

**“47<sup>th</sup> RSEP International Multidisciplinary Conference” 15-16 May 2026, HCC ST. MORITZ HOTEL, Barcelona, Spain**

**Public Debt, GDP Contraction in 2020, and The Speed of Recovery to the Pre-crisis Output Level: Evidence from the COVID-19 Crisis**

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DOI: <https://doi.org/10.19275/RSEPCONFERENCES394>

**Abstract**

This article examines whether the public debt-to-GDP ratio before the COVID-19 crisis was associated with a deeper output contraction in 2020 and a longer period of recovery to the pre-crisis GDP level. Using a cross-country quantitative design and multifactor linear regression models, the study evaluates two dependent variables: GDP growth in 2020 and the number of years required to return to the 2019 GDP level. The main explanatory variable is government debt in 2019, while lockdown stringency, investment share, institutional quality, population, and tourism exposure are used as controls. The results suggest that higher pre-crisis public debt was systematically associated with both a larger GDP decline in 2020 and a slower recovery path. The debt coefficient remains statistically significant across baseline and extended specifications, while supplementary models show that institutional quality and government effectiveness improved crisis performance but did not eliminate the adverse debt effect. The article argues that public debt should be interpreted as a crisis-preparedness variable because it shapes fiscal space, policy credibility, and the efficiency of discretionary intervention during large shocks. The findings contribute to the literature by shifting attention from the size of fiscal packages during the pandemic to the pre-crisis balance-sheet conditions under which those packages were deployed. The policy implication is that rebuilding fiscal space in normal times is not merely a question of formal fiscal discipline; it is also a condition for macroeconomic resilience when the next systemic crisis arrives.

**Keywords:** public debt; GDP contraction; recovery duration; COVID-19 crisis; fiscal space  
**Jel codes:** E62, H63, O11, O47

**1. Introduction**

The COVID-19 pandemic generated a macroeconomic shock that differed from a typical cyclical recession because of the health emergency, mobility restrictions, and abrupt fall in private demand occurred almost simultaneously across countries (Gopinath, 2020; Toda, 2020). Governments responded with extraordinary fiscal, monetary, and regulatory measures, and the scale of public borrowing increased rapidly in many advanced and emerging economies (Anderson et al., 2020; International Monetary Fund [IMF], 2021). Yet the depth of the 2020 downturn and the speed of subsequent recovery differed substantially across countries, even where the pandemic shock was global and policy support was historically large.

A large share of the policy debate concentrated on the volume of emergency spending, guarantees, and central-bank support. That perspective is incomplete. The more analytically demanding question is whether countries entered the crisis with sufficiently strong public balance sheets to use fiscal policy effectively. If public debt had already reached high levels before the shock, fiscal space may have been narrower, market credibility weaker,



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and the efficiency of crisis intervention lower (Ostry et al., 2010, 2015). Under such conditions, larger borrowing during the crisis would not necessarily imply better economic stabilization.

This article therefore shifts the focus from the size of pandemic-era support packages to the role of pre-crisis public debt. The central claim is that public debt should be understood not only as a stock variable affecting long-run sustainability, but also as a crisis-readiness variable affecting how governments can react when a sudden systemic disruption occurs. The article asks two linked questions: whether higher public debt in 2019 was associated with a larger GDP contraction in 2020, and whether it was also associated with a longer period of recovery to the 2019 GDP level.

The motivation for this question is practical as well as theoretical. If debt burdens accumulated before the pandemic constrained the room for maneuver once the crisis began, then fiscal consolidation and debt management in ordinary periods have macroeconomic implications that extend far beyond accounting metrics or compliance with fiscal rules. In that case, debt reduction should be treated as part of a resilience strategy, not merely as a bookkeeping exercise. The pandemic therefore offers a useful natural stress test for evaluating the economic significance of pre-crisis fiscal positions.

The article contributes to literature in three ways. First, it sharpens the empirical focus of the original manuscript by treating public debt as the primary explanatory variable, while institutional quality, government effectiveness, lockdown stringency, and fiscal-policy design are treated as secondary or conditioning factors. Second, it links the initial output shock to the recovery horizon, thereby showing that debt mattered both contemporaneously and intertemporally. Third, it repositions the findings within a journal-style argument centered on fiscal space, policy credibility, and macroeconomic resilience.

The research gap is clear. Existing studies have examined the size of fiscal responses during the pandemic, the role of non-pharmaceutical interventions, and the importance of institutional quality for crisis outcomes (Benmelech & Tzur-Ilan, 2020; Juranek et al., 2020; König & Winkler, 2020). A related literature has discussed public debt and long-run growth or fiscal sustainability (Reinhart & Rogoff, 2010; Ostry et al., 2015; Rimšēvičs, 2022). However, less attention has been given to the question of whether higher pre-crisis public debt level itself was associated with a deeper 2020 output collapse and a slower return to the 2019 GDP level in the cross-country COVID-19 setting.

Based on this gap, the article evaluates four hypotheses. H1: countries with higher public debt-to-GDP ratios in 2019 experienced a larger GDP decline in 2020. H2: countries with higher public debt-to-GDP ratios in 2019 required more time to recover to the 2019 GDP level. H3: the relationship between debt and crisis outcomes remains visible after controlling for lockdown stringency, investment structure, country size, and institutional quality. H4: institutions and government effectiveness improve crisis performance, but they function mainly as conditioning variables rather than substitutes for fiscal space.

## 2. Literature Review and Research Gap

The theoretical link between public debt and crisis performance begins with fiscal space. Ostry et al. (2010) define fiscal space as the room available for a government to provide budgetary resources for a desired purpose without undermining sustainability. In a severe crisis, fiscal space matters because it affects not only the legal or accounting capacity to borrow, but also the credibility of additional borrowing and the expected effectiveness of fiscal expansion. As debt rises, concerns about sustainability, future taxation, inflation, refinancing risk, or sovereign spreads may weaken the stabilizing effects of crisis management (Ostry et al., 2015).

The broader debt literature also argues that high debt can become a drag on macroeconomic performance. Reinhart and Rogoff (2010) associate high debt levels with weaker growth, while Rimšēvičs (2022) specifically discusses the post-COVID environment and the implications of public debt for economic growth. Although the exact debt threshold remains debated, the theoretical direction is well established: high debt can constrain policy choice, reduce resilience, and increase vulnerability to shocks.

COVID-19 created an unusually useful setting in which to revisit these ideas. Because the pandemic was global and the initial shock was compressed in time, differences in outcomes are less plausibly explained by different positions in the business cycle alone. At the same time, the crisis was not only fiscal. Output losses were also shaped by lockdown stringency, mobility reductions, the economic weight of tourism and face-to-face services, and the interaction between fiscal and monetary policies (Bartsch et al., 2020; Corsetti & Muller, 2008). Any empirical strategy must therefore treat public debt as the core variable while also controlling for these co-determinants.

A complementary strand of literature emphasizes institutions. North (1990, 1991) and Coase (1937, 1998) argue that institutions create the rules and transaction-cost environment within which economic agents operate. During

a pandemic, better institutions and stronger government effectiveness can improve compliance, accelerate policy implementation, and reduce uncertainty. Empirically, Demertzis and Raposo (2018), Kaufmann et al. (2010), and König and Winkler (2020) all suggest that governance quality matters for crisis management.

The pandemic literature also showed that the composition of public support matters. Benmelech and Tzur-Ilan (2020) demonstrate cross-country variation in the scale of fiscal and monetary responses, while Anderson et al. (2020) compile evidence that governments relied on markedly different mixtures of discretionary spending, tax measures, credit guarantees, and labor-market support. This matters for the present study because high debt may affect not only how much support is announced, but also how quickly it is delivered, how credible it appears, and whether it is maintained long enough to stabilize expectations.

Another relevant line of inquiry concerns automatic stabilizers and government size. Afonso and Jalles (2011) argue that the relationship between government size and economic performance is not monotonic; very large public sectors do not automatically produce better growth outcomes. Debrun et al. (2008) likewise question whether larger stabilizers always reduce volatility more effectively. These arguments align with the current article's emphasis on policy efficiency rather than policy volume. The issue is not whether governments intervened, but whether they did so from a sufficiently sustainable fiscal position.

However, the institutional and fiscal-policy literatures do not eliminate the debt question. Better institutions may help governments use resources more efficiently, but they do not automatically restore fiscal space once debt is already high. This distinction motivates the present article. The study does not deny the relevance of institutions; rather, it asks whether public debt retained an independent association with crisis outcomes even after institutional quality and other controls are introduced. That is the precise empirical gap the article addresses.

### **3. Data & Methodology**

#### 3.1 Research design

The study employs a quantitative cross-country design based on multifactor linear regression (MFLR). The aim is not to estimate a fully structural causal model of the pandemic, but to test whether public debt in the pre-crisis year retained a stable statistical association with two crisis outcomes after the inclusion of relevant controls. This design is appropriate because the article seeks to compare relative cross-country performance under a common global shock rather than to analyze a single-country institutional episode.

#### 3.2 Sample and period

The broader database assembled for the project covers the period from 2000 to 2025 to observe long-run debt dynamics before and after the global financial crisis and to place the pandemic episode in a wider fiscal context. The econometric focus of the article, however, is narrower. Independent variables are measured primarily in the pre-crisis year 2019, while the main variables cover 2020 to 2023. When recovery is measured, the 2019 GDP benchmark is used because it directly reflects the pre-pandemic economic position. Depending on data availability, the baseline GDP-contraction regressions include 122 countries, whereas the recovery-duration regressions include 113 countries. Additional descriptive comparison is used for OECD economies in order to show whether the broader cross-country pattern is also visible in a more homogeneous group of relatively advanced countries.

#### 3.3 Dependent variables

Two dependent variables are used. The first is GDP growth in 2020 (percent), which captures the size of the immediate output contraction during the first pandemic year. Because more negative values indicate a deeper downturn, a negative coefficient on public debt implies that higher debt is associated with a larger GDP decline. The second dependent variable is the duration of recovery to the pre-crisis GDP level, measured as the number of years required for a country to return to its 2019 GDP level. This variable captures the medium-term recovery path rather than the initial shock alone. The distinction matters because a country may absorb a sharp but brief output loss, whereas another may enter a persistent and costly recovery gap.

#### 3.4 Independent variable of primary interest

The principal explanatory variable is government debt as a percentage of GDP in 2019. This variable represents the pre-crisis debt burden and, conceptually, the degree of fiscal space with which countries entered the pandemic. By construction, the variable precedes the crisis outcomes and is therefore suited to the article's central argument that balance-sheet conditions mattered before emergency support was expanded.

### 3.5 Control variables

Several control variables are introduced sequentially. GDP per capita is included to account for differences in development level and economic structure. Population size is included in logarithmic form to capture country size effects. Average NPI stringency in 2020 controls for the intensity of lockdown-related restrictions, which earlier studies linked to mobility reductions and output losses (Juranek et al., 2020; Toda, 2020). Investment share in GDP controls for structural differences in domestic demand and productive capacity. Institutional quality and government effectiveness are used in supplementary specifications because better institutions may improve policy implementation and reduce transaction costs (Kaufmann et al., 2010; North, 1991). Finally, tourists per capita is used in the recovery models as a proxy for exposure to contact-intensive sectors that were especially affected by the pandemic.

### 3.6 Data sources

The article draws on the same international databases used in the original manuscript. Public debt, GDP growth, and macroeconomic control variables are taken from the IMF World Economic Outlook (IMF, 2022, 2023). NPI stringency is based on the Oxford COVID-19 Government Response Tracker. Institutional quality and governance indicators are taken from established cross-country governance datasets, including Kaufmann et al. (2010). OECD comparisons rely on OECD-compatible macroeconomic series and the same debt concepts used in the main analysis.

### 3.7 Model specification

The empirical strategy proceeds in stages. First, baseline regressions estimate the association between public debt and GDP growth in 2020. The debt variable is then supplemented with controls for NPI stringency, investment, institutional quality, and population. Second, recovery-duration regressions test whether public debt is associated with the number of years required to return to the 2019 GDP level, while controlling for the initial GDP shock and structural factors. This sequencing is important because it makes it possible to distinguish the effect of debt on the immediate contraction from its effect on the subsequent recovery path.

### 3.8 MFLR assumptions

The standard assumptions of MFLR were checked in the original analytical workflow. Residual normality was assessed using the Jarque-Bera test and histogram inspection. Residual-versus-fitted plots were reviewed for heteroscedasticity and related distributional anomalies. Logarithmic transformation was applied where necessary, especially for GDP per capita and population. The residual diagnostics suggested that the estimated equations were sufficiently stable for comparative inference. As in most cross-country work, the models should still be interpreted cautiously because unobserved heterogeneity cannot be eliminated completely.

### 3.9 Robustness checks

Robustness is evaluated in two ways. First, the debt coefficient is tracked across increasingly rich specifications. A robust finding should preserve its sign, remain close in magnitude, and retain statistical significance after new controls are added. Second, supplementary institutional and government-effectiveness models are used to determine whether the debt result survives when governance quality is considered explicitly. The article therefore treats institutional quality and government effectiveness as robustness and conditioning variables rather than as the main focus of the paper.

## 4. Results

### 4.1 Public debt and GDP contraction in 2020

The first main result supports H1. Across model specifications, higher pre-crisis public debt is associated with a larger GDP decline in 2020. The relationship is negative and statistically significant at the 1 percent level in all specifications that include debt. This pattern is visible before and after adding controls for lockdown stringency, investment, institutions, and country size.

Table 1. Public Debt and GDP Decline in 2020 (Dependent variable: GDP growth rate in 2020, %)

Factor	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
ln(GDP per capita)	-1.159*** (0.330)	-1.058*** (0.323)	-0.989*** (0.320)	-0.944*** (0.310)	-1.952*** (0.510)	-1.414*** (0.510)
Government debt		-0.037*** (0.010)	-0.037*** (0.010)	-0.037*** (0.011)	-0.037*** (0.010)	-0.037*** (0.010)
NPI stringency			-0.074** (0.033)	-0.080** (0.032)	-0.056** (0.033)	-0.104*** (0.034)
Investment share in GDP (%)				0.124*** (0.043)	0.124*** (0.043)	0.111*** (0.041)
Institutional quality					0.124** (0.050)	0.096** (0.050)
ln(Population)						0.806*** (0.225)
Constant	7.070** (3.124)	7.942** (3.132)	11.053*** (3.374)	7.744** (3.478)	9.401*** (3.474)	6.714** (3.394)
Observations	122	122	122	122	122	122

Note. \*\*  $p < .05$ , \*\*\*  $p < .01$ . Standard errors in parentheses. Independent variables are measured in the pre-crisis period of 2019, except for average NPI stringency in 2020.

Source: Author's calculations

Table 1 is central to the article's argument. In Model 2, the coefficient on government debt is -0.037 and statistically significant at the 1 percent level. The coefficient remains exactly -0.037 in Models 3 to 6 despite the introduction of additional controls. This stability strongly suggests that the debt result is not a statistical artifact caused by one omitted covariate. Instead, it points to a persistent cross-country association between higher debt and weaker crisis performance.

Substantively, the result indicates that countries entering the pandemic with higher debt burdens were more exposed to a deeper output collapse. This finding is consistent with the fiscal-space literature, which argues that highly indebted governments may face weaker credibility, narrower room for maneuver, and lower marginal efficiency of additional borrowing during crisis episodes (Ostry et al., 2010, 2015). It also qualifies the simple narrative that larger fiscal responses should necessarily produce better outcomes. What mattered was not only the gross size of support once the crisis started, but also the debt position from which that support was launched.

The control variables add useful context. More stringent NPIs are associated with more negative GDP outcomes, which is consistent with the mobility and lockdown literature (Juránek et al., 2020). A higher investment share in GDP is associated with better performance, suggesting that stronger productive structure may have partially cushioned the shock. Institutional quality is positively associated with GDP outcomes in the extended models, but the debt coefficient remains intact, which supports H3.

The result also helps explain why larger automatic stabilizers and discretionary packages did not uniformly produce smaller GDP losses in the original analysis. Countries with more extensive support often also had higher pre-existing debt, more severe structural exposure, or weaker policy transmission conditions. The estimates

therefore suggest that the relationship between fiscal intervention and crisis outcomes was conditional rather than mechanical (Benmelech & Tzur-Ilan, 2020).

A further implication concerns the timing of fiscal support. Countries with strong fiscal positions could often signal quickly that emergency measures would be sustained for as long as needed, whereas highly indebted countries faced a narrower corridor for action. Even when borrowing was possible, the perceived permanence and credibility of support may have differed. This mechanism cannot be measured directly with the present data, but it is consistent with the regression evidence and with the broader policy literature on crisis credibility.

#### 4.2 Public debt and the duration of recovery to the 2019 GDP level

The second main result supports H2. Higher public debt was associated not only with a deeper collapse in 2020, but also with a slower return to the pre-crisis output level. This is important because it shows that debt mattered over the full crisis trajectory, not only at the initial impact stage.

Table 2 Public Debt and the Duration of Recovery to the Pre-Crisis GDP Level (Dependent variable: recovery duration, years)

Factor	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
GDP growth in 2020 (%)	-0.132*** (0.014)	-0.125*** (0.014)	-0.127*** (0.014)	-0.124*** (0.014)	-0.126*** (0.015)	-0.127*** (0.015)
ln(GDP per capita)	0.075 (0.053)	0.072 (0.052)	0.073 (0.052)	0.147* (0.087)	0.159** (0.091)	0.212** (0.094)
Government debt		0.003** (0.002)	0.004** (0.002)	0.004** (0.002)	0.003** (0.002)	0.004** (0.002)
NPI stringency			-0.003 (0.005)	-0.005 (0.005)	-0.006 (0.006)	-0.008 (0.006)
Institutional quality					-0.009 (0.009)	-0.012 (0.008)
ln(Population)						0.019 (0.042)
Tourists per capita						-0.069** (0.033)
Constant	0.053 (0.500)	-0.116 (0.496)	0.041 (0.551)	-0.097 (0.566)	0.159 (0.580)	0.390 (0.583)
R-squared	0.51	0.53	0.53	0.54	0.54	0.56
Observations	113	113	113	113	113	113

Note. \*  $p < .10$ , \*\*  $p < .05$ , \*\*\*  $p < .01$ . Standard errors in parentheses. Independent variables are measured in the pre-crisis period of 2019, except for average NPI stringency in 2020 and GDP growth in 2020.

Source: Author's calculations

Table 2 shows that the debt effect extends into the recovery phase. In Models 2 to 6, the coefficient on government debt is positive and statistically significant at the 5 percent level. This means that countries with higher debt in 2019, on average, required more years to regain their 2019 GDP level. The debt variable therefore captures an intertemporal disadvantage: the same balance-sheet conditions that were associated with a larger initial contraction were also associated with a longer healing period.

The coefficient on GDP growth in 2020 is strongly negative and highly significant across all specifications. Because a more negative GDP growth rate indicates a deeper contraction, this result implies that countries with the deepest 2020 output collapse experienced the longest recovery period. The finding is intuitive, but it also strengthens the article's logic: public debt matters partly because it is associated with the depth of the initial shock, and the initial shock in turn shapes the duration of recovery.

The tourism variable in Model 6 is also informative. Countries more exposed to tourism and contact-intensive services recovered more slowly, which is consistent with pandemic-specific sectoral vulnerability. Even after controlling for this exposure, however, the debt coefficient remains positive and significant. This strengthens the interpretation that debt was not merely proxying for the service composition of the economy.

From a policy standpoint, recovery regressions are particularly important. A deep but brief recession and a deep, prolonged recovery gap are not equivalent. Higher public debt appears to have been associated with the latter outcome. That pattern is consistent with the idea that once fiscal space is narrowed, governments may find it harder to sustain support, reorient policy, or credibly underpin expectations during the medium-term recovery phase.

The recovery evidence also matters for distributional reasons. The longer a country remains below its pre-crisis output level, the greater the risk of persistent labor-market scarring, lower investment, weaker public revenues, and delayed repair of private balance sheets. In that sense, the relationship between debt and recovery duration has implications beyond the aggregate GDP path.

#### 4.3 OECD and global comparison

The broader cross-country results are reinforced by OECD evidence. Within the OECD sample, countries that entered the pandemic with lower public debt generally experienced a smaller output loss and returned more rapidly to their 2019 GDP level. The descriptive OECD pattern does not imply a universal debt threshold, but it does show that the debt-resilience relationship is not driven only by low-income or institutionally fragile countries. It is also visible within a relatively advanced-country group.

This OECD comparison is important for interpretation. A frequent objection in cross-country work is that debt may simply proxy for broad development differences. Yet many OECD countries share relatively high institutional capacity and access to capital markets. The persistence of the pattern within this group suggests that public debt retained independent relevance even among advanced economies. In other words, debt mattered not only because some countries were poorer, but because pre-crisis fiscal positions themselves were economically consequential.

The global and OECD evidence taken together therefore support the same conclusion: lower public debt before the crisis was associated with stronger macroeconomic resilience. This does not mean that every low-debt country performed well or that every high-debt country performed badly. It means that, on average, debt shifted the probability distribution of crisis outcomes in an unfavorable direction.

#### 4.4 Supplementary evidence: institutions and government effectiveness

The supplementary institutional evidence remains relevant even though government effectiveness and institutional quality are not the main focus of the article. Better institutions, stronger government effectiveness, and higher public trust are associated with better crisis outcomes and, in some specifications, with less stringent or more efficiently targeted restrictions (Kaufmann et al., 2010; Wolff, 2020). These factors likely reduce transaction costs, improve implementation quality, and increase the efficiency of fiscal support, which is consistent with the broader institutional literature (Coase, 1937; North, 1990).

For the purposes of the current article, however, the key point is narrower. Once institutional variables are introduced, the public-debt coefficient remains substantively important in the main GDP and recovery regressions. This suggests that governance quality conditioned the effectiveness of crisis management but did not supersede the role of debt. Put differently, good institutions helped, yet they did not fully offset the disadvantages associated with entering the pandemic with a heavily burdened public balance sheet.

This finding supports H4 and clarifies the structure of the paper. Institutional quality and government effectiveness are best interpreted as complementary resilience factors. They can mitigate damage and improve

the marginal efficiency of policy intervention, but they are not a substitute for fiscal space. A country with high debt and good institutions may perform better than a country with high debt and weak institutions, but that does not mean the debt burden ceases to matter.

#### 4.5 Interpreting the debt mechanism

Although the regressions are not designed to identify a single causal channel, the pattern of results is consistent with several mechanisms. First, higher debt will likely reduce fiscal space in an operational sense by increasing the perceived cost of additional borrowing. Second, debt may have weakened the credibility of announced support if private agents expected tighter policy, higher taxation, or inflationary adjustment later. Third, high debt may have limited the duration of crisis intervention by making governments more sensitive to changing market sentiment or to domestic political resistance against further expansion.

A related mechanism concerns policy composition. Countries with narrower fiscal room may rely more heavily on guarantees, temporary deferrals, or narrowly targeted measures rather than on broad-based stabilization. Such strategies can be rational, but they may also provide less immediate support to aggregate demand. In contrast, countries with stronger public balance sheets can sustain larger and more certain transfers, thereby improving both direct income stabilization and expectation management. The article cannot observe this full composition effect directly, yet the persistence of the debt coefficient is compatible with this logic.

The estimates also suggest that debt and institutions interact rather than operate separately. Better institutions can improve policy design, accelerate implementation, and reduce leakage, but they cannot fully compensate for the absence of fiscal space. This helps explain why institutional quality appears as a valuable conditioning variable while public debt remains central in the main regressions. In practical terms, resilience required both administrative capability and an adequate balance-sheet starting point.

### 5. Discussion

The results suggest that public debt should be conceptualized as a strategic resilience variable. In normal times, debt is often discussed primarily through the lens of sustainability rules, borrowing costs, or long-run growth. The pandemic shows that debt also has a crisis-management dimension. When a sudden systemic shock emerges, countries do not respond from a neutral starting point; they respond from the fiscal positions created by earlier policy choices. Those initial conditions shape credibility, room for maneuver, and policy efficiency.

This interpretation also helps reconcile an apparent paradox of the COVID-19 period: why did very large fiscal packages not always correspond to smaller GDP declines? One answer is that the gross size of support is a misleading metric when not evaluated together with pre-crisis debt, institutions, and structural exposure. In highly indebted countries, additional fiscal expansion may arrive later, transmit less effectively, or generate weaker confidence effects. The same euro of support may therefore have a lower stabilizing effect than in a country with stronger fiscal space and more credible institutions.

The article's findings are also consistent with a broader view of policy coordination. Bartsch et al. (2020) and Corsetti and Muller (2008) emphasize that fiscal policy works most effectively in interaction with supportive monetary conditions. Yet even where monetary policy was highly accommodated, debt still mattered in the present results. This implies that accommodative financial conditions were not sufficient to neutralize inherited fiscal vulnerabilities.

At the same time, the study does not claim that public debt alone determined the pandemic trajectory. Pandemic intensity, health-system stress, lockdown design, sectoral composition, and behavioral responses all mattered. The article instead makes a more limited but important claim: once those elements are recognized, public debt remains a statistically and substantively meaningful part of the explanation. That is enough to justify a stronger place for debt reduction in resilience-oriented policy frameworks.

Several policy proposals follow from these results. First, governments should rebuild fiscal space during normal times and treat debt reduction as part of national crisis preparedness. Second, debt-sustainability analysis should explicitly incorporate resilience considerations, including the ability to absorb large non-cyclical shocks without losing policy credibility. Third, fiscal packages in future crises should be judged not only by size, but by timing, targeting, and expected effectiveness under different debt conditions. Fourth, countries with high debt should strengthen institutional quality and government effectiveness in parallel, because better governance can improve the efficiency of scarce fiscal resources even if it cannot fully substitute for fiscal space.

Fiscal rules themselves could therefore usefully evolve in ways that move beyond crude deficit or debt ceilings toward multi-year reserves, funding conditions, and sector-specific stabilization channels. Such reforms would not weaken fiscal discipline; they would make discipline more usable in practice. If the crisis begins tomorrow, the relevant policy test is less whether debt ratios look elegant for descriptive purposes than whether

governments can mobilize fiscal resources quickly and deliver them to productive sectors without undermining macroeconomic confidence.

The article also suggests a sequencing lesson. Countries should not wait until a shock occurs to rebuild rooms for maneuver. Once debt has already risen sharply, corrective policy becomes harder to implement without imposing additional drag on output. That is why the debt result identified here matters for policy before the next crisis, not only during it.

Several limitations should be acknowledged. First, cross-country regressions cannot fully remove all sources of unobserved heterogeneity. Second, measurement differences in debt, governance, or crisis timing may introduce noise. Third, the article relies on comparative macro data rather than micro evidence on firm- or household-level transmission channels. Fourth, the analysis identifies robust associations, but not a definitive structural causal mechanism. These limitations, however, do not negate the consistency of the results across specifications.

## 6. Conclusions and Policy Proposals

This article examined whether pre-crisis public debt was associated with a deeper GDP contraction in 2020 and a slower return to the pre-crisis GDP level during the COVID-19 crisis. The answer is affirmative. Across the main regression models, higher public debt in 2019 is associated with more negative GDP growth in 2020 and with a longer recovery period. The result survives the inclusion of controls for lockdown stringency, investment structure, institutions, tourism exposure, and country size.

The first conclusion is therefore direct: countries that entered the pandemic with higher public debt tended to suffer larger output losses in 2020. The second conclusion is dynamic: those same countries also tended to recover more slowly to the 2019 GDP level. The third conclusion is interpretive: institutions and government effectiveness improved outcomes, but they did not displace the role of debt. The fourth conclusion is policy-oriented: the size of discretionary support during a crisis should not be evaluated independently of the fiscal starting position from which it is financed.

Several policy proposals follow from these results. First, governments should rebuild fiscal space during normal periods and treat debt reduction as a resilience policy, not only as a fiscal-rule requirement. Second, pre-crisis debt sustainability assessments should explicitly incorporate crisis-readiness considerations, especially the capacity to absorb a large external shock without losing policy credibility. Third, fiscal policy evaluation should focus not only on the volume of discretionary support but also on its expected efficiency under different debt conditions. Fourth, countries with high debt should strengthen institutional quality and government effectiveness in parallel, since governance can partially improve the transmission of fiscal support even when it cannot fully offset debt-related constraints.

Future research should connect cross-country macro evidence with more disaggregated data on the composition of debt, maturity structure, financing conditions, and sector-specific transmission channels. Such work would help explain more precisely why high debt translates into weaker crisis performance. Even at the current stage, however, the evidence points in a clear direction: lower public debt before the pandemic was associated with greater macroeconomic resilience during and after the COVID-19 shock.

A final implication concerns the post-crisis policy narrative. Countries that returned more slowly to their 2019 GDP level also faced a higher probability of policy fatigue: support became politically contested, inflation and interest-rate normalization complicated debt management, and the window for growth-friendly consolidation narrowed. This sequence illustrates why recovery duration is as important as the size of the initial decline. A country that exits the crisis later carries not only a macroeconomic gap, but also a policy burden that can weigh on medium-term performance.

For this reason, the article recommends that future fiscal surveillance at both national and supranational levels should combine conventional debt metrics with explicit resilience indicators. These could include the expected fiscal cost of severe non-cyclical shock, the speed of deployable liquidity support, and the administrative capacity to target assistance efficiently. Such an approach would not replace debt sustainability analysis; it would deepen it by linking debt management to real crisis-response capability.

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