



Article

The Widening of the North–South Divide: Debt Sustainability in a World Weakened by COVID-19

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Abstract: This research compares the global debt trends in the aftermath of the COVID-19 pandemic, focusing on economies that frame the North and South divide. The research centers on debt ratios, which serve as indicators of countries' ability to finance recovery and development projects. The study period runs from 2015 to 2022 and follows the IMF's country classification, which divides the world into advanced economies (AE) and emerging market and developing economies (EMDE). The research employs panel data regressions to assess three key debt ratios—external debt to Gross Domestic Product (GDP), external debt to exports, and public debt to GDP—against various pandemic-related indicators and control variables. The analysis provides three major contributions. Firstly, an examination of external and public debt burdens is conducted, showing that escalated external and public debt burdens in EMDE contrast with increasing public debt in AE, primarily due to fiscal stimulus. Secondly, it is argued that the ongoing pandemic has intensified the widening economic gap between the North (AE) and the south (EMDE). Thirdly, a review is presented of both orthodox and heterodox policies identified in existing literature that are considered capable of mitigating external vulnerabilities in EMDE. Findings highlight the critical need for multifaceted measures to address debt vulnerability and promote sustainable economic recovery in a post-pandemic world.

Keywords: COVID-19; globalization; indebtedness; inequalities; north–south divide



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1. Introduction

While some theorists see liberal globalization as an opportunity for global economic leveling, others view it as a cause of social injustice and deprivation across vast parts of the globe. The reduction of transportation and communication costs in the latter part of the twentieth century accelerated the process of globalization, resulting in the dissemination of knowledge, trade, and financial transactions, but also in the worsening of inequalities, population migration, and climate change. Among the plethora of consequences of capitalism-based globalization, a renewed economic geography emerged, carved on the ruins of inequality and economic meaninglessness experienced by millions of human beings who live in a constant struggle for change and the quest for their own identity.

This scenario, which gives rise to new spatial hierarchies, has already led to the observation of the global system through the eyes of central regions (rather than States), i.e., regions that are highly economically integrated and have financial and informational supremacy. They are followed by other peripheral or semi-peripheral regions, which are suppliers to central regions and exhibit low initiative, scarce technology, low investment, and limited decisional power (Taylor 2000). Even if this new order is recognized, the scenario of global regions replacing the mosaic of States remains unfulfilled.

For now, globalization seems to be a unifying force, viewing every space as having the potential for production and trade, whereas the international division of labor acts

as a dividing force, establishing dominating locations that stimulate activity elsewhere. The expression of this global hierarchy of spaces requires the affirmation of “the subaltern in counter-hegemonic globalization” (Evans 2000; Santos and Rodríguez-Garavito 2005), in light of the significant impacts produced on human life (and the planet), as measured by dual spatial relationships: benefits–costs, access to–exclusion, participation–isolation, hegemony–marginalization, North–South.

This divide is neither defined by geographical boundaries nor statistically fixed; it is not restricted to a “community of victims” either (Dussel 1998). The South refers to a region that is not defined by specific geographic locations. Instead, it reflects the impacts of an unfavorable exchange ratio vis-à-vis the advanced economies in the developed North, as reflected in human development indicators outlined in the United Nations Human Development Reports. These regions are referred to as “emerging and low-income economies” (Mignolo 2011).

The forms of economic subordination produced by market logic are more pronounced in the South, which has led to extensive discussions about the trajectory of growth in the South across various fields of knowledge, including economics. These discussions aim to determine the most appropriate explanation for its impoverishment, which could be attributed primarily to a direct relationship with colonialism and imperialism, as posited by dependency theories, or to a set of internal impediments hindering its growth and development processes, as suggested by obstacle theories and neoclassical counterrevolution.

Regardless of which theoretical contribution one chooses, the long-standing tension between growth in the North and poverty in the South is evident. Recently, the COVID-19 pandemic has accentuated this divide, particularly in terms of access to preventive and prophylactic healthcare and the varying economic capacities of different regions to support their economies and citizens, thereby impacting economic hardships and social injustices. It is true that the impacts felt in the South did not result in the devastation predicted in terms of fatalities and disease rates (UNCTAD 2020), likely due to a longer period of preparation, a faster response, a low testing rate, a lower average age of the population, and a favorable climate (Okonji et al. 2021). Nonetheless, though not as overwhelmingly as initially expected, there have been devastating effects resulting from uncertainties regarding access to essential goods and services, including healthcare, a decrease in trade volume, and potential long-term economic and financial consequences.

Following the closing of borders to Southern economies, (Aguilusa and Couto 2021, p. 1) eloquently recalled that there was only one pandemic, not two: “(. . .) Borders are not closed, people are closed. Economies, societies, and paths to progress are closed. [. . .] Once again, politics held science hostage. (. . .) There may be two feelings of justice. But there are no two pandemics” [our translation]. While this is true in terms of (one global) infection, the economic repercussions and amount of damage caused to emerging and low-income economies differed significantly from those of the developed world. The pandemic affected the whole world economy and caused the worst recession since 1929 (Sachs et al. 2021), but its impact varied across different parts of the world, widening the North–South divide.

Debt, either external or sovereign, is a significant issue for many countries in the South. This does not diminish the significance of debt sustainability in AE, as evidenced by a substantial body of studies on the Euro Area sovereign debt crisis (e.g., De Grauwe and Ji 2013; Greenwood-Nimmo et al. 2023) and the sustainability of fiscal debt in the United States (Aldama and Creel 2019). However, Southern countries frequently find themselves needing to borrow for development projects, and due to factors, such as lower credit ratings, unstable political environments, and sometimes unfavorable terms of trade, they may end up paying higher interest rates. This situation can lead to a cycle of debt, where countries borrow additional funds to pay off existing debts, further exacerbating their financial challenges.

The relationship between the North–South divide and debt is complex and multifaceted (Raffer and Singer 2002). On one hand, high levels of debt can exacerbate the economic challenges faced by countries in the South, hindering development and per-

petuating the divide. On the other hand, countries in the North largely influence the global financial system, which determines the terms and availability of credit for Southern countries, thus impacting their debt levels.

Given the presence of unique vulnerabilities on a global scale, this analysis aims to evaluate the effects of COVID-19 on the North and South divide, specifically by examining the interconnection between external and public debt and countries' capacity to address the pandemic.

Considering the global natural experiment triggered by the COVID-19 outbreak, which functions as an exogenous shock to borrowing needs (Zheng 2023), two questions are addressed: (a) How has the indebtedness of emerging markets and developing economies changed during the COVID-19 pandemic when compared to advanced economies? (b) Does this trajectory show the existence of a growing North–South divide?

The study categorizes global economies based on the IMF's classification: Advanced economies (AE) and emerging markets and developing economies (EMDE). Covering the timeframe from 2015 to 2022, we estimate several panel data regressions, analyzing three debt ratios (external debt to GDP, external debt to exports, and public debt to GDP) against various indicators of the pandemic, along with several control variables. Our measures of the pandemic vary, including post-COVID dummy variables and variables indicating the severity of the pandemic.

Limitations to our study include, firstly, the availability and quality of data, especially for EMDE, which may affect the precision of our findings; variations in data reporting and accuracy across countries could impact the robustness of the analysis. Secondly, the study's focus on the aftermath of the COVID-19 pandemic within a specific time frame (2015–2022) may not capture the full extent of the pandemic's long-term effects on global debt trends.

First, we demonstrate that EMDE faced escalated external and public debt burdens, while AE primarily encountered amplified public debt due to fiscal stimuli in response to the crisis. Despite initial concerns, EMDE managed to navigate a potential rollover crisis while maintaining elevated debt levels.

Second, we argue that the observed trend in debt dynamics during the COVID-19 pandemic does suggest the widening of a North–South divide. AE, primarily located in the Global North, have handled debt challenges differently compared to EMDE, mostly situated in the Global South. The divergent impact of the pandemic on debt levels could exacerbate the existing gap between these economic segments.

To address these vulnerabilities, we outline several financial policy measures conducive to debt reduction. These measures range from orthodox to heterodox policies for debt reduction, as outlined by Kose et al. (2022). Orthodox policies include strategies such as promoting economic growth, fiscal consolidation, privatization of public assets, and implementing wealth taxation. Heterodox policies involve alternative approaches to debt reduction, including inducing higher inflation through fiscal and monetary measures, implementing financial repression through capital controls and financial sector regulations, and considering debt default and restructuring as a last resort. We also emphasize that international assistance and initiatives are crucial for supporting countries burdened by high levels of debt, underscoring the importance of debt relief programs.

The paper is organized as follows: The next section gives an overview of the problem by preliminarily evaluating the main COVID-19 repercussions on AE and EMDE, introducing the relevant debt ratios for the study, and presenting the determinants of debt changes. Section 3 describes the methodology of the analysis. Section 4 then presents the results and offers a preliminary analysis of the debt trajectory during COVID-19. The research further discusses the results in Section 5, comparing developing and developed economies and identifying a few paths for unburdening the economies of the South. Finally, the concluding section summarizes the primary findings and points to the possibility of a fundamental shift in the current economic paradigm largely accountable for the North–South divide.

2. Background and Literature Review

2.1. Comparative Major COVID-19 Impacts in AE and EMDE

According to the World Economic Outlook (IMF 2020), the pandemic crisis triggered by COVID-19 hindered two decades of average growth of 4.1% in EMDE (one percentage point higher than in 1980–1999), a period during which important advances were made in poverty reduction and income distribution. In terms of economic growth, global GDP slowed by 2.8% as a result of the pandemic in 2020, with a rebound of 6.3% in the subsequent year (IMF 2023d). However, Figure 1 shows that neither the downturn nor the burst happened in the same way in all world economies.

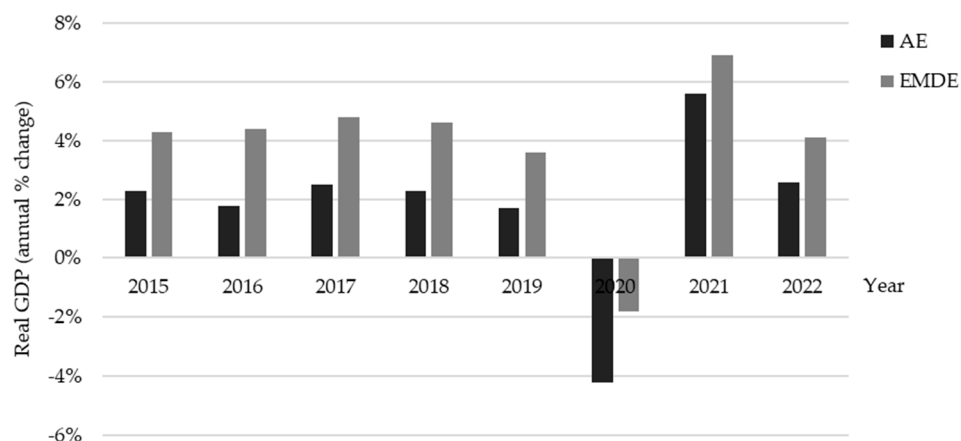


Figure 1. GDP growth rates (2015–2022). Source: IMF (2023d).

The pandemic had the greatest impact on AE, while EMDE experienced relatively less severe contractions, with notable disparities in the size of the shock. Latin America and the Caribbean experienced the greatest impact (−7.0%), while Asia performed better (−0.5%), primarily due to China’s performance (+2.2% in 2020). Over the first year of the pandemic, the decline in economic growth as well as the number of casualties aligned with the income inequality levels in each country, with nations more reliant on the service sector and those that enforced stricter measures, such as lockdowns, facing greater reductions in GDP growth (Ghecham 2022). Notwithstanding, over the course of 2020 and 2021, in AE, COVID-19 fatalities had a somewhat larger, though not statistically significant, negative impact on GDP. Conversely, lockdown restrictions had a more detrimental effect on the economic activities in EMDE. Furthermore, global trade served as a significant channel for the economic repercussions of the pandemic to spill over national borders (Gagnon et al. 2023).

This contraction in the global economy plunged more people into poverty. Indeed, the International Food Policy Research Institute estimated that in the absence of social and economic mitigation measures in the Global South, the number of poor would increase by 20% (almost 150 million people) with respect to the situation in the absence of COVID-19 (Laborde et al. 2021).

For the first time since 1990, estimates predicted worldwide poverty to increase, reversing over a decade of global progress toward poverty reduction (Sumner et al. 2020). In fact, the 2020 global Multidimensional Poverty Index (MPI) noted that the pandemic would set back progress in poverty reduction by 3–10 years. By 2022, estimates from the United Nations Development Programme, and the Oxford Poverty and Human Development Initiative suggested that the most pessimistic scenarios were then plausible (UNDP 2022). These scenarios were associated with lost schooling, slower learning processes, or even abandonment attributed to the pandemic. Furthermore, data on food insecurity indicated that the number of people living in food crises or worse increased to 193 million in 2021.

By then, due to large disparities in vaccine access and policy support, AE were expected to regain the pre-pandemic trend path faster than most emerging economies groups, with the exception of the Asian developing economies (IMF 2021c). The Gini

coefficient (which quantifies inequality within a population—a value of zero shows perfect equality, while 100 implies maximum inequality) declined by only three points over the two preceding decades (from 44 to 41, on average), but this was associated with an increase in income disparity in one-third of low-income developing countries (IMF 2020). There was a significant divide between AE and EMDE. The threat, even to modest gains, was significant. Indeed, although prior pandemics elevated the Gini coefficient, research suggested that the COVID-19 impacts were worse than the earlier crisis (Furceri et al. 2022).

Aside from income inequality, research revealed other severe discrepancies in the COVID-19 pandemic between AE and EMDE, particularly in terms of mortality (Ahmed et al. 2020) and vaccination (Arellano et al. 2023; Tatar et al. 2021), which seemed to widen the gap between them. Nonetheless, wealthy nations had lost more life years per capita than poorer countries, owing to the population's older age structure in richer countries and a disease with a highly age-selective lethality (Ferreira 2021).

Regarding gender equality, despite improvements, gender disparities in labor force participation remained high, especially in low-income countries (IMF 2020). However, even in AE, the COVID-19 shock deepened gender inequality by disproportionately affecting women (Flor et al. 2022; Yerkes et al. 2020). Other indicators of slow growth or reversal included increased inequality due to higher unemployment (Petrakos et al. 2023), unequal access to technological resources (Korkmaz et al. 2022), which determined the conditions necessary to provide distance education exacerbated the inequity in education (Ferreira 2021), and mental health, to name a few. The pandemic's unequal impact on vulnerable workers also jeopardized the progress made before the crisis and potentially exacerbated the imbalances between AE and EMDE (Bottan et al. 2020; Furceri et al. 2022).

More comprehensive measures of well-being than the GDP, such as the Human Development Index (HDI), which combines factors such as health, education, and the economy, indicated a steep and unprecedented decline in 90% of countries in 2020 or 2021 (UNDP 2022). An alternative measure proposed by Jones and Klenow (Jones and Klenow 2016 cit. in IMF 2020, p. 37), which considers factors such as real consumption per capita, life expectancy, leisure time, and consumption inequality, indicated a drop in well-being as high as 8%, owing in large part to a surge in inequality (IMF 2020). Policies of redistribution and measures to support afflicted individuals and businesses were critical for mitigating adverse effects on inequality, education, and overall well-being.

When comparing the economic impact of the COVID-19 pandemic with past shocks, such as the oil shocks or the 2007–2008 Global Financial Crisis (GFC), it reveals distinct characteristics and implications for each event. Firstly, the total economic impact of the COVID-19 pandemic is expected to exceed that of the GFC, both in size and scope. The pandemic lockdowns resulted in severe declines in oil prices (Rose 2020) and had an impact on currency volatility about eight times greater compared to the GFC (Gunay 2021), highlighting its global reach. The distributive consequences of the pandemic may surpass those arising from historical pandemics and exceed the effects observed in typical recessions and financial crises (Furceri et al. 2022). Secondly, the COVID-19 pandemic had significant consequences on government debts, requiring extensive debt relief measures. This differs from past sovereign debt crises, where the focus was more on austerity and restructuring (Becchetti and Scaramozzino 2021). Thirdly, the pandemic created both a demand and supply shock in the oil industry, leading to high levels of oil price volatility. This is different from traditional oil shocks, which were typically driven by supply-side factors (Bourghelle et al. 2021). Fourthly, the borrowing during the COVID-19 pandemic did not adequately account for the impact of climate change on countries' ability to repay debt, a concern that was less prominent in past financial crises (Dibley et al. 2021). Finally, although COVID-19 had a significant impact on financial markets, marked by substantial declines in stock market indexes and heightened volatility, the literature reports mixed results when comparing it to the GFC. On the one hand, El-Khatib and Samet (2021) suggest that the effects of the pandemic on stock markets did not reach the magnitudes observed during the GFC, with the most pronounced effects being observed in Asian

emerging markets and the least in European emerging markets (Topcu and Gulal 2020). Accordingly, De La Peña and García (2023) found that financial shocks accounted for half of the contraction of the GDP cycle in the GFC, while during COVID-19, the contraction was mainly due to a demand shock. Contrarily, Muzindutsi et al. (2022) found that the impact of the COVID-19 pandemic on financial markets was more severe than that of the GFC, with contagion effects being more pronounced in EMDE than in AE during both crises.

2.2. Debt Ratios to Respond to Crises and Shocks

Countries must (either save or) borrow in order to fund recovery and development programs, which are jeopardized in the presence of large debt loads and default risks. This is especially important in a world following COVID-19 (Elkhishin and Mohieldin 2021) and facing the likelihood of other infectious disease outbreaks that are anticipated to become more prevalent and difficult to control (UNOCHA 2021). The more indebted a country is and the greater the burden of debt repayment, the less able it is to fund a health crisis response and accomplish development objectives. As such, it is reasonable to anticipate a deepening of inequality in such countries.

Among the vast array of current debt metrics, this research focuses its examination on debt solvency, that is, the capacity of a country to respond to long-term obligations, and analyzes debt burden ratios, in particular stock-based indicators—external debt-to-GDP, external debt-to-exports, and government debt-to-GDP.

External debt refers to debt liabilities owed by (both public and private) residents of an economy to nonresidents. External debt is very important, particularly for developing countries, since it provides resources that supplement local savings and fund investment. Nonetheless, a high level of external debt may also disrupt growth and the efficient performance of capital markets. As such, debt ratios and the trajectory of external debt must be examined in order to reduce future risks and recognize (challenges to) economic policy choices. The *external debt-to-GDP* ratio measures the total outstanding external debt at the end of the year in relation to gross domestic product. i.e., it indicates the potential to repay foreign debt if resources were to be redirected from the production of domestic goods to generating exports (IMF 2000). Supplementarily, the *external debt-to-exports* ratio expresses the relationship between the total outstanding debt at the close of the year and the economy's exports of goods and services in that year (IMF 2000). This ratio is used as a measure of sustainability since, at a given interest rate, a rising debt-to-exports ratio signals that the country may have difficulty servicing its debt obligations in the future, as it indicates that overall debt is growing faster than exports, i.e., than the country's primary source of external revenue.

The *government debt-to-GDP* ratio is another relevant debt metric. National governments issue sovereign debt, which is considered a unique asset in the financial system due to its perceived safety and liquidity compared to private debt, thanks to the government's ability to tax future income. It aids economic agents in managing liquidity, smoothing consumption, and seizing investment opportunities. However, there is a contrasting view highlighting the challenges in enforcing sovereign debt contracts, especially with foreign investors. Enforcement is difficult not due to a lack of legal framework but because foreign courts cannot compel sovereigns to relinquish assets, most of which are within their borders. In advanced countries, where sovereign debt is largely held domestically, default is politically unviable, while in emerging markets, with weaker political institutions and segmented debt markets, the focus is on the sovereign's control over its territory and assets. Both perspectives underscore the sovereign's extraordinary powers: the ability to tax and to control territory and assets (Martinez et al. 2022).

It is also vital to pay close attention to the probability of adverse effects on these indicators. The trajectories of growing debt, stagnation of the output level, inflation, and increasing interest rates are all factors that may heighten the risks of failing to meet financial obligations, with consequences in the form of higher interest rates and the aggravation of payment terms. Indeed, a paradox emerges in that, in the context of rising interest rates,

the indebtedness capacity drops exactly when it is most required. [Arellano et al. \(2020\)](#) demonstrate that in EMDE, pandemic shocks heighten the risks of sovereign defaults, consequently limiting their capacity to borrow, while [Zheng \(2023\)](#) finds that in AE, where governments can issue more bonds to address unexpected fiscal shocks, there is no evidence to suggest that pandemic shocks lead to an increase in sovereign bond spreads.

For the purposes of this study, the observation of the aforementioned ratios is deemed adequate and sufficient, although additional indicators could be presented, such as liquidity indicators and solvency flow-based indicators. Examples of the former could include international reserves to short-term debt (which assesses future vulnerability to liquidity crises) and short-term debt to total outstanding debt (which measures reliance on short-term financing). Examples of the latter could include debt service to exports or debt service to GDP. Note that debt service is the amount of money necessary to repay the interest and principal on a loan over a certain term. As a result, debt-service-related metrics inform about the resources a country must allocate to repay its debts and the burden on the system due to crowding out alternative uses of financial resources. In general, it is useful to monitor debt service in relation to exports and (government) revenues ([IMF 2022a, 2014](#)).

One should note, in particular, that since the subprime mortgage crisis of 2007–2008, the growing trend of national (public) debt levels has been evident, but it escalated swiftly in reaction to the COVID-19 epidemic, which became related to the repeated financing demands of economic activity. Compared to 2008, almost 90% of advanced countries have greater national debt-to-GDP ratios in 2019. Meanwhile, in this same year, approximately two-fifths of low-income developing countries were at high risk of or experiencing debt distress ([UNCTAD 2019](#)).

Yet, the evaluation of national debt ratios for AE and EMDE is significantly different. For the former, low-interest monetary policies coupled with debt practices in their own currency have enabled them to maintain large debt ratios. In these economies, changing these practices is expected to slow down economic growth, decrease tax revenues, increase the need to invest in economic recovery, increase the costs of debt service, and increase the risk of having a high debt ratio. Nevertheless, increasing interest rates have more severe and sustained effects for developing economies since the majority of these nations have funded at least a portion of their debt by external borrowing, which increases the likelihood of debt distress and debt crises. Faced with this increased risk, some governments have to choose between cutting public spending or preserving it. The first choice makes growth, health, and social vulnerability more unequal, while the second one increases borrowing costs, debt burdens, and the risk of debt defaults.

Following the pandemic's outbreak, all economies were affected, but the impact was particularly acute in EMDE, where deteriorating financial capacity for external indebtedness jeopardized the implementation of anti-pandemic policies and significantly limited the continuation of external funding for long-term development programs. In contrast, AE continued, to a greater or lesser extent, to be capable of implementing fiscal stimulus packages in addition to expansionary monetary policy measures without major repercussions on their financial conditions or exchange rates.

Indeed, there is a clear difference in how the national debt ratios changed in AE and EMDC. Figure 2 illustrates the annual percentage change in debt indicators', with distinct representations for both groups of economies.

Beginning in 2010, EMDE were already experiencing a rapid accumulation of debt, often referred to as the "fourth wave" of debt ([Kose et al. 2020](#)). This trend was exacerbated during the pandemic-induced global recession of 2020, transforming the fourth wave into a more perilous "tsunami" due to the sharp increase in debt ([Kose et al. 2021](#)).

As such, it is not surprising that the economies that responded best to external pressures were those that "exhibit a balanced integration, rather than an asymmetric integration, and those that promote a conscious external allocation of savings to productive projects" ([Dornbusch and Helmers 1991](#), p. 234). As a result, those authors argue that "an efficient indebtedness strategy is an integral aspect of a broader development strategy." [Our translation].

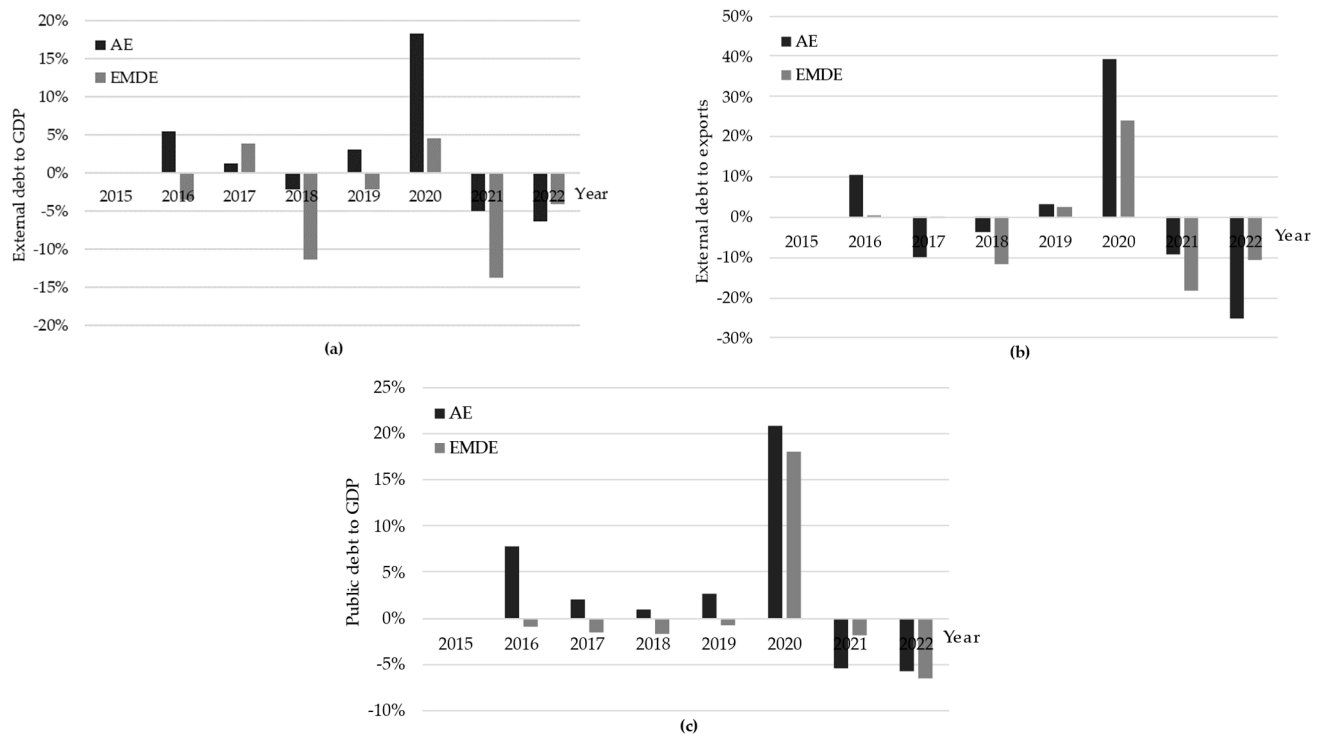


Figure 2. Year-on-year percentage changes in average debt ratios. (a) External debt to GDP; (b) external debt to export; (c) public debt to GDP. Source: Authors' calculations based on the data sources included in Appendix A Table A1.

2.3. Determinants of Debt Indicators

As mentioned earlier, this analysis explores the trajectory of debt indicators in AE and EMDE, as these indicators demonstrate the countries' ability to finance COVID-19 response strategies, whether externally or domestically. The specific debt indicators examined in this analysis include the ratios of *external debt to GDP*, *external debt to exports*, and *government debt to GDP*. The choice of these major indicators relates to their significance in assessing a country's ability to undertake an accommodating political economy as a response to the pandemic. This is not to diminish the relevance of all the many other indicators, economic or otherwise, to such an extent that an analysis of major social-economic impacts has been included in Section 2.1.

To determine the factors influencing the debt trajectory in our model, we rely on insights from previous research. Table 1 lists the key variables most commonly identified in these studies.

Additional determinants, such as debt architecture and the dominance of various forms of debt, as discussed by Elkhishin and Mohieldin (2021), could be considered. However, the aim of our study is not to dissect the influence of these determinants on debt indicators but to examine the impact of the pandemic. Therefore, we include control variables in a parsimonious manner rather than assessing the impact of explanatory variables.

Table 1. Description of control variables.

Group	Variable	References
Fiscal indicators	Gov. net lending/borrowing to GDP	(Awan et al. 2015; Mahara and Dhakal 2020; Omar and Ibrahim 2021)
	Gov. revenue to GDP	(Mensah et al. 2017; Waheed 2017)

Table 1. Cont.

Group	Variable	References
Macroeconomic indicators	GDP growth	(Dawood et al. 2021; Mensah et al. 2017; Swamy 2015; Waheed 2017)
	GDP per capita	(Omar and Ibrahim 2021)
	Investment to GDP	(Dawood et al. 2021; Omar and Ibrahim 2021; Swamy 2015; Waheed 2017)
	Inflation rate	(Dawood et al. 2021; Mensah et al. 2017; Swamy 2015; Waheed 2017)
	REER (real effective exchange rate)	(Dawood et al. 2021; Mahara and Dhakal 2020; Omar and Ibrahim 2021)
	Trade openness (share of exports and imports in GDP)	(Awan et al. 2015; Dawood et al. 2021; Mahara and Dhakal 2020; Swamy 2015)

3. Methodology

3.1. Sample Selection and Variables

Recall that the study employs the categorization of economies from the World Economic Outlook (IMF 2023d), which segments the world into advanced economies (AE—41 countries¹) and emerging market and developing economies (EMDE—155 economies). The analysis spans the period from 2015 to 2022. The key variables of interest include *external debt to GDP*, *external debt to exports*, and *government debt to GDP*. Table 2 provides the summary statistics for these variables.

Table 2. Summary statistics for the dependent variables 2015–2022.

		Mean ^(a)	Median	Std. Dev	Min	Max	Skew.	Nr. Obs.
AE	External debt to GDP	218.97	150.13	206.69	25.14	1230.81	2.10	291
	External debt to exports	314.88	299.12	179.20	57.68	978.22	0.82	282
	Government debt to GDP	73.31	61.40	47.17	0.05	260.08	1.53	312
EMDE	External debt to GDP	58.15	45.37	49.87	0.50	417.14	3.09	1173
	External debt to exports	177.78	154.15	132.15	5.46	1287.75	2.88	1031
	Government debt to GDP	56.73	50.79	36.70	2.06	349.88	2.63	1214

Source: Authors' calculations based on the data sources included in Appendix A Table A1. Legend: ^(a) simple average of debt ratios.

As control variables, we chose those frequently included in the literature and that have demonstrated statistical significance in explaining debt indicators. These potential determinants are detailed in Table 1, and their corresponding data sources are provided in Appendix A Table A1. Additionally, as part of Tables A2 and A3 in Appendix A, we present the descriptive statistics of these control variables, along with the correlation matrix between those variables, showcased in Tables A4 and A5.

3.2. Model Specification

Following Colak and Öztekin (2021), who analyzed the impact of the COVID-19 pandemic on bank lending around the world, the empirical methodology explores both time series and cross-sectional variations in countries' responses to the pandemic. Even when all countries in a group of economies (AE or EMDE) are exposed to the same shock, their response can vary. Those idiosyncrasies are captured by the variables identified in the previous section.

In order to mitigate concerns regarding the potential endogeneity of COVID with respect to other country-specific factors and to minimize the risk of biasing the coefficient

estimates due to unobservable differences among countries, we incorporate country-fixed effects (represented as γ_i).

Formally, the empirical model is as follows:

$$\text{LnDebt}_{i,t} = \alpha + \beta \cdot \text{CVD}_{i,t} + \lambda \cdot F_{i,t} + \delta \cdot M_{i,t} + \gamma_i + u_{i,t} \quad (1)$$

The dependent variable is the logarithmic debt ratio (measured by *external debt to GDP*, *external debt to exports*, or *government debt to GDP*).

The COVID-19 shock is the primary variable under consideration, a general vector denoted as $\text{CVD}_{i,t}$, which varies over time and, in some cases, across different countries. This measure includes, alternatively, a dummy variable, Post-CVD_t , representing the post-pandemic period (2020–22); or, year dummy variables representing 2020, 2021, and 2022; or, a cross-country heterogeneous impact measure, $\text{CVD_Affected}_{i,t}$, that equals 1, after 2020, for countries with above-median values of disease severity; and, as a robustness exercise, $\text{CVD-Contagion}_{i,t}$ that takes advantage of time- and country-based variation in the pandemic using continuous measures of disease severity (Colak and Öztekin 2021).

To take into account for other possible influences, we use a set of fiscal and macroeconomic indicators (represented by the general vectors $F_{i,t}$ and $M_{i,t}$, respectively) as control variables, as outlined in Table 1. We incorporate GDP per capita, investment to GDP, and trade openness in logarithmic form, while leaving variables denominated as “rates”, such as GDP growth, REER, and inflation rates, in their original, untransformed forms. These variables are incorporated contemporaneously; however, it is important to note that including them as lagged variables does not alter the effects of the primary variables of interest, $\text{CVD}_{i,t}$.

The country fixed effects measure the idiosyncrasies of a country that affect its debt and that are not time dependent. For example, the efficiency of the health system, the quality of governance, and many other country-specific variables are captured by the fixed effect.

3.3. Preliminary Data Analysis

As outlined earlier, our analysis encompasses 8 time periods (years), with 40 cross-sections for AE and 155 for EMDE. However, due to multiple missing values, our panel data is unbalanced. The initial data exploration involved several steps: We began by conducting summary statistics (refer to Tables A2 and A3 in Appendix A) and examining correlation matrices (Tables A4 and A5). Next, and prior to testing for stationarity, we assessed cross-sectional dependence in the panel data using the Pesaran CD (cross-sectional dependence test). After establishing the presence of cross-sectional dependence among the variables, using 2nd generation unit root tests such as Pesaran CIPS (cross-sectionally augmented Im-Pesaran-Shin) and/or CADF (cross-sectionally augmented Dickey–Fuller) was recommended (Kappler 2006). However, due to the unbalanced nature of our panel dataset, we proceeded with 1st generation unit root tests such as LLC (Levin, Lin, and Chu), Breitung, IPS (Im-Pesaran-Shin), Fisher type ADF and PP, and Hadri (Tables A6 and A7) to assess the stationarity of the variables (Baltagi 2021a).

To account for the presence of cross-sectional errors, the model is estimated through panel error generalized least squares (EGLS) with cross-section weights and panel-corrected standard errors (PCSE). These standard errors account for the potential correlation of observations within each cross-sectional unit, address the issue of within-group error correlation, and are robust to both heteroscedasticity and serial correlation within panels.

Moreover, after having established by a Hausman test that the random effect model is rejected (Baltagi 2021b), we used a fixed effect model to control for unobserved time-invariant factors and to produce unbiased estimates of the control variables (De Grauwe and Ji 2013).

4. Results and Preliminary Discussion

Our main hypothesis is that the pandemic-related shock and uncertainty lead to increased indebtedness, particularly in EMDE. We present the results separately for the

subsamples of EMDE and AE. Since there is a common set of control variables in each subsample, this allows for meaningful comparisons between them. Table 3 presents the results of estimating Equation (1).

Table 3. Results of the effect of the post-COVID-19 period on debt indicators.

	External Debt to GDP (ln)		External Debt to Exp.(ln)		Govt. Debt to GDP (ln)	
	EMDE (1)	AE (2)	EMDE (3)	AE (4)	EMDE (5)	AE (6)
Constant	7.494 *** (0.000)	7.516 *** (0.000)	10.688 *** (0.000)	12.348 *** (0.000)	6.906 *** (0.000)	5.701 *** (0.001)
Post_covid (dummy)	0.143 *** (0.000)	0.007 (0.662)	0.162 *** (0.000)	0.018 (0.262)	0.177 *** (0.000)	0.075 *** (0.000)
Gov. net balance	−0.005 *** (0.000)	−0.011 *** (0.000)	−0.013 *** (0.000)	−0.012 *** (0.000)	−0.012 *** (0.000)	−0.020 *** (0.000)
Gov. revenue (ln)	0.097 ** (0.013)	0.582 *** (0.000)	0.202 ** (0.062)	0.634 *** (0.000)	0.118 *** (0.001)	1.065 *** (0.000)
Investment (ln)	0.005 (0.748)	−0.038 (0.403)	0.108 *** (0.004)	0.095 ** (0.034)	−0.055 *** (0.000)	−0.582 *** (0.000)
GDP per capita (ln)	−0.529 *** (0.000)	−0.436 *** (0.000)	−0.363 *** (0.003)	−0.533 *** (0.000)	−0.402 *** (0.000)	−0.441 *** (0.001)
GDP growth (%)	−0.003 *** (0.000)	−0.004 *** (0.001)	−0.004 * (0.051)	−0.004 *** (0.001)	0.000 (0.339)	0.003 * (0.075)
REER (index)	0.000 (0.416)	−0.004 ** (0.013)	−0.001 * (0.054)	−0.003 ** (0.046)	−0.000 *** (0.000)	0.002 (0.278)
Inflation (index)	−0.001 (0.273)	−0.005 ** (0.064)	−0.000 (0.984)	−0.005 ** (0.044)	0.001 ** (0.028)	0.002 (0.460)
Trade openness (ln)	0.170 *** (0.000)	0.130 (0.193)	−0.794 *** (0.000)	−0.737 *** (0.000)	0.068 *** (0.004)	0.150 (0.313)
Country FE	Yes	Yes	Yes	Yes	Yes	Yes
Adjusted R-squared	0.985	0.992	0.993	0.988	0.986	0.985
Panel observations	908 ^u	285 ^u	851 ^u	279 ^u	927 ^u	285 ^u

Notes: Estimation method: Panel EGLS (cross-section weights). The *p*-values in parenthesis are based on cross-section weights (PCSE) standard errors and covariance (d.f. corrected). Legend: *, **, and *** indicate significance at the 10%, 5%, and 1% levels, respectively. The superscripts ^b and ^u in the number of observations stand for balanced and unbalanced panel observations.

The economic interpretation of the coefficients is as follows. Since the dependent variables are held in logs, the coefficient of the dummy variable indicates the $100 \times \beta\%$ change in the debt ratio after 2020. Regarding the control variables, the coefficient of log variables (e.g., *investment to GDP*) reflects the $\beta\%$ change in the debt ratio for a 1% change in the independent variable (i.e., the elasticity of debt to that variable), while the coefficient of non-log variables (e.g., GDP growth rate) reflects the $100 \times \beta\%$ change in the debt ratio for a 1 percentage point (p.p.) change in the independent variable.

The primary variable of interest in our analysis is *Post-CVD*. The results show that for EMDE, the post-pandemic period had a statistically significant and positive effect on all the considered debt measures. For instance, after the pandemic, on average, the external debt to GDP of EMDE increased by approximately 14%. On the other hand, for AE, this effect is not significant when examining external debt, whether relative to GDP or to exports. However, the data does suggest that, following the pandemic, government debt to GDP in AE rose by about 7.5%, against a 17.7% increase in EMDE. This implies that the economic shock of COVID-19 had a more severe impact on the debt levels of EMDE.

In each model, we also conducted estimations using the *net primary balance* in place of the *net government balance*. However, this substitution did not alter the impact of the primary variable of interest. As an additional analysis to address potential issues related to endogeneity, heteroskedasticity, or serial correlation, Appendix A Table A8 shows the results of estimating the baseline model using the panel (dynamic) generalized method of moments. The impact of the pandemic on debt indicators remains consistent with the previous findings. Note that, in an exploratory analysis presented in Appendix A Table A9, we also categorized countries based on their debt ratios: Those with debt ratios below the median of 2019 (pre-pandemic year) and those with debt ratios above the median of 2019. The results show that countries below the median (mainly EMDE) experienced a higher percentage change in all debt ratios compared to countries with higher initial ratios. Thus, countries with lower debt levels before the pandemic were better positioned to manage the economic impacts of the crisis.

To disentangle the fluctuations in debt between 2020 and 2022, we incorporated dummy variables to capture the influence of three distinct years: 2020, characterized by the acute impact of the COVID pandemic; 2021, a year potentially reflecting shifts in debt trends; and 2022, the final year of our study period. For simplicity and ease of understanding, the results presented in Table 4 focus solely on the coefficients of the key variables. We have chosen not to report the coefficients for the control variables.

Table 4. Results of the effect of the post-COVID-19 individual years on debt indicators.

	External Debt to GDP (ln)		External Debt to Exp.(ln)		Govt. Debt to GDP (ln)	
	EMDE (1)	AE (2)	EMDE (3)	AE (4)	EMDE (5)	AE (6)
Dummy_2020	0.165 *** (0.000)	0.086 *** (0.000)	0.187 *** (0.000)	0.090 *** (0.000)	0.170 *** (0.000)	0.040 (0.157)
Dummy_2021	0.152 *** (0.000)	−0.033 * (0.082)	0.209 *** (0.000)	−0.027 (0.154)	0.190 *** (0.000)	0.073*** (0.000)
Dummy_2022	0.058 *** (0.000)	−0.082 * (0.091)	0.052 ** (0.012)	−0.029 (0.487)	0.159 *** (0.000)	0.108*** (0.000)
Controls	Yes	Yes	Yes	Yes	Yes	Yes
Country FE	Yes	Yes	Yes	Yes	Yes	Yes
Adjusted R-squared	0.986	0.993	0.934	0.989	0.984	0.984
Panel observations	908 ^u	285 ^u	851 ^u	279 ^u	927 ^u	285 ^u

Notes: Estimation method: Panel EGLS (cross-section weights). The *p*-values in parenthesis are based on cross-section weights (PCSE) standard errors and covariance (d.f. corrected). Legend: *, **, and *** indicate significance at the 10%, 5%, and 1% levels, respectively. The superscripts ^b and ^u in the number of observations stand for balanced and unbalanced panel observations.

All other factors being constant, Table 4 indicates a pronounced increase in debt ratios for EMDE at the onset of the pandemic. In the years that followed, these ratios stayed notably above pre-pandemic levels. External debt ratios in AE predominantly experienced the most significant impact in 2020. Controlling for all other variables, we observed an increase in government debt relative to GDP in the subsequent years of the pandemic compared to pre-pandemic figures.

In Table 5, we examine whether the severity of the pandemic had a significant impact on the debt indicators. The variables of interest in Models A and B are dummy variables, assigned a value of 1 for countries where the number of deaths or cases exceeded the median value; alternatively, in Models C and D, the severity of the pandemic is measured by the number of deaths or cases per million in each country. These models also account for country-specific fixed effects instead of random effects, as determined by the Hausman test.

Table 5. Results of the effect of COVID-19 severity on debt indicators. Variables of interest: *CVD-affected* (=1 if country is above the median) in Models A and B, and *CVD-contagion* ($\log(1 + \text{Total number of COVID-19 confirmed deaths or cases per million})$) in Models C and D.

	External Debt to GDP (ln)		External Debt to Exp.(ln)		Govt. Debt to GDP (ln)	
	EMDE (1)	AE (2)	EMDE (3)	AE (4)	EMDE (5)	AE (6)
A. <i>CVD_Affected_deaths</i>	0.077 *** (0.000)	0.015 (0.380)	0.051 ** (0.041)	0.022 (0.252)	0.153 *** (0.000)	0.036 *** (0.000)
Adjusted R-squared	0.988	0.989	0.924	0.988	0.983	0.974
Panel observations	908 ^u	272 ^b	859 ^u	271 ^u	927 ^u	272 ^b
B. <i>CVD_Affected_cases</i>	0.064 *** (0.000)	0.009 (0.685)	0.001 (0.967)	0.017 (0.463)	0.096 *** (0.000)	0.078 *** (0.000)
Adjusted R-squared	0.989	0.990	0.924	0.988	0.975	0.992
Panel observations	908 ^u	272 ^b	851 ^u	271 ^u	927 ^u	272 ^b
C. <i>CVD_Contagion_deaths</i>	0.021 *** (0.000)	0.001 (0.659)	0.023 *** (0.000)	0.003 (0.288)	0.028 *** (0.000)	0.001 (0.648)
Adjusted R-squared	0.988	0.991	0.928	0.988	0.983	0.987
Panel observations	908 ^u	280 ^b	851 ^u	279 ^b	927 ^u	280 ^b
D. <i>CVD_Contagion_cases</i>	0.013 *** (0.000)	0.000 (0.923)	0.014 *** (0.000)	0.001 (0.534)	0.017 ** (0.000)	0.001 (0.207)
Adjusted R-squared	0.986	0.989	0.917	0.987	0.981	0.985
Panel observations	908 ^u	280 ^b	851 ^u	279 ^b	927 ^u	280 ^b
Controls	Yes	Yes	Yes	Yes	Yes	Yes
Country FE	Yes	Yes	Yes	Yes	Yes	Yes
Adjusted R-squared	0.986	0.993	0.934	0.989	0.984	0.984
Panel observations	908 ^u	285 ^u	851 ^u	279 ^u	927 ^u	285 ^u

Notes: Estimation method: Panel EGLS (cross-section weights). The *p*-values in parenthesis are based on cross-section weights (PCSE) standard errors and covariance (d.f. corrected). Legend: *, **, and *** indicate significance at the 10%, 5%, and 1% levels, respectively. The superscripts ^b and ^u in the number of observations stand for balanced and unbalanced panel observations.

Table 5 shows that the EMDE, which experienced a more severe impact from the pandemic, saw an increase in various debt indicators. This increase is most notable in government debt. However, in AE, the severity of the pandemic appeared to have no significant effect on external debt indicators, only on government debt, and when the pandemic is measured by the severity compared to median values.

5. Discussion

5.1. COVID-19 Debt Related Impact in EMDE and AE

The pandemic resulted in a huge rise in the indebtedness of all economic agents—businesses, families, and States—as lines of credit were made accessible to businesses with governmental guarantees and payment defaults for households, therefore increasing indebtedness. The public sector played a significant role by providing assistance to businesses and individuals affected by economic downturns.

In our analysis, it is crucial to acknowledge that we focus on debt ratios relative to GDP or exports. Consequently, changes in debt levels and shifts in GDP and exports influence these ratios.

After the outbreak of COVID-19, debt levels in a number of EMDE hit record highs (IMF 2022c), driven by the need for fiscal assistance to mitigate the effects of a once-in-a-generation crisis. AE also experienced this effect. Srivastava et al. (2020) suggested that

COVID-19 could lead to a 14.9% increase in government debt-to-GDP ratios in 19 of the G-20 countries, requiring major changes in fiscal policy and potentially modifying fiscal responsibility legislations.

In our study, CVD is identified as the main variable of interest. The findings of Table 3 indicate a statistically significant and positive influence of the post-pandemic period on all the debt measures for EMDE. Notably, the pandemic resulted in an estimated 14.3% increase in the external debt to GDP, 16.2% in the external debt to exports, and 17.7% in the public debt to GDP. Conversely, in AE, the impact of the pandemic on external debt, either relative to GDP or to exports, was not significant. However, data suggest an approximate 7.5% rise in the public debt to GDP in AE following the pandemic, suggesting a more profound impact of COVID-19 on EMDE's debt levels.

The global economic landscape continues to display its varied geometry, with differing levels of economic and financial fragility. On one hand, the vulnerability associated with external debt in EMDE has escalated during the COVID-19 shock (Elkhishin and Mohieldin 2021; Ozili 2023), as rising external debt burdens continued to absorb a growing share of developing countries' resources. On the other hand, the primary effect of AE was observed in public debt rather than external debts, as noted by Srivastava et al. (2020), since governments reacted to the COVID-19 pandemic with fiscal stimulus. These economies have accumulated large new public debt and significantly increased the money supply (thereby monetizing a part of the new debt) without experiencing a major increase in long-term borrowing costs, consumer price inflation, or currency depreciation (IMF 2021a). However, the risk of stagflation appears to have returned to the agenda (Demary and Hüther 2022) as a result of central banks raising interest rates to counter inflation, inverting investors' expectations regarding compliance with the sovereign debt service obligations of some highly indebted countries. Confirmation of a lengthy slump may lead to a prolonged deleveraging process characterized by low growth and high inflation.

Next, we proceed to examine the post-pandemic years: 2020, marked by the severe effects of COVID-19; 2021, suggesting adjustments in debt trends; and 2022, which finalizes our analysis period. The results presented in Table 4 indicate that, at the pandemic's outset, the increase in external debt ratios was more pronounced compared to pre-pandemic values; nevertheless, all other things being equal, the pandemic left debt ratios at higher levels than those observed before the pandemic. However, contrary to initial concerns highlighted by Grittayaphong and Restrepo-Echavarria (2022) regarding a potential rollover crisis in EMDE, due to the lack of demand for newly issued debt in 2020, this crisis did not materialize. While fiscal deficits significantly deteriorated in 2020, there was an improvement in 2021. Nonetheless, this improvement was insufficient to bring gross debt levels back to pre-pandemic levels; they remained elevated.

Regarding whether the pandemic's severity significantly impacted debt indicators, Table 5 shows that EMDE experiencing harsher pandemic effects generally exhibited increases in various debt indicators, especially government debt. However, for AE and holding all other things equal, the pandemic's intensity did not notably impact external debt indicators. In these countries, the response to the pandemic crisis caused an increase in public indebtedness, assisted by strengthening an already expansionist monetary policy and compelling central banks to ostensibly intervene to prevent interest rates from rising (Corradin and Schwaab 2023).

The primary short-term consequence of the disparity in fiscal space between high- and low-income countries—fiscal space being defined as “the room for undertaking discretionary fiscal policy (increasing spending or reducing taxes) relative to existing plans without endangering market access and debt sustainability” (IMF 2021b, p. 43)—is that AE were expected to recover more quickly than poor countries from the pandemic (Sachs et al. 2021).

Unlike AE, which benefited from favorable borrowing conditions, with interest rates at or near record lows, allowing for a relatively seamless increase in public borrowing to address the short-term impacts of COVID-19, low-income countries faced constraints in engaging in comparable deficit financing. In fact, Zheng (2023) found that sovereign

spreads increased more in emerging economies than AE, though the former borrowed less during the pandemic. Despite the heightened necessity for fiscal expansion in these countries, surpassing the urgency seen in AE, this limitation persisted. Low-income nations required increased financial support to tackle the pandemic-induced economic crisis and make strides towards achieving the Sustainable Development Goals (SDGs).

The pandemic is likely to delay the SDGs by at least a decade, which puts low-income developing countries (LIDC) at risk. To successfully achieve the SDGs, these countries should be able to borrow at the same scale relative to GDP and at approximately the same interest rate as the rich countries, which will require new forms of international policy support that promote increased fiscal space (Sachs et al. 2021). Although recognizing the need to ensure the ability of these economies to continue to undertake essential public expenditure while managing to maintain their international financial obligations (IMF 2021c), higher debt levels and large government financing needs in many countries are also a source of vulnerability. In fact, EMDE are considerably more susceptible than they were at the outset of the global financial crisis, indicating that the effect of the present shock might be more severe and recovery more distant (Elkhishin and Mohieldin 2021).

Moreover, one may argue that the resilience of the North not only coexists with the worsening (debt) situation of the South but is sometimes to the detriment of the South's financial detriment, whether directly or indirectly. E.g., vaccine availability and distribution were inconsistent and unevenly distributed, with only 2.3% of the COVID-19 vaccinations delivered globally being administered in the 30 countries with a humanitarian response plan; total humanitarian assistance, comprising contributions from both public and private donors, experienced only modest growth in 2021; in 2022, despite a 40% increase in funding to appeals, the marginal progress in meeting overall requirements led to a record-high funding shortfall (Development Initiatives 2023, p. 33). This raises the question of whether, had the North played a more significant role in assisting the South, it would have achieved such a rapid recovery (Balfour et al. 2022). With this uncertainty in mind, requiring future investigation, the following section reviews policy measures associated with reducing the external vulnerability of EMDE.

5.2. Tackling the COVID-19 Debt Hike

The pandemic's expansionist fiscal support prevented more severe economic contractions and larger job losses. However, many nations are currently grappling with elevated debt levels, increasing interest rates, and dimming growth forecasts. According to the IMF (2023a), the debt to GDP ratios worldwide are projected to grow by 1 percentage point (p.p.) annually from 2023 to 2028, surpassing the previous expectations prior to the pandemic (IMF 2023b). Debt crises in the EMDE were already a potential issue well before the pandemic and the onset of the polycrisis. The risk of a debt crisis is intensified by the constrained fiscal space in these countries, which is inadequate to support increased government spending during crises (Adarov et al. 2022). Additionally, the combined inability to attract private investment and the current tighter monetary policy measures aggravate the risk of recessions in developed countries, which could worsen the threat of debt crises (UNCTAD 2023).

Drawing on historical precedent, Kose et al. (2022) divide debt reduction efforts into two distinct policy options: orthodox policies based on increased growth, fiscal consolidation, privatization, and wealth taxation; and heterodox options based on financial repression, inflation, and default, as well as debt restructuring.

According to the orthodox view, the policy of promoting a *level of growth* greater than the rise in interest rates has aided several economies in reducing their debt stock in proportion to GDP. This has been occurring in several AE. However, relying solely on growth to decrease debt is risky because periods of strong development have historically been followed by rapid debt expansion in response to one-off shocks.

Implementing *fiscal consolidation* as a policy approach, through expenditure cutbacks or revenue increases, can generate primary fiscal surpluses that countries use to repay

debt. Nonetheless, given the magnitude of the required public finance interventions, fiscal consolidation may prove to be rather recessive since it would require countries that started the pandemic with already limited budgetary capacity to further strain their budgets. Furthermore, [Menguy \(2024\)](#) shows that a contractionary fiscal policy is more appropriate to ensure the sustainability of the long-term public debt, when the sensitivity of government expenditure to the public debt is high, and long-term labor and consumption taxation rates are high. Even though fiscal consolidation is considered a policy option to achieve the SDGs, [Sachs et al. \(2021\)](#) and [Kose et al. \(2022\)](#) caution about the trade-off between fiscal consolidation and the cost of slower growth.

If one focuses the intervention on one-off measures, it must be recalled that in the past, revenues from the *privatization of public assets* have been used to reduce public debt. However, some of the necessary preconditions for realizing the privatization potential have not yet been implemented, despite the benefits it can bring to some EMDE, including debt reduction.

Policy instruments such as *wealth taxes*, also known as capital taxes or equity taxes (taxes levied on an entity's ownership of assets), can address concerns about unequal wealth distribution among countries, within individuals, and across generations. EMDE, however, suffer from major implementation hurdles when it comes to increasing revenues via wealth taxes ([Kose et al. 2021](#)), since they diminish the return on investment, discourage savings, and thus slow growth.

As for heterodox policies, these include inflation, financial repression, default, and debt restructuring. While *unanticipated inflation* decreases the actual debt burden, it also has disadvantages as a debt reduction strategy since it would raise foreign currency-denominated external debt if coupled with exchange rate depreciation. Additionally, the high rate of inflation puts into question the credibility of the EMDE's central banks' achievements during the previous three decades. Moreover, under the current price pressure, "Relying on repeated inflation surprises to reduce public debt is not a viable strategy and will lead to spending pressures (for example, wages and cost of services)." ([IMF 2022b](#)). On the other hand, *financial repression* is a costly method of debt reduction since it discourages saving for productive purposes.

Default and debt restructuring may be a country's sole choices when confronted with foreign currency-denominated external debts. However, even a timely and orderly prepared debt restructuring, aimed at avoiding the higher costs associated with protracted debt crises ([IMF 2021c](#)), is a scenario that entails long-term consequences as well. Protracted negotiations prolong the loss of market access and may weaken the balance sheets of institutions, jeopardizing financial stability ([Kose et al. 2022](#)).

In cases where sovereign debt is unsustainable or financing requirements are significant, it may be necessary to alleviate financial constraints in order to address debt vulnerabilities, for instance, through the assistance of initiatives that boost countries' reserve assets via the General Allocation of Special Drawing Rights ([IMF 2021c](#)).

All of the aforementioned debt-reduction strategies present several drawbacks: Inflation, financial repression, and debt restructuring all impose significant economic and social costs, while wealth taxes or growth-enhancing measures might confront technological, logistical, and political obstacles. Thus, the precise mix of possible choices will vary according to each country's unique circumstances and the kind of debt involved.

As long as debt difficulties in EMDE remain more severe than in AE and there is no quick road to debt relief, the danger of a growing disparity between AE and EMDE exists. The problems inherent in debt relief pose some concerns about global governance, namely how AE can effectively assist EMDE in overcoming debt burdens ([Kose et al. 2021](#)). Debt relief mechanisms must carefully consider the risk of creating expectations for future relief; moreover, addressing sovereign debt problems requires a sustained investment and economic growth strategy, alongside with responsible debt management policies and institutions ([Ahiadorme 2023](#)).

Note that following the pandemic's outbreak, several initiatives were put into practice to tackle these countries' crisis repercussions. E.g., from April 2020 through the end of fiscal 2021, the World Bank provided more than USD 157 million to over 100 developing countries to fight the impacts of the pandemic (World Bank 2022); the G20 announced the Debt Service Suspension Initiative in April 2020; and the IMF also launched programs to channel resources from economically stronger members to countries where needs are greatest, such as the Poverty Reduction and Growth Trust and the Resilience and Sustainability Trust (IMF 2021c). But this may not be enough to handle sovereign debt overhangs in a post-pandemic economy, an exercise that will be particularly demanding for EMDE that hold high debt burdens, high interest rates, and tight margins for revenue and spending initiatives (IMF 2021c, p. 22).

Nonetheless, as previously said, the international community must take a more proactive role in aiding these countries, including through debt restructuring and reclassification whenever necessary. Recent literature highlights the necessity for rich countries and creditor organizations to provide relief to heavily indebted nations, aiding them in fulfilling their debt repayment responsibilities during and after the pandemic (Ozili 2023). Complementing this perspective, Arellano et al. (2020) find strong evidence in favor of the implementation of debt relief programs. They find that these programs offer significant social benefits, enhancing health and economic conditions in the indebted country without incurring costs for international lenders or financial institutions. With regards to debt relief, SDG-17.4 identifies the special needs of promoting debt financing, debt relief, and debt restructuring, where appropriate, and assists Heavily Indebted Poor Countries (HIPC) in reducing financial distress. However, it is crucial to address the high likelihood of many HIPC defaulting due to the depreciation of their currencies, their substantial level of indebtedness, and their significant budget deficits, even if debt is suspended or postponed.

Finally, delineating North–South cooperation initiatives does not diminish the relevance of *South–South cooperation* in terms of trade and development, which offers an opportunity for these countries to explore different paths to development that are more aligned with their unique contexts and challenges. This cooperation includes various forms of collaboration such as trade agreements, joint ventures, technology transfers, and shared development initiatives, as those related to education (Jules et al. 2023), health (de Moraes Achcar 2022) or agriculture (Shankland and Gonçalves 2016). This form of cooperation does not replace North–South relations but rather serves as a complementary approach that diversifies and enriches the global landscape of development and economic growth.

6. Conclusions

This paper has delineated the context and consequences of heightened indebtedness arising from the pandemic, shedding light on potential divergences in debt dynamics between developed and developing economies. The findings highlight the necessity of implementing multifaceted measures to alleviate debt vulnerability.

Two questions were addressed:

- (a) *How has the indebtedness of emerging markets and developing economies changed during the COVID-19 pandemic when compared to advanced economies?*

The COVID-19 pandemic triggered significant shifts in global indebtedness, setting record highs due to the dire need for fiscal support, notably impacting EMDE compared to AE. The global economic landscape portrayed varying vulnerabilities during the pandemic. EMDE faced escalated external and public debt burdens, while AE primarily encountered amplified public debt due to fiscal stimuli in response to the crisis. Despite initial concerns, EMDE managed to navigate a potential rollover crisis while maintaining elevated debt levels.

Firstly, in the AE, the response to the pandemic crisis caused an increase in public indebtedness by strengthening an already expansionist monetary policy and compelling central banks to ostensibly intervene to prevent interest rates from rising. Even so, the rapid growth in monetary aggregates associated with factors such as supply chain disruptions, rising energy prices, and ongoing global economic recovery efforts raised concerns about

inflation, potentially leading to higher interest rates in the medium term, especially in light of the closing of the output gap.

Secondly, according to the perspective of inflation, the macroeconomic manuals determine the increase in interest rates, thereby slowing down growth and pressing for an increase in the cost of debt service, both of which are capable of precipitating a financial crisis marked by high inflation and low growth (stagflation) for an extended period (considering the deflationary policies). Although generalized, this impact primarily affects the economies that are most vulnerable to their high levels of debt, including a few AE.

Thirdly, the EMDE were already heavily indebted before the epidemic, and their debt load has continued to grow considerably. In contrast to the AE, the EMDE, and particularly the LIDC, lack the financial means to sustain reaction measures to COVID-19's consequences, and hence their development trajectory is likely to be delayed by at least a decade. Developing economies lack the budgetary flexibility necessary to support emergency actions and responses to COVID-19's impacts, including the development of investment-led recovery plans aligned with the SDGs. Similarly, these countries have a restricted ability to finance themselves in the international market in comparison to high-income nations due to their poor credit quality in the market (measures to debt reduction).

(b) *Does this trajectory show the existence of a growing North–South divide?*

The economic North–South divide highlights a global economic system that increasingly favors the economically developed North over the South. The observed pattern in debt dynamics during the COVID-19 pandemic does suggest the widening of a North–South divide. AE, predominantly located in the Global North, managed to handle debt issues differently compared to EMDE, primarily situated in the Global South. The different impact of the pandemic on debt levels may further accentuate the pre-existing divide between these economic segments.

It is imperative to take a comprehensive approach to understand the disparities between AE and EMDE debt dynamics. The observed differences, while they might be unfortunately anticipated, highlight the impact of the prevailing global capitalist socioeconomic system. To transform this model, it is necessary to examine alternative paradigms for economic organization, thus enhancing our overall comprehension of global dynamics.

Addressing those debt vulnerabilities necessitates a tailored mix of measures, considering each country's unique circumstances. Our work outlined orthodox and heterodox policies to debt reduction, emphasizing the challenges and drawbacks associated with each. The orthodox suggestions include growth-enhancing measures, fiscal consolidation, privatization of public assets, and wealth taxation. The heterodox policies to reduce debt consider engineering high inflation through fiscal and monetary policy; financial repression, involving capital controls and regulations within the financial sector, aiming to establish discrepancies between real interest rates and growth rates that significantly exceed what would be justified by risk considerations in market-based scenarios; and debt default and restructuring, once governments run out of other options.

The research also touched on the need for international assistance and initiatives to support heavily indebted countries, highlighting the significance of debt relief programs. Regardless of the North–South connection, South–South cooperation in terms of trade and development remains extremely significant in terms of growth potential and the possibility for different development paths in the long run.

Future research could extend the time frame of the study beyond 2015–2022 to assess the lasting impacts of the pandemic on global debt trends; explore alternative country classifications beyond the traditional AE and EMDE segmentation that only partially captures the diversity of contexts; and investigate the effectiveness of specific policy measures directed at debt reduction and economic recovery in the South.

This essay examined the widening disparity between the economies of AE and EMDE in terms of indebtedness and debt sustainability, which has major economic consequences and, from there, a devastating effect on the human community. Within the heterodox perspective of economics and finance, there persists a dominant influence of market forces,

accentuating competitive advantage, resource exploitation through capital migration, the diminishing practical value of labor, and the prevalence of strict rationalities within financial frameworks. Addressing this seemingly irreversible dominance of market forces necessitates proactive efforts from academics, politicians, professionals, and activists seeking a paradigm shift. This shift would not necessarily be antagonistic to the market but would explore corrective measures within the market.

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Appendix A

Table A1. Data sources of dependent and control variables.

Variable Description	Source
External debt to GDP (%)	International Debt Statistics (World Bank 2023): External debt stocks, total (current USD) [DT.DOD.DECT.CD] & GDP (current USD) [NY.GDP.MKTP.CD]
External debt (current USD) [supplementary when World Bank data is not available]	Balance of Payments and International Investment Position (IMF 2023a): External debt ^(a) = Liabilities, Direct Investment, Debt Instruments [ILDD_BP6_USD] + Liabilities, Portfolio Investment, Debt Securities [ILPD_BP6_USD] + (Liabilities, Other Investment [ILO_BP6_USD] – Other Investment, Other Equity [ILOE_BP6_USD] Federal Reserve of St. Louis (supplementary where WB & IMF data n/a) https://fred.stlouisfed.org/ (accessed on 13 December 2023)
Gross domestic product (current USD)	World Economic Outlook (IMF 2023c): Gross domestic product, current prices (USD) [NGDPD]
External debt to exports (%)	International Debt Statistics (World Bank 2023): External debt stocks (% of exports of goods, services and primary income) [DT.DOD.DECT.EX.ZS]
Exports (in current USD) [supplementary when World Bank data is not available]	Balance of Payments and International Investment Position (IMF 2023a): Balance of Payments, Current Account, Goods and Services, Credit [BXGS_BP6_USD] + Primary Income, Credit [BXIP_BP6_USD] (current USD)
Government debt to GDP (%)	World Economic Outlook (IMF 2023c): General government gross debt (% of GDP) [GGXWDG_NGDP]
General government net lending/borrowing (% of GDP)	World Economic Outlook (IMF 2023c): General government net lending/borrowing (% of GDP) [GGXCNL_NGDP]
General government primary net lending/borrowing (% of GDP)	World Economic Outlook (IMF 2023c): Primary net lending/borrowing is net lending (+)/borrowing (–) plus net interest payable/paid (interest expense minus interest revenue) (% of GDP) [GGXONLB_NGDP]
General government total revenue (% of GDP)	World Economic Outlook (IMF 2023c): General government revenue (% of GDP) [GGR_NGDP]
Total investment (% of GDP)	World Economic Outlook (IMF 2023c): Total investment (% of GDP) [NID_NGDP]
GDP per capita	World Economic Outlook (IMF 2023c): Gross domestic product per capita, constant prices (Purchasing power parity; 2017 international dollar) [NGDPRPPPPC]
Real GDP growth	World Economic Outlook (IMF 2023c): Gross domestic product, constant prices (% year-on-year change) [NGDP_RPCH]
Inflation	World Economic Outlook (IMF 2023c): Inflation, average consumer prices (% year-on-year change) [PCPIPCH]

Table A1. Cont.

Variable Description	Source
Real effective exchange rate	REER (CPI-based) with 170 trading partners (Darvas 2023)
Trade openness = (exports + imports) to GDP	Balance of Payments and International Investment Position (IMF 2023a): Current Account, Goods and Services, Debit, US Dollars [BXGS_BP6_USD] & Current Account, Goods and Services, Credit, US Dollars [BMGS_BP6_USD]
Legend: ^(a) “External debt is not a separate component of the IIP but can be derived by summing the liability positions other than (1) financial derivatives (other than reserves) and ESOs [employee stock options], (2) equity and investment fund shares, and (3) other equity. These three liabilities are not debt instruments according to international statistical standards.” (IMF 2022a, p. 8).	

Table A2. Summary statistics for the control variables in AE.

	Variable	Mean	Median	Std. Dev	Max	Min	Observ.
Fiscal indicators	Gov. net lending/borrowing to GDP	−1.75	−1.24	5.49	25.35	−41.99	312
	Gov. primary net lending/borrowing	−0.69	−0.15	4.86	23.88	−36.64	285
	Gov. revenue to GDP	38.18	38.65	10.45	63.86	15.25	312
Macro Indicators	Investment to GDP	22.18	22.62	5.90	54.77	−1.13	312
	GDP per capita	50,149.58	47,653.76	16,926.40	125,279.30	26,526.08	312
	GDP growth	2.14	2.46	5.55	24.48	−54.24	312
	REER	102.21	98.10	13.45	134.15	78.05	280
	Inflation rate	2.07	1.34	2.91	19.45	−1.54	312
	Trade openness to GDP	125.01	104.01	80.29	402.46	23.61	298

Table A3. Summary statistics for the control variables in EMDE.

		Mean	Median	Std. Dev	Max	Min	Observ.
Fiscal indicators	Gov. net lending/borrowing to GDP	−3.36	−3.23	6.46	47.83	−55.41	1239
	Gov. primary net lending/borrowing	−1.95	−1.62	5.86	47.98	−55.41	1199
	Gov. revenue to GDP	27.34	24.12	18.84	164.17	2.06	1236
Macro indicators	Investment to GDP	24.50	23.46	9.16	79.40	−3.95	1065
	GDP per capita	12,990.81	9988.47	13,478.07	101,000.90	386.49	1239
	GDP growth	2.42	3.25	6.24	62.29	−33.36	1235
	REER	125.84	108.55	197.45	6242.25	48.46	1116
	Inflation rate	80.79	3.52	1945.63	65374.08	−44.36	1235
	Trade openness to GDP	80.71	75.68	39.32	320.92	0.19	1145

Table A4. Correlation matrix for the control variables in AE.

	Gov. Net Balance	Gov. Primary Net	Gov. Revenue	GDP Growth	GDP per Capita	Invest.	Inflation	REER	Trade Open
Gov. net lending/borrowing to GDP	1.000 —	—	—	—	—	—	—	—	—
Gov. primary net lending/borrowing	0.947 *** (0.000)	1.000 —	—	—	—	—	—	—	—
Gov. revenue to GDP	0.156 ** (0.011)	0.203 *** (0.001)	1.000 —	—	—	—	—	—	—
GDP growth	0.329 *** (0.000)	0.381 *** (0.000)	−0.145 ** (0.018)	1.000 —	—	—	—	—	—
GDP per capita	0.217 *** (0.000)	0.119 * (0.055)	−0.132 ** (0.033)	0.195 *** (0.002)	1.000 —	—	—	—	—
Investment to GDP	0.120 * (0.052)	−0.013 (0.837)	−0.182 *** (0.003)	0.137 ** (0.025)	0.373 *** (0.000)	1.000 —	—	—	—
Inflation rate	0.052 (0.400)	0.017 (0.782)	0.041 (0.506)	0.160 *** (0.009)	0.048 (0.436)	0.170 *** (0.006)	1.000 —	—	—

Table A4. Cont.

	Gov. Net Balance	Gov. Primary Net	Gov. Revenue	GDP Growth	GDP per Capita	Invest.	Inflation	REER	Trade Open
REER	−0.083 (0.182)	−0.141 ** (0.022)	−0.375 *** (0.000)	−0.051 (0.413)	−0.105 * (0.088)	0.012 (0.843)	0.137 ** (0.026)	1.000 —	—
Trade openness	0.153 ** (0.013)	0.075 (0.223)	−0.354 *** (0.000)	0.201 *** (0.001)	0.194 *** (0.002)	0.072 (0.246)	0.105 * (0.089)	0.262 *** (0.000)	1.000 —

Notes: The *p*-values are in parenthesis. *, **, and *** indicate significance at the 10%, 5%, and 1% levels, respectively. Balanced sample (listwise missing value deletion) with 263 observations.

Table A5. Correlation matrix for the control variables in EMDE.

	Gov. Net Balance	Gov. Primary Net	Gov. Revenue	GDP Growth	GDP per Capita	Invest.	Inflation	REER	Trade Open
Gov. net lending/ borrowing to GDP	1.000 —	—	—	—	—	—	—	—	—
Gov. primary net lending/borrowing	0.878 *** (0.000)	1.000 —	—	—	—	—	—	—	—
Gov. revenue to GDP	0.213 *** (0.000)	0.096 *** (0.003)	1.000 —	—	—	—	—	—	—
GDP growth	0.211 *** (0.000)	0.200 *** (0.000)	−0.103 *** (0.002)	1.000 —	—	—	—	—	—
GDP per capita	−0.056 * (0.089)	−0.164 *** (0.000)	0.344 *** (0.000)	−0.030 (0.353)	1.000 —	—	—	—	—
Investment to GDP	−0.057 * (0.083)	−0.106 *** (0.001)	0.072 ** (0.028)	0.099 *** (0.002)	0.115 *** (0.000)	1.000 —	—	—	—
Inflation rate	−0.102 *** (0.002)	−0.092 ** (0.005)	−0.116 *** (0.000)	−0.153 *** (0.000)	−0.035 (0.277)	−0.104 *** (0.001)	1.000 —	—	—
REER	−0.080 ** (0.014)	−0.102 *** (0.002)	−0.090 *** (0.006)	−0.131 *** (0.000)	−0.019 (0.566)	−0.010 *** (0.002)	0.841 *** (0.000)	1.000 —	—
Trade openness	0.113 *** (0.001)	0.066 ** (0.044)	0.379 *** (0.000)	0.083 ** (0.011)	0.323 *** (0.000)	0.048 (0.144)	−0.101 *** (0.002)	−0.040 (0.217)	1.000 —

Notes: The *p*-values are in parenthesis. *, **, and *** indicate significance at the 10%, 5%, and 1% levels, respectively. Balanced sample (listwise missing value deletion) with 263 observations.

Table A6. Cross-section dependence test (null hypothesis: no cross-section dependence) and unit root tests (null hypothesis: panel contains unit root) for EMDE (*p*-values).

		Cross-Section Dependence	Panel Unit Root Test					
			Common Unit Root		Individual Unit Root			n/a
		Pesaran CD	LLC	Breitung	IPS	F-ADF	F-PP	Hadri
Debt	External debt to GDP (ln)	0.000 ***	0.000 ***	1.000	0.949	0.991	0.000 ***	0.000 ***
	External debt to exports (ln)	0.000 ***	0.000 ***	1.000	0.957	0.999	0.019 ***	0.000 ***
	Gov. debt to GDP (ln)	0.000 ***	0.000 ***	1.000	0.973	0.999	0.000 ***	0.000 ***
Fiscal	Gov. net budget to GDP	0.000 ***	0.000 ***	0.125	0.556	0.374	0.000 ***	0.000 ***
	Gov. revenue to GDP (ln)	0.000 ***	0.000 ***	1.000	0.451	0.040 **	0.000 ***	0.000 ***
Macro	Investment to GDP (ln)	0.000 ***	1.000	0.500	0.724	0.718	0.000 ***	0.000 ***
	GDP per capita (ln)	0.000 ***	0.000 ***	1.000	0.975	1.000	0.021 **	0.000 ***
	GDP growth	0.000 ***	0.000 ***	0.000 ***	0.055 *	0.000 ***	0.000 ***	0.000 ***
	REER	0.000 ***	0.000 ***	1.000	0.861	0.272	0.000 ***	0.000 ***
	Inflation rate	0.000 ***	0.000 ***	1.000	0.999	1.000	0.915	0.000 ***
	Trade openness to GDP (ln)	0.000 ***	0.000 ***	1.000	0.920	0.997	0.001 ***	0.000 ***

Notes: Pesaran cross-section dependence test ***, **, and * show cross-section dependence at 1%, 5%, and 10% significance levels, respectively, implying that 2nd generation unit root tests are more appropriate. Panel unit root tests ***, **, and * show stationarity at 1%, 5%, and 10% significance levels, respectively; tests for unit root in level; individual intercept and trend included in the test equation; automatic lag length selection based on Schwarz information criteria.

Table A7. Cross-section dependence test (null hypothesis: no cross-section dependence) and unit root tests (null hypothesis: panel contains unit root) for AE (*p*-values).

		Cross-Section Dependence	Panel Unit Root Test					
			Common Unit Root			Individual Unit Root		n/a
			Pesaran CD	LLC	Breitung	IPS	F-ADF	F-PP
Debt	External debt to GDP (ln)	0.000 ***	0.000 ***	0.105	0.568	0.589	0.000 ***	0.000 ***
	External debt to exports (ln)	0.000 ***	1.000	0.500	0.838	0.997	0.991	0.000 ***
	Gov. debt to GDP (ln)	0.000 ***	0.000 ***	0.441	0.894	0.999	0.985	0.000 ***
Fiscal	Gov. net budget to GDP	0.000 ***	0.000 ***	0.014 **	0.651	0.801	0.040 *	0.000 ***
	Gov. revenue to GDP (ln)	0.008 ***	0.000 ***	1.000	0.435	0.081 *	0.000 ***	0.000 ***
Macro	Investment to GDP (ln)	0.000 ***	0.000 ***	0.984	0.865	0.978	0.114	0.000 ***
	GDP per capita (ln)	0.000 ***	0.000 ***	0.000 ***	0.718	0.952	0.431	0.000 ***
	GDP growth	0.000 ***	0.000 ***	0.000 ***	0.091	0.001	0.000 ***	0.000 ***
	REER	0.000 ***	0.000 ***	1.000	0.873	0.979	0.122	0.000 ***
	Inflation rate	0.000 ***	1.000	1.000	1.000	1.000	1.000	1.000
	Trade openness to GDP (ln)	0.000 ***	0.000 ***	1.000	0.974	1.000	1.000	0.000 ***

Notes: Pesaran cross-section dependence test ***, **, and * show cross-section dependence at 1%, 5%, and 10% significance levels, respectively, implying that 2nd generation unit root tests are more appropriate. Panel unit root tests ***, **, and * show stationarity at 1%, 5%, and 10% significance levels, respectively; tests for unit root in level; individual intercept and trend included in the test equation; automatic lag length selection based on Schwarz information criteria.

Table A8. Results for the effect of the COVID-19 pandemic on debt indicators using GMM.

Variable	External Debt to GDP (ln)		External Debt to Exp.(ln)		Govt. Debt to GDP (ln)	
	EMDE (1)	AE (2)	EMDE (3)	AE (4)	EMDE (5)	AE (6)
Post_covid (dummy)	0.171 *** (0.000)	0.042 *** (0.003)	0.322 *** (0.000)	0.023 (0.213)	0.284 *** (0.000)	0.121 *** (0.000)
LN_DEBT (−1)	0.155 *** (0.000)	0.161 (0.162)	0.012 (0.919)	0.186 (0.113)	−0.096 * (0.085)	0.279 *** (0.003)
Instrumental variables	Yes	Yes	Yes	Yes	Yes	Yes
Country FE	Yes	Yes	Yes	Yes	Yes	Yes
Adjusted R-squared	0.988	0.998	0.902	0.964	0.977	0.991
Panel observations	787 ^u	249 ^u	736 ^u	244 ^u	804 ^u	249 ^u
Cross-sections included	123	35	115	35	125	36

Note: Estimation method: Panel GMM EGLS (cross-section weights). The *p*-values in parenthesis are based on cross-section weights (PCSE) standard errors and covariance (d.f. corrected). Legend: *, **, and *** indicate significance at the 10%, 5%, and 1% levels, respectively. The superscripts ^b and ^u in the number of observations stand for balanced and unbalanced panel observations.

Table A9. Results of the effect of the post-COVID-19 period on debt indicators with countries categorized by debt ratios: Below the 2019 median (BM) and above the 2019 median (AM) countries.

	External Debt to GDP (ln)		External Debt to Exp.(ln)		Govt. Debt to GDP (ln)	
	BM (1)	AM (2)	BM (3)	AM (4)	BM (5)	AE (6)
Constant	7.313 *** (0.000)	10.066 *** (0.000)	11.464 *** (0.000)	13.136 *** (0.000)	6.992 *** (0.000)	9.663 *** (0.000)
Post_covid (dummy)	0.202 *** (0.000)	0.037 *** (0.000)	0.181 *** (0.000)	0.078 *** (0.000)	0.221 *** (0.000)	0.124 *** (0.000)
Gov. net balance	−0.002 (0.330)	−0.007 *** (0.000)	−0.012 *** (0.001)	−0.007 *** (0.000)	−0.016 *** (0.000)	−0.009 *** (0.000)
Gov. revenue (ln)	0.088 * (0.056)	0.059 (0.220)	0.284 ** (0.029)	0.084 * (0.082)	0.318 *** (0.000)	0.051 (0.242)

Table A9. Cont.

	External Debt to GDP (ln)		External Debt to Exp.(ln)		Govt. Debt to GDP (ln)	
	BM (1)	AM (2)	BM (3)	AM (4)	BM (5)	AE (6)
Investment (ln)	0.153 *** (0.000)	−0.039 ** (0.025)	0.099 ** (0.016)	0.129 *** (0.000)	−0.016 (0.519)	−0.110 *** (0.000)
GDP per capita (ln)	−0.448 *** (0.000)	−0.501 *** (0.000)	−0.370 ** (0.023)	−0.333 *** (0.000)	−0.479 *** (0.000)	−0.574 *** (0.000)
GDP growth (%)	−0.000 (0.934)	−0.004 *** (0.000)	−0.002 (0.406)	−0.005 *** (0.000)	0.001 * (0.074)	0.001 * (0.054)
REER (index)	−0.006 *** (0.000)	−0.006 *** (0.000)	−0.009 *** (0.000)	−0.007 *** (0.000)	−0.004 *** (0.000)	−0.000 *** (0.000)
Inflation (index)	−0.002 * (0.067)	−0.001 * (0.096)	−0.002 (0.461)	−0.002 ** (0.021)	−0.001 * (0.076)	0.001 ** (0.017)
Trade openness (ln)	−0.024 (0.573)	0.056 (0.215)	−0.848 *** (0.000)	−1.013 *** (0.000)	0.066 * (0.069)	0.055 ** (0.034)
Country FE	Yes	Yes	Yes	Yes	Yes	Yes
Adjusted R-squared	0.967	0.991	0.913	0.978	0.953	0.983
Median 2019	56.817		165.164		48.954	
Cross-sections included	77	81	72	78	76	85
Panel observations	563 ^u	627 ^u	534 ^u	594 ^u	575 ^u	637 ^u

Notes: Estimation method: Panel EGLS (cross-section weights). The *p*-values in parenthesis are based on cross-section weights (PCSE) standard errors and covariance (d.f. corrected). Legend: *, **, and *** indicate significance at the 10%, 5%, and 1% levels, respectively. The superscripts ^b and ^u in the number of observations stand for balanced and unbalanced panel observations.

Notes

- ¹ The group of AE in this analysis consists of 40 economies, aligning with the 41 countries in the IMF categorization, except for Luxembourg, which was excluded due to its exceptionally high debt levels.

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