

Results: When moving from IDA/blend to IBRD...

| Regression results for 153 countries for years 1987-2015 | | | | | | |
|--|-------------------|-------------------|------------------------------|-------------------|-------------------|------------------------------|
| Coefficient on IBRD Dummy | | | | | | |
| | Total Bank-wide | | | HD GPs | | |
| | Mean of IDA/Blend | Year + Country FE | Year + Country FE + Controls | Mean of IDA/Blend | Year + Country FE | Year + Country FE + Controls |
| Any project (0/1) | 0.731 | -0.187** | -0.196** | 0.731 | -0.249*** | -0.244*** |
| (Probit ME) | | (0.176) | (0.073) | | (0.047) | (0.053) |
| Number of projects | 2.282 | -0.680** | -0.852** | 0.582 | -0.342*** | -0.360*** |
| | | (0.347) | (0.398) | | (0.089) | (0.097) |
| Log of total loans | 3.185 | -0.508* | -0.651*** | 1.372 | -0.774*** | -0.868*** |
| | | (0.275) | (0.249) | | (0.239) | (0.245) |

Notes: Coefficients on IBRD dummy reported. Each coefficient is from a separate regression of the variable in the row on an IBRD dummy and relevant fixed effects and controls. 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%.

Results: When moving from IDA/blend to IBRD...

Table: Regression results for 153 countries for years 1987-2015

| Coefficient on IBRD dummy | | | |
|--|----------------------|------------------------------|--------------------------|
| | HD GP and HD sectors | | |
| | Mean of IDA/Blend | Country + year fixed effects | Fixed effects + controls |
| HD projects share | 0.238 | -0.071** | -0.068** |
| (number of HD projects/number of total projects) | | (0.032) | (0.034) |
| HD GP share | 0.226 | -0.055 | -0.069* |
| | | (0.037) | (0.035) |
| HD Sectors Share | 0.207 | -0.031 | -0.035 |
| | | (0.031) | (0.030) |

Notes: Coefficients on IBRD dummy reported. Each coefficient is from a separate regression of the variable in the row on an IBRD dummy and relevant fixed effects and controls. 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%.

Regression results: Robustness

- Use the entire sample period: 1961-2015
 - IDA graduation started following an exogenously determined GDP per capita cut-offs only in 1987
- Exclude countries that “reverse graduate” from the analysis
- Exclude very big and very small countries
 - Those below the 5th percentile or above the 95th percentile of the population distribution
- Control for non-Bank ODA
- Control for country’s spending in the HD sectors
 - Caveat: Data available only for a subsample of countries and years

Regression Results: Robustness

| Regression results for 153 countries | | | | | |
|--------------------------------------|--------------------|-------------------------------|---|--|--------------------------|
| Coefficient on IBRD Dummy | | | | | |
| | Base specification | Longer time frame (1961-2016) | Exclude reverse graduates (5 countries) | Exclude small and large countries (11 countries) | Control for non-Bank ODA |
| Any project (0/1) | -0.196*** | -0.124*** | -0.181** | -0.210** | -0.144* |
| (Probit ME) | (0.0588) | (0.040) | (0.082) | (0.092) | (0.085) |
| Any HD project (0/1) | -0.244*** | -0.150*** | -0.235*** | -0.220*** | -0.272*** |
| (Probit ME) | (0.053) | (0.035) | (0.050) | (0.057) | (0.067) |
| Share of HD projects | -0.068** | -0.043** | -0.043 | -0.068* | -0.100** |
| | (0.034) | (0.019) | (0.036) | (0.036) | (0.039) |
| HD sectors share | -0.069* | -0.042** | -0.042 | -0.070* | -0.091** |
| | (0.035) | (0.020) | (0.037) | (0.038) | (0.042) |
| HD sectors share | -0.035 | -0.028 | -0.011 | -0.034 | -0.061* |
| | (0.030) | (0.020) | (0.032) | (0.032) | (0.035) |

Notes: Coefficients on IBRD dummy reported. Each coefficient is from a separate regression of the variable in the row on an IBRD dummy and relevant fixed effects and controls. 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%.

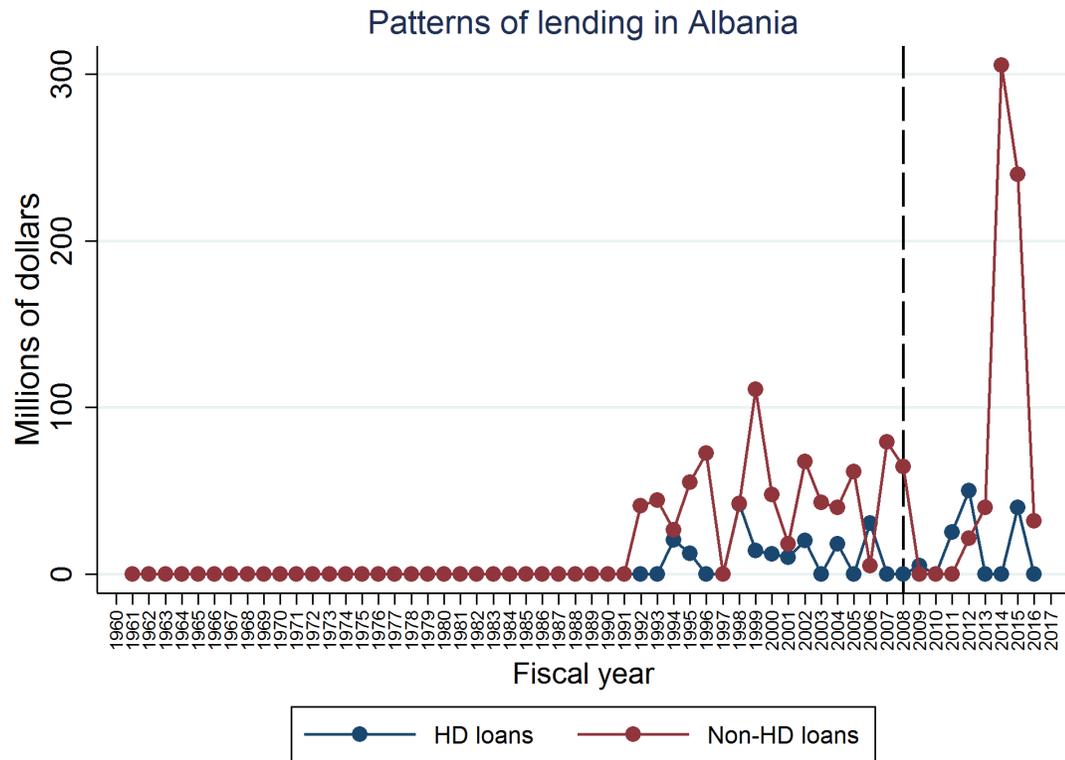
Summary of results

- Overall HD share increased over time, but more in IDA countries
 - Patterns broadly similar across (geographic) regions
 - Share of HD lending is significantly driven by increase in SPL lending
- Results suggest that IDA graduation is correlated with overall decline in Bank lending
 - Countries finance 0.57-0.68 (25-30 percent) fewer projects
 - Average total lending declines by 47.9 percent from a baseline of \$210m
- IDA graduation is also correlated with a disproportionate decline in HD lending
 - Finance 0.19-0.34 (36-65 percent) fewer HD projects
 - Share of HD projects declines by 7.4 p.p. (26 percent)
 - Average HD lending declines by 58 percent
- Results are robust to a wide range of robustness checks but need to be interpreted with caution
 - IDA graduation not an exogenous event (future work)

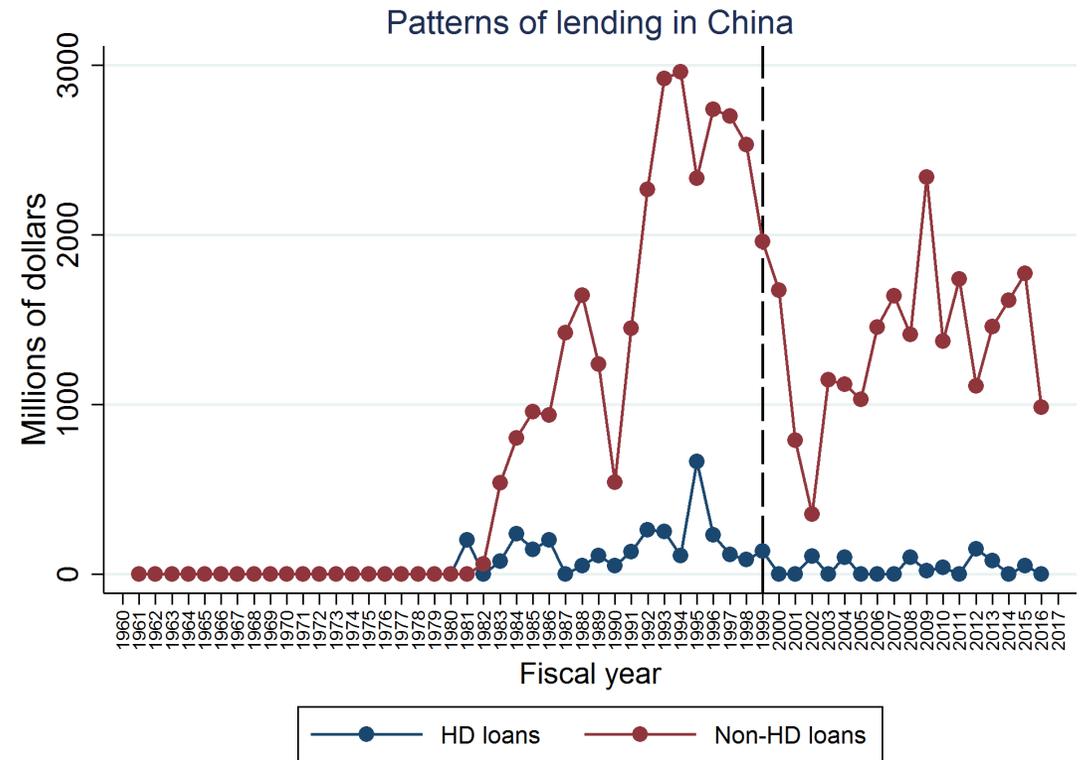
Conclusions and Policy Implications

- Test the popular conjecture that countries are less likely to borrow for HD when they graduate from IDA
 - Idea: Infrastructure projects generates immediate and tangible returns, whereas return from schooling takes a long time
- Overall find support for the hypothesis that Bank lending declines when countries graduate from IDA
- Also find a disproportionate decline in HD lending
- Implications for policy:
 - Transitional support could help countries transition smoothly
 - Example: Bolivia, Sri Lanka and Vietnam graduated at the end of FY2017 but are receiving transitional support on an exceptional based in the FY2018-2020 period
 - Buy-downs could be another feasible option

The graduates and their borrowing

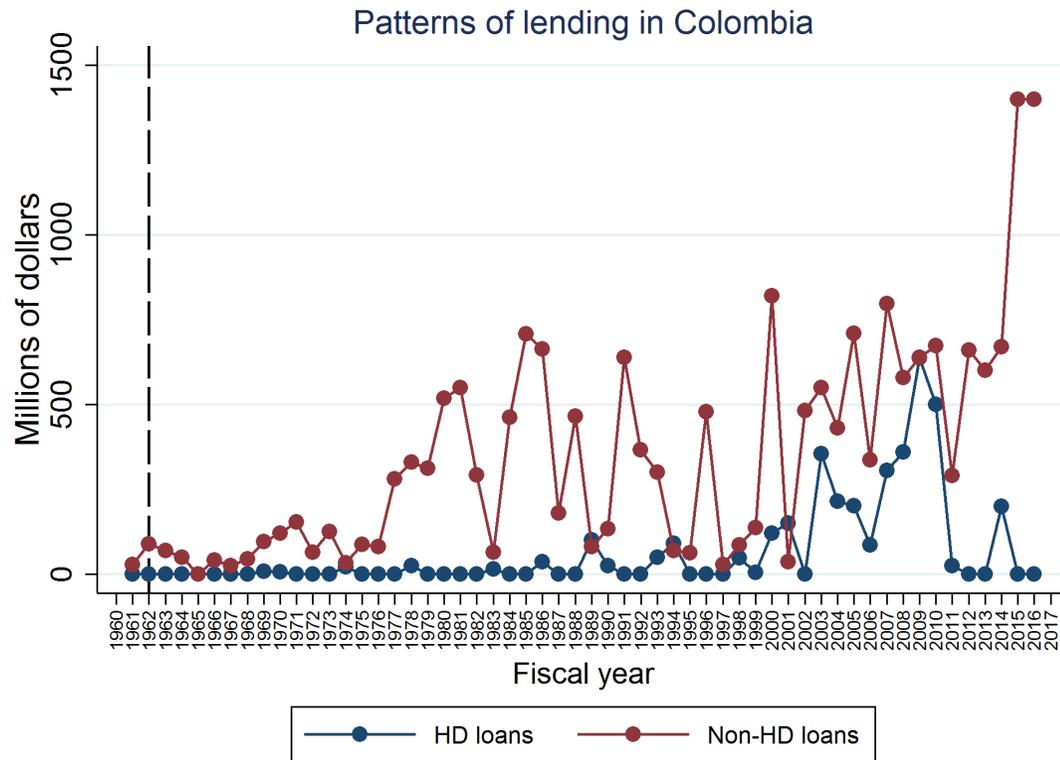


Vertical black dotted line represents year of IDA graduation

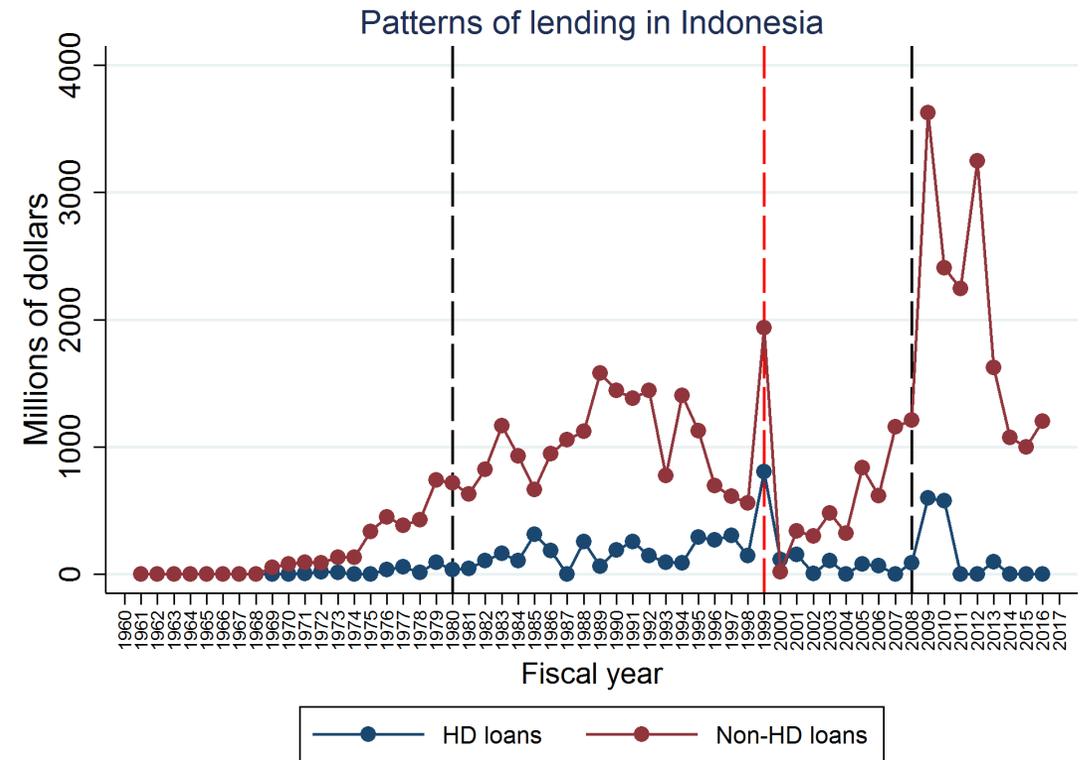


Vertical black dotted line represents year of IDA graduation

The graduates and their borrowing



Vertical black dotted line represents year of IDA graduation



Vertical black dotted line represents year of IDA graduation, red line year of reverse graduation