

Delegating Discipline: How Indexes Restructured the Political Economy of Sovereign Bond Markets

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Abstract

Outside of the rich world, international financial markets are thought to discipline borrowing governments by monitoring their political and economic characteristics. But increasingly, asset managers do not assess individual country risk/return profiles. They replicate benchmark indexes, delegating investment decisions to index providers. This has two structural effects. First, it relocates market discipline into the hands of index providers. Second, it alters the constraints sovereigns face when accessing bond markets, conditioning the relationship between a sovereign's political-economic fundamentals and its ability to raise capital on bond markets. Using a novel dataset of index inclusion and weights, we show country-specific factors traditionally associated with bond market access do not have the expected constraining effects for countries included in a major index. This supports our theory that index investment has delegated a disciplinary role in sovereign bond markets to index providers, conditioning the importance of country-specific factors in investors' capital allocation decisions.

Introduction

Financial globalization has long been thought to constrain a government's policy autonomy, particularly in developing countries (Mosley 2003, chap. 4). As a result of widespread capital mobility, investors punish governments that implement policies that make debt repayment less likely. In this "market discipline" framework, atomized investors monitor country-specific characteristics and update governments' terms of market access through collective market rationality (Tomz 2007). Governments in turn may be incentivized to formulate national economic policy per market preferences (Rodrik 2012). The result is that governments are disciplined by the invisible hand of market forces. Those that implement Washington Consensus-type policies, achieve strong economic fundamentals, and exhibit good governance are rewarded with better access to sovereign debt markets, while those that diverge are penalized.

To be sure, recent studies of capital allocation to developing countries identify how push factors and market imperfections like global liquidity cycles, informational asymmetries, and bounded rationality limit market discipline by making investors less responsive to country-specific factors. We build on this work by identifying a major structural shift in bond markets: the rise of index providers and index investment strategies. While other push factors exist, index investment is an alternative pathway through which push factors affect market access, which is not due to liquidity, information, or rationality but shifts in market structure.

An increasing portion of foreign investors do not invest in Emerging Markets (EMs)¹ by assessing individual country-by-country risk/return profiles. They instead invest in EMs as an *asset class*, tracking a benchmark index of assets in the class. Indices are constructed by index

¹ We use EM as index providers do: as a broad reference to any low and middle-income country, all of which are candidate countries for EMBIG inclusion. To illustrate the reach of the EMBIG, in 2015, the last year of our study, there were 135 low and middle-income countries, while 65 countries were included in the EMBIG that year. Our analysis is relevant to most candidate countries except those that have no intention of borrowing on international bond markets. See Appendix F for more details.

providers who decide which countries will be included, and what weighting they will receive in the index. Because investors ensure their portfolios closely track indexes, the power to decide how capital is allocated across the globe – to decide which borrowers receive more or less portfolio investment – is delegated to index providers. The rise of index investment has relocated bond market discipline into the hands of index providers.

Yet index investment remains a neglected structural push-factor in the political economy of debt markets.² While indexes have risen across many financial markets, we focus on the EM sovereign external bond market. This market is dominated by one benchmark index, the JP Morgan EMBIG Diversified index. The EMBIG has an outsized influence on this market due to the size of funds that track it and its country coverage. On volume, the World Bank estimates that 70% of mutual fund investments and over 50% of active portfolio investments in the EM sovereign bond market are explained by EMBIG index composition (Raddatz, Schmukler, and Williams 2014). As of 2018 at least \$306 billion assets under management formally tracked EMBIG, making it the most widely followed index in the EM sovereign bond asset class (J.P. Morgan 2018). On coverage, while the EMBIG has been important for the 14 countries included from its creation in 1993, it has evolved to hold systemic importance as country coverage increased to 38 at the end of 2007, then 72 as of January 2019 (Brown and Sienaert 2019).

Inclusion in EMBIG is based on a limited set of quantitative criteria decided by JP Morgan: countries must be under a national income threshold, be under a credit rating threshold, and issue a minimum bond size. Included countries are assigned an index weight according to the market capitalization of their existing bonds. This has created two groups of sovereign external

² With one notable exception, a study of how stock markets are “steered” by indices (Petry, Fichtner, and Heemskerk 2019).

borrowers in the developing world: countries that are included in the index and countries that are excluded from the index.

Economists have shown this index inclusion/exclusion distinction and index weights affect borrowing costs, at least in the immediate term (Pandolfi and Williams 2019; Raddatz, Schmukler, and Williams 2014). But as important for borrowing governments is market access, or the *volume* of investor demand for its debt. While “a higher interest rate disadvantages countries... being denied access to credit entirely, or having to pay so much higher rates that access is no longer worthwhile, disadvantages them substantially more” (Beaulieu, Cox, and Saiegh 2012, 710). Empirically, disciplinary prices at which borrowers cannot or will not borrow are impossible to observe in bonds that do not exist: we must look at volume to observe this type of discipline in the EM sovereign bond market. If the demand for an EM’s bonds is small or non-existent, the EM will be disciplined into obtaining low or no volumes of bond debt and more debt from alternatives such as multilaterals and bilaterals. The amount of portfolio capital flowing into a government in a given year is a key indicator of investor demand and thus market access (see Ballard-Rosa, Mosley, and Wellhausen 2021b).

We theorize that the inclusion/exclusion distinction – and the index providers who define the inclusion/exclusion criteria – affects a sovereign’s bond market access. In practice, because of the sheer size of the funds tracking the EMBIG, inclusion in the index comes with a high floor of “automatic demand” from investors (van der Wansem, Jessen, and Rivetti 2019, 6). This makes the index (EMBIG) and its provider (JP Morgan) a new locus of political-economic discipline in sovereign bond markets. When an EM is excluded from EMBIG, domestic characteristics traditionally associated with creditworthiness affect EM market access, as market discipline theories of sovereign debt would expect. But once an EM is included in EMBIG, these

domestic factors no longer systematically determine investor demand for the EM's debt. In short, EMBIG inclusion/exclusion conditions whether or not an EM's bond market access is significantly correlated to its national political and economic characteristics.

To test this theory, we use a novel dataset of EMBIG inclusion and weighting for all developing countries from 1990 to 2015. We establish index inclusion's treatment effect on EM bond market access, then use interaction models to show that this treatment significantly conditions the relationship between EM country characteristics and bond market access. Country features that inform default probability (such as debt levels, fiscal deficits, GDP levels, and government partisanship) only have the traditionally expected effects on EM market access for countries that are excluded from, or given very low weights in, the index. In contrast, index inclusion and higher weights make these factors unrelated to EM bond market access. Capital allocation according to a borrower's political-economic features does not systematically apply to these EMs. An important secondary finding is that index inclusion conditions the effect of important systemic factors, as included or high-weighted countries are less sensitive to declines in global liquidity compared to excluded and low-weighted countries.

The implication is that, regardless of initial intention or design, the EMBIG index has profoundly restructured both supply and demand sides of the EM sovereign debt market. The index alters the supply-side because it increases investor interest in holding the bonds of included countries, regardless of borrower characteristics. This simultaneously affects the demand-side by allowing included borrowers to issue bonds regardless of fundamentals, easing disciplinary pressures and expanding policy autonomy.

JP Morgan, the EMBIG index provider, has been delegated significant influence over how capital is allocated to sovereigns across the developing world. This constitutes a new locus

of discipline, one not easily captured by models of sovereign debt where borrowers are subject to the judgments of atomized investors through market signals. By deciding on inclusion criteria, JP Morgan determines which EMs face further scrutiny of its political and economic characteristics when borrowing (through exclusion) and which do not (through inclusion). Discipline according to country-specific characteristics is thus weakened amongst countries included in the EMBIG, at least in the short term, as they can access sovereign bond markets irrespective of national economic, institutional, and political characteristics. This increases policy space to prioritize domestic policy preferences rather than the preferences of investors. But this can have perverse long-term effects, as discussed in the conclusion.

The next section positions this study's emphasis on investment practices and market structure among the IPE of sovereign debt literature. The third section reviews the rise of index investment practices and the importance of benchmark indexes for investments in asset classes. The fourth section introduces the EMBIG and summarizes the hypothesis. The fifth section covers the data, the sixth covers the empirical strategy, and the seventh discusses results. The conclusion considers implications.

Financial Globalization and Market Discipline in the Developing World

The extent to which national governments retain policy autonomy under economic globalization remains a central but unresolved question. Policy autonomy is of vital importance because it tells us how much influence domestic constituents have over key national policies in the face of economic integration. While strong versions of the argument that market forces make convergence towards a single liberal economic model and small welfare state inevitable have been all but discredited (Garrett 1998),³ aspects of this argument persist in important ways. This is particularly the case with respect to sovereign debt markets and developing countries.

³ Though see Busemeyer (2009).

Received wisdom in the era of financial globalization is still that these markets discipline developing country governments. For market discipline to work, investors must monitor country-specific factors that determine risk and allocate capital accordingly. In turn governments, to the extent they want to access bond markets, need to be responsive to investor preferences when formulating policy. If either of these links in the chain break down, then market discipline will be limited. In this paper we focus on the first link, investor scrutiny of country creditworthiness. Although outside the scope of this paper, the second link, government responsiveness, may also vary or break down (Mosley 2003, chaps 5–6).

Earlier accounts emphasized how EM sovereign market access reflects assessments of borrower creditworthiness and default probability, as investors “continually update their beliefs about the type of government they are confronting” then “condition lending decisions” on this information (Tomz 2007, 10). While the conditions for perfect discipline do not exist in modern sovereign debt markets, financial liberalization and technological advances are believed to have resulted in markets “becoming increasingly effective at discriminating among sovereign borrowers” (Lane 1993, 71). This is particularly the case for developing countries. Market discipline should be stronger in EMs because their higher risk of default requires investors to monitor a wider range of borrower characteristics more carefully than they would for advanced economies (Mosley 2003, chap. 4).

The disciplining principle remains central to our understanding of how capital is allocated to developing country governments. Implicitly or explicitly, investors are positioned as atomized, active decision-makers that monitor and respond to country-specific characteristics. Focal points for investor scrutiny are said to include macroeconomic fundamentals such as GDP growth, debt levels, or deficits (Koepke 2019; Presbitero et al. 2016; Ahmed and Zlate 2014; Kim and Wu

2008; De Vita and Kyaw 2008), political considerations such as government economic ideology and policies (Kaplan and Thomsson 2017; Kaplan 2013; Frot and Santiso 2013; Hardie 2006; Vaaler, Schrage, and Block 2006; Bechtel 2009; Bernhard and Leblang 2006; Jensen and Schmith 2005), and institutional factors such as democracy or transparency (Biglaiser and Staats 2012; Beaulieu, Cox, and Saiegh 2012; Schultz and Weingast 2003; Cormier 2022a).

In a market discipline framework, these are key pieces of information that investors monitor in individual countries to update their perceptions of repayment probability then allocate capital. The implication is that improved macroeconomic fundamentals, austere and open economic policies, economically-conservative politicians, and good governance would improve developing countries' access to disciplinary investors. This view is so pervasive that recent debt management guidance from the World Bank submits that governments "are faced with increasing scrutiny" as they issue bonds in markets where investors are adding environmental and social risks to the traditional economic, policy, and institutional concerns that determine demand for sovereign bonds (World Bank 2020).

Recent studies highlight that market discipline is not constant but contingent on systemic factors, particularly global liquidity cycles. During periods of low rich-world interest rates, investors' search for returns renders them risk tolerant, increases global liquidity, and more capital flows to EMs. Conversely, higher US interest rates make rich-world assets more appealing, decreasing the amount of capital available to EMs (Miranda-Agrippino and Rey 2013; Rey 2015; Bauerle Danzman, Winecoff, and Oatley 2017; Milesi-Ferretti and Tille 2011; Winecoff 2020; Naqvi 2019). Country-specifics are more likely to shape capital flows at such times because investors become risk averse and increase scrutiny (Campello 2015; Ballard-Rosa, Mosley, and Wellhausen 2021b). Other limits to discipline include rationally-bounded investors

relying on heuristics or cognitive shortcuts to make investment decisions (Gray 2009; Gray and Hicks 2014; Brazys and Hardiman 2015), resulting in herding and contagion rather than disciplinary capital allocation (Gray 2013; Brooks, Cunha, and Mosley 2015). Others suggest market discipline is limited because investors disagree about what good policies are (Mosley, Paniagua, and Wibbels 2020). While this research highlights important limits to market discipline, less attention has been paid to market structure.

We question the premise that it is “markets” doing the disciplining, however imperfect. We argue that with the rise of index investment, discipline is increasingly delegated to and concentrated in index providers, rather than atomized investors. In practice, asset managers increasingly do not allocate capital in response to country-specific information, but by replicating the holdings pre-determined by JP Morgan’s dominant EMBIG index. This shifts the locus of discipline from investors to index providers. We further argue this structural shift is important because it has circumscribed the disciplinary link between EM country characteristics and their ability to raise capital. EMBIG inclusion/exclusion does more than shape capital allocation and market access alongside a borrower’s domestic political-economic features. Rather, it disassociates capital flows to EM sovereigns from their domestic features.

Asset Manager Concentration and the Rise of Index Investment

A critical structural shift in recent decades has been the rise of a concentrated set of index providers, and a rise in the proportion of investors who use these indices (Miyajima and Shim 2014; Arslanalp et al. 2020). A small number of highly concentrated asset managers have come to hold a significant portion of EM debt (Arslanalp and Tsuda 2015) as retail and institutional investors, including pension and insurance funds, increasingly rely on asset managers to access EM assets (Naqvi 2019). This makes it vital to understand asset manager investment strategies.

Large asset managers typically treat EMs as an *asset class*, investing in them due to factors that affect EMs as a group. This includes relative returns compared to advanced markets, or portfolio diversification from other asset classes such as commodities or equities, rather than individual country fundamentals (Arslanalp et al. 2020). Given these investment motivations, it makes sense to invest in EMs as a group rather than as individual countries.

Pre-constructed EM indices provide the ideal way to do this. Asset managers follow indexes using either passive or active investment strategies. Passive investors replicate pre-constructed benchmark indices regardless of their perceptions of individual country default risk. Active investors also broadly match the index but tweak precise holdings to produce a higher return for their clients than the index. Notably, asset managers increasingly use passive rather than active strategies, especially since the 2008 crisis (Miyajima and Shim 2014; Petry, Fichtner, and Heemskerk 2019; Arslanalp et al. 2020). The upshot is that, as index investment has risen in importance, all types of asset managers are influenced by the index as they make portfolio allocation decisions. This is true regardless of whether a fund follows a passive or active strategy, and regardless of whether they scrutinize country-specific characteristics or not. Even active investors' holdings are initially determined by the constitution of the index.

In the EM sovereign debt market, the dominant benchmark index is the JP Morgan EMBIG Diversified with \$306 billion assets under management (AUM) formally tracking the index (J.P. Morgan 2018).⁴ Because it serves as a benchmark, its influence extends far beyond just those passive funds that replicate it. The World Bank estimates that over 50% of the

⁴ This has only increased since, for example in 2019 the number was \$324.7 billion (Interview, index provider, London, 05/01/2021). The EMBIG series contains three different indices, each with slightly different inclusion criteria, but the EMBIG Diversified is by far the most important based on the volume of capital that tracks it. A number of smaller EM debt indices also exist such as the JPM's GBI-EM for local currency sovereign debt. These are far smaller both in the volume of funds that track them and the number of countries they cover.

portfolio allocations of active investors, and 70% of investment mutual funds, are explained by benchmark EM index composition (Raddatz, Schmukler, and Williams 2014). This is why, although JP Morgan's hard currency EM index has been important for the 14 countries included since its creation in 1993, it has more recently come to hold systemic importance. EMBIG's country coverage increased to 38 at the end of 2007, and 72 as of January 2019 (Brown and Sienaert 2019). While factors such as global financial cycles influence the total pool of capital available for investment in EMs, the *distribution of investment across EMs* is increasingly determined by the benchmark EMBIG's index inclusion and weights. To date however, the literature with one notable exception (Petry, Fichtner, and Heemskerk 2019),⁵ has largely neglected indices, even though their rise has fundamentally altered capital allocation.

EMBIG Index Construction

The EMBIG Diversified includes all USD denominated sovereign bonds issued by EM sovereigns and quasi-sovereign entities.⁶ The purpose of the EMBIG is not to forecast creditworthiness of its constituent countries, pick countries that guarantee the highest returns to the investor, or pick countries with the lowest default probability. The purpose is to provide a benchmark that reflects EMs as an asset class, providing a valuable service product for asset managers that lowers their transaction costs when investing in the asset class.

Accordingly, EMBIG uses a limited, quantitative set of index inclusion and weighting criteria. A country is included if its GNI-per-capita falls below an income threshold, its credit ratings are under investment-grade ceilings, and individual bonds have a size of at least \$500 million USD. An EM's first included bond must have a maturity of over two and a half years for

⁵ That study considers stock markets. We concur with their argument that indices have shifted the locus of discipline in markets, but further show (1) that this applies to sovereign debt as well as stock markets and (2) that this conditions the behavior of other variables traditionally associated with bond debt.

⁶ <https://www.wsj.com/articles/phantom-yields-boost-jpmorgan-embig-indexes-11559381400>

initial entry, and subsequent bonds a maturity of one year, which means that the criteria for initial inclusion is more stringent than subsequent inclusion. Currently, if an included country's GNI-per-capita goes above the current ceiling of \$19,713, and its rating goes to A-/A3/A- or above at all three major rating agencies for three consecutive years, then it is dropped from the index. There is no lower bound for credit ratings. Although there is a requirement that bonds must be accessible by foreign investors, in practice this is irrelevant because USD denominated bonds are issued as tradeable Eurobonds and not subject to local law.⁷

Such objective quantitative criteria sets the EMBIG apart from other bond indices in other financial markets. For example, inclusion into JPM's local currency EM bond index, the GBI-EM, is subjective because individual countries can be included or excluded on a discretionary basis if their policies are judged to be too restrictive. Once an EM is included, it is assigned a weight in the index according to the existing market capitalisation⁸ of all its eligible bonds. This means that countries with more outstanding debt receive a higher weight in the index. A mathematical formula is then applied to increase the weights of smaller countries and limit the weights of larger countries, limiting concentration risk.

JPM occasionally changes the EMBIG criteria, which typically involves adjusting the income ceiling, credit rating thresholds, or weight caps rather than making wholesale changes to the inclusion methodology or expanding the requirements. For example, JPM initially used World Bank income categories for the income ceiling, but changed this to a numerical GDP-per-capita threshold that it can modify. Country weights have also been capped in different ways over the lifetime of the index.⁹ The most recent change came in January 2019, when JPM created

⁷ Interview, index provider, London, 05/01/2021.

⁸ A function of issuance amount and bond price.

⁹ Interview, index provider, London, 05/01/2021

a new rule whereby countries with a PPP ratio¹⁰ under 60% were eligible for inclusion even if their GNI was above the ceiling. The change was made in response to asset manager pressure to include the Gulf Cooperation Council (GCC) countries in the index.¹¹ Investors considered the GCCs an attractive investment destination but could not invest in them and still closely track the EMBIG index because the GCCs fell above the income ceiling, so were not included. This led JPM to formally modify the eligibility criteria (Kronfol 2018).

These examples indicate the power of JP Morgan to determine the countries that do or do not gain inclusion in the index, and the influence it has over asset manager investment decisions. As we theorize below, this means that the locus of market discipline in the EM sovereign bond market has shifted from investors to the JP Morgan, the dominant index provider in the market.

The Importance of Index Inclusion for EMs

EMBIG inclusion or exclusion transforms countries' market access. Changes in country inclusion or weightings within the index trigger a rebalancing among all the funds that track it (The Economist 2020), resulting in sizeable movements in investor portfolio allocations (Raddatz, Schmukler, and Williams 2014). Because of the sheer size of the funds tracking the EMBIG, inclusion in the index comes with a high floor of "natural demand" from investors.¹²

For relatively small EMs, even minor changes in their index weighting can have major impacts on capital flows and borrowing costs, while outright inclusion or exclusion can drastically affect the amount they can borrow. For instance, the announcement of the above-mentioned inclusion of GCC countries attracted up to \$60bn of new capital (Mayenkar 2018). Moreover, not only did this move increase market access for GCC countries, it simultaneously

¹⁰ The ratio of nominal exchange rates to PPP exchange rates.

¹¹ Interview, index provider, London, 05/01/2021.

¹² Interview, Index provider, London, 05/01/2021.

decreased the weightings of other countries already in the index, reducing their market access for reasons completely exogenous to domestic fundamentals (IMF 2019, 37).

Developing country policymakers are keenly aware of the importance of inclusion into one of the major EM indices for increasing market access. The World Bank now advises countries to take the EMBIG inclusion criteria into account in their debt management operations because “if a bond qualifies for inclusion in an index it can therefore generate some ‘automatic’ demand” (van der Wansem, Jessen, and Rivetti 2019, 6). EMs no longer need to predict fickle market reactions, but can communicate directly with index providers to get advice on how to gain index inclusion and increase their weighting.¹³ This incentivizes EMs to manage their borrowings and debt in ways that maximize chances of inclusion. Small economies such as Papua New Guinea, Uzbekistan, and Tajikistan are striving to issue a single instrument with a size of 500mn USD and long-term maturation, even when they do not need to borrow such large amounts.¹⁴ Similarly, In March 2015 the Armenian government wanted to raise \$300m USD, but debt managers wanted the new bond to be eligible for the EMBIG, so bought back \$200m USD of a previous issue and issued a new bond at \$500m.¹⁵ In this sense, the index restructures not only the supply side of the sovereign debt market, but borrower incentives and behaviors on the demand side as well (on this theme see Bunte 2019; Cormier 2021; 2022b; Zeitz 2021).

Hypothesis

Knowing that investors have delegated allocation decisions to the index, inclusion in the EMBIG is a key threshold for borrowing EMs seeking to access the sovereign bond market. This makes EMBIG inclusion/exclusion criteria a source of discipline in that market. Our hypothesis

¹³ Interview, portfolio manager at large asset manager, former index provider, London, 11/01/2021.

¹⁴ Interview, index provider, London, 05/01/2021.

¹⁵ <https://www.globalcapital.com/article/qs98xx2yml5b/armenia-combines-buyback-and-new-issue-to-target-embi>

is that this new source of discipline – index inclusion – conditions the relationship between country-specific features and bond market access. Because asset managers’ investment decisions track bond index inclusion and weightings, these practices push capital to EMs in the EMBIG index regardless of national political and economic characteristics. In contrast, country-specific factors continue to shape bond market access for excluded and low-weighted EMs.

H1: EMs included in EMBIG and with higher weights do not have bond market access significantly affected by country-specific features, while excluded and lower-weighted EMs do.

Data

We construct a country-year panel dataset. The sample includes 60 developing countries from 1990-2015. The appendix lists country-years and descriptive statistics.

Dependent Variable (DV)

As discussed in the introduction, economists have found indexes affect short-term borrowing costs. But as important is the volume of bond market demand for a sovereign’s debt. And empirically, disciplinary rates at which borrowers cannot or will not borrow are impossible to observe in bonds that do not exist. We must consider volume to analyze this aspect of market access. In practice, if investor demand for an EM’s bonds is small or non-existent, the EM will be disciplined into obtaining low or no volumes of bond debt and more debt from alternative sources.

Our DV is thus the volume of portfolio capital flowing into a government each year (measured by bond issuance) as a percent of all other external financial flows. This captures the idea that lack of market access will divert borrowers into obtaining more official credit from multilaterals and bilaterals, including both traditional Western creditors and newer lenders such

as China.¹⁶ This also standardizes flows by the amount a country needs to obtain from external sources each year. While recent work has shown that borrowing portfolios are also influenced by domestic partisan factors, we control for this as discussed below.

$$DV = \frac{BondIssuance_currentUSD}{BondIssuance_currentUSD + OfficialBorrowings_currentUSD}$$

The numerator, following Ballard-Rosa, Mosley, and Wellhausen’s study of the ability to “issue more debt” (2021b, 353), is a country’s annual amount of long-term government bond issues on foreign markets. We obtain sovereign long-term bond issues from that study’s replication data and group them by country-year. We use long-term issues (greater than one-year in maturity) because bonds must have a maturity of at least that length to be included in EMBIG, making shorter-term cash management operations unlikely to be directly affected by EMBIG inclusion or exclusion. We obtain all official credit flows to the government each year from the World Development indicators (WDI).

Explanatory Variables

Two variables capture the EMBIG index effect. First is a dummy *Included*, coding whether an EM is included in EMBIG that year. Second is a country’s index weighting, which specifies how much of a country’s debt an investor should hold in their portfolio if they seek to replicate the index. We calculate the annual average of a country’s weight in the index to fit the country-year dimensions of the panel data. *IndexWeight* takes a value of 0 if a country is not in the index.

Control Variables

We control for domestic macroeconomic, domestic institutional, and global structural factors traditionally expected to determine a developing country’s sovereign bond market access.

¹⁶ We add external commercial bank loans, a less-common instrument in the time period here with less-complete data, to the denominator as a robustness check in Appendix E.

Macroeconomic controls include *GDPpcap* and *GDPgrowth*, both of which should enhance market access. Higher *Inflation* should make countries less attractive to investors given repayment challenges if local currencies devalue (Eichengreen, Hausmann, and Panizza 2007). In this sense, *Inflation* also captures the effect of the degree to which central bank independence is or is not practically enhancing monetary stability and repayment probability (Bodea and Hicks 2015). Outstanding external *DebtLevels* should decrease market access due to repayment concerns (Reinhart and Rogoff 2009). *Deficit* levels may negatively affect EM market access, insofar as some argue bond markets seek to discipline EM governments into tighter fiscal policy (Kaplan and Thomsson 2017).¹⁷ *DomFinDepth* controls for the amount of local financial resources available to a government in a given year as a percentage of GDP, which may alter external flows (Ballard-Rosa, Mosley, and Wellhausen 2021a). The WDI provides these data. *USIRates*, from Ballard-Rosa et al. (2021b), proxy for global liquidity. Higher US interest rates should decrease global liquidity and constrain bond market access from the supply-side or affect perceptions on the demand side (Zeitz 2021).

Domestic institutional and political controls account for regime type, transparency, partisanship, capital account openness, and credit ratings. *Democracy* is the Varieties of Democracy (VDem) liberal democracy measure (Coppedge et al. 2016) to reflect democratic advantage arguments (Beaulieu, Cox, and Saiegh 2012; Biglaiser and Staats 2012; Schultz and Weingast 2003). *Transparency* is VDem's measure of government transparency, which reduces sovereign risk (Cormier 2022a) and affects Chinese credit flows (Cormier 2022c). The Database

¹⁷ We need to include fiscal and debt control variables because they not only influence the total amount being borrowed, but also the composition of different creditors used for fulfilling borrowing needs. For example, to preview results, it is notable that larger deficits change *how* an EMs borrowing needs are met. Outside of the index, larger deficits are associated with less market debt *despite* larger financing requirements. This suggests markets discipline excluded countries' fiscal policies. Included EMs, however, have no problem financing bigger deficits through more market borrowing because they are not disciplined like excluded EMs.

of Political Institutions (DPI) provides government partisanship measures (Beck et al. 2001), which affect various government borrowing decisions (Ballard-Rosa, Mosley, and Wellhausen 2021a; Cormier 2022b). *NewLeftGovt* codes if a left-leaning government has been elected in the last two years, as new left-leaning governments have been found to face market volatility (Brooks, Cunha, and Mosley 2022). Open capital accounts (*ka_open*) should enhance market access (Chinn and Ito 2006). *CreditRating* is the best S&P, Moody's, or Fitch rating an EM has, that year from Bloomberg.

Empirical Strategy

We use this data in two steps. Step one confirms index inclusion has a consistently positive treatment effect on bond market access across all years. Step two is the core of our analysis and estimates a series of interaction terms to show how the treatment of index inclusion conditions the effect of political and economic EM characteristics traditionally thought to determine EM sovereign bond market access.

Step One: Index Treatment Effect

We first check that index inclusion has a consistently positive treatment effect on bond market access across time. To do this, we regress logged annual bond issuance amount on *Included* with country and time fixed effects (Table 1).¹⁸ We then test whether this effect is consistent across all sample years using difference-in-difference (DID) decomposition tests. We also test for a structural break in the data using regression discontinuity in time and Chow tests.

Recently-developed DID decomposition tools check for evidence of treatment bias, particularly whether early and late treatments have heterogenous effects over time within the same unit (Goodman-Bacon 2018). We apply these tests to the Table 1 dummy estimator,

¹⁸ We do not use the main fractional DV here to avoid incidental parameter bias (Greene 2004) in this simple fixed effect estimation. We return to our main fractional DV in the main analysis below (step two).

decomposing it into early and later treated observations, and the non-treated observations they are measured against. We identify a consistent effect across all treatment timings. See appendix C for tables, plots, and discussion. We then identify regression discontinuity in time to identify further evidence of a structural break in bond market access when EMs are initially treated (see appendix C). We finally use a Chow test to identify statistically significant intercept and slope differences between included and excluded observations (appendix C). Together, these tests indicate index inclusion has consistent treatment effects on, and constitutes a structural break in, EM bond market access across the sample's units and timeframe.

Table 1: Dummy Model of Bond Issuance	
	OLS
Included	2.365*** (0.464)
N	2,364
*** p<0.001	
Country and Year fixed effects; Robust SEs	

Step Two: Index Conditioning Effect

But our main interest is whether inclusion conditions the relationship between other variables and EM bond market access. To test for EMBIG's conditioning effect, we use *Included* and *IndexWeight* in a series of interaction models. We address selection bias arising from EMBIG eligibility criteria by estimating these interactions in two-stage Heckman models¹⁹. The first stage models index eligibility as a function of JP Morgan's EMBIG eligibility criteria (discussed above): one, two, and three year lags of *GDPpcap*, as well as one, two, and three year lags of *CreditRating*. It also includes a dummy for whether the observation is before or after

¹⁹ The DV is a fraction but our inferences depend on marginal effects. This allows us to use linear models with unit fixed effects (Papke and Wooldridge 2008, 130) rather than probit models that cannot include unit fixed effects (Greene 2004).

2005, a year of major change in EMBIG.²⁰ Lastly, it includes a dummy for whether the country was in the index last year, as EMs already in the index face less-stringent inclusion criteria than countries being included for the first time (discussed above). None of these variables are in the outcome equation and at least a few are plausibly excludable from an outcome model of this year's borrowing, particularly the deeper lags of GDP and credit rating.

We lag covariates to address reverse causality and joint determination (appendix E includes models without lags, with consistent results). The main twostep specification is:

$$(1) \text{ SelectionHazard}_{it} = \text{GDPpcap}_{it-1} + \text{GDPpcap}_{it-2} + \text{GDPpcap}_{it-3} + \text{Covariate}_{it-1} + \text{CreditRating}_{it-1} + \text{CreditRating}_{it-2} + \text{CreditRating}_{it-3} + \text{Post2005}_{it} + \text{Included}_{it-1}$$

$$(2) \text{ DV}_{it} = \text{IndexVariable}_{it} + \text{Covariate}_{it-1} + \text{IndexVariable}_{it} * \text{Covariate}_{it-1} + \text{Controls}_{it-1} + \text{SelectionHazard}_{it} + \text{Country FE}_i + \text{Year FE}_t + \varepsilon_{it}$$

Identifying Initially-Significant Covariates

We must first identify which of the theoretically-important covariates from the literature, identified in the data discussion above, are significantly correlated to bond market access before accounting for the index, and would thus be subject to the theorized index effect. In other words, we cannot test for a conditioning effect where a covariate is insignificant in the first place. We accordingly identify which covariates are significant on their own terms:

$$\text{DV}_{it} = \text{Controls}_{it-1} + \text{SelectionHazard}_{it} + \text{Country FE}_i + \text{Year FE}_t + \varepsilon_{it}$$

Table 2 finds five variables significantly correlate to bond debt. These are shaded in grey. All are associated with market access in the expected direction. Higher debt levels, larger deficits, new left-leaning governments, and higher US interest rates are associated with less bond

²⁰ 2005 (a) saw JP Morgan change the income threshold for inclusion from World Bank income category to GDP per capita raw values (Interview, Index provider, London, 05/01/2021) and (b) was the last year any country had over 10% weight in the index, which remains the weight cap.

market access and issuance. Higher GDP levels are associated with more bond market access and issuance. These yield five specific and testable sub-hypotheses of *H1*, summarized in Table 3.

GDPpcap	0.000*
	(0.000)
GDPgrowth	-0.001
	(0.003)
Inflation	-0.000
	(0.000)
DebtLevels	-0.001**
	(0.000)
ka_open	0.047
	(0.034)
DomFinDepth	0.001
	(0.001)
Deficit	-0.007*
	(0.003)
CreditRating	-0.003
	(0.005)
Democracy	0.056
	(0.137)
Transparency	0.034
	(0.028)
NewLeftGovt	-0.072*
	(0.029)
USIRates	-0.054***
	(0.014)
Full N	2041
Selected (Eligible) N	902
Inverse Mills Ratio	-0.248*
	(0.106)
* 0.05 ** 0.01 *** 0.001	
Country and Year fixed effects; All variables lagged	

Table 3: Sub-Hypotheses

SH1 (Debt Levels): Higher outstanding debt levels will significantly decrease bond market access if excluded, but not if included.

SH2 (GDP per capita): Richer economies will have significantly more bond market access if excluded, but not if included.

SH3 (Fiscal Deficits): Higher fiscal deficits will significantly decrease bond market access if excluded, but not if included.

SH4 (New Left Government): Left governments will face significantly decreased bond market access in their first years in office if excluded, but not if included.

SH5 (Liquidity): Low global liquidity will significantly decrease bond market access for excluded EMs, but included EMs will not be significantly affected by low liquidity.

Results

Tests support these sub-hypotheses. Country-specifics affect EM market access *only* when a country is excluded from EMBIG or has a small weight. When a country is included in EMBIG or has a larger weight, traditional variables are insignificant or have the opposite effect on bond issuance. This is evidence that the index disciplines sovereigns itself by defining inclusion criteria, which in turn determines which EMs face further discipline from the bond market based on their political-economic characteristics (and which do not).

Inclusion Dummy Interaction Models

Table 4 estimates a model where Table 2's greyed variables are interacted with the dummy variable *Included*, as expressed in the main specification. The estimates find evidence in favor of all Table 3 sub-hypotheses. Of interest are the greyed terms and their interaction terms. *GDPpcap*, *DebtLevels*, *Deficit*, *NewLeftGovt*, and *USIRates* estimate the effect of these variables when *Included* = 0, so when a country is not in the index. These indicate the traditionally-expected relationship between these variables and bond markets. When an EM is not in the EMBIG index, higher GDP increases bond market access while higher debt levels, larger deficits, new left governments, and higher US interest rates are all associated with less bond debt and more finance from alternative sources.

However, these relationships disappear for EMs included in the index. Where *GDPpcap*, *DebtLevels*, *Deficit*, *NewLeftGovt*, and *USIRates* are interacted with *Included* = 1 (so the country is in the index), these variables no longer significantly affect EM bond issuance in the traditionally expected manner. *DebtLevels x Included*, *Deficit x Included*, *NewLeftGovt x Included*, and *USIRates x Included* do not significantly affect bond issuance in any direction among countries included in EMBIG. *GDPpcap x Included* is significantly associated with less

bond debt, so the opposite relationship observed for excluded EMs. Figure 1 visualizes these relationships by plotting the average marginal effect of each interacted variable.

Index Weights Interaction Models

Table 5 estimates a model where Table 2's greyed variables are interacted with a country's weight in the EMBIG, *IndexWeight*, as expressed in the main specification. The estimates find evidence in favor of all Table 3 sub-hypotheses. Figure 2 then plots the marginal effects of each interacted covariate, adjusted by the weight a country has in the index. These adjusted marginal effects show that only when an EM is excluded from the index or has a low weight do the covariates constrain bond market access as expected. For inference, where the confidence interval ribbon crosses the 0 value on the y-axis is where the covariate loses a significant statistical relationship with demand for the EM's bond debt.

NewLeftGovts only face decreased bond market access if the EM has an index weight under 2%. Similarly, higher *DebtLevels* and larger *Deficits* only decrease bond market access at weights under 2%. Larger *GDPpcap* only increases market access below 5% weights. Together, index weights determine whether EM bond market access is significantly associated with the borrower's political and economic characteristics. Moreover, higher *USIRates* do not significantly constrain bond market access for EMs with at least 6% weights. This suggests that higher-weighted index countries are, in comparison to lower-weighted and excluded EMs, relatively insulated from cyclical bond market liquidity determined by rich-world interest rates.

While the inclusion/exclusion dummy variable distinction conditions the average relationship between these variables and bond markets, weights provide nuanced insight into this conditioning effect – the index may erase the importance of country-specifics for larger-weighted EMs but not smaller-weighted EMs.

Table 4: Dummy Interaction Models

Included	0.388*** (0.082)
GDPpcap	0.000*** (0.000)
GDPpcap x Included	-0.000*** (0.000)
GDPgrowth	-0.001 (0.002)
Inflation	-0.000 (0.000)
DebtLevels	-0.001*** (0.000)
DebtLevels x Included	0.000 (0.001)
ka_open	0.063 ⁺ (0.029)
FinancialDepth	0.001 (0.001)
Deficit	-0.008* (0.003)
Deficit x Included	0.005 (0.004)
CreditRating	0.002 (0.004)
Democracy	0.043 (0.121)
Transparency	0.029 (0.024)
NewLeftGovt	-0.073* (0.030)
NewLeftGovt x Included	0.040 (0.048)
USIRates	-0.034** (0.012)
USIRates x Included	-0.020 (0.013)
Full N	2041
Selected (Eligible) N	902
Inverse Mills Ratio	-0.159 [^] (0.099)

* 0.05 ** 0.01 *** 0.001

Country and Year fixed effects

Heckman twostep standard errors

All variables lagged

⁺ takes on significance at .05 level though wasn't significant in Table 3. See Appendix E for further discussion and analysis.

[^] IMR significant at p>.11

Table 5: Index Weight Interaction Models

Included	0.036 (0.033)
GDPpcap	0.000** (0.000)
GDPpcap x IndexWeight	-0.000 (0.000)
GDPgrowth	-0.000 (0.003)
Inflation	0.000 (0.000)
DebtLevels	-0.002*** (0.000)
DebtLevels x IndexWeight	0.000 (0.000)
ka_open	0.050 (0.036)
FinancialDepth	0.001 (0.001)
Deficit	-0.010** (0.004)
Deficit x IndexWeight	0.002* (0.001)
CreditRating	-0.001 (0.005)
Democracy	0.048 (0.147)
Transparency	0.028 (0.029)
NewLeftGovt	-0.082* (0.032)
NewLeftGovt x IndexWeight	0.015 (0.014)
USIRates	-0.048*** (0.015)
USIRates x IndexWeight	0.000 (0.004)
Full N	2041
Selected (Eligible) N	902
Inverse Mills Ratio	-0.254* (0.111)

* 0.05 ** 0.01 *** 0.001

Country and Year fixed effects

Heckman twostep standard errors

All variables lagged

Figure 1: Average Marginal Effects of Interacted Terms in Table 4 Model

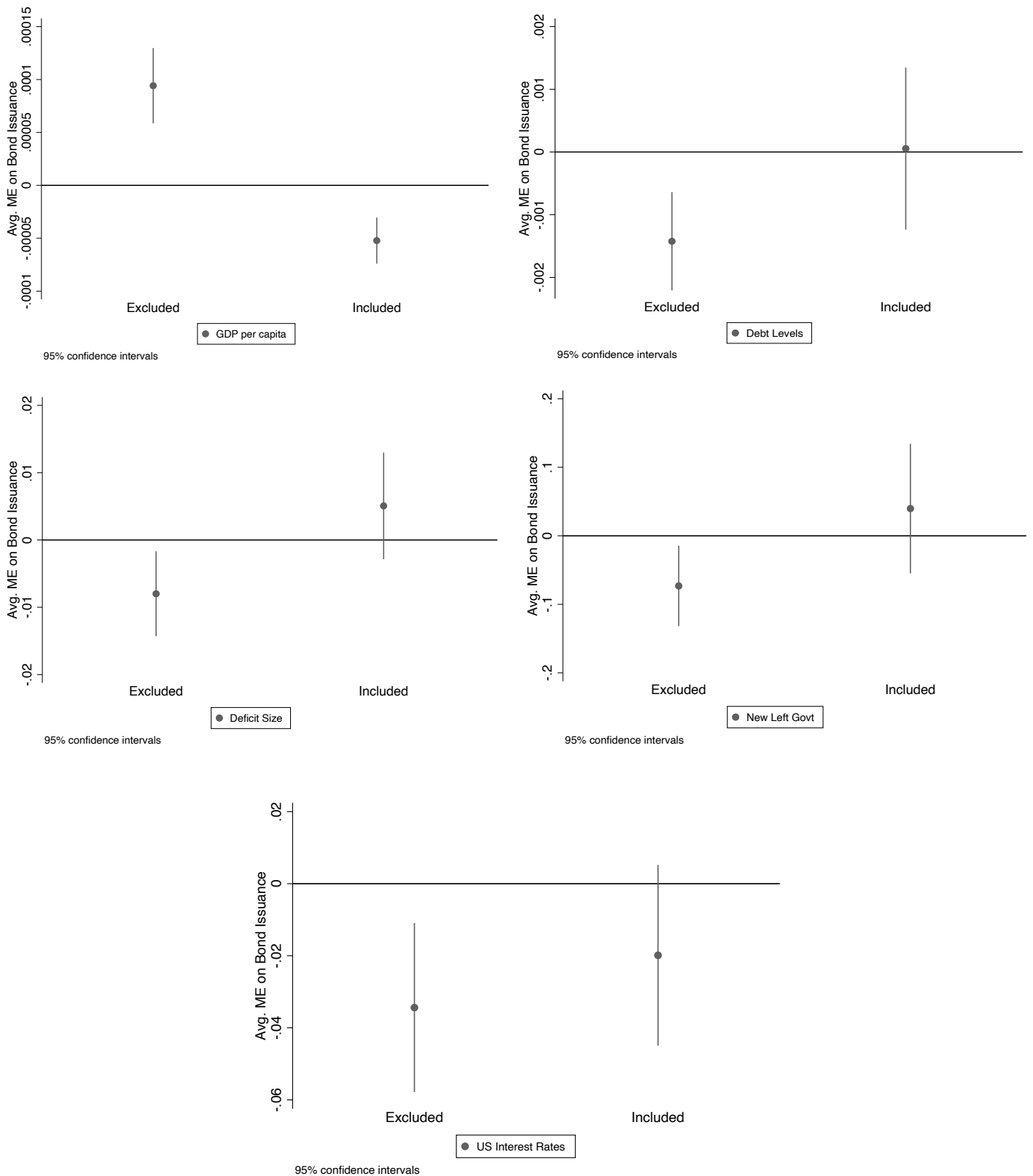
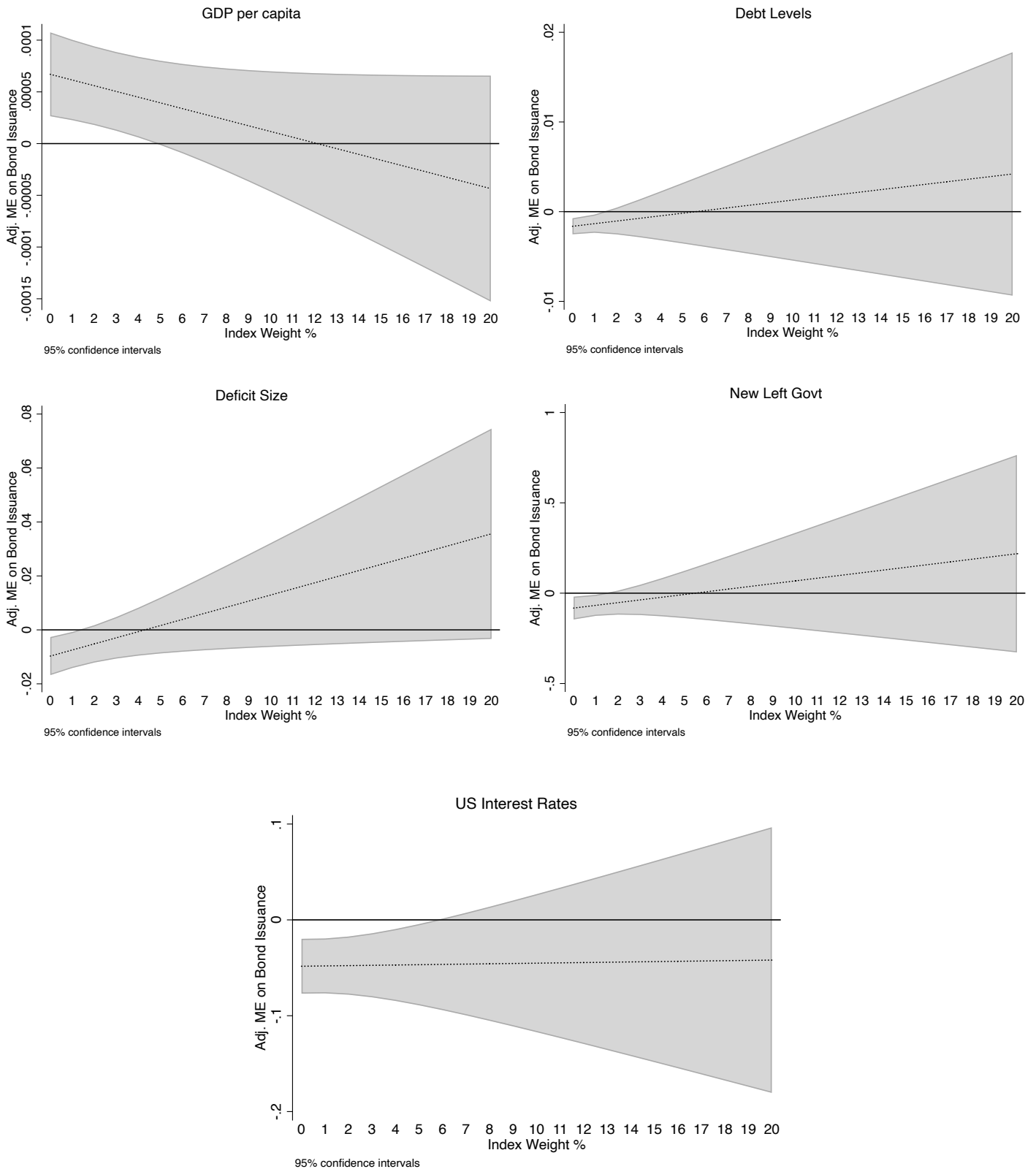


Figure 2: Adjusted Marginal Effects of Interacted Terms in Table 5 Model



Appendix and Robustness Tests

Appendix A provides descriptive statistics. Appendix B lists the EMBIG-eligible developing countries in the full-observation sample. Appendix C includes three tests about the consistency of the dummy estimator and the inclusion/exclusion structural break in the data discussed in Step One. Appendix D uses bond yields as the dependent variable in the same models as above. The results provide suggestive evidence that the relationship between country-specific features and yields may be subject to the same index conditioning effect as the relationship between country specific features and volume of investor demand identified here. However, as discussed at length in the appendix, there are data limitations, subsequent statistical biases, and inconsistent results that mean these estimations must be read with caution. This warrants further investigation in future research. Appendix E presents robustness tests. This includes models that replicate Table 4 and Table 5 but without lagged covariates, models that add commercial bank loans to the denominator of the dependent variable, and a model with central bank independence controls. Results persist.

Conclusion

We examine EM sovereign bond markets, where JP Morgan's EMBIG index is the dominant benchmark index. We show EMBIG inclusion and weights significantly condition the relationship between country-specific characteristics and EM bond issuance. Domestic variables only constrain bond market access for excluded or low-weighted EMs. Included and high-weighted EM bond issuance is not systematically determined by domestic variables. A secondary finding is that index inclusion conditions not only the relationship between country-specific factors and bond market access, but also systemic factors and market access, namely global liquidity. During low-liquidity periods investors divest first from excluded or low-weighted EM

bonds, indicating that index inclusion determines which developing countries are even more adversely affected by global credit cycles. An index like EMBIG has this effect on capital allocation because asset managers passively or actively benchmarking the index are obliged to buy included countries' bonds as dictated by the index. Investors that track indices will continue to hold the EM bonds included in it until they desire to divest from EMs as an asset class.

These findings highlight how recent structural transformations in global finance, namely the rise of index investment, have delegated discipline into the hands of index providers and their index criteria. This has profound implications. To the extent that indices weaken the disciplinary relationship between a borrower's characteristics and capital flows (at least in the short-term), it follows that inclusion should loosen a government's budget constraint, allow them to delay macroeconomic adjustment, and increase autonomy in other policy areas. In short, inclusion should theoretically give governments more leeway to pursue domestic policy preferences. The conditions under which governments take advantage of this position in global financial markets is likely to depend on domestic political factors and is an important avenue for future research.

While inclusion may increase policy autonomy in the short to medium term, this can have perverse long-term consequences. By incentivizing over-borrowing on the demand-side and creating a new form of herding on the supply-side, index investment may increase the likelihood and severity of sovereign debt crises, as benchmarking practices are likely to intensify "sudden stops" in capital flows for countries that have not faced more-gradual discipline in markets (Chari 2022). Furthermore, included countries might see investor flight and deteriorating market access due to exogenous changes such as an increase in the weights of other EMs that reduces their own relative weight, or adjustments in inclusion and weighting criteria.

These implications mean our research highlights the need to look more carefully at market structure to better understand the political economy of financial markets. While we highlight the clear influence of a dominant index provider in the EM sovereign debt market, indexes and benchmark-driven investment practices are a broader phenomenon that increasingly describes many financial markets. The rise of index investment effectively delegates investment decisions to index providers such as JP Morgan, Citigroup, Barclays, and MSCI in markets as varied as equities, corporate debt, and commodities (Petty, Fichtner, and Heemskerk 2019). Research on financial markets needs to account for the unique inclusion and weighting criteria of the indices that govern capital allocation in 21st century financial markets.

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