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Do Inequality, Corruption, and Informality Matter?

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Abstract[*†‡*]

Widening income disparities, higher corruption, and increased informality in many emerging market and developing economies (EMDEs)—all with pressing and mounting fiscal problems—have rekindled interest in the empirical analysis of the key factors determining the occurrence of fiscal consolidations. Using discrete choice models, this paper examines the drivers of fiscal consolidation episodes in a sample of 148 EMDEs between 1980 and 2019, with a focus on Latin American and Caribbean countries. Inequality does not seem to drive consolidations—which are more likely during good economic times—while more informality increases the probability of their occurrence and corruption decreases it. In turn, when examining the drivers of successful consolidations, larger income inequality acts as a boost, while informality is a hinderance. In fact, while the size of the public investment multiplier in Latin America and the Caribbean is larger than in other regions, when informality is high, the multiplier effect is reduced to a much lower and insignificant magnitude. Results are robust to several sensitivity and robustness tests.

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1. Introduction

The COVID-19 pandemic has left a large dent in the government budgets across the world. During 2020, governments had no choice but to increase public spending to fight the pandemic at a time when shrinking economic activity depressed their falling revenues. Consequently, public debt rose by 5 percentage points (pp) on average in 2020, to 46 percent of GDP. In 2021, higher-than-projected inflation reduced public debt-to-GDP ratios in advanced economies (AEs) and emerging markets (EMs) (IMF, 2022). This reprieve is likely to be short lived. As inflation rises, government bonds become less attractive to investors, and the costs of borrowing rises. There are a considerable number of low-income developing countries (LIDCs) that are in debt distress and would need to embark on fiscal consolidation in the foreseeable future, particularly if debt relief is not forthcoming (Clements et al., 2021). In addition, in the context of EMs and LIDCs, the International Monetary Fund (IMF) recently estimated that scarring from the COVID-19 pandemic will increase the already sizable financing needed to achieve the Sustainable Development Goals (Benedek et al., 2021).

Given these developments, the issue of fiscal consolidation will remain pertinent in the foreseeable future for both advanced economies and emerging markets, while being of greater urgency in EMs and LIDCs because of depleting (or a lack of) fiscal space. Fiscal retrenchment to get public finances back on the sustainability track and address fiscal solvency concerns is therefore the path to follow. International institutions such as the IMF project that a large share of countries will pursue fiscal consolidation in the coming years. Such projections are only realistic, however, to the extent that current economic and political conditions are sufficiently conducive to fiscal adjustment. There is considerable literature on fiscal consolidations in AEs—reflecting greater availability of data—focused on the type of fiscal adjustment (spending rather than tax-based) that is durable and more growth friendly. By contrast, studies on EMs and LIDCs are limited, in particular those on the Latin American and Caribbean (LAC) region. At the same time, many developing countries suffer from higher-than-average levels of inequality and informality and poor institutional quality (high corruption), all of which can compromise fiscal consolidations' ability to take off and/or succeed.[4] This is

[4] Some of these issues are being investigated in European countries that underwent consolidation after the global financial crisis of 2008 and failed to achieve it because of these issues (Pappa, Sajedi, and Vella, 2015).

particularly evident in the LAC region, where, despite nearly all countries experiencing a significant decline in income inequality since the early 2000s, structural challenges such as weak labor markets, limited social mobility, and persistent disparities in access to education and health care continue to hinder equitable economic growth.[5]

In fact, more generally, the region has faced significant fiscal challenges over the years, with various countries in the region grappling with high levels of public debt, persistent fiscal deficits, and macroeconomic instability (Eyzaguirre and Santos, 2018). These challenges have posed obstacles to sustainable economic growth, social development, and financial stability. Some key factors contributing to these fiscal challenges include macroeconomic volatility,[6] revenue dependence,[7] informal economy,[8] public expenditure pressures,[9] and political and governance challenges.[10]

The purpose of this empirical paper is fourfold. First, it identifies and characterizes in a novel way fiscal consolidations in a large sample of emerging markets and developing economies (EMDEs). Second, it empirically studies the main determinants of fiscal consolidation. Third, it adds previously neglected dimensions of inequality, corruption, and informality. Finally, it looks at whether drivers are different depending on the compositional nature of the consolidation program; their degree of success is also inspected.

The paper seeks answers to the following more detailed set of questions. What are the key stylized facts characterizing fiscal consolidations in LAC countries? What are the key macroeconomic considerations that induce them to implement fiscal consolidations? Is it high debt, slowing growth, or worsening terms of trade? To what

[5] See, for example, López Calva and Lustig (2010), Gasparini, Cruces, and Tornarolli (2011), Gasparini and Lustig (2011), Azevedo, Inchauste, and Sanfelice (2013), Székely and Mendoza (2015), Gasparini, Cruces, and Tornarolli (2016), and Székely and Mendoza (2016).

[6] LAC economies have experienced high levels of macroeconomic volatility, including fluctuations in commodity prices, exchange rates, and interest rates. These volatile conditions can disrupt fiscal planning and make it challenging to maintain fiscal stability (Céspedes, Chang, and Velasco, 2017).

[7] Many countries in the region rely heavily on a few key sources of revenue, such as commodity exports or specific industries. This dependence exposes governments to significant revenue fluctuations, making it difficult to sustain stable fiscal policies and mitigate fiscal risks (Talvi and Végh, 2005).

[8] A sizable informal economy exists in many LAC countries, leading to tax evasion, low revenue collection, and limited fiscal space. Informality poses challenges for effective fiscal management because it undermines tax compliance, hampers revenue mobilization efforts, and limits the reach of social protection programs (Melguizo and Scartascini, 2015).

[9] The region faces various pressures on public expenditure, including demands for social programs, education, health care, and infrastructure development. Meeting these demands while maintaining fiscal sustainability requires careful expenditure prioritization, efficiency improvements, and effective public administration (Cetrángolo and Lema, 2017).

[10] Political instability, corruption, and weak governance have affected fiscal management in several LAC countries. Lack of political consensus, short-term policy focus driven by electoral cycles, and inadequate institutions can hinder effective fiscal consolidation efforts (Levy-Yeyati and Panizza, 2011).

extent do inequality, corruption, and informality matter? Are there meaningful differences in terms of the composition of fiscal adjustment (i.e., in terms of whether it is expenditure based or tax based)? What makes a consolidation succeed?

To answer these questions, we rely on a new dataset constructed using the first difference of new estimates of the cyclically adjusted primary balance (CAPB) obtained by means of the Hamilton (2018) filter. This is done for a large sample of 148 EMDEs between 1980 and 2019. We find that the duration of a fiscal episode is higher in AEs than in LAC and that the initial fiscal conditions prevailing just before a given episode seem to have had an impact on the size of subsequent fiscal efforts. In addition, the typical fiscal consolidation episode is of short duration (i.e., 2–3 years) and involved relatively modest gains. Then, relying on binary choice models, we find that a consolidation is more likely to take place in "good times": when growth is high, countries experience positive terms of trade shocks, and inflation is low. High debt remains a significant determinant of consolidation because LAC countries have limited access to financial markets compared with AEs. Inequality in the region does not seem to drive consolidations, while more informality and less corruption increase the probability of their occurrence. More-corrupt countries seem less inclined to carry out expenditure-based fiscal adjustments. The opposite is true for those with larger informal sectors. In fact, while the size of LAC's public investment multiplier is larger than in other country groups, when informality is high the multiplier effect gets reduced to a much lower and insignificant magnitude. Results are robust to several sensitivity and robustness tests, including, inter alia, alternative consolidation measures that use forecast errors, narrative approaches, and the use of other estimators.

The remainder of the paper is organized as follows. Section 2 reviews the relevant literature. Section 3 discusses the empirical methodology and Section 4 presents the data together with key stylized facts. Section 5 discusses the empirical results and Section 6 concludes and elaborates on policy implications.

2. Literature Review

This paper focuses on the conditions that may lead countries to embark on fiscal consolidation, the success of fiscal consolidation, and to what extent inequality, corruption, and informality have an impact on such an adjustment process. Hence, the paper relates to four strands of literature: (i) the determinants of fiscal consolidations, (ii) the relationship between inequality and fiscal consolidations, (iii)

the relationship between corruption and fiscal consolidations, and (iv) the relationship between informality and fiscal consolidations. Most of the existing literature is sufficiently general and, consequently, does not specifically factor in or address idiosyncrasies (or problems) in the LAC region that might hinder the success of a fiscal consolidation program.

Fiscal consolidations—which involve reducing budget deficits and stabilizing public debt—are crucial for sustainable economic growth and financial stability. Understanding the determinants of fiscal consolidations can provide insights for policymakers to design effective consolidation strategies. The literature examining the determinants of fiscal consolidations focuses on the factors that influence the success or failure of such consolidation efforts, including macroeconomic factors, political factors, and structural factors.

First is the set of macroeconomic factors. First and foremost, economic growth plays a significant role in determining the success of fiscal consolidations (Alesina and Ardagna, 2010; Fatás and Mihov, 2013). Higher economic growth can lead to increased tax revenues and reduced spending on unemployment benefits, thereby easing the fiscal adjustment process. Studies have shown that fiscal consolidations implemented during periods of economic expansion tend to be more successful than those implemented during recessions. However, the relationship between growth and consolidation is complex because consolidation measures themselves can impact economic growth. Therefore, policymakers need to strike a balance between fiscal discipline and supporting economic activity. Second, interest rates have implications for the cost of public debt, which is a crucial consideration in fiscal consolidations (Giavazzi and Pagano, 1990; Perotti, 1996). Higher interest rates can increase debt servicing costs, making fiscal adjustments more challenging. Conversely, lower interest rates can create more favorable conditions for consolidations by reducing the burden of interest payments. However, the relationship between interest rates and fiscal consolidations is influenced by factors such as monetary policy, inflation expectations, and market perceptions of a country's creditworthiness. Third, inflation can impact fiscal consolidations through its effects on public debt dynamics and economic growth (Alesina and Perotti, 1996; Alesina, Ardagna, and Trebbi, 2006). Higher inflation erodes the real value of public debt (denominated in local currency), making it easier to achieve debt reduction

targets.[11] However, excessively high inflation can undermine macroeconomic stability and negatively affect investor confidence. Moreover, inflation can also influence the effectiveness of fiscal measures by affecting consumption, investment, and tax revenues. Thus, policymakers must carefully manage inflation dynamics while implementing consolidation strategies. Fourth, exchange rate fluctuations can have important implications for fiscal consolidations, especially in economies with high external debt or significant exposure to foreign currency (Corsetti, Meier, and Müller, 2012; Kalemli-Ozcan, Sørensen, and Yosha, 2012). Depreciation of the domestic currency can increase the cost of servicing foreign currency debt, putting additional pressure on fiscal consolidation efforts. Moreover, exchange rate movements can impact inflation, import/export competitiveness, and external demand, thereby influencing the effectiveness of fiscal measures.

Turning to the political factors, the institutional framework within which fiscal consolidations take place plays a crucial role in their success (Alesina and Perotti, 1995; Hallerberg and Marier, 2004). Strong and independent institutions, such as fiscal councils or independent central banks, can enhance fiscal discipline and provide credibility to consolidation efforts. Effective institutions can help overcome political resistance, ensure transparency, and enforce fiscal rules. In contrast, weak institutional arrangements can hinder consolidation efforts, leading to policy reversals or inadequate implementation of fiscal measures. In addition, electoral considerations can significantly affect the timing and composition of fiscal consolidations (Drazen and Eslava, 2010; Potrafke, 2013). Politicians may be reluctant to implement unpopular measures close to elections, potentially leading to delay or insufficient consolidation efforts. On the other hand, post-election periods can provide windows of opportunity for governments to implement necessary but politically challenging reforms. Understanding the interplay between electoral cycles and fiscal consolidations is crucial for designing realistic and effective consolidation strategies. Moreover, political ideology can shape policymakers' preferences for fiscal consolidation strategies (Alesina and Passalacqua, 2015; Besley and Persson, 2011). Conservative or right-leaning governments tend to prioritize fiscal discipline, emphasizing expenditure cuts and tax increases. In contrast, left-leaning governments may focus on growth-oriented policies, relying more on revenue

[11] That said, Hilscher, Raviv, and Reis (2022) find that inflation by itself is unlikely to lower the U.S. fiscal burden significantly because debt is concentrated at short maturities and perceived inflation shocks have little short-run persistence and are small.

enhancement measures and public investment. The ideological orientation of governments can influence the choice of consolidation measures, the speed of adjustment, and the distributional impact of consolidation efforts. Furthermore, public support or opposition to fiscal consolidations can influence their success (Guichard, Kennedy, and Wurzel, 2007; Tommasi and Velasco, 1996). Public opinion may reflect concerns about the distributional impact of consolidation measures or skepticism about their effectiveness. Governments that have a broad consensus and public understanding of the need for fiscal adjustments are more likely to implement and sustain successful consolidation programs. Communication strategies that engage and educate the public about the necessity and benefits of consolidation can help build support for such measures.

Next, several structural factors can be identified as drivers of consolidations. The size and composition of the public sector can affect the feasibility and effectiveness of fiscal consolidations (Alesina and Perotti, 1997; Kopits and Symansky, 1998). High levels of public expenditure and extensive government intervention in the economy can create rigidities and reduce the flexibility to adjust spending. Reforms that aim to streamline public administration, reduce redundant expenditures, and improve the efficiency of public services can contribute to successful consolidation efforts. Second, the structure of the tax system can influence the feasibility and fairness of fiscal consolidations (Arnold, 2008; Keen and Lockwood, 2010). A well-designed tax system with a broad tax base, low tax evasion, and a balanced mix of direct and indirect taxes can enhance revenue mobilization. Tax reforms that improve tax compliance, reduce distortions, and promote economic efficiency can support consolidation efforts while minimizing negative impacts on growth and income distribution. Third, the composition of public expenditures can affect the effectiveness of fiscal consolidations (Hall and Jones, 1999; Perotti, 1999). Targeted spending cuts or efficiency improvements in non-productive areas, such as subsidies or bureaucracy, can create fiscal space for priority areas, such as education, health care, or infrastructure. Strategic allocation of resources can contribute to sustainable fiscal consolidation while preserving key public investments necessary for long-term growth.

Turning to the second stream of literature, inequality can influence the political feasibility of fiscal consolidations. High levels of inequality may create social and political pressures for redistribution, making it challenging for policymakers to implement consolidation measures that could exacerbate inequality (Alesina and

Perotti, 1996). The political economy of fiscal consolidations is shaped by the interests and preferences of different income groups and their ability to influence policy decisions (Persson and Tabellini, 1994). The level of inequality in a society can affect public support and social acceptability of fiscal consolidations. When inequality is high, there may be a greater demand for redistributive policies, and consolidation measures that are perceived as disproportionately burdening certain income groups may face resistance (IMF, 2017). Public support for consolidation measures can be influenced by perceptions of fairness and equity. Inequality can have implications for economic growth and macroeconomic stability, which can, in turn, affect the likelihood of fiscal consolidations. High levels of inequality can hinder economic growth and stability by reducing aggregate demand and creating social and political tensions (Berg and Ostry, 2011). Lower growth rates and macroeconomic instability can make fiscal consolidations more challenging to achieve and sustain. The level of inequality can impact a country's fiscal capacity and its ability to generate sufficient revenues for consolidation measures. Inequality affects tax revenues because higher-income individuals tend to have a greater ability to engage in tax planning and evasion (Cingano, 2014). Thus, countries with higher levels of inequality may face greater challenges in generating revenues to support fiscal consolidations. Inequality can contribute to social and political instability, which can impede the implementation of fiscal consolidations. High levels of inequality may be associated with social unrest, protests, and political instability (Alesina and Perotti, 1996). These factors can create uncertainty and hinder the political will and stability necessary for successful consolidation efforts.

Turning to the third stream of literature, corruption can significantly impact the likelihood of successful fiscal consolidations. Corruption can distort policy priorities, diverting resources away from necessary fiscal consolidation measures. Funds intended for consolidation efforts may be siphoned off through bribery, embezzlement, or other corrupt practices, reducing the available resources for consolidation (Kaufmann and Vicente, 2011). As a result, the likelihood of implementing effective consolidation measures can be diminished. Corruption undermines institutions and weakens governance structures, making it more difficult to implement and sustain fiscal consolidations. Weak institutional frameworks can facilitate corrupt practices, erode public trust, and impede the enforcement of fiscal rules and regulations (Mauro, 1998). In such environments, the likelihood of successful consolidation efforts decreases. Corruption erodes public

trust in government and reduces public support for fiscal consolidations. When corruption is prevalent, citizens may be less willing to accept austerity measures or contribute to fiscal adjustment efforts if they perceive that their sacrifices will be undermined by corrupt practices (Dreher and Gassebner, 2013). This lack of public support can hinder the implementation and success of fiscal consolidations. Corruption can lead to the misallocation of resources, diverting funds from productive investments and infrastructure development. This misallocation can hamper economic growth and impede the effectiveness of fiscal consolidation efforts (Wei, 2001). Inefficient use of resources due to corruption reduces the potential benefits of consolidation measures. Corruption hampers transparency and accountability in fiscal management, making it difficult to track the use of public funds and assess the progress of consolidation efforts. Lack of transparency increases the risk of hidden deficits, off-budget expenditures, and noncompliance with fiscal targets (Aidt and Dutta, 2008). Without transparent processes and accountability mechanisms, the likelihood of successful fiscal consolidations is diminished.

Finally, turning to the fourth stream of literature, informality can have implications for the likelihood of successful fiscal consolidations. Informality often leads to a smaller tax base and lower tax compliance rates. The presence of a large informal sector can limit the government's ability to generate sufficient tax revenues, thereby impeding fiscal consolidation efforts (Schneider and Enste, 2000). The reduced tax base restricts the available resources for consolidation measures, making it challenging to achieve fiscal targets. Informal workers often have limited or no access to social security systems and safety nets. They may rely more heavily on public services and welfare programs, placing additional strain on public finances (Melguizo and Scartascini, 2015). In the context of fiscal consolidation, the lack of comprehensive social protection measures for informal workers can create challenges in ensuring equitable burden-sharing. Informality is often associated with weak governance structures and the prevalence of informal practices. This can undermine the rule of law, erode public trust, and impede the implementation and enforcement of fiscal consolidation measures (Perry, Maloney, and Arias, 2007). Weak governance hampers the effectiveness of fiscal policies and reduces the likelihood of successful consolidation efforts. The resistance of the informal economy to formalization can pose challenges for fiscal consolidations. Fiscal policy affects the incentives to tax evade both directly, through the tax burden, and indirectly, through its effects on the formal economy (Slemrod, 2019). Thus, a fiscal consolidation can

have important secondary effects if it generates a reallocation of resources between the formal and informal sectors and implies that a larger increase in the tax rate is needed to reduce debt, and this amplifies the distortionary effects of the consolidation (Pappa, Sajedi, and Vella, 2015). Informal businesses may resist formalization due to concerns about increased tax burdens, regulatory compliance, and limited access to credit and public services (Maloney and Valencia, 2017). The persistence of informality makes it difficult for governments to expand the tax base and implement measures to reduce fiscal imbalances. Because informal economic activities often operate outside formal regulatory frameworks, they remain untaxed and unregulated, limiting the government's ability to generate revenue and enforce fiscal policies effectively. This incomplete coverage of tax collection and regulatory oversight weakens the impact of fiscal measures, making it harder to address economic imbalances and achieve fiscal consolidation objectives (Maloney and Valencia, 2017). As a result, fiscal policies are less effective, and governments face greater challenges in stabilizing public finances.

3. Methodology

3.1. Defining Fiscal Consolidation Episodes

Fiscal consolidation episodes have been documented in the literature using one of two techniques. The first is a "narrative" approach, while the second one relies on an ad hoc criterion based on changes in the CAPB. Per the first approach, fiscal consolidation episodes are identified from approved budget plans and historical accounts of past fiscal policy. This approach was first popularized by Romer and Romer (2010) as well as Devries et al. (2011), who subsequently published a list of fiscal consolidation episodes for 17 AEs between 1978 and 2009. Proponents of this "policy action" based approach argue that the fiscal measures identified are unaffected by the cycle (because their construction is "bottom up"), thereby minimizing identification problems[12] as well as risks of reverse causality (Guajardo, Leigh, and Pescatori, 2014). More recently, Alesina et al. (2015) updated the Devries et al. (2011) database for a subset of European countries with data from 2014. More recently and following Devries et al.'s (2011) approach, David and Leigh (2018) presented a new database of fiscal consolidations for 14 LAC economies during 1989–2016. They

[12] Nevertheless, as Jordà and Taylor (2016) argue, said fiscal shocks may not be exogenous and can be predicted by given macroeconomic covariates.

focused on discretionary changes in taxes and government spending primarily motivated by a desire to reduce the budget deficit and long-term fiscal health and not by a response to prospective economic conditions. To identify the motivation and budgetary impact of the fiscal policy changes, we examine contemporaneous policy documents including budgets and central bank, IMF, and Organisation for Economic Co-operation and Development (OECD) reports. All in all, the narrative approach does not come without a series of drawbacks: it relies on judgment calls and may not eliminate endogeneity problems (i.e., fiscal policy reacting to changes in output and not the other way around).

The narrative approach to identifying fiscal consolidation episodes cannot be considered in this paper for several reasons. First, our analysis focuses on a large and diverse sample of EMDEs, including many LAC countries, making the application of a narrative approach logistically challenging. Second, the existing publicly available datasets that employ a narrative approach, such as those compiled by Devries et al. (2011) and Alesina et al. (2015), are limited to only 17 AEs and do not extend beyond 2014, leaving them outdated and incomplete for our purposes. Finally, replicating this approach across more than 80 EMDEs for the entire study period would be a resource-intensive endeavor, with high risk of inconsistencies due to varied economic and institutional contexts. This said, for LAC countries, we complement our primary analysis by using the narrative dataset by David and Leigh (2018) for a subset of 14 countries, where feasible, to add depth to the study while maintaining methodological rigor.

Hence, the analysis that follows relies on changes in the CAPB. In relation to this approach, literature has adopted several alternative conventions. For instance, a high threshold for the minimum increase (or "improvement") in the CAPB-to-GDP ratio to reduce the probability of single-year fiscal consolidation episodes was applied by Giavazzi and Pagano (1996). They used an annual threshold of 3 percentage points (pp) of GDP. As an alternative to the above, they also proposed using cumulative changes in the CAPB-to-GDP ratio of 5, 4, and 3 pp over four, three, and two years respectively. Adding some flexibility regarding time horizons, Alesina and Ardagna (1998) allowed for more single-year fiscal consolidation episodes. However, they considered changes in the CAPB-to-GDP ratio of at least 2 pp in one year or 1.5 pp, on average, over two years. Afonso (2010), in turn, allowed for relative thresholds based on sample characteristics. Specifically, Afonso (2010) defines a fiscal consolidation episode when the annual change in the CAPB-to-GDP ratio is at least

1.5 times the sample standard deviation (or equal to one sample standard deviation, on average, over two years). As there is no single, agreed-upon definition in the literature, and being aware of best practices reviewed above, we adopt a middle-ground approach in defining CAPB-to-GDP change thresholds for the determination of fiscal consolidation episodes. We opt for the Alesina and Perotti (1997) approach, under which a fiscal consolidation episode is defined as a minimum annual improvement in the CAPB-to-GDP ratio of 0.5 pp over two consecutive years.[13]

Another relevant issue is the CAPB measure of choice. CAPB data can be obtained either via a publicly available source (e.g., the IMF's World Economic Outlook [WEO] database) or computed using a filtering approach (by decomposing GDP and government revenues into their cyclical and trend components). In relation to this, there is no clear consensus in the literature regarding the "optimal" way to estimate potential output. According to Borio, Disyatat, and Juselius (2017), past studies have applied (i) univariate statistical approaches, usually consisting of filtering out the trend component from the cyclical one, or (ii) structural approaches, deriving the estimates directly from a theoretical model. Aware of the shortcomings of using either of the two approaches[14] and the disadvantage of not maximizing the total number of observations in our panel database when using the WEO CAPB,[15] we apply a filtering technique.

Once the potential output (and, consequently, the output gap) is obtained, we use it to compute a new measure of the CAPB. Reflecting the fact that the elasticity of government revenues (REV) to output growth is close to one while primary expenditure (PEXP) is largely inelastic to growth (i.e., we assume the same as Girouard and André, 2005), we multiply government revenues by the factor [1/(1+OG/100)] to calculate $\mathrm{REV}_{\mathrm{adj}}$ (adjusted government revenues), with OG being the output gap obtained via the Hodrick-Prescott(HP) or Hamilton filters.[16] Mathematically, we have:

[13] The start year of a fiscal consolidation episode is, therefore, the year in which there is a minimum annual improvement in the CAPB-to-GDP ratio of 0.5 pp, if there is also a minimum annual improvement in the CAPB-to-GDP ratio of 0.5 pp in the following year. Accordingly, the end year of a fiscal consolidation episode is the last year (in a sequence of years) with a minimum annual improvement in the CAPB-to-GDP ratio of 0.5 pp, after which the annual CAPB-to-GDP either improves by less than 0.5 pp or worsens (i.e., decreases).

[14] Statistical methods suffer from the end-point problem—that is, they are extremely sensitive to the addition of new data and to real-time data revisions. Structural models, on the other hand, may be difficult to implement consistently in cross-sectional environments and rely on the imposition of pre-determined assumptions.

[15] The IMF does not have an official method for computing potential output. While the most common IMF approach relies on a production function, assumptions vary greatly across countries.

[16] For a discussion of these approaches, see, for example, Hamilton (2018).

$$\mathrm{CAPB} = \mathrm{REV}_{\mathrm{adj}} - \mathrm{PEXP}. \quad (1)$$

Composition-wise, a fiscal consolidation episode is defined as an expenditure-based episode if the ratio of the cumulative fall in the primary expenditure-to-GDP ratio (defined as the sum of all annual changes in the primary expenditure-to-GDP ratio within the episode) to the cumulative adjustment (defined as the sum of all annual changes in the CAPB-to-GDP ratio) is larger than (or equal to) 2/3 in absolute value. If the sum of all annual changes in the primary expenditure-to-GDP ratio within a fiscal consolidation episode is positive, the episode is classified as a tax-based consolidation. All remaining cases are classified as "mixed" consolidation episodes. Succinctly, a fiscal consolidation episode is defined as expenditure based when $\frac{|\Delta \mathrm{PEXPC\_GDP}|}{|\Delta \mathrm{CAPBC\_GDP}|} \geq 2/3$ and $\Delta \mathrm{PEXPC\_GDP} < 0$, with $\mathrm{CAPBC\_GDP}$ and $\mathrm{PEXPC\_GDP}$ denoting cumulative CAPB and primary expenditure (in percent of GDP) within a given episode. Conversely, a fiscal consolidation episode is defined as tax based when $\Delta \mathrm{PEXPC\_GDP} \geq 0$. It follows that any episodes that do not satisfy the criteria set forth above are classified as mixed fiscal consolidation episodes.

Weighing the aforementioned factors, our preferred specification for the definition of fiscal consolidation episodes in this paper will employ a CAPB change threshold of 0.5 pp over two consecutive years (Alesina and Perotti, 1997), with the CAPB data obtained based on the Hamilton filter (yielding our "Hamilton-based" criterion for fiscal consolidations). This specification comes with several advantages, namely: (i) allowing us to maximize our sample size by identifying more than 1,000 (450) fiscal consolidation years (episodes) across 185 countries (37 AEs and 148 EMDEs) between 1980 and 2019 (for our purposes only EMDEs will be used in the empirics), (ii) ensuring broad consistency and comparability with the already-established literature on fiscal consolidations (most of which relies on CAPB metrics), and (iii) prioritizing relatively durable fiscal consolidations as opposed to one-off shocks to CAPB levels (given that the CAPB threshold criterion is applied to CAPB-to-GDP changes over two years as opposed to a single year).

Table 1. Fiscal Consolidation Episodes in LAC by Criteria

Country	WEO FC episode	HP FC episode	Hamilton FC episode
Argentina	2002–2004, 2018–2019	2002–2004, 2017–2019	2002–2004, 2017–2019
Belize	none	2004–2008, 2010–2011, 2016–2018	2001–2002, 2004–2006, 2016–2018
Bolivia	none	1994–1995, 2003–2006	1989–1990, 1994–1995, 1999–2000, 2003–2006
Brazil	1998–1999, 2016–2017	1998–1999	none
Chile	2004–2006, 2010–2011	2003–2006, 2010–2011	2003–2006, 2010–2011
Colombia	2011–2012	1990–1991, 2000–2001, 2012–2012	1990–1991, 2000–2001, 2011–2012
Costa Rica	none	2005–2007	2005–2007
Dominican Republic	2004–2005	2004–2005, 2013–2015	2004–2005, 2013–2015
Ecuador	none	1999–2000, 2010–2011, 2017–2018	1999–2000, 2010–2011, 2017–2018
El Salvador	2003–2004, 2016–2017	2003–2004, 2016–2017	1993–1994, 2003–2004, 2016–2017
Guyana	2009–2010, 2012–2013	2007–2008	2008–2009
Honduras	none	1991–1992, 1994–1995, 2004–2005, 2010–2011, 2014–2015	1991–1992, 1994–1995, 2004–2005, 2010–2011, 2014–2015
Jamaica	none	1998–2000, 2012–2013	1998–2000, 2012–2013
Mexico	1999–2001, 2016–2017	2000–2001, 2015–2017	
Panama	1999–2000, 2005–2007	1995–1996, 1999–2000, 2005–2007, 2015–2016	1995–1996, 1999–2000, 2005–2007
Paraguay	none	1985–1986, 1989–1990, 1993–1994, 2003–2004, 2010–2011	1985–1986, 1989–1990, 1997–1998, 2003–2004, 2010–2011
Peru	2006–2007, 2010–2011, 2018–2019	2006–2007, 2010–2011, 2018–2019	1999–2001, 2016–2017
Suriname	2006–2007, 2016–2018	1992–1996, 2003–2007, 2016–2017	1994–1995, 2006–2007, 2017–2018
Trinidad and Tobago	none	1989–1991, 2018–2019	1989–1991, 2007–2008, 2018–2019
Uruguay	2001–2003	2001–2004	2002–2003
Venezuela	none	1989–1990, 1995–1996, 1999–2000, 2002–2005	1989–1990, 1995–1996, 1999–2000, 2002–2005, 2019

Source: Authors' elaboration.

Note: "FC" = fiscal consolidation.

3.2. Empirical Approach

Our aim is to explore whether income inequality, corruption, and informality (ICI for short) affect the likelihood of consolidating public finances while controlling for other variables identified in the literature as affecting the implementation of fiscal consolidations. Hence, our main dependent variable of interest is the occurrence of a fiscal consolidation episode. To capture this, we rely on a fiscal consolidation (FC)

dummy for country *i* in year t that takes the value of 1 if country *i* is in a fiscal consolidation episode (as defined above) in year t (0 otherwise). Based on this binary characterization, our baseline empirical exercise consists of estimating logistic regressions to assess the likelihood of a given country experiencing a fiscal consolidation year, with the counterfactual being the opposite of this (i.e., not experiencing a fiscal consolidation year). We estimate the following model:

$$\text{Prob}(\text{FC} = 1|X) = \Phi(ICI'\boldsymbol{\alpha} + X'\boldsymbol{\beta}), \tag{2}$$

where $\alpha, \boldsymbol{\beta}$ are vectors of the parameters to be estimated; ICI is a proxy for inequality, corruption, or informality; X is a vector of control variables; and $\Phi(\cdot)$ is the logistic function. Our list of control variables includes the real GDP growth rate, the rate of inflation, and the debt-to-GDP ratio. These variables are sourced from the April 2022 IMF WEO vintage. We also add trade openness (proxied by the value of imports and exports in percent of GDP), percent changes in the terms of trade, and percent changes in the real effective exchange rate from the World Bank's World Development Indicators (WDI) database as controls. The model associated with equation (2) can be written as:

$$FC_{it} = \boldsymbol{\alpha} ICI_{it-1} + \boldsymbol{\beta} X_{it-1} + \varepsilon_{it}, \tag{3}$$

where, again, the FC variable takes the value 1 if a fiscal consolidation episode takes place (i.e., we allow for multi-year fiscal consolidation episodes): $FC_{\text{it}} = 1$ if a fiscal consolidation takes place in country *i* during year t (0 otherwise); *i* = 1, ..., N; t is the year; and ε_{it} is an independent and identically distributed (i.i.d.) error term. In this case, each set of estimates $\widehat{\boldsymbol{\alpha}}$ and $\widehat{\boldsymbol{\beta}}$ is interpreted as showing (the rise or fall in) the likelihood of a fiscal consolidation year being experienced by country *i*.

4. Data and Stylized Facts

Macroeconomic data come from the IMF's April 2022 WEO database. These include real GDP, the budget-balance-to-GDP ratio, CAPB (percent of GDP), total government revenues (percent of GDP), primary government expenditures (percent of GDP), the CPI inflation rate (percent), and government gross debt (percent of GDP). Additional information on trade openness (value of exports and imports, percent of

GDP), changes in the terms of trade, and changes in the real exchange rate come from the World Bank's WDI database as mentioned above.

Inequality proxies are given by the Gini index, which goes from 0 to 100, with the latter denoting more unequal income distribution. Several sources are used. The first is Solt's (2009, 2020) Standardized World Income Inequality Database (SWIID), which covers 177 countries from 1960 to the present and includes both gross (market) and net (dispensable) Gini. The SWIID dataset combines income information from the United Nations World Income Database (UNWIDER) and the Luxembourg Income Study (LIS). SWIID provides comparable standardized Gini coefficients to measure income inequality based on estimates of market (pre-taxes and transfers) and net (post-taxes and transfers) income inequality. This thus allows the comparison of income disparities before and after redistribution by taxation and transfers over time. Note that taxes determine households' disposable income available for consumption and thus influence the income distribution. However, disposable income does not consider indirect taxes. This creates a limitation when only disposable income is considered. As a result, we look at both pre-tax-and-transfers and post-tax-and-transfers Gini indices.[17] According to Poterba (2007), using the latter mitigates the reverse causality problem because post-tax-and-transfers vary "mechanically" and "economically" with the fiscal system whereas the pre-tax-and-transfers measure varies solely through the endogenous responses of labor supply or the general equilibrium effect on factor prices. We use both the market and net income Gini indices, with high coverage across countries and over time, in the estimations.[18]

The second is Milanovic's All Ginis dataset, which represents a compilation and adaptation of income or consumption Gini coefficients (calculated across households or household per capita, on gross or net basis) retrieved from nine sources and ends in 2017. Out of these nine sources the following are used due to

[17] The Gini indicators based on disposable income cover the total market income received by all household members (gross earnings, self-employment income, and capital income), plus the current cash transfers they receive, less income and wealth taxes, social security contributions, and current transfers that they pay to other households.

[18] The imputation methodology to standardize observations collected from various sources makes these series subject to measurement uncertainty (Jenkins, 2015). Indeed, there are some concerns about the reliability of SWIID's imputed estimates particularly in data-poor regions (Jenkins, 2015). That said, Ferreira, Lustig, and Teles (2015) compared eight inequality datasets and conclude that "although there is much agreement across these databases, there is also a non-trivial share of country/year cells for which substantial discrepancies exist" and that "the methodological differences […] often appear to be driven by a fundamental trade-off between a wish for broader coverage on the one hand, and for greater comparability on the other."

sample limitations for the region under scrutiny (LAC): POVCAL, SEDLAC, World Income Distribution (WID), and WIDER.

For corruption two sources are used. The first is the World Bank's Country Policy and Institutional Assessment (CPIA) transparency, accountability, and corruption variable in the public sector (rating 1–6, with 6 denoting a better score). The second is the Corruption Perceptions Index (CPI) from Transparency International, which ranks 180 countries around the world by their perceived levels of public sector corruption (results are given on a scale of 0 [highly corrupt] to 100 [very clean]). For both indices their respective mirrors are computed so that the reading is as follows: the larger the value, the more corrupt the country in a given year.

For informality two sources are used. The first is the Elgin et al. (2021) dataset on informality, which includes several proxies: Dynamic Stochastic General Equilibrium (DSGE) model–based estimates of informal output (percent GDP) and multiple indicators multiple causes (MIMIC) model–based estimates of informal output (percent GDP), self-employment (percent total employment), and informal employment (percent total employment).[19] The second source for informality is from the International Labor Organization (ILO) and includes the total informality rate (percent).

To maximize coverage (particularly within LAC), the preferred sources for our three dimensions are the SWIID for inequality, the CPI for corruption, and Elgin et al. (2021) DSGE-based estimates of informal output (percent GDP) for informality. That said, sensitivity is done using alternative proxies of the different concepts.

Table 2 provides comparative summary statistics between AEs and Latin America. We observe that the number of fiscal episodes is significantly lower when we consider the WEO-based consolidation criterion compared with the HP-based or Hamilton-based criteria. This is particularly salient in the case of Latin America, where there were only 61 WEO-based consolidations versus 192 HP-based and 183 Hamilton-based. Also, the average adjustment in percent of GDP is lower when the former criteria is used (less than 2 percent of GDP when using WEO-based and more than 2 percent of GDP with HP- or Hamilton-based). So, using the WEO underestimates the average size of consolidations due to data limitations. In addition, the duration of a

[19] MIMIC is essentially a structural model where the shadow economy is estimated from a system of equations composed of economic and institutional variables. The DSGE variable comes from a deterministic DGE model initially proposed by Elgin and Oztunali (2012).

fiscal episode is higher for AEs than the duration observed for Latin America. In fact, while the reported duration is, on average, three years for AEs, the duration of fiscal episodes for Latin America is slightly lower at 2.5 years. The full set of episodes by Latin American country (with corresponding years) is provided in Table A1 in the Appendix. For instance, two methods—WEO and HP—that determine fiscal consolidation episodes on the basis of the change in the CAPB essentially coincide in identifying, for instance, the fiscal contractions of Argentina in 2002–2004 or Brazil in 1998–1999.

Table 2. Summary Statistics of Fiscal Consolidations by CAPB Measure and per Criterion of Economic Development

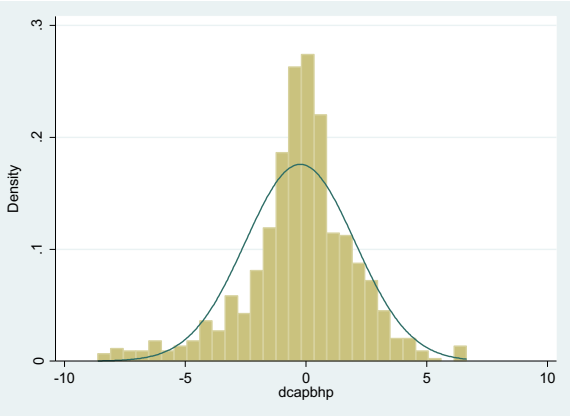
	Advanced Economies			
	Total # years of FC episodes	Avg. # FC episodes	Avg. size of adjustment in FC episode (% GDP)	Avg. duration of FC episode (years)
WEO-based	191	1.65	1.72	3.21
HP-based	267	2.25	1.94	3.14
Hamilton-based	276	2.35	1.87	3.05
	Latin America			
	Total # years of FC episodes	Avg. # FC episodes	Avg. size of adjustment in FC episode (% GDP)	Avg. duration of FC episode (years)
WEO-based	61	1.59	1.99	2.34
HP-based	192	2.06	2.53	2.66
Hamilton-based	183	2.33	2.17	2.64

Source: Authors' calculations.
Notes: "FC" = fiscal consolidation. Average size of adjustment in FC episode is the cumulative adjustment (defined as the sum of all annual changes in the CAPB-to-GDP ratio within the episode) within a given episode, divided by the duration (total number of years) of the episode. Average duration of FC episode (years) is the sum of all years during which a country has consolidated within a given episode.

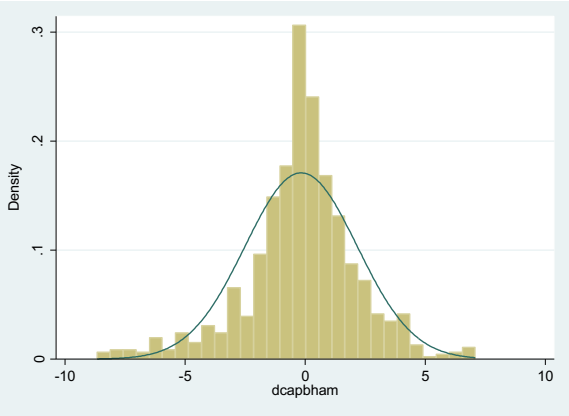
Figure 1 reports the distribution of changes in CAPB (percent of GDP) in LAC. In the rest of the text we will refrain from presenting WEO-based evidence and focus instead on HP- and Hamilton-based consolidations.

Figure 1. Changes in CAPB (percent of GDP) during Fiscal Consolidations in Latin America and the Caribbean

HP-based consolidations



Hamilton-based consolidations

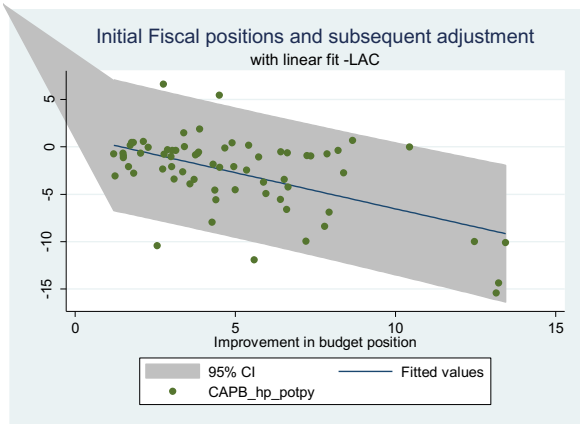


Source: Authors' calculations.
Note: The figure plots both the histogram and Kernel densities for each criterion (HP and Hamilton) for LAC.

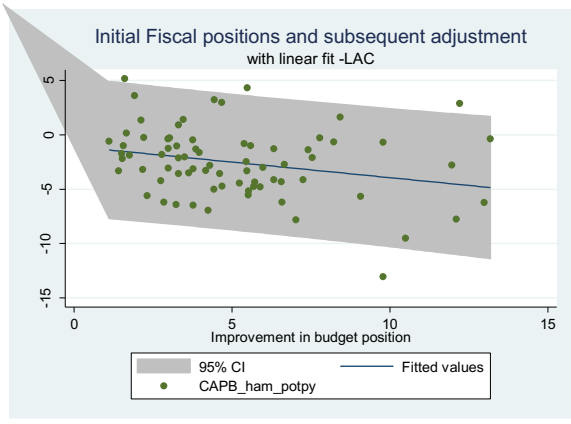
As far as the characteristics of fiscal consolidation episodes, initial fiscal conditions prevailing just before a given consolidation episode seem to have had an impact on the size of subsequent fiscal efforts (Figure 2). The lower the CAPB, the larger the ensuing fiscal consolidation. This may reflect that large budget deficits made it more necessary to consolidate and, at the same time, raised public awareness of the extent of the fiscal imbalance problem, making it easier to act.

Figure 2. Initial Fiscal Imbalance and Subsequent Adjustments to Fiscal Consolidations in Latin America and the Caribbean

HP-based consolidations



Hamilton-based consolidations

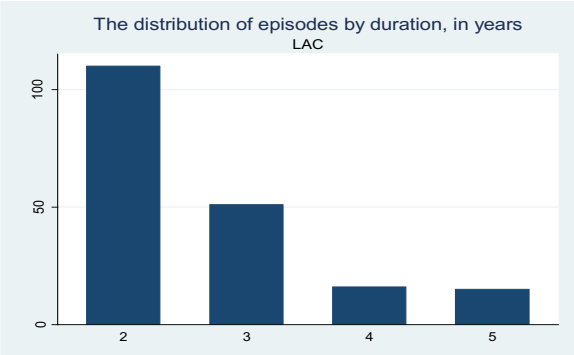


Source: Authors' calculations.

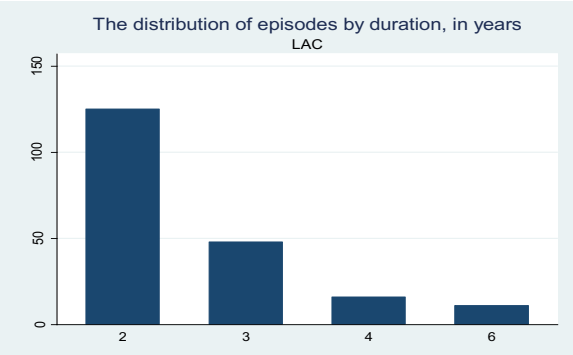
Most of the fiscal consolidation episodes in LAC were of short duration (see the top two panels in Figure 3, but with some exceptions—see Table A1 in the Appendix) and involved relatively modest gains (see bottom panels of Figure 3). However, there were a number of large efforts, amounting to improvements of more than 10 percent of GDP. It is also possible to observe that, in general, sizable fiscal consolidations lasted for longer periods and smaller consolidations had a shorter duration (Figure 4).

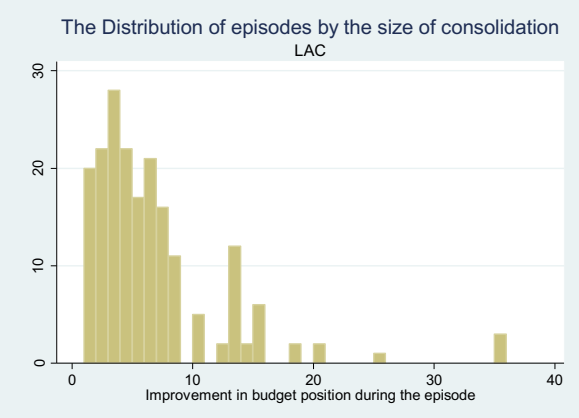
Figure 3. Duration and Size of Consolidation Episodes in Latin America and the Caribbean

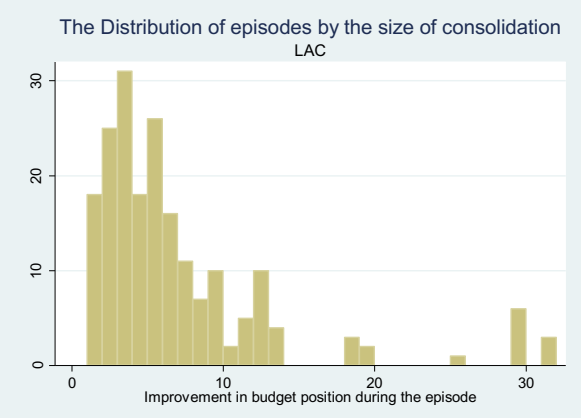
HP-based consolidations



Hamilton-based consolidations



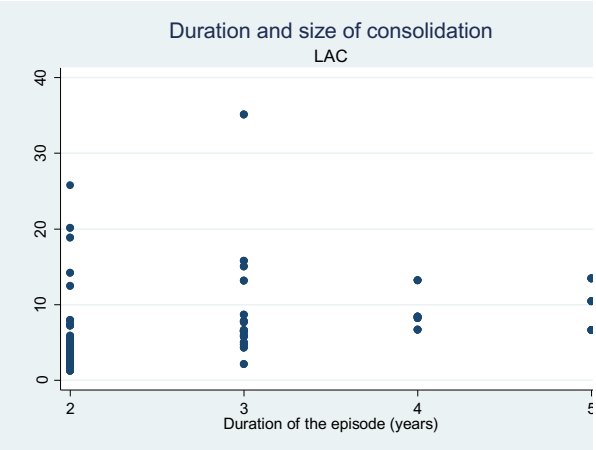




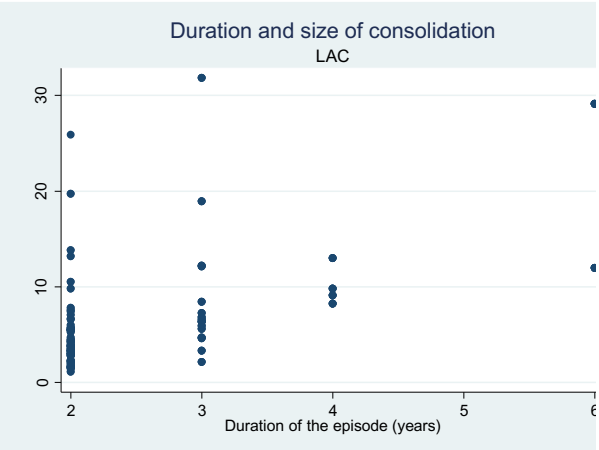
Source: Authors' calculations.
Notes: Top panels: budget position measured by the CAPB (percent of potential GDP). Bottom panels: improvement measured during the consolidation years of the identified episode.

Figure 4. Relationship between Duration and Size of Consolidation Episodes in Latin America and the Caribbean

HP-based consolidations



Hamilton-based consolidations



Source: Authors' calculations.
Notes: Budget position measured by the CAPB (percent of potential GDP). Improvement measured during the consolidation years of the identified episode.

5. Empirical Results

This section presents the main findings on the role of inequality, corruption, and informality as determinants of fiscal consolidations, based on the specifications discussed in Section 3. Based on the discussion in Sections 3 and 4 and for the regression specifications mentioned below, we rely on an unbalanced panel database at an annual frequency. Summary statistics for the variables included in the regressions are shown in Table A1 in the Appendix.

5.1. Determinants of Fiscal Consolidations

We begin with the estimation of logistic regression (3) to explore the main determinants of fiscal consolidations in EMDEs and Latin America (both excluding the Caribbean countries) in Tables 3 and 4 respectively.[20] Both show the results when we: (i) initially exclude the ICI variables (column 1) and (ii) individually add each ICI variable one at a time.

For the EMDE sample, we observe that the worse the level of informality, the more likely it is for a country to consolidate, but the result is surrounded by great uncertainty (compare columns 8–10 in Table 3 with column 11). Corruption comes out

[20] Results are based on the Hamilton-based CAPB criterion for identifying fiscal consolidation episodes. The WEO-based results are available upon request. The HP-based results are partially shown in the Appendix and discussed in Section 5.3 on robustness and sensitivity.

negative and statistically significant in driving consolidations. With respect to the controls, we see that better economic conditions (expressed in terms of higher real GDP growth) make it less likely that a country will experience a consolidation (Table 3, column 1). Public debt to GDP is a positive and significant determinant of the likelihood of a consolidation. External conditions also matter. Trade openness seems to be associated with an increase in the likelihood of a consolidation taking place. Positive terms of trade shocks appear to spur fiscal consolidations.

One of the most robust results is that real (effective) exchange rate depreciations are associated with a higher probability that a country will be consolidating in line with the literature—see Table A2 in the Appendix. This may reflect the fact that depreciations indicate a loss of international market confidence in the country's macroeconomic management, thus providing the political and economic rationale for changing current economic policies and undertaking fiscal consolidation. The finding is consistent with past studies (e.g., Lambertini and Tavares, 2005; Mati and Thornton, 2005) that show that nominal (effective) exchange rate depreciations are associated with a higher likelihood of (successful) fiscal consolidations. Because including this variable reduces by more than half the total number of observations (from +1,500 to +600), we decided not to use the specification that adds this control as baseline in what follows.

Table 3. Panel Analysis: Hamilton-Based Fiscal Consolidations, EMDEs

Specification regressors	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Real GDP growth (t-1)	-0.047***	-0.043**	-0.044**	-0.086***	-0.095***	-0.060*	-0.106***	-0.054***	-0.054***	-0.221***
	(0.017)	(0.021)	(0.020)	(0.028)	(0.030)	(0.032)	(0.033)	(0.018)	(0.017)	(0.060)
Debt ratio (t-1)	0.004	0.006**	0.006**	0.010**	0.006	0.014**	0.006+	0.007**	0.008***	0.040***
	(0.003)	(0.003)	(0.003)	(0.005)	(0.006)	(0.007)	(0.004)	(0.003)	(0.003)	(0.015)
Inflation (t-1)	-0.008	-0.014	-0.014	-0.034**	-0.024	-0.004	-0.020	-0.003	-0.003	0.066
	(0.010)	(0.011)	(0.011)	(0.016)	(0.020)	(0.031)	(0.014)	(0.008)	(0.008)	(0.055)
Trade openness (t-1)	0.005*	0.006***	0.007***	0.006**	0.006**	0.006*	0.009***	0.007***	0.006**	0.029***
	(0.002)	(0.002)	(0.002)	(0.003)	(0.003)	(0.004)	(0.003)	(0.003)	(0.003)	(0.007)
Terms of trade growth (t-1)	0.015*	0.007	0.007	0.007	0.004	0.073***	0.003	0.015*	0.015*	0.017
	(0.008)	(0.006)	(0.006)	(0.009)	(0.008)	(0.025)	(0.008)	(0.009)	(0.009)	(0.029)
SWIID Market Gini (t-1)		0.007								
		(0.022)								
SWIID Disposable Gini (t-1)			0.010							
			(0.015)							
POVCAL Gini (t-1)				0.002						
				(0.015)						
World Bank Gini (t-1)					0.007					
					(0.017)					
Corruption Perceptions Index (CPI) (inverted) (t-1)						0.010				
						(0.017)				
Country Policy and Institutional Assessment (CPIA) (inverted) (t-1)							-0.388*			
							(0.220)			
DSGE-based informality (t-1)								0.004		
								(0.009)		
MIMIC-based informality (t-1)									0.004	
									(0.009)	
										0.021**
										(0.010)
Observations	1,598	1,243	1,243	596	425	507	545	1,426	1,437	212
McFadden Pseudo-R2	0.018	0.024	0.025	0.044	0.038	0.059	0.073	0.026	0.026	0.168
No. Countries	81	79	79	76	73	76	46	73	74	42

Notes: The dependent variable is a dummy taking the value of 1 in a fiscal consolidation year (0 otherwise), defined using the Hamilton-based criterion. Standard errors in parentheses clustered at the country level. Constant term omitted. +, *, **, *** denote statistical significance at the 15, 10, 5, and 1 percent levels, respectively.

Table 4 zooms in on Latin American countries where inequality does not seem to drive consolidations, while more informality increases the probability of their occurrence. However, the higher the corruption levels, the less likely it is for a country to consolidate its public accounts (note that the result is significant at 15 percent).

We can see that in line with the average EMDE result, better economic conditions make it more likely that a country in the region will experience a consolidation. Also, the higher the level of indebtedness, the less likely the consolidation will take place.[21] Trade openness seems to be associated with an increase in the likelihood of a consolidation taking place, but this result is more fragile than before.

Table 4. Panel Analysis: Hamilton-Based Fiscal Consolidations, Latin America

Specification regressors	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Real GDP growth (t-1)	0.005	-0.057	-0.074	-0.440**	-0.076+	-0.146+	-0.254
	(0.066)	(0.059)	(0.071)	(0.198)	(0.053)	(0.097)	(0.207)
Debt ratio (t-1)	0.013**	0.021***	0.014+	0.137***	0.021***	0.024*	0.029
	(0.006)	(0.006)	(0.010)	(0.051)	(0.005)	(0.012)	(0.027)
Inflation (t-1)	0.029	0.002	0.030	0.269+	0.014	0.061	0.182*
	(0.031)	(0.021)	(0.038)	(0.175)	(0.026)	(0.048)	(0.108)
Trade openness (t-1)	0.007	0.019***	0.016**	0.101**	0.019**	0.019*	0.009
	(0.006)	(0.006)	(0.007)	(0.044)	(0.009)	(0.011)	(0.017)
Terms of trade growth (t-1)	0.006	0.004	-0.000	0.001	0.008	-0.003	0.002
	(0.009)	(0.013)	(0.015)	(0.066)	(0.011)	(0.019)	(0.026)
SWIID Market Gini (t-1)		-0.056					
		(0.049)					
SEDLAC Gini (t-1)			0.057				
			(0.059)				
Corruption Perceptions Index (CPI) (inverted) (t-1)				-0.065+			
				(0.043)			
DSGE-based informality (t-1)					-0.025		
					(0.024)		
MIMIC-based informality (t-1)						0.019	
						(0.016)	
Informal employment (t-1)							0.095**
							(0.038)
Observations	274	228	176	73	249	114	89
McFadden Pseudo-R2	0.048	0.106	0.098	0.376	0.105	0.111	0.291
No. Countries	13	13	10	11	12	8	10

Notes: The dependent variable is a dummy taking the value of 1 in a fiscal consolidation year (0 otherwise), defined using the Hamilton-based criterion. Standard errors in parentheses clustered at the country level. Constant term omitted. +, *, **, *** denote statistical significance at the 15, 10, 5, and 1 percent levels, respectively.

An additional issue of interest is to test whether our set of drivers affect differently depending on the compositional characteristics of the consolidation. That is, if the determinants of consolidations differ based on whether they are implemented as expenditure-based fiscal adjustments (where 2/3 or more of the adjustment in the

[21] The presence of an IMF-supported program or other forms of external conditionality also facilitates reforms, but there is no clear link between fiscal policies and reforms. Reforms are positively associated with IMF-supported programs in LAC countries (David, Komatsuzaki, and Penknagura, 2020).

CAPB is undertaken on the expenditure side) or tax-based ones (where adjustment is undertaken while expenditure rises). Tables 5a and 5b look at EMDEs and Latin America, respectively. EMDE results suggest that expenditure-based adjustments are more likely where indebtedness levels are higher and countries are more open to trade. Inequality, corruption, and informality do not seem to matter in this sample regardless of the composition of the consolidation. For Latin America (Table 5b), similar to the EMDE results, larger debt, higher inflation, and more trade seem to propel expenditure-based fiscal adjustments. In addition, while more-corrupt countries seem less inclined to design expenditure-based consolidations, those with larger informal sectors do cut expenditures when consolidating. For tax-based consolidations, most coefficient estimates are not statistically significant.

Table 5a. Panel Analysis: Hamilton-Based Fiscal Consolidations, Expenditure-Based and Tax-Based Consolidations, EMDEs

Specification	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Type of consolidation	Expenditure-based				Tax-based			
Real GDP growth (t-1)	-0.043	-0.011	-0.048**	-0.267***	-0.031	-0.090**	-0.045*	0.132+
	(0.033)	(0.037)	(0.023)	(0.067)	(0.031)	(0.043)	(0.028)	(0.083)
Debt ratio (t-1)	0.007*	0.018**	0.011***	0.041***	0.004	0.001	0.001	0.021
	(0.004)	(0.007)	(0.004)	(0.016)	(0.004)	(0.008)	(0.005)	(0.023)
Inflation (t-1)	-0.033**	0.000	-0.011	0.132*	0.003	-0.005	0.005	-0.297**
	(0.014)	(0.040)	(0.012)	(0.069)	(0.011)	(0.032)	(0.010)	(0.144)
Trade openness (t-1)	0.009***	0.007*	0.008***	0.036***	0.001	0.002	0.003	0.005
	(0.003)	(0.004)	(0.003)	(0.010)	(0.003)	(0.006)	(0.003)	(0.010)
Terms of trade growth (t-1)	0.008	0.040*	0.015*	-0.018	0.003	0.098**	0.009	0.100**
	(0.007)	(0.024)	(0.008)	(0.016)	(0.007)	(0.040)	(0.007)	(0.046)
SWIID Market Gini (t-1)	-0.006				0.018			
	(0.023)				(0.026)			
Corruption Perceptions Index (CPI) (inverted) (t-1)		0.006				0.011		
		(0.016)				(0.035)		
MIMIC-based informality (t-1)			0.008				-0.002	
			(0.014)				(0.014)	
Informal employment (t-1)				0.013				0.024
				(0.013)				(0.021)
Observations	1,243	507	1,437	212	1,243	507	1,437	212
McFadden Pseudo-R2	0.042	0.053	0.037	0.217	0.007	0.060	0.007	0.182
No. Countries	79	76	74	42	79	76	74	42

Notes: The dependent variable is a dummy taking the value of 1 in an expenditure- or tax-based fiscal consolidation year (0 otherwise), defined using the Hamilton-based criterion. Standard errors in parentheses. Constant term omitted. +, *, **, *** denote statistical significance at the 15, 10, 5, and 1 percent levels, respectively.

Table 5.b. Panel Analysis: Hamilton-Based Fiscal Consolidations, Expenditure-Based and Tax-Based Consolidations, Latin America

Specification	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Type of consolidation	Expenditure-based				Tax-based			
Real GDP growth (t-1)	-0.263***	-0.395	-0.437*	-0.969***	0.036	60.234	-0.058	0.220*
	(0.079)	(0.317)	(0.252)	(0.082)	(0.110)	(0.000)	(0.087)	(0.118)
Debt ratio (t-1)	0.010	0.113*	0.036	0.057**	0.010	33.597	0.023+	-0.068***
	(0.007)	(0.060)	(0.030)	(0.024)	(0.013)	(0.000)	(0.015)	(0.010)
Inflation (t-1)	0.014	0.404***	-0.000	0.654***	0.038	-276.380	0.014	-1.990***
	(0.046)	(0.154)	(0.144)	(0.139)	(0.043)	(0.000)	(0.083)	(0.651)
Trade openness (t-1)	0.035***	0.098***	0.064***	0.012	0.004	23.741	0.004	-0.025
	(0.008)	(0.036)	(0.011)	(0.019)	(0.009)	(0.000)	(0.015)	(0.045)
Terms of trade growth (t-1)	0.016	-0.080**	0.001	0.011	-0.011	49.871	0.000	0.106**
	(0.016)	(0.037)	(0.007)	(0.019)	(0.019)	(0.000)	(0.013)	(0.051)
SWIID Market Gini (t-1)	0.167+				0.015			
	(0.111)				(0.067)			
Corruption Perceptions Index (CPI) (inverted) (t-1)		-0.059*				-22.942		
		(0.035)				(0.000)		
MIMIC-based informality (t-1)			0.283***				0.002	
			(0.093)				(0.017)	
Informal employment (t-1)				0.305***				0.180***
				(0.037)				(0.049)
Observations	176	73	114	89	176	73	114	89
McFadden Pseudo-R2	0.257	0.426	0.437	0.709	0.027	1.000	0.060	0.482
No. Countries	10	11	8	10	10	11	8	10

Notes: The dependent variable is a dummy taking the value of 1 in an expenditure- or tax-based fiscal consolidation year (0 otherwise), defined using the Hamilton-based criterion. Standard errors in parentheses. Constant term omitted. +, *, **, *** denote statistical significance at the 15, 10, 5, and 1 percent levels, respectively.

5.2. Determinants of Successful Fiscal Consolidations

We also examine the drivers of successful consolidations. A given fiscal consolidation is considered successful if the associated pairs of country years led to the following:

- Definition 1 (V1): a reduction in the debt-to-GDP ratio in the year the consolidation episode ended
- Definition 2 (V2): a reduction in the debt-to-GDP ratio in the year following the end of the consolidation episode
- Definition 3 (V3): a reduction in the debt-to-GDP ratio in any given year of the consolidation episode

When a given condition above was met, the success variable would take the value 1, and 0 otherwise. Because the unit of observation is the individual episode, rather than years in which consolidation may or may not have been undertaken, the resulting samples are considerably smaller. We then estimated logistic regressions of the success variables against the same set of controls as in the previous Section 5.1.

The results indicate that, for EMDEs as a whole (Table 6a) but also for Latin America (Table 6b), high real GDP growth is a strong pre-condition for success. Successful consolidations seem to also take place when the starting levels of public debt and inflation are higher. Larger income inequality (informality) seems to act as a boost (hinderance) for successful consolidations. Note that because the number of useful observations is rather small for the Latin America regressions in particular, caution is warranted when interpreting these results. A related and equally important empirical question explores the other direction of the relationship at hand and boils down to assessing the fiscal multiplier effects conditioned on the existing levels of inequality, corruption, and informality. Box 1 explores this aspect, looking specifically at Latin America as a complement to the remainder of the analysis.

Table 6a. Determinants of Successful Fiscal Consolidations, EMDEs

Specification	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Success definition	V1	V1	V1	V1	V2	V2	V2	V2	V3	V3	V3	V3
Real GDP growth (t-1)	0.180***	0.248***	0.161***	0.726***	0.120***	0.201**	0.148***	0.136	0.110***	0.193**	0.105***	0.099
	(0.042)	(0.089)	(0.040)	(0.252)	(0.043)	(0.082)	(0.047)	(0.255)	(0.035)	(0.083)	(0.034)	(0.086)
Debt ratio (t-1)	0.000	0.014	0.006+	0.005	0.007**	0.019*	0.010**	0.122*	0.006	0.014	0.009+	-0.006
	(0.005)	(0.010)	(0.004)	(0.018)	(0.004)	(0.011)	(0.004)	(0.066)	(0.005)	(0.012)	(0.006)	(0.016)
Inflation (t-1)	0.066**	-0.014	0.042*	0.031	0.024	-0.187*	0.007	-0.252	0.059+	0.033	0.048+	0.001
	(0.030)	(0.040)	(0.022)	(0.069)	(0.026)	(0.096)	(0.025)	(0.203)	(0.042)	(0.046)	(0.034)	(0.076)
Trade openness (t-1)	-0.001	-0.001	0.004	0.003	-0.003	-0.007	-0.001	0.030	-0.003	0.008	0.001	0.006
	(0.004)	(0.004)	(0.004)	(0.010)	(0.003)	(0.006)	(0.004)	(0.022)	(0.004)	(0.006)	(0.005)	(0.012)
Terms of trade growth (t-1)	-0.006	-0.082+	-0.024	-0.159	-0.005	0.009	-0.023	-0.185+	-0.005	0.042	0.011	-0.086+
	(0.025)	(0.053)	(0.022)	(0.148)	(0.024)	(0.054)	(0.024)	(0.124)	(0.022)	(0.053)	(0.017)	(0.059)
SWIID Market Gini (t-1)	0.030*				0.012				0.011			
	(0.015)				(0.024)				(0.019)			
Corruption Perceptions Index (CPI) (inverted) (t-1)		-0.010				0.033+				-0.006		
		(0.018)				(0.022)				(0.020)		
MIMIC-based informality (t-1)			-0.006				-0.000				0.013	
			(0.011)				(0.011)				(0.015)	
Informal employment (t-1)				-0.068**				0.021				-0.028*
				(0.031)				(0.033)				(0.016)
Observations	224	92	254	34	224	92	254	34	224	92	254	34
McFadden Pseudo-R2	0.096	0.069	0.074	0.295	0.052	0.095	0.060	0.340	0.067	0.088	0.061	0.079

Notes: The dependent variable is a dummy taking the value of 1 in a successful consolidation year (0 otherwise), defined using the Hamilton-based criterion and following one of the definitions for "success" described in the main text. Standard errors in parentheses. Constant term omitted. +, *, **, *** denote statistical significance at the 15, 10, 5, and 1 percent levels, respectively.

Table 6b. Determinants of Successful Fiscal Consolidations, Latin America

Specification	(1)	(2)	(3)	(4)
Success definition	V1	V2	V3	V3
Real GDP growth (t-1)	0.476+	0.253	0.170**	0.170
	(0.329)	(0.264)	(0.069)	(0.256)
Debt ratio (t-1)	0.012	0.022**	0.051***	-0.023
	(0.013)	(0.011)	(0.017)	(0.052)
Inflation (t-1)	0.269+	0.161	0.363**	0.864+
	(0.183)	(0.242)	(0.158)	(0.566)
Trade openness (t-1)	0.038	0.020	0.025	-0.084
	(0.028)	(0.027)	(0.038)	(0.075)
Terms of trade growth (t-1)	-0.047+	-0.069	-0.059	-0.188
	(0.033)	(0.085)	(0.082)	(0.253)
SEDLAC Gini (t-1)	0.144**	0.056	-0.317	
	(0.062)	(0.142)	(0.561)	
MIMIC-based informality (t-1)				0.073
				(0.110)
Observations	32	32	32	18
McFadden Pseudo-R2	0.306	0.218	0.404	0.574

Notes: The dependent variable is a dummy taking the value of 1 in a successful consolidation year (0 otherwise), defined using the Hamilton-based criterion and following one of the definitions for "success" described in the main text. Standard errors in parentheses. Constant term omitted. +, *, **, *** denote statistical significance at the 15, 10, 5, and 1 percent levels, respectively.

Box 1. Non-Linear Fiscal Multiplier Effects Depending on Inequality, Corruption, and Informality

Here we estimate the conditional response of real GDP following a government spending shock, conditioned on the level of inequality, corruption, and informality. We use Jordá's (2005) non-linear local projections to obtain impulse responses that are allowed to vary according to a continuous function $F(z_{it})$, as follows:

$$y_{i,t+k} - y_{i,t-1} = \alpha_i + \tau_i + [\beta_k^L \times \tau \times S_{i,t}] + [\beta_k^H \times (1-\tau) \times S_{i,t}] + \theta X_{i,t} + \varepsilon_{i,t}, \qquad \text{(B1)}$$

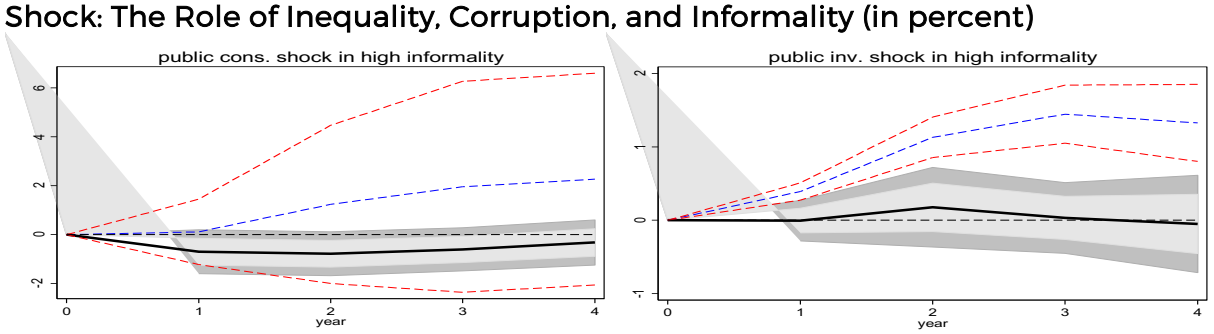
where y is the real GDP (in logs) and $S_{i,t}$ is the government spending shock; τ is an indicator function that takes the value $= 1\ if\ \overline{z_{it}} < med^{sample}$ such that $\overline{z_i}$ is a country-specific average of an indicator of inequality, corruption, or informality and med^{sample} is the corresponding sample median value.[a] We are interested particularly in the β_k^H coefficient—that is, when the state is of high inequality, high corruption, or high informality. Equation B1 is estimated using Ordinary Least Squares (OLS) with Driscoll-Kraay (1998) robust standard errors (clustered at the country level).

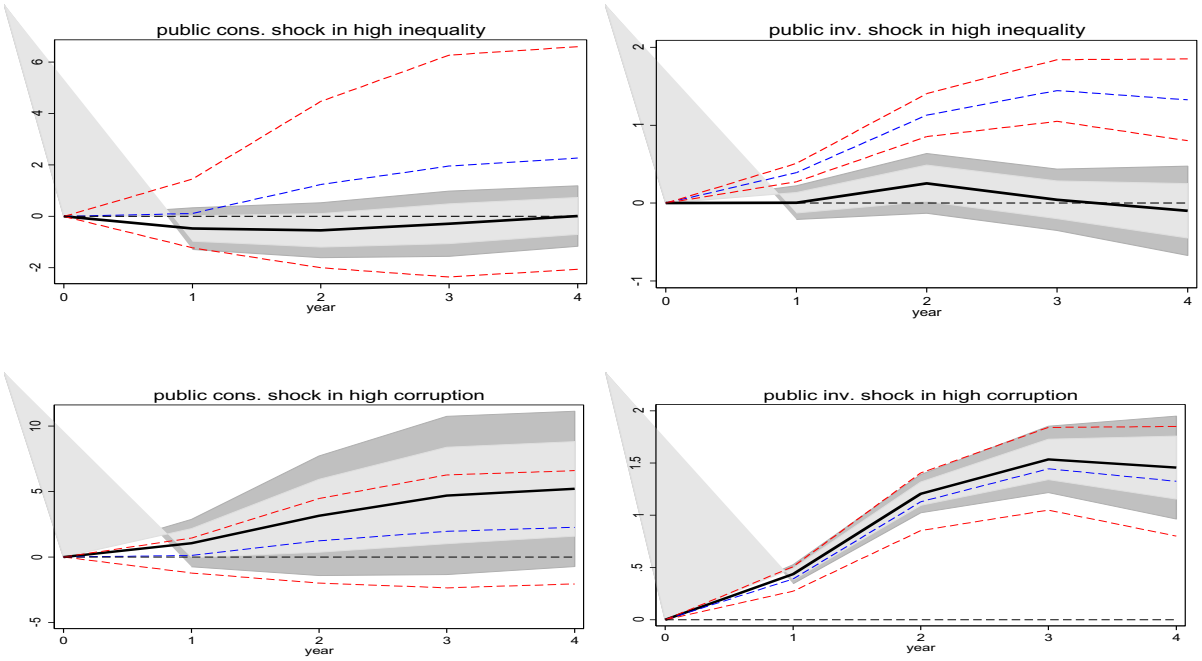
To run equation B1, the big issue relates to identifying $S_{i,t}$. The observed heterogeneity in the estimates of fiscal spending multipliers reflects to a great extent the general challenges associated with the identification of exogenous shocks in public spending. To date, several approaches have been employed to address this issue.[b] We will rely on the approach that uses government spending forecast errors employed by Auerbach and Gorodnichenko (2012, 2013), Abiad, Furceri, and Topalova (2016), Furceri and Li (2017), and Colombo et al. (2022). These authors argue that this methodology overcomes the obstacles that often confound the causal estimation of the effect of fiscal policy on economic performance.[c] The measure of government spending shocks is the difference between the actual real value of public investment or consumption and the corresponding value expected by analysts as of October of the same year. More formally, and similarly to Colombo et al. (2022), the identification

of unexpected fiscal policy shocks using forecast errors in government spending is done in two steps. First, we compute the t-period forecast error for public spending for country i, $FE_{i,t|t-1} = \Delta lnG_{i,t} - \Delta lnG_{i,t|t-1}$, where $\Delta lnG_{i,t}$ defines the actual government spending growth rate and $\Delta lnG_{i,t|t-1}$ is the t-1 IMF forecast of $\Delta lnG_{i,t}$ made at time t-1 for year t.[d] This approach also solves, by construction, the problem of "fiscal foresight," which arises when agents react to anticipated rather than realized shocks (see, e.g., Forni and Gambetti, 2010; Ben Zeev and Pappa, 2015). Second, the corresponding public spending component is regressed on lags of the corresponding forecast error (plus country and time effects) to purge predictable components and by taking the residual of this projection (normalized by the average share in percent of GDP of the public spending variable) as the fiscal shock. Relative to Colombo et al. (2022), we have expanded the range of forecast data (and, hence, the spending shocks) from 1995–2015 as in their paper to the 1980–2019 period.[e]

Results given by the impulse response are shown in Figure B1, which plots the unconditional responses (dashed blue line) together with the conditional ones (solid black line) with associated confidence bands. We observe a positive and insignificant unconditional output response to government consumption shocks, but a positive and significant unconditional response to government investment shocks. The size of the public investment multiplier in Latin America is larger than in other groups of countries, such as OECD economies. When informality is high the public investment multiplier effect gets reduced to a much lower and insignificant magnitude. The effect on output from a public consumption shock when informality is high remains statistically insignificant. These results are broadly in line with those obtained by Colombo et al. (2022) using a shorter time span but for a larger sample of countries. The underestimation of fiscal multipliers seems more pronounced in countries with a higher level of informality, which for Pappa, Sajedi, and Vella (2015) can be measured through tax evasion.[f] The same applies for high inequality. For corruption, the output impact of a public consumption shock is not statistically different from zero and is not distinguishable from the baseline. In the case of a public investment shock the effect remains positive and significant but, again, statistically not different from the unconditional result.

Figure B1. Conditional Response of Real GDP Growth to Government Spending Shock: The Role of Inequality, Corruption, and Informality (in percent)





Notes: The *x* axis is in years; t=0 is the year of the fiscal spending shock (i.e., an unanticipated 10 percent increase); t=1 is the first year of impact. Solid black lines denote the response to a fiscal spending shock when inequality, corruption, and informality are high; the dark gray area denotes 90 percent confidence bands and the light gray area denotes 68 percent confidence bands, based on standard errors clustered at country level. The dashed blue line denotes the unconditional result together with 90 percent confidence bands depicted as dashed red lines.

[a] Due to a lack of sufficient continuous observations for inequality, corruption, and informality proxies, the approach discussed by Auerbach and Gorodnichenko (2012, 2013) to estimate the local projection in the context of a smooth transition autoregressive (STAR) model developed by Granger and Teräsvirta (1993) is not possible.
[b] These include identification based on the assumption that government spending does not respond to macroeconomic shocks in the same period in a Structural Vector Autoregressive (SVAR) framework (Blanchard and Perotti, 2002; Ilzetzki, Mendoza, and Végh, 2013); the natural experiment approach exploiting variation in the military spending buildups (Ramey and Shapiro, 1998; Ramey, 2011a, 2011b; Ramey and Zubairy, 2018) and official lending (Kraay, 2012, 2014) as sources of exogenous fluctuations in government spending.
[c] According to Ramey (2016), shocks should be exogenous with respect to other current and lagged endogenous variables, they should be uncorrelated with other exogenous shocks, and they should represent unanticipated movements in exogenous variables. The forecast-error approach is arguably able to address all three.
[d] According to An et al. (2018), IMF fiscal forecasts are accurate and preferred compared to private-sector forecasts.
[e] Lack of a large comprehensive and cross-country comparable dataset on tax revenue forecasts prevent us from exploring the other side of the budget, namely tax hikes or shocks—that is, revenue-based consolidations.
[f] Basile, Girardi, and Miele (2016) exploit Italian data on tax evasion and unreported income to investigate the response of the formal and informal sectors to public expenditure shocks. They find that in Italy fiscal expansions cause a reduction in the share of unreported income.

5.3. Robustness and Sensitivity

Several sensitivity and robustness exercises were conducted, beginning with the sensitivity exercises to address omitted variable bias. Results are shown in Table A3 in the Appendix. Testing for the "original sin" (i.e., countries' obligation to borrow in foreign currency while being able to pay in domestic currency), we obtain (based on

the specification under column 2 of Table 3) a statistically insignificant coefficient for (lagged) interest payments. We also tested for the "urgency to consolidate" (i.e., the distance between a country's debt-stabilizing primary balance and CAPB in percent of GDP), obtaining a positive and statistically significant coefficient for the EMDE sample but not for Latin America. Finally, we explored the role of (lagged) international reserves minus gold retrieved from the World Bank WDI database and obtained a statistically insignificant coefficient. We found that in Latin America, the larger the stock of reserves, the less likely it is for a country to consolidate.

Tables A4 and A5 in the Appendix repeat Tables 3 and 4 for the EMDE and LAC samples, respectively, by replacing the binary dependent variable with a continuous variable given by the yearly change in the Hamilton-based CAPB (percent GDP). This will capture all structurally adjusted improvements in the overall balance, from the smallest to the largest—in contrast with the dummy variable logistic approach. OLS regressions suggest that results are broadly similar with a key difference: for both the EMDE and LAC samples, the larger the level of informality, the larger the ensuing improvement in the CAPB.

In terms of robustness, we start by using an alternative CAPB-based definition to identify the consolidation years—namely, the HP. Results presented in Table A6 in the Appendix, while slightly weaker in statistical terms, are generally consistent with those in Tables 3 and 4 for the EMDE and LAC samples, respectively.

Next, we construct alternative measures of consolidation. The first builds on Gali and Perotti (2003), Golinelli and Momigliano (2009), Alesina and Ardagna (2010), Corsetti, Meier, and Müller (2012), and Auerbach and Gorodnichenko (2012). We estimate a fiscal policy rule of the form:

$$\Delta CAPB_{it} = \alpha_i + \mu_t + \beta \Delta CAPB_{it-1} + \gamma \mathrm{GAP}_{it} + \delta \mathrm{DEBT}_{it-1} + \varepsilon_{it}, \qquad (4)$$

where α_i stands for unobserved country effects, μ_t captures time effects, $\Delta CAPB_{it}$stands for the yearly change in the CAPB as a percent of GDP using the Hamilton-based approach, GAP_{it} is the output gap obtained using the Hamilton-based approach, and DEBT_{it} stands for the debt-to-GDP ratio. To account for the contemporaneous correlation between the output gap and the dependent variable, we estimated equation (4) by means of an instrumental variable technique where the output gap is instrumented by each own lag and the first lag of real GDP growth rate. Given that for Latin America N=13<T=40, the estimates are less susceptible to the

so-called Nickell bias (Nickell, 1981). According to Gali and Perotti (2003), the response of the dependent variable to output gap reflects the systematic discretionary fiscal policy component, while ε_{it} is the random component. This reflects the non-systematic fiscal policy response or the unanticipated fiscal policy shocks, which are independent across countries. The fiscal consolidation shock that is used as an alternative to the binary dummy variable used as baseline is defined as follows: $D_{it} = 1$ if $\varepsilon_{it} > 0$ and $D_{it} = 0$ if $\varepsilon_{it} \leq 0$ (i.e., it has positive value during times of fiscal consolidation, which implies that the CAPB increases). Table 7.a shows the results. The block of fixed controls remains qualitatively similar, and as before we still get that, for Latin America, inequality does not seem to drive consolidations, while more informality increases the probability of their occurrence.

Table 7a. Panel Analysis: Fiscal Consolidation Based on Two-Step Regression, EMDEs versus Latin America

Specification	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Sample	EMDEs				Latin America			
Real GDP growth (t-1)	0.141***	0.111**	0.147***	0.129*	0.222***	0.122	0.342***	0.384**
	(0.025)	(0.054)	(0.026)	(0.073)	(0.074)	(0.238)	(0.110)	(0.164)
Debt ratio (t-1)	0.010***	0.011+	0.012***	0.033***	0.022+	0.075**	0.059***	0.085***
	(0.002)	(0.007)	(0.003)	(0.013)	(0.016)	(0.034)	(0.022)	(0.026)
Inflation (t-1)	0.005	0.035	0.010	-0.104**	0.030	-0.196+	0.066	-0.070+
	(0.009)	(0.025)	(0.009)	(0.044)	(0.025)	(0.124)	(0.061)	(0.048)
Trade openness (t-1)	0.001	0.011***	0.002	-0.003	-0.007**	0.032	-0.002	-0.016+
	(0.002)	(0.004)	(0.002)	(0.007)	(0.003)	(0.025)	(0.013)	(0.010)
Terms of trade growth (t-1)	0.002	0.012	0.004	0.025	0.007	0.069*	-0.005	0.016
	(0.006)	(0.014)	(0.006)	(0.031)	(0.014)	(0.041)	(0.026)	(0.025)
SWIID Market Gini (t-1)	0.022**							
	(0.009)							
Corruption Perceptions Index (CPI) (inverted) (t-1)		0.010				-0.005		
		(0.015)				(0.029)		
DSGE-based informality (t-1)			0.005					
			(0.007)					
SEDLAC Gini (t-1)					-0.043			
					(0.035)			
MIMIC-based informality (t-1)							0.009	
							(0.008)	
Informal employment (t-1)				-0.003				0.061***
				(0.010)				(0.019)
Observations	1,275	514	1,451	214	130	73	115	89
McFadden Pseudo-R2	0.055	0.059	0.057	0.088	0.126	0.278	0.217	0.272

Notes: The dependent variable is a dummy taking the value of 1 in a fiscal consolidation year (0 otherwise). Standard errors in parentheses. Constant term omitted. +, *, **, *** denote statistical significance at the 15, 10, 5, and 1 percent levels, respectively.

The second consolidation measure relies on the alternative identification approach that uses forecast errors. Auerbach and Gorodnichenko (2013) use forecast errors to examine how the fiscal multiplier varies with the business cycle in OECD economies. This measure of government shocks is computed as the difference between the actual public spending and the public spending expected previously by professional forecasters. Using forecast error–based shocks, Abiad, Furceri, and Topalova (2016) identify the causal impact of higher public investment on output, private investment, unemployment, and public debt ratios. Abiad, Furceri, and Topalova (2016) argue that this methodology overcomes the obstacles that often confound the causal estimation of the effect of fiscal policy on economic performance. The Auerbach and Gorodnichenko (AG) approach was also utilized by Furceri and Li (2017), Honda, Miyamoto, and Taniguchi (2020), and Miyamoto et al. (2020). This methodology has the advantage of overcoming the problem of "fiscal foresight" (see Forni and Gambetti, 2010; Leeper, Richter, and Walker, 2012; Leeper, Walker, and Yang, 2013; and Ben Zeev and Pappa, 2017).

More formally, we construct a measure of contractionary fiscal policy shocks as an unexpected improvement in the budget balance as a share of GDP. These "fiscal policy" forecast errors are the differences between the actual budget balances reported in the following year and the one-year-ahead forecasts in the autumn edition of the IMF's WEO report. Mathematically, we have $FE_{i,t|t-1} = BB_{i,t} - {BB^f}_{i,t|t-1}$, where $BB_{i,t}$ defines the actual budget balance in percent of GDP and ${BB^f}_{i,t|t-1}$ is the IMF forecast of $BB_{i,t}$ made at time t-1. We use budget balance forecasts from 2003 until 2019. Positive forecast errors mean that the actual budget balance was larger than the forecast, suggesting an unanticipated fiscal retrenchment. These take the value 1 and 0 otherwise. Table 7.b shows the results. For EMDEs we get slightly conflicting results on the influence of informality on the probability of occurrence of a consolidation, while for Latin America the positive and significant result keeps surfacing as before.

Table 7.b. Panel Analysis: Fiscal Consolidation Based on Forecast-Error Approach, EMDEs versus Latin America

Specification	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Sample	EMDEs				Latin America			
Real GDP growth (t-1)	0.071***	-0.008	0.053**	0.078	0.128+	-0.188*	0.123	0.094**
	(0.026)	(0.026)	(0.021)	(0.056)	(0.087)	(0.111)	(0.127)	(0.037)
Debt ratio (t-1)	0.007	-0.007*	0.005	-0.008	0.024	-0.007	0.010	-0.012*
	(0.005)	(0.004)	(0.004)	(0.007)	(0.025)	(0.012)	(0.023)	(0.007)
Inflation (t-1)	0.010	-0.013	0.016	0.051	0.154**	-0.070	0.242***	-0.004
	(0.011)	(0.025)	(0.013)	(0.065)	(0.072)	(0.058)	(0.043)	(0.076)
Trade openness (t-1)	-0.003	0.002	0.000	0.011+	0.005	0.001	-0.023	0.006
	(0.003)	(0.002)	(0.003)	(0.007)	(0.018)	(0.011)	(0.017)	(0.010)
Terms of trade growth (t-1)	0.004	0.014	0.006	-0.044**	-0.075*	-0.005	-0.096***	-0.048+
	(0.010)	(0.020)	(0.009)	(0.021)	(0.044)	(0.051)	(0.034)	(0.033)
SWIID Market Gini (t-1)	0.016							
	(0.016)							
Corruption Perceptions Index (CPI) (inverted) (t-1)		-0.008				-0.004		
		(0.008)				(0.021)		
DSGE-based informality (t-1)			0.022**					
			(0.009)					
SEDLAC Gini (t-1)					0.098			
					(0.092)			
MIMIC-based informality (t-1)							0.033***	
							(0.008)	
Informal employment (t-1)				-0.013*				0.002
				(0.007)				(0.010)
Observations	1,275	514	1,451	214	130	73	115	89
McFadden Pseudo-R2	0.020	0.009	0.017	0.048	0.157	0.037	0.183	0.050

Notes: The dependent variable is a dummy taking the value of 1 in a fiscal consolidation year (0 otherwise). Standard errors in parentheses. Constant term omitted. +, *, **, *** denote statistical significance at the 15, 10, 5, and 1 percent levels, respectively.

The third and final consolidation measure relies on the narrative approach dataset put together by David and Leigh (2018). This dataset of fiscal consolidations for 14 LAC economies during 1989–2016 includes the size of the discretionary changes in taxes and expenditures jointly and separately. This allows us to perform a composition examination of the drivers similarly to the CAPB baseline approach we did earlier. Table 7.c shows the results; they are generally weaker, but this could be the result of both a different sample composition and a different time span under scrutiny.

Table 7.c. Panel Analysis: Fiscal Consolidation Based on Narrative Approach, Latin America

Specification	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Type of consolidation	ALL				Tax-based				Expenditure-based			
Real GDP growth (t-1)	-0.011+	-0.003	-0.014	-0.015	-0.005	-0.001	-0.006	-0.003	-0.006	-0.002	-0.008	-0.012
	(0.007)	(0.014)	(0.015)	(0.013)	(0.004)	(0.008)	(0.007)	(0.005)	(0.004)	(0.007)	(0.009)	(0.008)
Debt ratio (t-1)	0.002	0.003	-0.001***	-0.001	0.001	0.002	-0.000	-0.001	0.001	0.000	-0.001*	-0.000
	(0.002)	(0.002)	(0.000)	(0.001)	(0.001)	(0.002)	(0.000)	(0.000)	(0.001)	(0.001)	(0.000)	(0.001)
Inflation (t-1)	0.005	-0.001	0.010	0.005*	0.002	-0.000	0.005	0.001	0.003	-0.001	0.004*	0.004**
	(0.005)	(0.009)	(0.008)	(0.003)	(0.002)	(0.005)	(0.007)	(0.001)	(0.003)	(0.004)	(0.002)	(0.002)
Trade openness (t-1)	-0.000	-0.002*	-0.001	-0.000	-0.000	-0.001	-0.001	-0.000+	-0.000	-0.001**	-0.000	-0.000
	(0.001)	(0.001)	(0.001)	(0.001)	(0.000)	(0.001)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.001)
Terms of trade growth (t-1)	0.002	-0.002	0.003	-0.001	0.003	-0.002	0.003	-0.001	-0.001	0.001	0.000	0.000
	(0.004)	(0.005)	(0.004)	(0.001)	(0.003)	(0.003)	(0.004)	(0.001)	(0.001)	(0.002)	(0.001)	(0.001)
SEDLAC Gini (t-1)	0.006				0.006				0.000			
	(0.008)				(0.004)				(0.004)			
Corruption Perceptions Index (CPI) (inverted) (t-1)		0.005+				0.004*				0.001		
		(0.003)				(0.002)				(0.001)		
MIMIC-based informality (t-1)			0.001				0.001				0.000	
			(0.001)				(0.001)				(0.001)	
Informal employment (t-1)				0.000				0.000				-0.000
				(0.001)				(0.001)				(0.001)
Observations	147	90	115	102	147	90	115	102	147	90	115	102
R2	0.059	0.038	0.062	0.020	0.059	0.066	0.052	0.008	0.050	0.016	0.040	0.035

Notes: The dependent variable is a continuous variable denoting the size of the consolidation in a given year identified by David and Leigh (2018) in percent of GDP and 0 in non-consolidating years. Standard errors in parentheses. Constant term omitted. +, *, **, *** denote statistical significance at the 15, 10, 5, and 1 percent levels, respectively.

To test the robustness of the results of the logit regressions, we re-estimated the baseline model by OLS, probit, and a rare events logit (or relogit) estimator. In a logistic regression, the maximum likelihood estimates are consistent but only asymptotically unbiased. The basic problem is having a number of units (inclusive growth episodes) in a panel that has no events. This means that the country-specific indicators corresponding to the all-zero countries perfectly predict the zeroes in the outcome variable (Gates, 2001; King and Zeng, 2001). King and Zeng (2001) describe these so-called "rare events" as "dozens to thousands of times fewer ones […] than zeroes"; it is a well-known phenomenon in the statistical literature (for an overview, see Gao and Shen, 2007). The simplest way of dealing with the problem is decreasing the rareness of the event.[22] By lowering the threshold of what constitutes an event, expanding the data selection period, or in other ways, we may reduce the need to correct for rareness. Another way to correct it is to employ King and Zeng's (2001) bias correction method: the relogit estimator. Their relogit estimator for dichotomous dependent variables provides a lower mean square error in the presence of rare events and can be defined as follows:

$$\text{Prob}(\text{IG}_{\text{it}} = 1|Z_{it}) = \Phi(Z'_{it}\vartheta) \Leftrightarrow \text{Prob}(\text{IG}_{\text{it}} = 1|S_{it}, X_{\text{it}}) = \Phi(\alpha_i + S_{it}{}'\boldsymbol{\eta} + X_{it}{}'\boldsymbol{\gamma}), \quad (5)$$

with i = 1, …, N; t = 1, …, T, where $\Phi(\cdot) = \frac{1}{1+e^{-(Z'_{it}\vartheta)}} = \frac{1}{1+e^{-(\alpha_i + S'_{it}\boldsymbol{\eta} + X_{it}{}'\boldsymbol{\gamma})}}$, α, η, γ are the vectors of the parameters to be estimated, and $\Phi(\cdot)$ is the logistic function.

The parameters can be estimated by maximum likelihood, and the variance of the estimated coefficients can be expressed as $Var(\hat{\vartheta}) = (Z'VZ)^{-1}$, where V is a diagonal matrix, with diagonal entries equal to $\Phi(\cdot) \cdot [1 - \Phi(\cdot)]$. In the case of rare events, $\Phi(\cdot)$ will be generally small. However, as pointed out by King and Zeng (1999a, 1999b, 2001), the estimates of $\Phi(\cdot)$ and $\Phi(\cdot) \cdot [1 - \Phi(\cdot)]$ among observations that include rare events (in our case, for which IG = 1), will be typically larger than those among observations that do not include rare events (i.e., for which IG = 0). Consequently, their contribution to the variance will be smaller, rendering additional "rare" events more informative than additional "frequent" events. Therefore, we follow King and Zeng (1999a, 1999b) and correct for the small sample and rare events biases

[22] To minimize the potential problem of rare events, we also include in the baseline regressions (and robustness that follow) episodes of inclusive growth of one year in duration.

and estimate a relogit model where the sampling design is random or conditional on Zit.

Table 8 provides the regression results. Parameter estimates obtained by OLS, probit, and relogit models are similar to the baseline ones estimated with a logit: inequality does not seem to drive consolidations, while more informality (corruption) increases (decreases) the probability of their occurrence.

Table 8. Panel Analysis: Alternative Estimators, Latin America

Specification	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Estimator	OLS				Probit				Relogit			
Real GDP growth (t-1)	-0.013	-0.035	-0.019*	-0.021+	-0.046	-0.257**	-0.075*	-0.100	-0.069	-0.327**	-0.114	-0.183
	(0.009)	(0.026)	(0.009)	(0.013)	(0.034)	(0.118)	(0.046)	(0.083)	(0.079)	(0.147)	(0.113)	(0.232)
Debt ratio (t-1)	0.004**	0.004*	0.003**	0.002	0.011**	0.080***	0.013**	0.014	0.019**	0.095**	0.021+	0.023
	(0.001)	(0.002)	(0.001)	(0.002)	(0.006)	(0.030)	(0.006)	(0.010)	(0.009)	(0.045)	(0.014)	(0.027)
Inflation (t-1)	0.000	0.017	0.009*	0.022*	-0.001	0.158*	0.032	0.093*	-0.004	0.212	0.048	0.135+
	(0.004)	(0.013)	(0.004)	(0.010)	(0.015)	(0.082)	(0.024)	(0.048)	(0.037)	(0.153)	(0.076)	(0.092)
Trade openness (t-1)	0.003**	0.005*	0.002**	0.002*	0.010**	0.059**	0.011*	0.005	0.016***	0.071**	0.016+	0.010
	(0.001)	(0.002)	(0.001)	(0.001)	(0.004)	(0.025)	(0.006)	(0.010)	(0.006)	(0.031)	(0.011)	(0.010)
Terms of trade growth (t-1)	0.003*	0.002	-0.000	-0.002	0.010**	0.003	-0.002	0.000	0.016	0.002	-0.003	-0.000
	(0.001)	(0.004)	(0.003)	(0.004)	(0.005)	(0.036)	(0.011)	(0.014)	(0.021)	(0.053)	(0.019)	(0.030)
SEDLAC Gini (t-1)	0.005				0.022				0.034			
	(0.009)				(0.041)				(0.047)			
Corruption Perceptions Index (CPI) (inverted) (t-1)		-0.003				-0.037+				-0.042+		
		(0.005)				(0.026)				(0.027)		
MIMIC-based informality (t-1)			0.002				0.011				0.016	
			(0.002)				(0.008)				(0.016)	
Informal employment (t-1)				0.005**				0.048***				0.065**
				(0.002)				(0.017)				(0.030)
Observations	129	73	114	89	129	73	114	89	129	73	114	89
R-squared	0.121	0.227	0.105	0.213								
McFadden Pseudo-R2					0.113	0.386	0.111	0.279				

Notes: The dependent variable is a dummy taking the value of 1 in a fiscal consolidation year (0 otherwise). Different estimators identified in the second row. Standard errors are reported in parentheses. Constant term omitted. *, **, *** denote statistical significance at the 10, 5, and 1 percent levels, respectively.

6. Conclusions and Policy Implications

For this paper we constructed a novel fiscal consolidation database in EMDEs during the period 1979–2019. Using logit models, we then examined the factors motivating these fiscal consolidation episodes. Our results suggest a complex landscape in assessing whether (and when) these countries undertake fiscal adjustment. Among the most salient results are the following. Consolidation is more likely to take place in "good times": when growth is high, countries experience positive terms of trade shocks, and inflation is low. This could be attributable to policymakers' concern for the poor against the background of inadequate mechanisms to shield economically vulnerable segments of the population during fiscal consolidations. High debt remains a significant determinant of consolidation, as these countries have limited access to financial markets compared with AEs. Inequality does not seem to drive consolidations in LAC, while more informality and less corruption increase the probability of their occurrence. More-corrupt countries in this region seem less inclined to carry out expenditure-based fiscal adjustments. The contrary is true for those with larger informal sectors.

The results have important implications for policymakers in the post-COVID-19 environment, where many countries are faced with high debt-to-GDP ratios and high (and rising) costs of debt service due to inflationary pressures. With limited external financing and many countries already in debt distress, EMDEs have no alternative but to implement fiscal tightening. Our results suggest that countries with lower levels of corruption, which can be viewed as a proxy for the strength of (fiscal) institutions, should be able to consolidate (especially from the expenditure side, which is, typically, more difficult politically). The results of this paper also have important bearing on the design of IMF-supported programs, which many countries will need to enter in the coming years.

Future work could consider extending the framework presented in this paper by conducting a duration analysis of the consolidation episodes as well as the factors—including fiscal rules—that help extend these episodes over several years.

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Appendix

Table A1. Summary Statistics of Regression Variables for the Whole EMDE Sample

Variable	Observations	Mean	Standard deviation	Minimum	Maximum
Real GDP growth	2,222	4.11	4.30	-41.88	38.2
Debt ratio	1,953	55.36	37.62	0.07	451.33
Inflation	2,213	6.94	12.86	-72.72	256.10
Change in Real Effective Exchange Rate (REER)	889	-0.40	7.90	-77.93	36.20
Trade openness	2,000	79.46	41.19	6.07	347.99
Terms of trade growth	2,024	0.24	8.93	-97.51	150.28
Gini Disposable	1,564	41.20	7.21	23.4	66.4
Gini Market	1,564	45.55	6.79	22.4	70
gini_SEDLAC	153	51.40	4.55	40.97	59.41
Gini POVCAL	703	40.44	9.11	24.03	65.77
~cpi_inv	631	62.38	11.96	26	92
sims_informal	133	59.65	21.10	22.47	88.64
DSGE_informal	1,738	35.97	9.77	8.55	66.43
informal_emp	220	62.91	21.33	18.91	99.65

Table A2. Panel Analysis Including the Exchange Rate: Hamilton-Based Fiscal Consolidations, EMDEs

Specification regressors	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Real GDP growth (t-1)	-0.045*	-0.029	-0.022	-0.052	-0.062+	-0.135**	-0.141**	-0.072***	-0.063***
	(0.028)	(0.031)	(0.031)	(0.042)	(0.043)	(0.055)	(0.058)	(0.024)	(0.023)
Debt ratio (t-1)	-0.006	-0.004	-0.006	-0.016*	-0.015+	0.014	-0.016	-0.002	-0.003
	(0.006)	(0.006)	(0.007)	(0.008)	(0.009)	(0.018)	(0.016)	(0.006)	(0.006)
Inflation (t-1)	-0.021	-0.045**	-0.036+	-0.033+	-0.022	-0.070	0.067*	-0.041*	-0.024
	(0.021)	(0.023)	(0.023)	(0.021)	(0.031)	(0.077)	(0.037)	(0.024)	(0.024)
REER growth (t-1)	-0.058***	-0.061**	-0.067***	-0.104***	-0.098***	-0.078*	-0.075*	-0.053**	-0.054***
	(0.022)	(0.025)	(0.024)	(0.025)	(0.032)	(0.040)	(0.047)	(0.022)	(0.021)
Trade openness (t-1)	0.008***	0.013***	0.012***	0.011***	0.012***	0.002	-0.010	0.011***	0.010***
	(0.003)	(0.003)	(0.003)	(0.004)	(0.004)	(0.008)	(0.011)	(0.003)	(0.003)
Terms of trade growth (t-1)	0.009	0.001	0.001	0.012	0.008	0.141***	0.005	0.009	0.008
	(0.010)	(0.010)	(0.010)	(0.012)	(0.011)	(0.052)	(0.010)	(0.010)	(0.009)
SWIID Market Gini (t-1)		-0.037*							
		(0.020)							
SWIID Disposable Gini (t-1)			-0.027						
			(0.023)						
POVCAL Gini (t-1)				-0.038**					
				(0.019)					
World Bank Gini (t-1)					-0.014				
					(0.020)				
Corruption Perception Index (CPI) (inverted) (t-1)						-0.001			
						(0.027)			
Country Policy and Institutional Assessment (CPIA) (inverted) (t-1)							-0.726+		
							(0.486)		
DSGE-based informality (t-1)								0.012	
								(0.015)	
MIMIC-based informality (t-1)									0.011
									(0.015)
Observations	652	534	534	288	211	205	170	606	621
McFadden Pseudo-R2	0.044	0.076	0.072	0.114	0.109	0.130	0.119	0.064	0.054

Notes: The dependent variable is a dummy taking the value of 1 in a fiscal consolidation year (0 otherwise), defined using the Hamilton-based criterion. Standard errors in parentheses clustered at the country level. Constant term omitted. +, *, **, *** denote statistical significance at the 15, 10, 5, and 1 percent levels, respectively.

Table A3. Panel Analysis Addressing Omitted Variable Bias: Hamilton-Based Fiscal Consolidations, EMDEs versus Latin America

Specification regressors	(1)	(2)	(3)	(4)	(5)	(6)
Sample	EMDEs	Latin America	EMDEs	Latin America	EMDEs	Latin America
Real GDP growth (t-1)	-0.047***	0.007	-0.020	0.049	-0.044**	0.024
	(0.017)	(0.066)	(0.022)	(0.079)	(0.019)	(0.077)
Debt ratio (t-1)	0.006**	0.014**	0.004+	0.014+	0.002	0.009
	(0.003)	(0.005)	(0.003)	(0.010)	(0.003)	(0.007)
Inflation (t-1)	-0.007	0.028	0.004	0.077*	-0.011	0.022
	(0.009)	(0.031)	(0.010)	(0.045)	(0.011)	(0.036)
Trade openness (t-1)	0.005*	0.006	0.004*	0.005	0.004+	-0.004
	(0.002)	(0.006)	(0.002)	(0.007)	(0.002)	(0.008)
Terms of trade growth (t-1)	0.015*	0.005	0.014*	0.000	0.024***	0.009
	(0.008)	(0.009)	(0.008)	(0.007)	(0.008)	(0.010)
Interest payments (t-1)	-0.056	-0.023				
	(0.050)	(0.153)				
Urgency to consolidate (t-1)			0.044**	0.047		
			(0.018)	(0.046)		
Log reserves minus gold (t-1)					-0.059	-0.329*
					(0.045)	(0.174)
Observations	1,595	271	1,554	265	1,461	274
McFadden Pseudo-R2	0.019	0.048	0.022	0.044	0.020	0.071

Notes: The dependent variable is a dummy taking the value of 1 in a fiscal consolidation year (0 otherwise), defined using the Hamilton-based criterion. Standard errors in parentheses clustered at the country level. Constant term omitted. +, *, **, *** denote statistical significance at the 15, 10, 5, and 1 percent levels, respectively.

Table A4. Panel Analysis: Hamilton-Based Fiscal Consolidations Using the Change in CAPB as Dependent Variable, EMDEs

Specification regressors	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Real GDP growth (t-1)	-0.031**	-0.029*	-0.028*	-0.035+	-0.054**	-0.010	-0.047*	-0.024*	-0.023*
	(0.014)	(0.017)	(0.017)	(0.024)	(0.023)	(0.029)	(0.023)	(0.012)	(0.012)
Debt ratio (t-1)	0.008***	0.009***	0.009***	0.015***	0.009	0.013***	0.020***	0.007***	0.008***
	(0.002)	(0.002)	(0.002)	(0.005)	(0.009)	(0.005)	(0.007)	(0.002)	(0.002)
Inflation (t-1)	-0.022***	-0.028***	-0.027***	-0.029+	-0.027	-0.001	-0.023*	-0.018**	-0.015**
	(0.008)	(0.010)	(0.010)	(0.020)	(0.027)	(0.020)	(0.012)	(0.008)	(0.007)
Trade openness (t-1)	0.000	-0.000	-0.001	0.003	-0.002	0.003*	-0.000	0.000	0.000
	(0.001)	(0.001)	(0.001)	(0.003)	(0.003)	(0.002)	(0.002)	(0.001)	(0.001)
Terms of trade growth (t-1)	-0.005	-0.008	-0.008	0.001	0.007	0.021+	-0.023	-0.007	-0.007
	(0.010)	(0.012)	(0.012)	(0.008)	(0.009)	(0.013)	(0.019)	(0.010)	(0.010)
SWIID Market Gini (t-1)		-0.010							
		(0.010)							
SWIID Disposable Gini (t-1)			-0.010						
			(0.008)						
POVCAL Gini (t-1)				0.002					
				(0.012)					
World Bank Gini (t-1)					-0.009				
					(0.009)				
Corruption Perception Index (CPI) (inverted) (t-1)						0.009*			
						(0.005)			
Country Policy and Institutional Assessment (CPIA) (inverted) (t-1)							-0.035		
							(0.170)		
DSGE-based informality (t-1)								0.004	
								(0.003)	
MIMIC-based informality (t-1)									0.007**
									(0.003)
Observations	1,598	1,243	1,243	596	425	507	545	1,426	1,437
R-squared	0.012	0.019	0.019	0.035	0.022	0.028	0.027	0.011	0.012

Notes: The dependent variable is the yearly change in the CAPB, defined using the Hamilton-based criterion. OLS with standard errors in parentheses clustered at the country level. Constant term omitted. +, *, **, *** denote statistical significance at the 15, 10, 5, and 1 percent levels, respectively.

Table A5. Panel Analysis: Hamilton-Based Fiscal Consolidations Using the Change in CAPB as Dependent Variable, Latin America

Specification regressors	(1)	(2)	(3)	(4)	(5)	(6)
Real GDP growth (t-1)	-0.073	0.078	0.091	-0.099	0.079	0.128**
	(0.084)	(0.057)	(0.062)	(0.105)	(0.054)	(0.038)
Debt ratio (t-1)	0.005	0.010	0.051**	0.014	0.007	0.020
	(0.004)	(0.008)	(0.018)	(0.014)	(0.006)	(0.012)
Inflation (t-1)	-0.076***	-0.097***	-0.093	-0.014	-0.080**	-0.047+
	(0.021)	(0.025)	(0.065)	(0.059)	(0.025)	(0.024)
REER growth (t-1)	0.027	0.001	-0.002	-0.009	-0.001	-0.107*
	(0.035)	(0.040)	(0.066)	(0.020)	(0.038)	(0.045)
Trade openness (t-1)	-0.000	0.009**	0.032**	0.017*	0.002	-0.007
	(0.003)	(0.003)	(0.011)	(0.007)	(0.003)	(0.011)
Terms of trade growth (t-1)	0.002	-0.012	-0.027	0.051**	-0.011	-0.029*
	(0.007)	(0.012)	(0.020)	(0.013)	(0.009)	(0.012)
SWIID Market Gini (t-1)		0.016				
		(0.045)				
SEDLAC Gini (t-1)			-0.033+			
			(0.017)			
Corruption Perception Index (CPI) (inverted) (t-1)				0.002		
				(0.006)		
DSGE-based informality (t-1)					-0.000	
					(0.011)	
MIMIC-based informality (t-1)						0.007***
						(0.001)
Observations	155	117	54	41	133	53
R-squared	0.059	0.121	0.145	0.199	0.077	0.304

Notes: The dependent variable is the yearly change in the CAPB, defined using the Hamilton-based criterion. OLS with standard errors in parentheses clustered at the country level. Constant term omitted. +, *, **, *** denote statistical significance at the 15, 10, 5, and 1 percent levels, respectively.

Table A6. Panel Analysis: HP-Based Fiscal Consolidations, EMDEs versus Latin America

Specification	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Sample	EMDEs				Latin America			
Real GDP growth (t-1)	-0.070***	-0.072**	-0.070***	-0.202***	-0.081	-0.283**	-0.161*	-0.183
	(0.023)	(0.036)	(0.019)	(0.057)	(0.064)	(0.132)	(0.096)	(0.133)
Debt ratio (t-1)	0.006**	0.013*	0.008***	0.031***	0.023***	0.088+	0.027**	0.014
	(0.003)	(0.007)	(0.003)	(0.012)	(0.007)	(0.056)	(0.012)	(0.017)
Inflation (t-1)	-0.005	-0.003	0.003	0.030	-0.012	0.155	0.056	0.117
	(0.009)	(0.029)	(0.008)	(0.062)	(0.025)	(0.199)	(0.050)	(0.093)
Trade openness (t-1)	0.007***	0.008**	0.008***	0.028***	0.019***	0.075*	0.020*	0.026**
	(0.003)	(0.003)	(0.003)	(0.007)	(0.007)	(0.041)	(0.011)	(0.012)
Terms of trade growth (t-1)	0.008	0.057**	0.016*	0.006	0.019**	-0.018	-0.002	-0.023
	(0.006)	(0.024)	(0.009)	(0.026)	(0.008)	(0.045)	(0.020)	(0.027)
SWIID Market Gini (t-1)	0.014							
	(0.016)							
Corruption Perception Index (CPI) (inverted) (t-1)		0.018				-0.047		
		(0.017)				(0.037)		
DSGE-based informality (t-1)			0.008					
			(0.010)					
SEDLAC Gini (t-1)					0.010			
					(0.066)			
MIMIC-based informality (t-1)							0.014	
							(0.015)	
Informal employment (t-1)				0.002				0.029
				(0.013)				(0.022)
Observations	1,246	507	1,439	212	129	73	114	89
McFadden Pseudo-R2	0.035	0.058	0.037	0.144	0.123	0.293	0.114	0.180

Notes: The dependent variable is a dummy taking the value of 1 in a fiscal consolidation year (0 otherwise), defined using the HP-based criterion. Standard errors in parentheses clustered at the country level. Constant term omitted. +, *, **, *** denote statistical significance at the 15, 10, 5, and 1 percent levels, respectively.