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The effect of EIB operations on private sector lending outside the European Union⁺

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Abstract: Does an increase in lending by multinational development banks affect the private lending activity in developing countries? We show that this is indeed the case using data on loans and investments by the European Investment Bank (EIB) in combination with data on syndicated loans. We find that a pronounced increase in EIB operations is followed by a surge in the number and volumes of syndicate loans in countries outside the European Union. Our results suggest that multinational banks can incentivize private sector lending by playing an important role in signaling to private markets that borrowers in emerging and developing countries are safe.

JEL Classification Numbers: F21, F34, H81

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I. Introduction

Developing countries can have a hard time attracting foreign capital due to their low institutional capacity and heightened political risks. The scarcity of foreign capital makes it difficult for these countries to engage in large growth-inducing development projects such as infrastructure financing. Multilateral development banks (MDBs) and international financial institutions (IFIs) can play an important role in undoing the unwanted consequences of capital scarcity by taking charge of providing financing to developing countries and signaling future investment opportunities to financial market participants (Hainz and Kleimeier, 2012; Arezki et al., 2017; Broccolini et al., 2021).

Among other MDBs, the European Investment Bank has been operating outside the European Union (EU) under specific mandates since 1977, with the aim of increasing investments and attracting capital in low-income countries. While the EIB's main focus has been on investments inside the EU, the EIB's governing bodies have allocated about 10% of the annual business volume to operations outside the EU, which are covered by an EU budgetary guarantee. Under such guarantee, the EIB carries out additional operations under its own-risk facilities, relying on efficiency gains.¹

In this paper, we ask whether an intensification of EIB operations in a developing country can lead to an increase in private lending and improved lending conditions. We focus on episodes of intensified EIB operations in countries outside the EU because these countries are more likely to benefit from the signaling effects of MDB lending (Degl'Innocenti et al., 2022). To answer this question, we use loan-level data from the EIB that covers more than 78 emerging and developing countries outside the EU in combination with cross-country level data on syndicated lending from Dealogic Loan Analytics. We estimate the relationship between an outsized growth in EIB operations and the subsequent number, volume, and average maturity of syndicated loan deals, using country-level and country-sector-level panel regressions.

Focusing on episodes of intensification of EIB operations, we find that such episodes are associated with a 9-to-23 percent increase in the number of syndicated loans in the year following the sharp increase in EIB operations.² We also find a near doubling of loan volumes in the syndicated market following the buildup of EIB activities in a developing country. Instead, our results do not show an increase in the average maturity of syndicated loans, suggesting that market participants are reticent about relaxing contract terms in these countries despite the increase in EIB lending and investments.

¹ From 2021, the mandates are envisaged to be replaced by a broader instrument, the European Fund for Sustainable Development Plus, making EU budgetary guarantees available to the EIB as well as to other IFIs. This change constitutes a direct call for the EIB to take steps to improve its development impact.

² Episodes of intensification of EIB operations are years in which the number of EIB operations exceeds a certain threshold which will be discussed below.

We focus on loan syndication as it represents a relevant, if not the dominant source of external private finance in countries with underdeveloped financial markets (Gadanecz, 2004). To diversify their lending portfolios and reduce their exposure to solvency risks, banks enter into loan syndications to provide access to finance in emerging and developing countries, substantially contributing to aggregate investments and sustaining economic growth (Godlewski and Weill, 2008). An increase in syndicated loan volumes thus reflects an increase in the supply of private credit in that country. At the same time, however, syndicated loans are not the exclusive source of private lending and other financing instruments could be in principle considered to assess the signaling effects of EIB activities on private lending.

We enrich this first set of results with a number of sensitivities that explore different mechanisms at play. First, we show that loans foster activities in syndicated loan markets more than equity investments and that the driving force behind the changes documented in syndicated lending is the first episode when a country experiences an increase in EIB lending. Subsequent episodes of large EIB loan involvements in a country do not lead to significant changes in the number of syndicated loans. Then, we test for persistency of these effects over time. We find that EIB operations have a short-lived effect on syndicated loan markets, with effects disappearing two years after the ramp-up in EIB lending and investment. Finally, we also explore whether certain characteristics of country beneficiaries play a more prominent role in determining the power of the signaling effects of EIB operations. We show that the response in syndicated loan markets is higher in countries with lower income, stronger institutions, higher capital inflows and higher government debt. Capital account openness and the degree of globalization of a given country do not seem to play any role in how its syndicated loan market perceives an increase in EIB operations.

We conclude our analysis by using country-sector-level data to show that increased EIB presence leads to a higher average maturity of loans in the country-sector-level data and to higher loan volumes. These results suggest that EIB operations do not have just an aggregate effect on private lending but can also be used to foster investments in certain sectors of the economy. Increased MDB lending may serve as a signal of borrowers' creditworthiness, incentivizing the private investors to extend more loans to countries and sectors that receive such institutional assistance.³ We show that EIB operations in the utilities and financial sector are more strongly associated with increased private lending via syndicated loan markets. Our results are robust to variations in our definition of what constitutes an

³ It is important to note that borrowers that are considered as creditworthy for the EIB might not necessarily be creditworthy for other private investors. EIB operations are typically covered by a guarantee from the European Commission and private sector operations have historically been covered by a Political Risk Guarantee, which private investors do not benefit from.

increase in the EIB presence and to controlling for the contemporaneous ramp up in lending activity by other IFIs, such as the World Bank (WB) and the International Monetary Fund (IMF).⁴

Our paper contributes to the literature analyzing the role that IFIs and MDBs play in guiding international capital flows towards developing countries. Morris and Shin (2006) use a model of debt crisis to show that the IMF assistance programs can play a catalyzing role in terms of private lending to developing countries by mitigating moral hazard when IMF's assistance complements the adjustment effort of the decision country rather than substitutes it. Mody and Saravia (2006) corroborate these findings by showing that the conclusions of the theoretical model are backed by the data, especially for countries in which IMF programs are viewed as likely to lead to policy reform. Corsetti et al. (2006) argue through the lens of a global games model that the sheer size of IFIs such as the IMF can stimulate the behavior of international financial markets towards developing countries by reducing the scale and likelihood of liquidity runs and facilitating the debt rollovers. We contribute to this literature by showing that countries with strong institutions seem to benefit the most from EIB lending in terms of the future capital flows.

Broccolini et al. (2021) provide evidence of persistent mobilization effects of financing by MDBs in the syndicated loan market, effects which are not offset by a reduction in other forms of foreign lending such as bond financing. Degl'Innocenti et al. (2022) find that the presence of MDBs in loan syndicates leads to a doubling of loan participants. Hainz and Kleimeier (2012) show that the participation of development banks in loan syndicates can help mitigate political risks for private investors. Gurara et al. (2020) show that MDBs' participation in syndicated lending is associated with higher borrowing costs and longer maturities—signaling a greater willingness by MDBs to finance risky projects to borrowers located in riskier countries, which may not be financed by the private sector.

The presence of EIB operations has been shown to spur firm employment, revenues and profitability in the EU. Gereben et al. (2019) use data on EIB lending and financial statements of small and medium-sized enterprises (SMEs) to show that firms based in Central and Eastern Europe which receive EIB lending record significantly higher employment and profitability compared to firms that do not receive and EIB funding. Importantly, the impact of EIB lending does not depend on the economic cycle of the countries in which the SMEs operate. Amamou et al. (2022) provide similar evidence for SMEs based in the European Union. They show that the impact of EIB funding has a geographical gradient, in that it has a higher impact in the countries of Central, Eastern and Southern

⁴ Although the EIB's activities differ in scope and size from the ones of the IMF, they are more similar to the ones of the WB.

Europe but limited in Western and Northern Europe. EIB operations also act as a catalyzer of private investments by signaling quality of borrowers. European Investment Bank (2022) finds that EIB venture debt beneficiaries based in the EU receive increased investments from other financiers in the years following the EIB operation. Yet, there is little empirical evidence on the role of EIB as catalyzer of private funds in developing countries. This paper aims at filling this gap. We complement the earlier findings by focusing explicitly on the impact of EIB operations on the lending activity in the syndicated loan market of countries located outside the EU. We show that intensified EIB operations in countries with higher debt and capital inflows leads to more syndicated loans in the years following the increase in EIB operations.

II. Data

We use data from the EIB and from the Dealogic Loan Analytics database to test the signaling effects of EIB operations. The EIB dataset is based on operations (lending and equity investments) initiated by the EIB to businesses in countries outside the EU. The operation-level data covers more than 6,000 EIB operations in 140 countries, approved since 1965. We restrict the analysis to countries and sectors with at least 10 loans over the entire sample period. This data filter leaves us with about 4,200 loans in 78 emerging and developing countries. We identify 19 major borrowers as those countries with at least 50 operations from the EIB, a cutoff that corresponds to the top quartile of the distribution, and which received a loan or equity investment in at least half of the years since their first operation originated by the EIB. Table 1 reports summary statistics on EIB operations for countries included in our sample. Countries have on average between zero and ten EIB projects per year, with sizable variation around the mean. Average annual amounts for EIB projects can reach up to 736 million EUR across our sample of countries.

We construct a measure of EIB involvement in each country based on an indicator variable that proxies for episodes of intensified operations. To this end, we cumulate the number of EIB operations over a three-year rolling window and populate the indicator variable when the total number of operations a country is greater or equal to five. This threshold is chosen to correspond to the 90th percentile of the distribution of number of operations per country in a balanced country-year sample. To avoid persistence in this indicator variable, we set the variable to missing if it was equal to one in the previous year.⁵ Figure 1 summarizes our measure of episodes of intensified EIB involvement across countries. It shows that our measure of EIB presence has increased across countries over the past 40 years. It also shows that the EIB was consistently involved in investing in “new countries”

⁵ Our results are robust to changes in the measure of EIB presence, such as total volume of operations. We discuss in the robustness subsection below how our results change when using alternative measures of EIB involvement.

between 1980 and 2006, as the number of first country events was higher in those 26 years than from 2006 onwards.⁶ The decline in the number of “first-time” events over the last decade, however, could also be due to a limited number of countries where the EIB can operate intensively for the first time.

We supplement the EIB data with cross-country loan-level data on syndicated loan deals from the Dealogic Loan Analytics database. This dataset covers more than 300,000 deals originated by loan syndicates and signed since 1980 by companies located worldwide. As our analysis focuses on countries outside the EU, we limit our Dealogic Loan Analytics sample to non-EU countries in which the EIB has initiated operations. We use information from loan-level data to construct measures of total number of syndicated loans, the total value of these loans and their average maturity by country, sector and year. These measures will serve as our main outcome variables in the regressions that estimate the extent to which syndicated lending activity is influenced by an intensification of EIB operations. Table 1 reports some summary statistics on the syndicated loan deals included in our sample for each country across years.

Figure 2 plots the number of syndicated deals and the total loans volumes for the deals in countries included in our sample. During the past four decades, countries in our sample experienced a sharp increase in the number of syndicated deals and loan volumes between 1989 and 1997, followed by a substantial decline in the early 2000s. This trend reversed in 2003 when syndicated loans to countries in our sample started increasing again, reaching a peak after the Global Financial Crisis, and flattening afterwards. Figure 3 compares the evolution of the number of EIB operations to the number of syndicated deals for countries included in our sample. It shows that there is a positive correlation between EIB investments and the syndicated loan market. Episodes of high EIB involvement precede originations in the syndicated loan market. This is especially evident during the decline in syndicated loans in the early 2000s. The EIB increased its number of operations markedly during that period, which was followed later by a sharp rise in syndicated lending in the mid-2000s.

Thanks to the granularity of our data, we can also group syndicated loans and EIB operations into 13 sectors. For each of the sectors, we construct similar measures of number, size and maturity of syndicated loans as we do for the country-level data. The matched dataset at the country-sector level covers over 27,000 loans approved in 78 countries between 1980 and 2019. We use the sector-level data to check whether the EIB presence in particular sectors is associated with near-immediate increase in syndicated lending at the sector level. Aside from the data described above, we also use

⁶ “First country event” are instances when countries were experiencing their first episode of intensified EIB operation. Other events are all other instances when countries were experiencing a sharp build up in EIB operations.

measures of investments by the WB and the IMF in our regressions. Funding provided by these two IFIs can also have a signaling effect on private lending similar to that of the EIB (Dasgupta and Ratha, 2000; Bird, 2007; Broccolini et al., 2021). Including measures of their investment intensity allows us to better identify the effects of EIB lending from the ones of other IFI.⁷ For each of these two institutions we construct investment intensity measures as follows. In the case of the IMF intensity measure, we construct a dummy variable that takes a value of one in the years when the country has agreed to any IMF program (Dreher, 2006) and zero otherwise. In the case of the WB intensity measure, we follow the method we used to construct the EIB involvement variable described above using data on WB investment projects. We construct a dummy variable that takes the value of one if the number of WB projects over a three-year span is greater than 10.⁸ Besides these two IFIs' involvement measures, we supplement the country-level data set using data on the GDP growth and private credit to GDP ratio for countries included in our sample.

III. Country-level analysis

This section introduces our country-level analysis and reports its main results. We start by describing the empirical strategy that we use to test the importance of EIB lending for loan activity in the syndicated market. We then present the estimation results of our country-level analysis. We conclude with a discussion of how changes in the econometric model affect our estimates and whether heterogeneity across several different country-level dimensions impacts our results.

A. Empirical strategy

We test empirically for a positive effect of intensified EIB presence by running the following regression model:

$$Y_{c,t+1} = \alpha Y_{c,t} + \beta_1 EIB_{c,t} + \beta_2 WB_{c,t} + \beta_3 IMF_{c,t} + \boldsymbol{\gamma}' \mathbf{X}_{c,t} + \tau_t + \omega_c + \varepsilon_{c,t} \quad (1)$$

where the dependent variable, $Y_{c,t+1}$ is: (i) the number of syndicated loan deals, (ii) the USD volume of syndicated loan deals, or (iii) the average maturity of the syndicated loan deals. All dependent variables are at the country-year level (country c and year $t+1$) and are expressed in natural logarithms.⁹ To capture the persistence of lending in the syndicated loan market not explained by any EIB, IMF or WB activities, our set of explanatory variables includes the lagged value (year t) of the

⁷ While EIB operations are smaller than those of the IMF and the WB, these are nonetheless nonnegligible. In our sample, the average volume of EIB operations is equal to .5% of destination country's GDP, while WB operations represent on average 2.3% of the country GDP. The median values are .2% and 1% respectively.

⁸ This threshold corresponds to the 97th percentile of the distribution of number of WB operations per country in our balanced country-year sample used in the regression analysis.

⁹ We also consider below the dynamic effects of the EIB presence by estimating our baseline model with further leads of the dependent variables up to 5 years into the future.

dependent variable, which captures any anticipated intensification or boom in EIB activities.

The key explanatory variable, $EIB_{c,t}$, is defined as a dummy which takes the value of one in years when countries experience a substantial increase in the number of EIB operations. Our empirical model also controls for the intensity of WB operations at the country-year level, $WB_{c,t}$, as well as for the presence of IMF agreements, $IMF_{c,t}$. Besides the measures of IFI presence, the regression model also includes a set of macroeconomic controls, $X_{c,t}$, namely the country GDP growth and share of private credit to GDP. We also saturate the regression model with country, ω_c , and year, τ_t , fixed effects. $\varepsilon_{c,t}$ is the error term.

B. Results

Table 2 shows the estimation results for our regression model in equation (1). We start by presenting the estimates for the regression that includes only our measure of EIB presence, the lagged dependent variable measured in year t , and country and year fixed effects. Column 1 shows that the EIB presence is associated with an increase in the number of loans by 9 per cent in the year following the sharp buildup in EIB operations. This estimate is significant at the 5 per cent level. Adding the other IFI presence indicator variables to the regression raises the estimate of the EIB presence by 5 percentage points, to a total of 14 per cent, and its statistical significance (column 2). Interestingly, we find that contemporaneous WB presence also improves the prospects of the syndicated loan market, as the number of loans increases by 10 per cent in the year following increased WB presence. Our results on the WB presence are similar to the ones in Bird and Rowlands (2000) who find that WB lending has a catalytic effect on capital from other sources in developing and transition economies. IMF programs do not seem to play much of a role in determining lending activity in the syndicated loan market. This however changes once we include country-level GDP growth and private credit to GDP to the regression (column 3). The IMF presence indicator has a negative coefficient, suggesting that IMF programs might be signaling ensuing economic distress, which forces private lenders to reconsider their lending commitments to countries in our sample. This result is in line with earlier evidence in Faini et al. (1991) who show that there is a negative correlation between IMF lending and net private credit. In contrast, Rowlands (2001) finds that the effect of IMF lending on private credit is negligible.

In column 4, we replace the EIB presence dummy with a similar measure based on whether the increased EIB presence was achieved through loans rather than equity. We find that only EIB loans are associated with an increase in syndicated lending. The point estimates on the EIB loan presence variable increase to 0.23 and are estimated with greater precision than in the baseline model reported in column 3. The lack of significant effects for EIB operations that involve equity investments is

likely due to the limited size of such operations, as EIB mainly uses loans to provide funding outside the EU. An episode of intensified EIB loan operations has an average volume three times as large as the volume recorded during an episode of intensified EIB investments in equity. Next, we construct the EIB presence measure based on whether the EIB has mainly dealt with public institutions rather than private ones in a given country-year observation.¹⁰ Column 5 shows that EIB operations with public borrowers are positively associated with future increases in syndicated lending, while those with private borrowers are not. This result suggests that EIB operations with public borrowers have a crowd-in effect on private lending, while those with private borrowers do not. The crowd-in effect is likely triggered by the nature of EIB financing of public entities, as these operations typically aim to improve countries' infrastructure and overall productivity of public sector entities. Such investments advance considerably the growth prospects of beneficiary countries and are likely to lead to higher involvement of private entities in future financing of projects in said countries. Column 6 shows that the first episode of intensified EIB presence in a country's history triggers a significant response in syndicated lending, while subsequent episodes of increased presence have no significant effect on private lending.¹¹ This suggests that the salience of EIB presence loses its impact on private lending across time. What seems to matter for the activity in the syndicated market is the first time the EIB increases its operations in a country. Column 7 shows that increased EIB operations involving small and medium-sized enterprises do not seem to have any statistically significant catalytic effect on private capital. Such operations are on average two and half times smaller in disbursement value than operations with larger entities in our sample. In contrast to results for SME operations, increased EIB operations that involve larger companies are the ones associated with more subsequent syndicated lending. This result indicates that returns to scale might play a significant role when it comes to fostering private finance involvement in countries outside the EU.

Overall, the results in table 2 highlight that the EIB operations are associated with positive developments in private debt markets. Across all specifications, we find that an intensified EIB presence is associated with an increase in the number of syndicated loans of between 9 and 23 per cent in the year immediately after the period of outsized growth in EIB operations. We explore next whether loan balances and maturity change after intensified EIB presence. Table 3 summarizes our results. Column 1 lists our benchmark result that uses the number of loans as the dependent variable (as in table 2, column 3). Column 2 shows that the total amount of syndicated loans increases

¹⁰ We use only EIB commitments with institutions that have 100% of their capital owned by the public to create the dummy variable for the increased EIB involvement in the public sector. The dummy takes the value of 1 in a given year if the EIB had more than 3 operations with public institutions during the previous 3 years, including the given year. Similarly, we create the dummy for the increased EIB financing of private companies only based on companies that 100% of their capital owned by private investors.

¹¹ As described in the previous section, our dummy for intensified EIB presence is based on an outsized increase in the number of EIB operations over a three-year rolling window. We construct the first episode dummy based on the the first year in which our EIB presence dummy takes the value of one.

significantly in the year following the buildup in EIB operations. The increase is sizable in economic terms, resulting in a near doubling of loan volume. However, we do not find much of a change in the maturity of syndicated loans after a rise in the EIB presence, suggesting that usual contract terms, such as the maturity of a loan, do not seem to vary much in response to the signal on borrower creditworthiness derived from an intensification of EIB operations.

The absence of a response in the average maturity of syndicated loans to EIB presence could be due to the stickiness of loan terms. To assess whether this is indeed the case, we re-estimate our equation (1) when changing the lead structure of the dependent variables. We use up to five leads of the dependent variable to test for persistency of EIB operations' signaling effects. Figure 4 shows the dynamic responses of the number of loans, the loan amounts, and the average maturity. The number of loans increases significantly in the first two years after an intensified EIB presence in a given country, while the loan amount and average maturity do not change much in the years following the increased EIB presence. Overall, our results indicate that there is a significant increase in syndicated market activity after the EIB intensifies its presence in a given country outside the EU, but that this increase is short-lived.

We explore next how country-level heterogeneity influences our results. We interact a set of country characteristics with our main EIB presence variable to construct characteristic-specific dummies for countries in our sample. Table 4 shows our results when the dependent variable considered in the regression is the total number of syndicated loans. We start by separating borrowers based on the amount of their EIB borrowing in column 1.¹² We find a scale effect of EIB presence, as the increase in private lending is driven mostly by countries that are main EIB borrowers. Furthermore, low-income countries experience a larger increase in private lending than middle-income economies, suggesting that signaling effects are especially important for less developed economies. Column 3 confirms the importance of strong institutions in economic development. Countries with strong institutions seem to benefit the most from EIB lending in terms of their future syndicated lending market activity.

We also estimate the importance of existing capital flows in fostering the signaling effects of EIB involvement. Column 4 shows that the size of capital inflows does not seem to matter to determine by how much intensified presence of EIB operations affect syndicated lending. Furthermore, the degree of indebtedness of countries seems to influence the increase in syndicated lending. Countries

¹² We define a country as a main EIB borrower if the country had more than 50 EIB operations during our sample period and had an investment/loan in at least half of the years of its involvement with the EIB.

with high debt experience a larger and statistically significant increase in the number of syndicated loans after an increase in EIB presence, while countries with low debt do not (column 5). Columns 6 and 7 show that, to a large extent, differences across countries in current account openness and the degree of globalization are not important predictors of how the EIB presence impacts syndicated lending. In sum, the estimated impact of EIB presence on the number of syndicated loans mainly comes from countries that are large EIB borrowers, have a low income and strong institutions.

While these three characteristics seem to determine the near-immediate response in private lending to the intensified presence of EIB operations, it is unclear how persistent these responses are over time. For example, countries with weak institutions might not benefit instantly from the signaling effects of EIB lending as weak institutions dilute the immediate response through corruption. Over time, once EIB operations lead to tangible changes in the economic prospect of a given country, private lenders can increase lending even if institutions are not yet there to support the boom in credit. We test if this is indeed the case by studying the dynamic effects of the response to intensified EIB presence across two groups of countries based on the degrees of economic development and the strength of institutions similarly to the exercise presented in Figure 4.

Figure 5 shows that low-income countries experience a sizable increase both in the number of syndicated loans and the total loan amount after an intensification of EIB operations. As in the case of our aggregate results in Figure 4, we do not find a persistent effect of EIB presence. Syndicated markets in middle-income countries do not react significantly to sharp increases in EIB operations in those countries. This suggests that once a country moves from low-income to the middle-income status, its debt markets are mature enough not to rely on any signals regarding economic activity from IFIs. Strong institutions also seem to have only an immediate effect in terms of how the presence of EIB operations is interpreted by private lenders as shown in Figure 6.

C. Robustness

We investigate next whether the EIB presence has a more potent effect compared to WB presence. In table 5, we compare a model that includes only one of these two indicator variables. We find that both EIB and WB presence have a similar effect on the number of syndicated loans. The EIB presence seems to precede a higher increase in the amount of syndicated loans, while WB operations seem to lead to longer average maturities of loan in syndicated markets. Overall, the evidence presented in table 5 suggests that there is not much of a difference between the two IFIs we consider in our paper in terms of the signaling effects of their operations.

We also check whether our benchmark definition of EIB presence based on the number of operations is robust to alternative specifications. In table 6, we replace our EIB presence variable with the total amount disbursed under EIB operations in a given country during year t , as well as the cumulated amount of EIB operations between years $t-2$ and t . Both these new dependent variables are expressed in logs. We document across all columns of table 6 that an increase in the amount lent by the EIB is associated with a future increase in the number of syndicated loans, their total amount as well as the average maturity of these loans. These results suggest that the signaling effects that we uncovered earlier are robust to different specifications of our EIB presence variable. These results also suggest that both the intensive and the extensive margins of EIB lending are operational in our sample.

Next, we test whether the increased presence of EIB operations fosters economic risks in a given country. To this end, we use the economic risk rating from the International Country Risk Guide to proxy for level of economic risk that world's largest institutional investors, multilateral organizations and transnational firms face in a given country. A higher rating implies a lower level of economic risk. Figure 7 plots the dynamic effects of EIB presence on the economic risk rating. We find that EIB presence has a positive impact on the economic risk faced by investors in a given country, especially two years after the intensification of EIB operations. The effects diminish gradually in statistical terms after the second year. This result further highlights the importance of EIB lending operations in serving as a positive signal regarding the economic prospects of a country to prospective private investors.

Lastly, we check whether the effect we uncovered in our estimation of equation (1) is robust to changes in the econometric model and the estimation routine. Table 7 reports the results of our exploration. In columns (1) to (4) we show results when estimating instrumental-variable (IV) regressions where the dependent variable is either the number or the volume of syndicated loans in a given country-year. The explanatory variables are the number of EIB operations (or the total volume of EIB operations depending on column number of the table), the WB and IMF presence dummies, the GDP growth rate, and the share of private credit to GDP. All these variables are for each country-year, and we also include time dummies when estimating the IV regressions. We instrument the number of EIB operations (or the total volume of EIB operations) using the distance between the capital of the country where the EIB invests and Luxembourg's capital, which we obtain from CEPII's Gravity dataset (Conte et al., 2022). As columns (1) to (4) show, we uncover a positive and statistically significant association between the number or volume of EIB operations and measures of activity in the syndicated loan markets of countries outside the EU, confirming our earlier results in Table 2.

We also tested whether estimating equation (1) using the Arellano-Bond estimator would alter our main findings. Column (5) of Table 7 reports our results, where we now use the EIB presence variable as our main variable of interest, similar to what we did before in Table 2. As column (5) shows, we find that an increase in the EIB presence is associated with a statistically significant increase in the number of syndicated loans. In columns (6) and (7) of Table 7, we show that the main coefficient of interest reported in column (3) of Table 2 is robust to: (i) removing the lagged dependent variable from equation (1), and (ii) also dropping the time and country fixed effects. The results confirm that removing some of the regressors included in equation (1) does not alter our main results on the signaling effect of EIB operations on activity in the syndicated market.

IV. Country-sector-level analysis

We explore next the extent to which the presence of EIB operations has a signaling effect on industry-level syndicated lending. Besides estimating the aggregate signaling effects, the richness of our data allows us to also estimate the disaggregated effects of an intensification in EIB presence. Using country-sector-level data, we estimate the following regression model:

$$Y_{c,s,t+1} = \alpha Y_{c,s,t} + \beta_1 EIB_{c,s,t} + \beta_2 WB_{c,t} + \beta_3 IMF_{c,t} + \boldsymbol{\gamma}' \mathbf{X}_{c,t} + \tau_t + \omega_c + \lambda_s + \varepsilon_{c,s,t} \quad (2)$$

where the dependent variable is defined at the country-sector-year level, is expressed in logs, and measures either the number of loans, their total volume, or their average maturity. This regression model allows us to better control for unobserved heterogeneity using more granular fixed effects at the country, sector and year level. As in the case of the country-level regression, we control for the WB and IMF presence and for country-level macroeconomic conditions.

We estimate equation (2) for five leads of the dependent variable and plot the estimated coefficients in figure 8. As in the previous section, we are interested in the dynamic effects of increased EIB presence on the number of syndicated loans, the total loan volume and the average maturity. Figure 8 shows that, in contrast to our country-level results, we do not find a statistically significant effect for the number of loans at the country-sector level. This suggests that investors in the syndicated loan market may pay less attention to sector-level developments, such as increases in EIB operations in a given sector, and more attention to broader developments, such as an increase in EIB operations across any sector. However, similar to our country-level results, we do find a statistically significant increase in the total loan amount after an intensification in EIB presence in a given country-sector. The sharp buildup in EIB operations increases syndicated loan volume by about 35 per cent in the

year following the increase in EIB presence. The effect becomes statistically indistinguishable from zero after the first year. Interestingly, while we did not find any statistically significant effect of EIB presence on the maturity of loans using the country-level data, we do find that the EIB presence leads to a higher average maturity of loans in the country-sector-level data. These results reinforce our conclusion that episodes of intensified EIB operations outside the EU are associated with subsequent larger capital flows via the syndicated loans market. Thus, EIB operations may serve as a signal of borrowers' creditworthiness, incentivizing the private sector to extend more loans to countries that benefit from higher EIB presence.

We also test whether increased EIB operations in certain sectors are more conducive to investment for private sector lending. To do so, we separate our country-sector-year panel by sector and re-estimate equation (2) for each sector, excluding the sector fixed effect and clustering the standard errors by country. In figure 9, we provide the dynamic responses for two sectors that exhibit the largest degree of association between an intensification in EIB operations and syndicated lending, and a separate set of responses for all other sectors. The two sectors that exhibit the largest dynamic responses are the utilities sector and the finance, insurance, and real estate sectors.¹³

Panel A of figure 9 shows that an increase in EIB operations in the utilities sector is associated with significant increases in number of syndicated loans, loan amounts and average maturities in the years following the ramp up in EIB operations. Results shown in Panel B mirror the evidence in figure 8 which employs the full panel. This should come as no surprise as EIB operations are especially beneficial for the finance sector in a given country, as it is precisely these institutions that handle a significant share of disbursements of EIB operations to other sectors of the economy. Panel C shows the dynamic responses when the panel of all other sectors are used to estimate the relationship between episodes of increased EIB operations and activity in the syndicated loan market. Overall, the evidence presented in Figure 9 suggests that EIB efforts in certain sectors are perceived by market participants as more revealing regarding the quality of borrowers in a given country.

¹³ These sectors are the fifth and the second largest in terms of total value of EIB operations across years and countries in our panel.

V. Conclusion

We study the impact of EIB lending to developing countries on activity in the syndicated loan markets of these countries. Using a novel matched dataset on syndicated loans and EIB operations, we show that lender syndicates increase the number and volume of loans following a sharp buildup in EIB operations. We document that the increase in syndicated loan market activity is short-lived, lasting about 2 years after the buildup in EIB lending, and occurs especially in countries that have stronger institutions, lower income, and higher capital inflows.

The impact on syndicated loans of increased EIB presence comes from increased presence in terms of loans rather than equity investments. We also show that the catalytic effect on syndicated lending comes from increased EIB presence in publicly owned entities rather than private ones, and increased EIB operations involving larger entities rather than SMEs. Furthermore, the first episode in which a country experiences a boom in EIB operations is the one that is associated with a significant increase in syndicated lending, while subsequent episodes of increased EIB operations have a limited effect on syndicated market activity.

In line with existing evidence, our results highlight the importance of MDBs in catalyzing private investment towards countries that face significant challenges in attracting private long-term capital. EIB financing can stimulate private investment decisions in such countries as they tend to alleviate the first mover risks that private capital actors might shy away from when committing significant financing to a developing country.

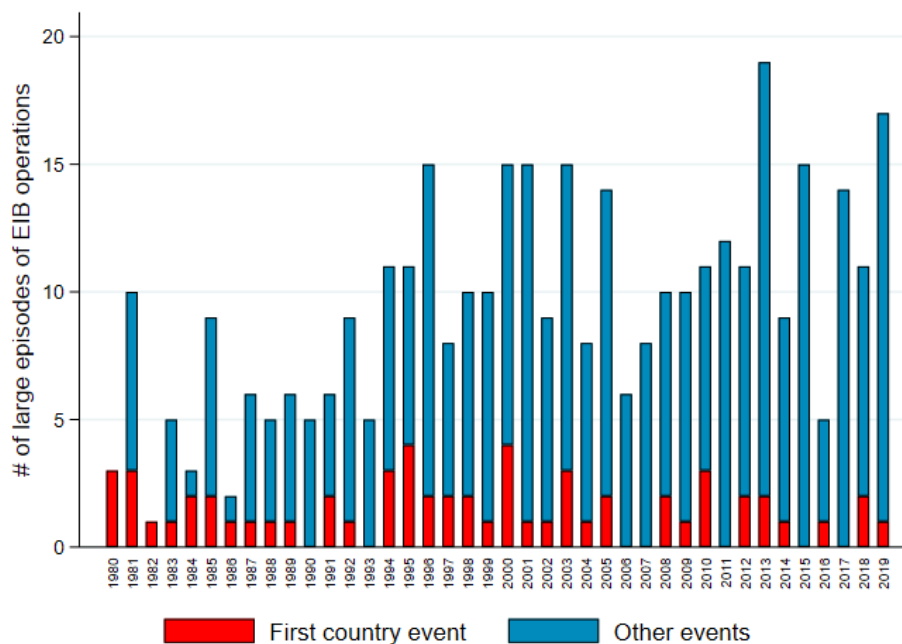
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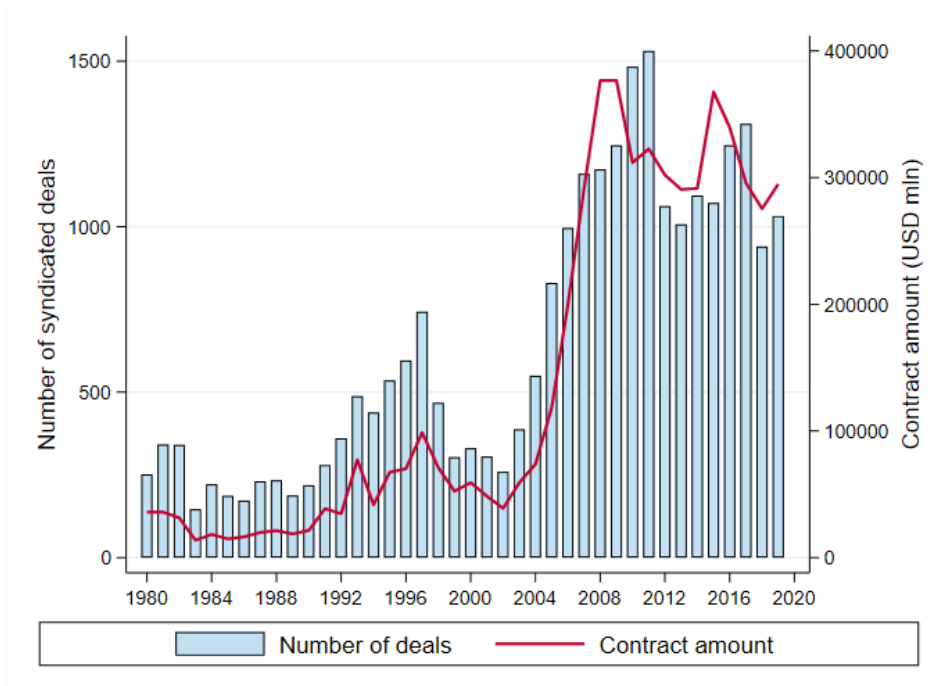
Appendix

Figure 1: EIB presence



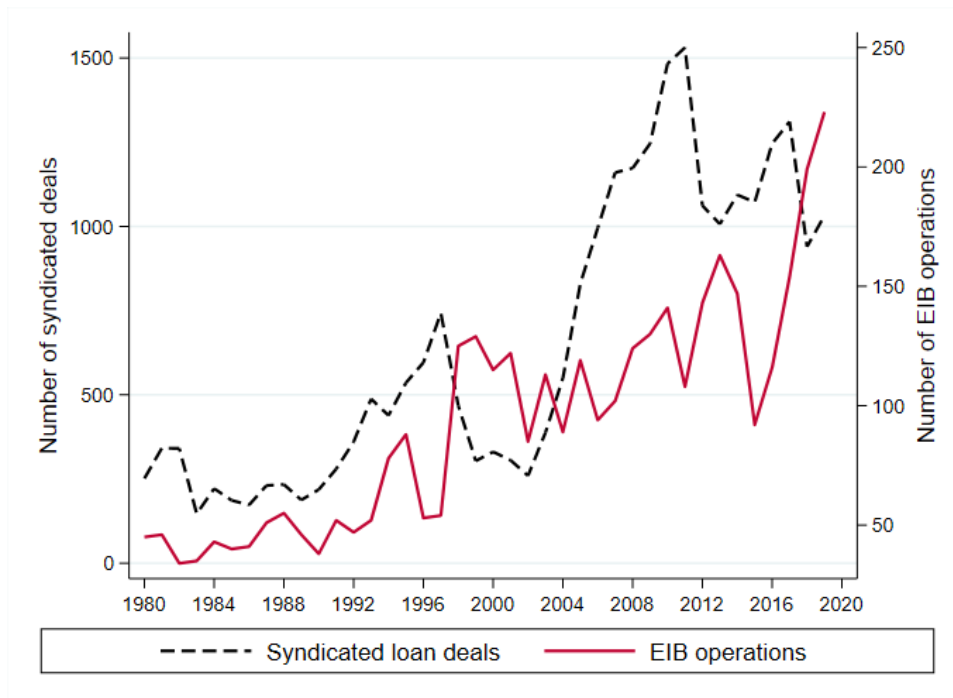
Notes: The chart shows the trend in the number of country-episodes when EIB operations were intensified. To measure intensity of EIB operations, we construct a dummy variable that takes the value of one in a given country-year when the total number of EIB operations over a three-year rolling window is greater or equal to five. “First country event” are instances when countries were experiencing their first episode of intensified EIB operation. Other events are all other instances when countries were experiencing a sharp build up in EIB operations.

Figure 2: Syndicated lending



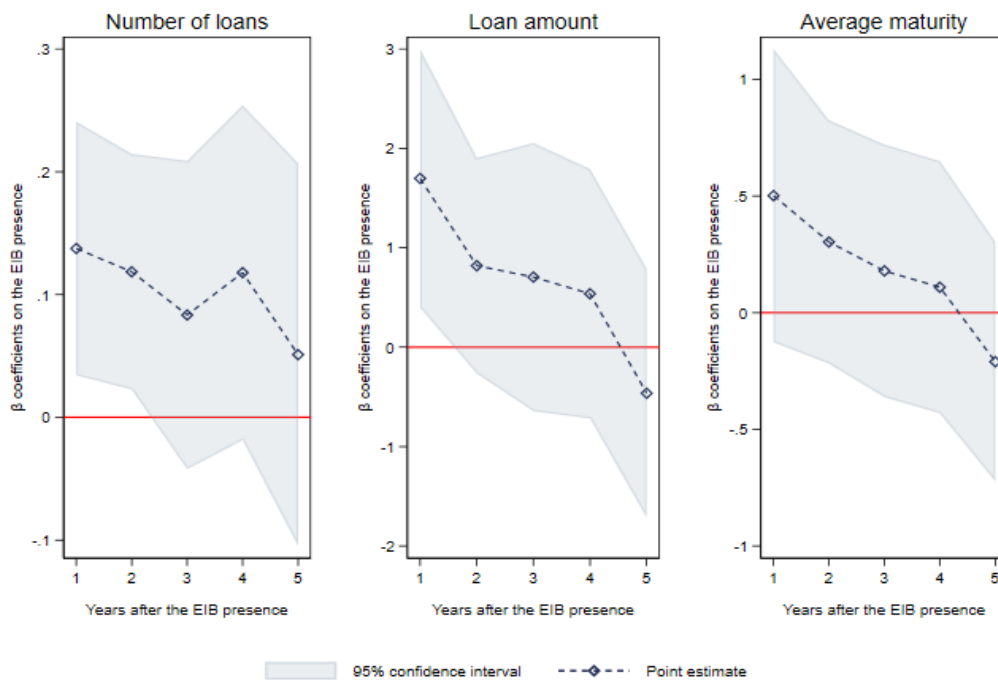
Notes: The chart shows the trend in the total number of syndicated loans and total loan contract amounts for countries considered in our sample.

Figure 3: EIB operations



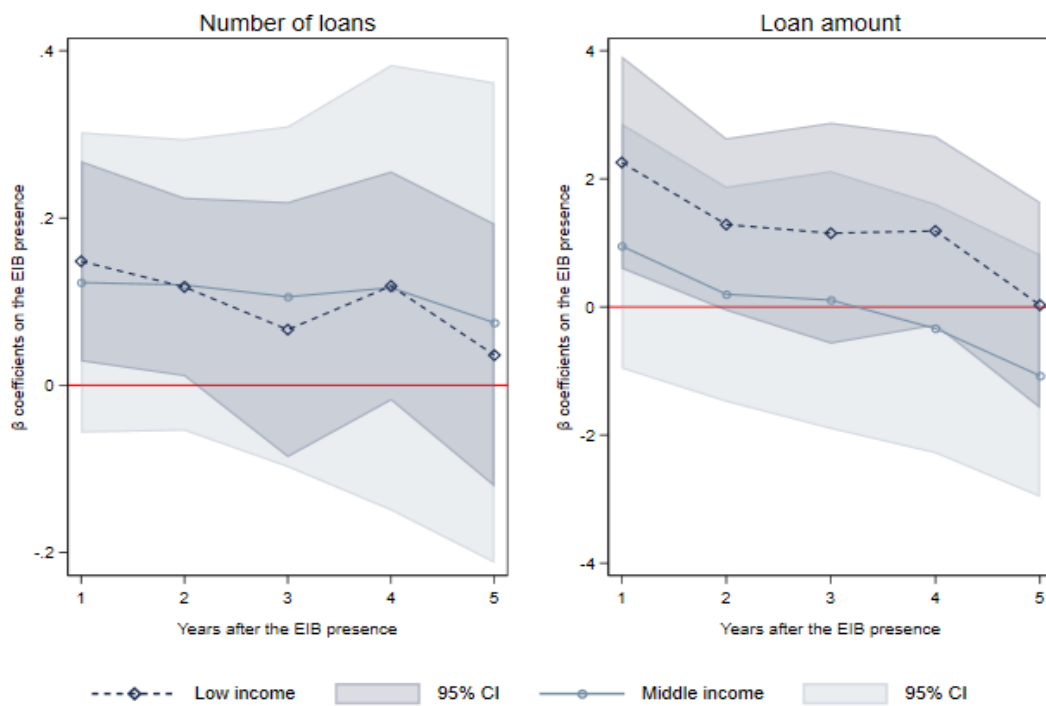
Notes: The chart compares the trends in the number of EIB operations and the number of syndicated deals over time for all countries in our sample.

Figure 4: Dynamic responses



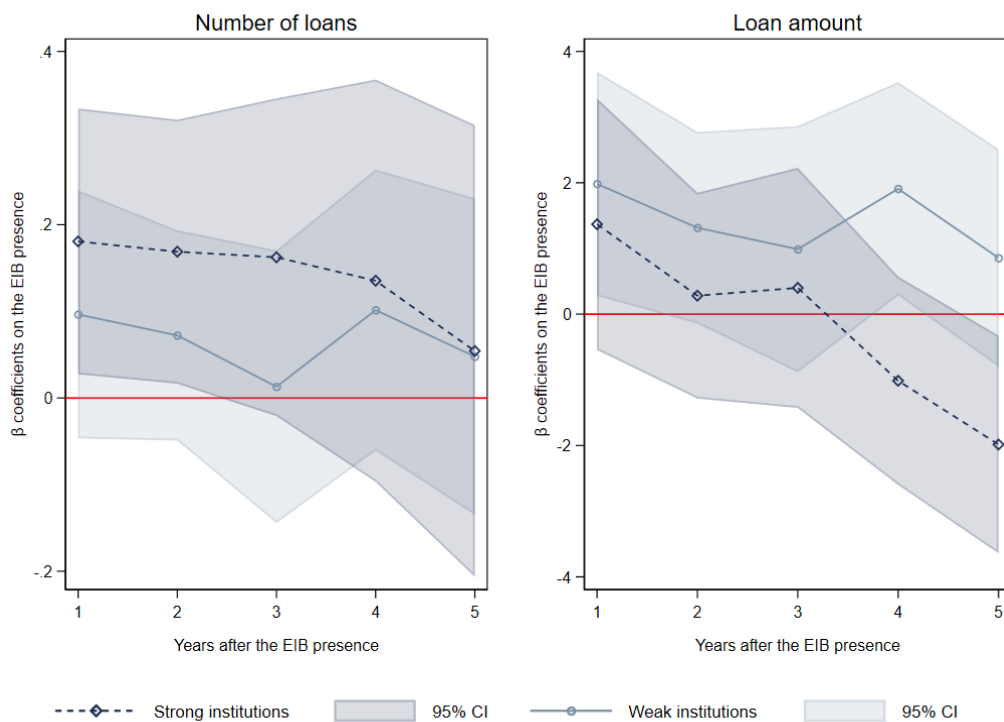
Notes: The chart shows the estimated coefficient for the EIB presence dummy in equation (1) where we shift the dependent variables ahead in time. The dependent variables are listed at the top of each subfigure.

Figure 5: Dynamic responses – degree of development



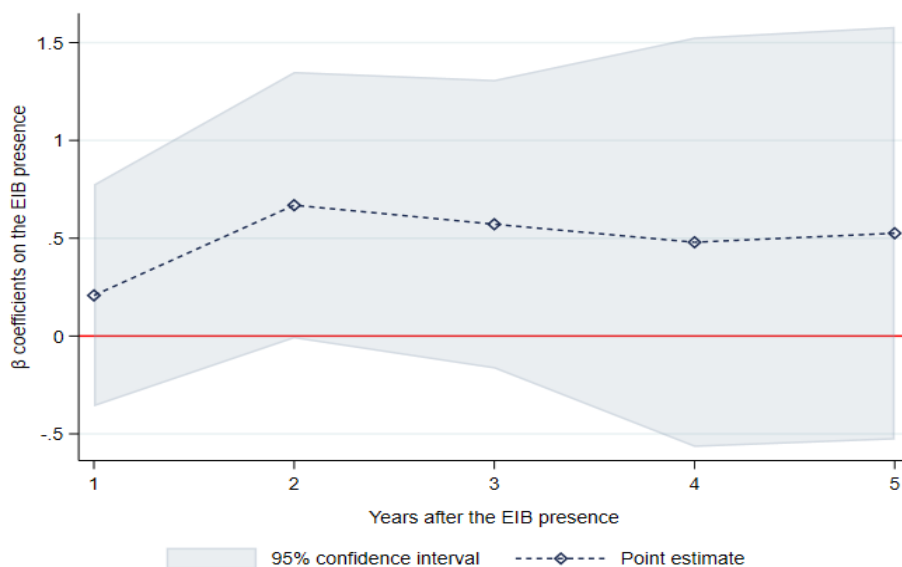
Notes: The chart compares the estimated coefficient for the EIB presence dummy in equation (1) in the case of middle vs. low-income countries. The dependent variables are listed at the top of each subfigure.

Figure 6: Dynamic responses – strength of institutions



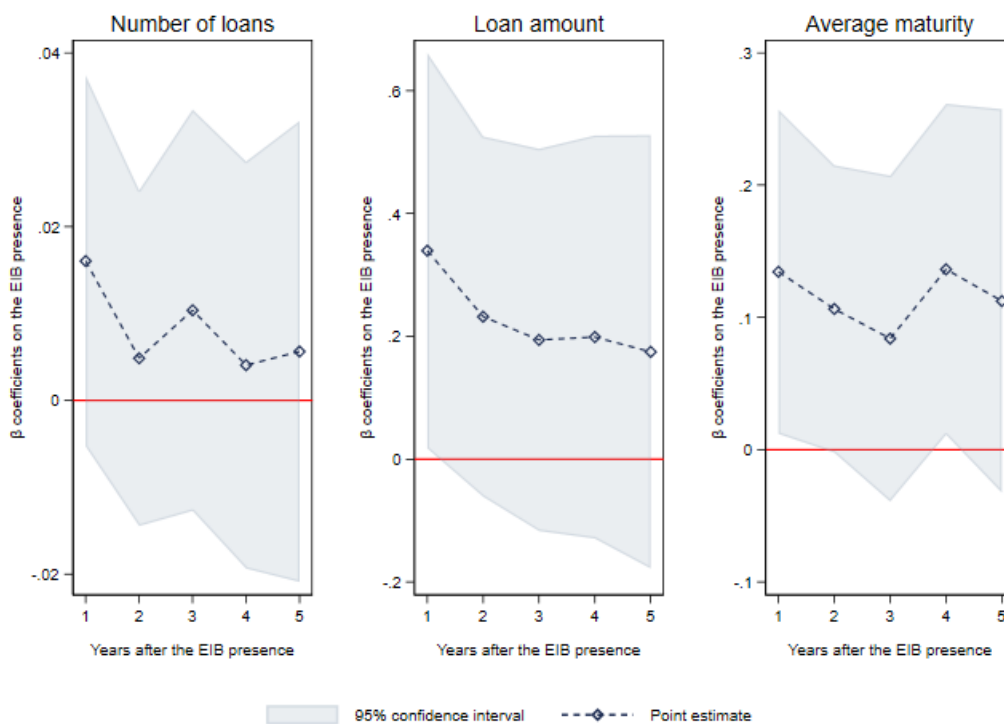
Notes: The chart compares the estimated coefficient for the EIB presence dummy in equation (1) in the case of countries with strong vs. weak institutions. The dependent variables are listed at the top of each subfigure.

Figure 7: Economic risk rating



Notes: The chart shows the estimated coefficient for the EIB presence dummy in equation (1) where we shift the dependent variables ahead in time. The dependent variable is the economic risk rating of each country from the International Country Risk Guide.

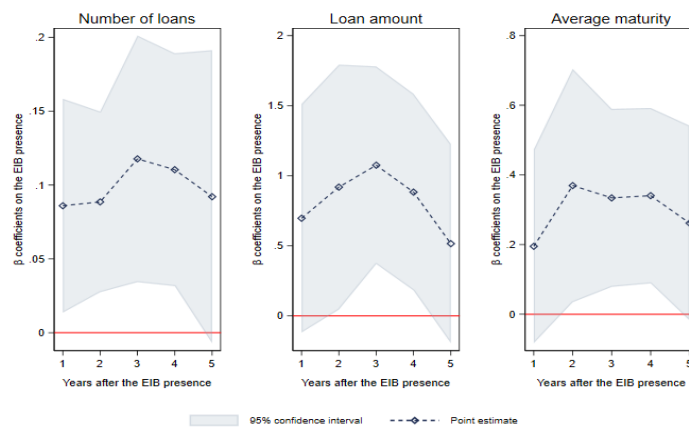
Figure 8: Dynamic country-sector-level responses



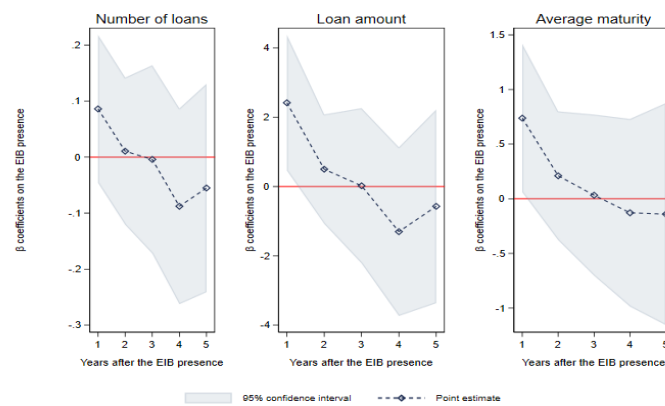
Notes: The chart shows the estimated coefficient for the EIB presence dummy in equation (2) where we shift the dependent variables ahead in time. The dependent variables are listed at the top of each subfigure. The country-sector-year panel is used to estimate equation (2).

Figure 9: Dynamic responses by sector

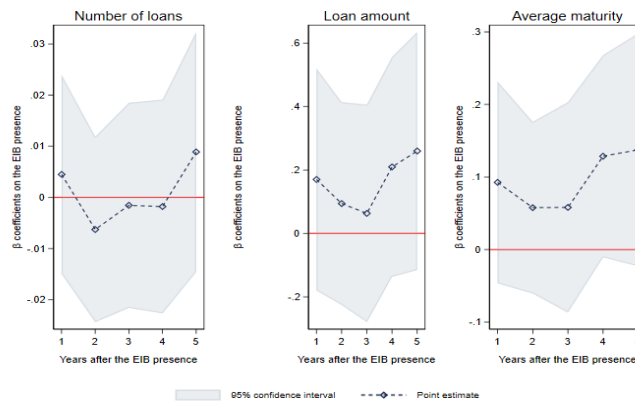
Panel A: EIB operations in the utilities sector



Panel B: EIB operations in the finance, insurance, and real estate sectors



Panel C: EIB operations in all other sectors



Notes: The charts show the estimated coefficient for the EIB presence dummy in equation (2) where we shift the dependent variables ahead in time. The dependent variables are listed at the top of each subfigure. The country-sector-year panel is used to estimate equation (2). In each of the three panels above, we filter the data based on the sector of EIB operation. Panel A reports our results when using only the data based on EIB operations in the utilities sector. Panel B repeats this exercise for the finance, insurance and real estate sector. Panel C reports the results when all other sectors are used in the dynamic regressions.

Table 1. Summary statistics

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
	Number of EIB operations		Amount of EIB operations (mln. EUR)		Number of boom EIB years	Number of syndicated loans		Amount of syndicated loans (mln. USD)	
	mean	sd	mean	sd		mean	sd	mean	sd
Albania	1	1	13	22	6	1	1	30	62
Algeria	1	2	68	112	7	4	5	623	1000
Argentina	0	1	23	49	2	22	20	3349	4568
Armenia	1	2	10	25	4	1	2	31	62
Barbados	0	1	2	6	0	1	1	258	483
Belarus	0	2	13	63	1	2	4	580	1911
Belize	0	1	1	2	0	0	0	69	396
Benin	1	2	5	12	3	0	1	19	52
Bosnia and Herzegovina	3	4	64	92	9	1	2	81	168
Botswana	1	1	4	8	5	0	1	92	408
Brazil	1	2	88	129	9	76	53	13436	13815
Burkina Faso	1	1	5	8	4	0	0	11	41
Burundi	0	1	2	11	0	1	1	87	234
Cabo Verde	0	1	4	11	0	0	0	2	10
Cameroon	1	1	11	19	5	1	2	119	210
Chad	0	1	1	4	1	0	0	46	221
China	1	4	72	156	4	136	140	28060	38934
Congo, Dem. Rep.	0	1	5	20	3	1	1	68	148
Congo, Rep.	0	1	2	7	1	0	1	40	150
Cote d'Ivoire	1	2	9	21	8	2	4	296	550
Dominican Republic	1	2	10	18	7	3	4	178	245
Ecuador	0	1	18	56	1	2	3	189	287
Egypt, Arab. Rep.	4	4	251	314	18	9	8	2443	3326
Eswatini	1	1	4	9	3	0	0	1	4
Ethiopia	1	1	11	18	1	1	3	184	411
Fiji	1	1	4	11	2	0	0	5	15
French Polynesia	1	1	3	7	2	0	0	2	11
Gabon	0	1	2	6	2	2	2	137	227
Gambia, The	0	1	2	9	0	0	0	0	0
Georgia	1	3	45	109	5	1	3	86	189
Ghana	1	1	10	22	3	5	5	1088	1418
Guinea	1	1	10	25	1	0	1	24	54
India	1	2	74	170	4	107	119	20994	27783
Israel	1	1	36	62	2	5	4	2883	10588
Jamaica	1	1	8	15	5	1	1	63	135
Jordan	2	2	34	42	12	2	2	290	506
Kenya	2	2	33	56	13	2	3	454	980
Lebanon	2	3	63	106	10	1	2	185	583
Lesotho	0	1	8	27	2	0	0	16	82
Liberia	0	1	2	8	0	4	3	1540	1875
Madagascar	1	1	19	49	7	0	0	5	21
Malawi	1	1	9	18	4	0	1	5	15
Mali	0	1	5	13	2	1	1	79	121
Mauritania	1	1	8	15	4	0	1	35	126
Mauritius	1	1	9	10	6	2	2	725	1308
Mexico	0	1	18	35	1	52	29	14212	9081
Moldova	1	2	20	48	5	1	2	28	66
Mongolia	0	1	2	10	2	1	2	51	96
Montenegro	3	5	21	38	6	0	1	16	49
Morocco	5	5	202	201	17	4	4	432	632
Mozambique	1	2	14	22	8	1	2	107	241

Namibia	1	1	8	18	3	0	1	27	66
Niger	0	1	6	28	1	0	1	9	24
Nigeria	1	1	25	34	6	8	9	1781	2486
North Macedonia	1	1	24	38	4	1	1	30	69
Panama	0	1	19	80	0	12	10	2184	2577
Papua New Guinea	0	1	5	14	0	2	1	407	1223
Russian Federation	0	1	18	51	3	55	66	17767	26588
Rwanda	0	1	3	8	2	0	1	10	33
Samoa	0	1	0	1	0	1	1	69	142
Senegal	1	2	16	36	8	1	2	73	155
Serbia	6	8	146	209	12	2	4	300	556
Seychelles	0	1	2	6	0	0	0	10	28
South Africa	2	3	76	79	10	19	15	5991	6019
St. Lucia	0	1	1	2	0	0	1	146	335
St. Vincent and the Grenadines	0	1	1	2	0	0	0	12	69
Syrian Arab Republic	0	1	32	61	2	0	1	46	152
Tanzania	1	1	10	21	4	1	2	139	254
Togo	0	0	1	2	0	0	0	17	50
Trinidad and Tobago	0	1	5	11	1	1	1	199	346
Tunisia	7	8	164	157	20	3	3	257	282
Turkey	10	12	736	939	14	50	25	12196	11437
Uganda	1	2	12	24	7	1	2	134	283
Ukraine	5	15	150	295	4	9	17	1267	3781
Vietnam	0	1	12	32	3	9	10	1246	1678
West Bank and Gaza	0	1	7	20	3	0	0	6	24
Zambia	2	2	25	34	14	2	2	216	411
Zimbabwe	1	1	6	12	5	3	3	112	121

Notes: The table provides summary statistics for the main variables used in our analysis. For each country we compute several statistics across years, 1980-2019. Columns (1) and (2) report the average and standard deviation of the number of EIB operations in a given country, while columns (3) and (4) report the average annual amount of EIB projects and its standard deviation. Column (5) counts the number of years in which we recorded an intensification in EIB operations (i.e., the EIB presence dummy used in regressions). Columns (6) to (9) refer to the syndicated loans data and report the average and standard deviation of the number of deals and their total value of loans in a given country across years.

Table 2. Number of loan deals

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Nr. of loans (t)	0.58*** (0.04)	0.56*** (0.04)	0.50*** (0.04)	0.50*** (0.04)	0.48*** (0.05)	0.49*** (0.04)	0.49*** (0.05)
EIB presence	0.09** (0.04)	0.14*** (0.04)	0.14** (0.05)				
WB presence		0.10** (0.05)	0.12** (0.05)	0.11* (0.06)	0.13** (0.06)	0.11** (0.05)	0.08 (0.06)
IMF presence		-0.02 (0.02)	-0.06** (0.03)	-0.03 (0.03)	-0.04 (0.03)	-0.07*** (0.03)	-0.05 (0.03)
EIB presence - loan				0.23*** (0.06)			
EIB presence - equity				0.00 (0.04)			
EIB presence - public					0.15*** (0.05)		
EIB presence - private					0.03 (0.06)		
EIB presence - first						0.22** (0.08)	
EIB presence - others						0.07 (0.06)	
EIB presence - SME							-0.02 (0.06)
EIB presence – non-SME							0.11*** (0.04)
GDP growth			0.01** (0.00)	0.01*** (0.00)	0.01** (0.00)	0.01** (0.00)	0.01** (0.00)
Private credit (% GDP)			0.00** (0.00)	0.01** (0.00)	0.01** (0.00)	0.01** (0.00)	0.01*** (0.00)
Observations	2,713	2,348	1,734	1,544	1,582	1,740	1,571
R-squared	0.85	0.83	0.84	0.85	0.84	0.83	0.83
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Country FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Notes: The table presents estimates of equation (1). The dependent variable is always the number of syndicated loan deals. The EIB, IMF and WB presence dummies take the value of one during years of intensified presence in the case of EIB and WB, and in years when any IMF program occurs in a given country. EIB presence in some rows is constructed depending on whether presence was mostly through loans rather than equity, in public rather than private entities, or whether the country-year experience a first intensified EIB presence or not. For SME and non-SME presence variables we used the number of SME operations to construct the presence indicators. Robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1.

Table 3. Other dependent variables

	(1)	(2)	(3)
	Number of loans	Loan amount	Average maturity
EIB presence	0.14** (0.05)	1.70** (0.66)	0.50 (0.32)
Observations	1,734	1,734	1,734
R-squared	0.84	0.56	0.50
Other controls	Yes	Yes	Yes
Year FE	Yes	Yes	Yes
Country FE	Yes	Yes	Yes

Notes: The table presents estimates of equation (1). The dependent variable is either the total number of syndicated loans, the total amount of syndicated loans or the average maturity of these loans. The EIB presence dummy takes the value of one during years of intensified presence. All regressions include the rest of the controls used in table 2, column (3). Robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1.

Table 4. Heterogeneity

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
EIB presence x (1 - EIB main borrower)	0.13 (0.08)						
EIB presence x EIB main borrower	0.15** (0.07)						
EIB presence x Middle income		0.12 (0.09)					
EIB presence x Low income		0.15** (0.06)					
EIB presence x Weak institutions			0.10 (0.07)				
EIB presence x Strong institutions			0.18** (0.08)				
EIB presence x Low capital inflows				0.09 (0.07)			
EIB presence x High capital inflows				0.12* (0.06)			
EIB presence x Low debt					0.18 (0.15)		
EIB presence x High debt					0.20*** (0.07)		
EIB presence x Low cap. acc. openness						0.14** (0.06)	
EIB presence x High cap. acc. openness						0.14* (0.08)	
EIB presence x Less globalized							0.11* (0.06)
EIB presence x Highly globalized							0.15* (0.08)
Observations	1,734	1,734	1,734	1,626	1,706	1,674	1,733
R-squared	0.84	0.84	0.84	0.85	0.84	0.84	0.84
Other controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Country FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Notes: The table presents estimates of equation (1). The dependent variable is always the number of syndicated loan deals. EIB presence in some rows is multiplied by other dummies depending on country characteristics (e.g., a dummy for low-income vs. middle-income economies). Dummies for high/low are constructed based on the median value in the cross-country distribution, with the exception of the debt variable (Column 5) which uses the top and bottom quartiles to construct the dummy. All regressions include the rest of the controls used in table 2, as well as year and country fixed effects. Robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1.

Table 5. EIB and WB - relative importance of signaling effects

	(1)	(2)	(3)	(4)	(5)	(6)
	Number of loans		Loan amount		Average maturity	
EIB presence	0.14***		1.78**		0.54	
	(0.05)		(0.67)		(0.33)	
WB presence		0.13**		1.54**		0.73***
		(0.05)		(0.64)		(0.27)
Observations	1,734	1,734	1,734	1,734	1,734	1,734
R-squared	0.840	0.839	0.556	0.555	0.501	0.502
Other controls	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Country FE	Yes	Yes	Yes	Yes	Yes	Yes

Notes: The table presents estimates of equation (1) where we exclude sequentially the EIB presence dummy and the WB presence dummy. The dependent variable is the number of syndicated loan deals in columns (1) and (2), the total amount of syndicated loans in columns (3) and (4), and the average maturity of these loans in columns (5) and (6). All regressions include the rest of the controls used in table 2, as well as year and country fixed effects. Robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1.

Table 6. Size of EIB presence

	(1)	(2)	(3)	(4)	(5)	(6)
	Number of loans		Loan amount		Average maturity	
EIB size (t)	0.04***		0.33***		0.10*	
	(0.01)		(0.12)		(0.05)	
EIB size - cumulated (t-2, t)		0.04***		0.39***		0.12**
		(0.01)		(0.12)		(0.06)
Observations	1,927	1,927	1,927	1,927	1,927	1,927
R-squared	0.84	0.84	0.56	0.56	0.50	0.50
Other controls	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Country FE	Yes	Yes	Yes	Yes	Yes	Yes

Notes: The table presents estimates of equation (1) where we exclude the EIB presence variable is defined based on the amounts of EIB operations in a given country which call EIB size in the table above. The dependent variable is the number of syndicated loan deals in columns (1) and (2), the total amount of syndicated loans in columns (3) and (4), and the average maturity of these loans in columns (5) and (6). All regressions include the rest of the controls used in table 2, as well as year and country fixed effects. Robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1.

Table 7. Different empirical specifications

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	2SLS	2SLS	2SLS	2SLS	GMM	OLS	OLS
	Nr. of loans	Vol. of loans	Nr. of loans	Vol. of loans	Nr. of loans	Nr. of loans	Nr. of loans
Number of EIB operations	0.04* (0.02)						
Volume of EIB operations		0.02*** (0.01)					
Lagged Nr. of EIB operations			0.04* (0.02)				
Lagged Vol. of EIB operations				0.02*** (0.01)			
EIB presence					0.13* (0.08)	0.23*** (0.08)	0.25*** (0.07)
Observations	1,983	1,983	1,983	1,983	1,735	1,734	1,735
R-squared	0.30	0.16	0.31	0.15	-	0.79	0.33
Other controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	No
Country FE	No	No	No	No	No	Yes	No

Notes: All regressions include the WB and IMF presence dummies, GDP growth rate, the share of private credit to GDP, as well as time dummies and country dummies where specified in the table. Column (1) shows estimates of an IV model where the total number of EIB operations is instrumented by the distance between a country's capital and the city of Luxembourg. Columns (2) to (4) re-estimate the same model using different variables proxying for the EIB presence, such as the total volume of EIB operations, and lagged number and volume of EIB operations. The dependent variables in columns (1) to (4) are the number or volume of syndicated loans as specified in the column headers. The F-statics for all IV regressions in columns (1) to (4) are above 99 and well above the Stock and Yogo weak instrument critical values. Column (5) shows the results of estimating equation (1) using the Arellano-Bond estimator via the Stata implementation of Kripfganz and Schwarz (2019) that correctly accounts for time fixed effects. Column (6) shows the results of estimating equation (1) when excluding the lagged dependent variable. Column (7) presents the results when excluding the lagged dependent variable and the time and country fixed effect. Standard errors are shown in parentheses and are clustered at the year level in column (1) to (4) and at the country and year levels in column (6). *** p<0.01, ** p<0.05, * p<0.1.

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