The Scarring and Hysteresis Effects of Steep Recessions and the Implications for Fiscal Policy in ECA Transition EMDEs

Martin Brownbridge
Sudharshan Canagarajah
Abstract

The deep recession in many of the emerging market transition economies of Europe and Central Asia caused by the COVID-19 crisis has raised fears of long-term damage to potential output through scarring and hysteresis. These economies were also hit hard by the great recession caused by the global financial crisis. This paper provides empirical estimates of the impact of the great recession on the subsequent medium-term level of real gross domestic product in a sample of 65 middle-income countries. It finds evidence of a significant hysteresis parameter in these countries. The paper also examines how the combination of a hysteresis parameter and a positive fiscal multiplier can mean that a countercyclical fiscal expansion that successfully mitigates the output loss in a recession need not worsen public debt levels in the medium to long term because of its positive impact on potential output and thus the tax base.

This paper is a product of the Office of the Chief Economist, Europe and Central Asia Region. It is part of a larger effort by the World Bank to provide open access to its research and make a contribution to development policy discussions around the world. Policy Research Working Papers are also posted on the Web at http://www.worldbank.org/prwp. The authors may be contacted at scanagarajah@worldbank.org.
The Scarring and Hysteresis Effects of Steep Recessions and the Implications for Fiscal Policy in ECA Transition EMDEs

Martin Brownbridge and Sudharshan Canagarajah

Key words: Hysteresis, Scarring, Global Financial Crisis, COVID-19 Recession

JEL Classification E62, O47

The authors write in their personal capacity and accept all responsibility for errors. They thank the following World Bank colleagues—Michael Lokshin, Ashley Taylor and James Newman for their valuable comments on earlier drafts of this paper.
1. Introduction

The ongoing COVID-19 crisis has already had a severe macroeconomic impact on the emerging markets and developing economies (EMDEs) of Europe and Central Asia (ECA).¹ Most of these countries experienced a contraction of real GDP in 2020; the median fall in real GDP was 4.3 percent (see appendix table 1), which is approximately double the average percentage fall in GDP of EMDEs globally. Many of the ECA transition EMDEs have suffered a much worse health crisis from the second wave of COVID-19 in the winter of 2020-21 than they did from the first wave in the spring of 2020, which indicates that the economic disruption of the crisis will extend well into 2021.

The medium to long-term economic and fiscal consequences of the COVID-19 crisis are very uncertain.² A major risk is that the recession will have a long-lasting negative impact on output through what is termed “hysteresis” (Cerra et al, 2020). Hysteresis is a similar concept to that of “scarring” which is often used in the context of labor markets Scarring in labor markets, through a loss of general labor skills or firm specific human capital can be a major cause of hysteresis in output (Arulampalam et al, 2001; Bell et al, 2020).

There is evidence that the great recession triggered by the Global Financial Crisis (GFC) in 2008-09 reduced long-term output in high income countries and in many EMDEs, including those in ECA. Many of the ECA transition EMDEs suffered a recession following the GFC, with a median contraction of real GDP of 1.8 percent in 2009, but the ongoing COVID-19 induced recession is much deeper. The potential for steep recessions to have hysteresis effects on output has profound implications for macroeconomic stabilization policy. Hysteresis implies that successful countercyclical macroeconomic policy measures that reduce the magnitude of, and/or shorten, a recession will have long-lasting benefits. It also means that, if a temporary countercyclical fiscal expansion has positive effects on long-term output and thus the tax base, it need not necessarily lead to a worsening of public debt ratios, even if it temporarily raises these ratios in the short-term. There are important differences between the great recession and the COVID-19 recession in the ECA transition EMDEs; in particular, supply-side shocks appear to have made a more important contribution to the contraction of output in 2020 than in 2009. Nevertheless, important insights can still be derived from the experience of the great recession which have relevance for tackling the challenges posed by the COVID-19 recession.

This paper analyzes the hysteresis effects of the great recession in EMDEs to derive insights as to the likely long-term impact of the COVID-19 recession and the policy implications of that. It contributes to a growing body of literature, motivated by the COVID-19 crisis, which explores the long-term economic impact of major adverse shocks, such as recessions and pandemics (e.g. Dieppe et al, 2020; Jordà et al, 2020; Furceri et al, 2021). To test for evidence

---

¹ We use the classification of emerging markets and developing economies used in the Global Economic Prospects, 2021. There are 16 EMDEs in Europe and eight in central Asia. All of these countries were formerly centrally planned economies, with the exception of Turkey which we exclude from our analysis. We also exclude Turkmenistan because there are no GDP data for that country in the GEP. Hence our analysis covers 22 transition economies, 11 of which are of the former Soviet Union and six of the former Yugoslavia.

² The January 2021 Global Economic Prospects offers a bleak analysis of the medium term prospects for real GDP growth for EMDEs, arguing that the COVID-19 crisis is likely to steepen the slowdown in the growth of global potential output because of its adverse impact on human capital formation, investment and global value chains (World Bank, 2021).
of hysteresis from the GFC recession, we estimate cross-country regressions using a sample of 65 middle income countries (MICs) in which the dependent variable is a measure of the extent to which actual output in each country in 2013 was lower than that which had been forecast immediately prior to the GFC, and the explanatory variables includereal output growth in 2009, the year in which the recession was concentrated. We find that the medium-term trajectory of real output was affected by the scale of the output shock in 2009. The paper then examines what a plausible hysteresis parameter implies for a countercyclical fiscal policy response to the COVID-19 recession and especially the long-term impact on public finances.

The paper is organized as follows. Section 2 briefly reviews the literature on the concept of hysteresis. Section 3 provides empirical data on the impact of the great recession on output levels and growth rates in ECA transition EMDEs. Section 4 comprises cross-country econometric estimates of the factors influencing output levels following the 2009 recession, including the magnitude of the recession itself. Section 5 examines the possibility that, if fiscal multipliers and hysteresis effects are sufficiently strong, a fiscal stimulus which damps a recession may improve public debt ratios in the long term, by boosting real output and thus the tax base. Section 6 concludes and offers some policy implications of the analysis.

2. The Concept of Hysteresis

The concept of hysteresis refers to the notion that long-term trends in potential output are not exogenous to cyclical fluctuations in output and, in particular, that severe recessions have a prolonged negative impact on potential output through what is sometimes referred to as “scarring” of the supply capacity of the economy. Cerra et al (2020) review the theoretical reasons for hysteresis and the empirical evidence. They note that in standard macroeconomic theory, the long run trend in output is independent of cyclical fluctuations but that three types of models can generate hysteresis; models of endogenous growth, models with multiple equilibria due to expectations and models with non-linearities or boundary restrictions, such as those which incorporate a liquidity trap as a result of the zero lower bound on interest rates.

Haltmaier (2012) uses a sample of 187 recessions in 40 countries to examine whether recessions affect trend growth in each of the two two-year periods immediately following the recession. She finds that the depth of a recession affects subsequent trend output in advanced economies but that the length of the recession is more important in emerging markets. Blanchard et al (2015) examine 122 recessions in 23 advanced economies and distinguish between those caused by supply shocks and those caused by demand shocks. They find that 69 percent of recessions are followed by a sustained gap between actual output and the pre-recession output trend and that almost half of recessions are followed by lower trend growth. They find that recessions caused by supply-side shocks (e.g. higher oil prices or financial crises) are even more likely to be followed by a sustained output gap and they argue that in these cases the supply-side shock is most likely to be the cause of both the recession and the fall in output relative to its pre-recession trend. However, the majority of recessions caused by demand-side shocks (those associated with a fall in inflation) are also followed by a sustained output gap, for which they put forward two possible explanations: hysteresis and reverse causality. To eliminate the likelihood of the latter, they examine 28 recessions caused by intentional disinflation policies of which 63 percent were followed by a sustained output gap and 20 percent by lower growth, which they attribute to hysteresis.
Several researchers have estimated the impact of the great recession on subsequent output. Ball (2014) estimates that the GFC and associated great recession reduced potential output in OECD countries by an average of 8.4 percent in 2015 relative to its pre-crisis trend with wide variations between countries. Rawdanowicz et al (2014) also argue that large negative output gaps during and after the GFC depressed potential output in OECD countries.

The channels through which steep recessions depress potential output over the long term are probably threefold. First, prolonged periods of unemployment may induce workers to drop out of the workforce, thereby reducing the labor force participation rate. Yagan (2019) uses regional data from the United States to find that individuals living in areas which experienced a larger shock to output during 2007-09 were less likely to be employed in 2015, controlling for age and other factors, than individuals living in areas with smaller output shocks. Lower employment levels were the result of lower labor force participation in 2015 rather than higher unemployment. Tumino (2015) uses panel survey data on UK labor markets and finds evidence of unemployment scarring after the great recession as well as in two earlier periods in the United Kingdom.

Second, private sector irreversible fixed capital investment is sensitive to uncertainty (Hubbard, 1994) and to firms’ expectations of their future earnings (Gennaioli, Ma and Shleifer (2015). A steep recession is likely to both heighten uncertainty about future economic prospects and induce firms to downscale their forecasts of future earnings, thereby causing firms to delay or scale down their investment. Third, steep recessions may reduce growth in total factor productivity. Furceri et al (2021) argue that the effect of recessions on TFP is ambiguous theoretically but they construct measures of cyclically adjusted sectoral TFP for industrial economies and find that deep recessions (but not normal recessions) reduce TFP by 3-4 percent over the following 5 years, mainly through the reallocation of factor inputs from relatively high to relatively low productivity sectors.

The concept of hysteresis has been formalized in terms of a hysteresis parameter (e.g. DeLong and Summers, 2012; Fatas and Summers, 2017), whereby a cyclical change in real output affects the long-term potential output as shown below, where $\Delta Y_c$ denotes a cyclical change in output (or the change in a negative output gap), $Y_p$ future potential output and where $\eta$ denotes the hysteresis parameter.

$$\eta \Delta Y_c = \Delta Y_p$$

Some researchers have attempted to estimate the size of the hysteresis parameter empirically, by comparing initial negative shocks with the subsequent reduction in real output below a counterfactual (e.g. Rawdanowicz et al, 2014, for OECD economies after the GFC), but these estimates tend to vary considerably between countries. Our econometric estimates, in section 4, of the impact of the 2009 recession on medium-term output in MICs, can also be interpreted as a hysteresis parameter for this group of countries.
3. **Shocks to Real GDP: A comparison of the GFC and COVID-19 Crises in ECA Transition EMDEs**

The great recession induced by the GFC had a major impact on real output in the ECA transition EMDEs and it was followed by both lower levels of real output over the medium-term relative to what had been forecast immediately before the GFC and to lower real output growth rates compared to those which had prevailed before the GFC. This is illustrated in figures 1 and 2. Figure 1 depicts the median level of real GDP in the ECA transition EMDEs from 2002 to 2013 and compares this with the forecast for 2008-2013 published in the October 2008 WEO. Compared to the 2008 forecast, median GDP in 2013 was lower by 18 percent. Figure 2 depicts median real GDP growth rates of these countries from 2002 to 2020. Median growth was -1.8 percent in 2009. All these 22 countries suffered a drop in real GDP growth in 2009 and 13 of them incurred negative real growth in that year. Median growth rates in the five years after 2009 were on average 3.3 percentage points lower than in the five years preceding 2009 (median growth was 6.6 percent during 2004 to 2008 compared to 3.3 percent during 2010 to 2014). Figure 2 also shows the impact of the COVID-19 crisis in 2020, which was much more severe than the shock to growth incurred in 2009. In 2020, 20 of the 22 ECA transition EMDEs suffered a contraction of real output and the median fall in real output was 4.3 percent. Appendix table 1 provides data on the growth rates of individual ECA transition EMDEs.

The question we address in the following section is whether the medium-term shortfall in real GDP after the 2009 recession can be attributed to the severity of the recession itself, i.e. to the hysteresis effects of the recession, or were caused by other factors exogenous to the recession. As noted in the introduction, this issue has important implications for the relative costs and benefits of stabilization policy during deep recessions, such as the ongoing COVID-19 recession.

**Figure 1** Median Real GDP in ECA Transition EMDEs, 2002 = 100, outcomes and 2008 forecast (dashed line): 2002-2013

![Median Real GDP in ECA Transition EMDEs, 2002 = 100, outcomes and 2008 forecast (dashed line): 2002-2013](source: World Economic Outlook databases)
4. Did the GFC have Hysteresis Effects in EMDEs?

In this section we undertake an economic estimate of the causes of the fall in real GDP in the four years after the 2009 recession, relative to what had been forecast immediately prior to the recession. In effect we are taking the pre-recession forecast as a counterfactual for what would have happened to the path of real output had not the GFC and the great recession not occurred. The aim is to disentangle the effects of the recession itself – the hysteresis effects - from all the other possible causes of the difference between actual GDP in 2013 and the forecast for 2013 GDP made before the recession, in 2008.

We use a cross section of 65 MICs. We confine our sample to MICs because the ECA transition EMDEs which are the focus of this paper are all MICs and the impact of hysteresis may differ between HICs and MICs (Haltmaier, 2012). We exclude from our sample very small economies, with populations of less than half a million, and oil exporters. The latter are excluded because their growth rates after the 2009 recession were strongly influenced by the boom in global oil prices which lasted until 2014 and the former because many of these are undiversified economies whose performance is influenced by idiosyncratic events. We have also excluded several countries because of lack of data for some variables. Our sample includes MICs from five regions: Europe and Central Asia, Asia and the Pacific, Latin America and the Caribbean, Sub-Saharan Africa and the Middle East and North Africa. Across the 65 countries, the mean difference between real GDP in 2013 and that which had been forecast in October 2008 was negative 11.9 percent (table 1). Besides the hysteresis effects of the recession itself, there are several possible explanations for the medium-term reduction in GDP compared to what had been forecast prior to the recession.

Source: World Economic Outlook Database
First, both the 2009 recession itself and the subsequent decline in the trajectory of real GDP, compared to what had been forecast before the recession, could have been the result of a supply-side shock, such as an oil price shock, a financial crisis or even a technology shock. A supply-side shock could have both an immediate negative impact on output, through an inward movement of the aggregate supply curve, and longer lasting effects because some of the industries which had been viable before the shock would be rendered unviable by it. However, a supply-side shock does not appear to have been the main cause of the 2009 recession. An inward shift in the aggregate supply curve would both reduce real output and push up prices, but in the vast majority of the MICs in our sample, inflation was lower in 2009 than it had been in 2008 and in only one of the countries which suffered a contraction of real GDP in 2009 (Mexico) did inflation rise in 2009, and only by 0.2 percentage points. It is possible that a financial crisis could have both negative supply-side and demand-side effects, with the latter outweighing the former, leading to a recession with lower inflation but with longer lasting negative supply-side effects. But of the MICs in our sample, only Mongolia and Ukraine incurred a systemic banking crisis, as defined in Laeven and Valencia (2013), during 2007-11. Instead of a supply-side shock, the main cause of the recession in emerging markets was a contraction in demand, and especially investment demand, because of shocks to export markets, external capital flows and remittances (Blanchard et al, 2010; Gallego et al, 2010). Nguyen and Qian (2013), using data from the World Bank Financial Crisis Enterprise Survey, found that the fall in demand for goods and services was a far more important determinant of firms’ performance than a shortage of credit in six eastern European countries.

Second, the strong growth performance of many EMDEs in the years leading up to the 2009 recession may have been unsustainable, because it relied too heavily on growth in domestic demand driven by a domestic credit boom which was itself fueled by external capital inflows, and hence a reversion to slower and more sustainable growth was unavoidable. Many of the EMDEs in ECA which suffered the steepest recessions in 2009 displayed external and other macroeconomic vulnerabilities prior to the crisis (Atoyan, 2010; Koh and Yu, 2020). To control for the possibility that growth prior to 2009 was unsustainable, we include in our regressions the average current account balance of each country during the three years immediately preceding 2009. Other variables could also have been used as indicators of unsustainable growth prior to the recession, such as the rate of domestic credit growth and total external debt to GDP, but these are not available for all the countries in the sample.

Third, the structural and policy environment in the MICs after the recession could have contributed to the differences in output performance among these countries. Qureshi et al (2014) found that, in a sample of 30 EMDEs, differences in total factor productivity growth between the pre and post GFC periods were correlated with lower barriers to trade and better access to finance and that the latter also influenced the degree to which the GFC affected investment rates. To control for the potential effects of a wide range of structural and policy factors, we include among our regressors the change in each countries’ Global Competitiveness Index (GCI) score between 2008-09 and 2012-13. The GCI scores aggregate scores from 10 different structural and policy characteristics which affect the supply side of the economy, including infrastructure, institutions, goods market efficiency, labor market efficiency and financial market sophistication (World Economic Forum, 2008, 2012).
Fourth, changes in the external trading environment can affect growth rates, especially for MICs dependent on commodity exports. To control for this, we include among our regressors the change in the external terms of trade between 2008 and 2013. We also include regional dummy variables to capture effects on post-recession output performance which might be common across specific regions; for example, countries are likely to have closer trading links with other countries in the same region than in other regions and thus a stronger (weaker) regional growth performance would have positive (negative) effects on that of the individual countries within a region. The ECA transition EMDEs may have been affected by the euro area crisis in the years following the GFC, more than EMDEs in other regions.

In light of the above discussion, we estimate regressions with the following variables. The dependent variable is a measure of the extent to which real output was lower, five years after the start of the great recession, than what had been forecasted immediately before the recession, in October 2008. The independent variables include the real GDP growth rate in 2009 (equation 1) and the difference between real GDP in 2009 and that which had been forecasted in October 2008 (equation 2). The latter variable is intended to proxy the cyclical fall in GDP in 2009 or the output gap, although it will over-state the actual negative output gap in some countries if real output was above its potential or equilibrium level in 2008, which appears plausible. The coefficients on 2009 real GDP growth and the difference between 2009 real GDP and its forecast in October 2008 are estimates of the hysteresis parameter, i.e. they show the impact of the 2009 recession itself on medium-term output, controlling for other factors.

The other independent variables are the average current account balance in the three years prior to the 2009 recession, as a proxy for the extent to which pre-recession growth may have been unsustainable, the change in GCI scores as a proxy for changes in structural and policy factors which affect the competitiveness of the economy, the change in the external terms of trade to capture the impact of changes in the external trading environment and the regional dummies to capture region specific effects.

Equations 1 and 2 are set out below, where \((Y_{2013}/ Y_{2008})-1\) denotes the percentage difference between actual real GDP in 2013 and the October 2008 forecast of 2013 real GDP published in the WEO database, \(\Delta Y_{2009}\) denotes real GDP growth in 2009, \((Y_{2009}/ Y_{2008})-1\) denotes the percentage difference between actual Real GDP in 2009 and the October 2008 forecast of 2009 real GDP, \(CAB_{2006-08}\) denotes the average current account balance during 2006-08 as a percent of GDP, \(GCI_{2012}-GCI_{2008}\) denotes the change in the Global Competitiveness Index score between the 2008-09 GCR and the 2012-13 GCR, \(\Delta TOT_{2008-13}\) denotes the percentage change in the external terms of trade between 2008 and 2013 and RDs denote regional dummy variables. All the explanatory variables other than the regional dummies have an expected positive sign.
\[
\left( \frac{Y_{2013}}{Y_{2013f2008}} \right) - 1 = b_0 + b_1 \Delta Y_{2009} + b_2 \text{CAB2006} - 0.08 + b_3 \text{GCI2012} - \text{GCI2008} + b_4 \Delta \text{TOT2008} - 13 + B_5 - 8 \text{RDs} + \varepsilon 
\]

\[
\left( \frac{Y_{2013}}{Y_{2013f2008}} \right) - 1 = b_0 + b_1(Y_{2009}/Y_{2009f2008}) - 1 + b_2 \text{CAB2006} - 0.08 + b_3 \text{GCI2012} - \text{GCI2008} + b_4 \Delta \text{TOT2008} - 13 + B_5 - 8 \text{RDs} + \varepsilon 
\]

We estimate equations 1 and 2, both with and without the regional dummy variables, on our cross-section sample of 65, non-fuel exporting, MICs, using OLS. The summary statistics of the variables used in the regressions are shown in table 1 and the results of the regressions are shown in table 2.

Table 1: Summary Statistics

| Variable | Mean | Standard Deviation | Maximum | Minimum |
|----------|------|--------------------|---------|---------|
| Percent difference between 2013 real GDP and 2008 forecast of 2013 GDP | -11.9 | 12 | 20.6 | -42.6 |
| 2009 real GDP growth (percent) | 0.15 | 4.8 | 9.4 | -15.4 |
| Percent difference between 2009 real GDP and 2008 forecast of 2009 GDP | -5.6 | 5.1 | 1.6 | -25.9 |
| Average current account balance 2006-08 (percent of GDP) | -4.3 | 8.3 | 15.4 | -40.4 |
| Change in the GCI score; 2008-09 to 2012-13 | 0.09 | 0.18 | 0.48 | -0.52 |
| Change in the ToT, 2008 to 2013 (percent) | 3.7 | 9.5 | 24.1 | -34.1 |

The coefficients on 2009 real GDP growth or the cyclical change in real GDP in 2009 are positive and significant at the one percent confidence level in three of the regressions and at the 5 percent confidence level in the other one. The magnitude of the coefficients is above one in both regressions without regional dummies. The inclusion of the regional dummies reduces the size of the coefficients, but they remain quite substantial, implying a hysteresis parameter in the region of 0.6-0.7.

The coefficients on the 2006-08 current account balance have the expected positive sign in all four regressions but are only significant in the models which exclude the regional dummy variables. The coefficient on the terms of trade is positive in all four models but is significant only at the 10 percent confidence level and only in equation 1a, without the regional dummies.
Both the current account balance and the change in the terms of trade are correlated with the regional dummy variables. The coefficients on the change in the GCI scores are positive and significant at the confidence level 5 or above in three of the four models, suggesting that improvements in competitiveness had tangible benefits for real output. In both the regressions with regional dummies, the coefficients on those for the ECA region were negative and significant, suggesting factors common across the ECA region depressed real output after the GFC.

These results suggest that there was a significant and fairly large hysteresis parameter which adversely affected the performance of real GDP in MICs in the years following the 2009 recession. The larger was the fall in real GDP in 2009, the larger was the gap between actual GDP four years later and the level at which real GDP had been forecast immediately before the recession. As discussed above, it is unlikely that these two variables had a common exogenous cause, such as a supply side shock. Hence it appears likely that 2009 recession itself contributed to the subsequent weaker than forecast performance of real output over the medium term.

**Table 2:**  
**Regressions of difference between 2013 Real GDP and its 2008 forecast**

| Dependent variable | Percent difference between 2013 Real GDP relative to 2008 Forecast of 2013 real GDP |
|-------------------|-----------------------------------------------------------------------------------|
| Independent variables | Model 1a | Model 1b | Model 2a | Model 2b |
| Constant | -12.3 (-8.7)*** | -11.7 (-3.0)*** | -6.3 (-3.4)*** | -7.4 (-1.94)* |
| 2009 Real GDP Growth | 1.1 (4.5)*** | 0.7 (2.7)*** | 1.1 (4.5)*** | 0.64 (2.7)*** |
| Percent difference between 2009 real GDP and 2008 forecast of 2009 real GDP | 0.43 (3.0)*** | 0.12 (0.83) | 0.44 (3.1)*** | 0.12 (0.85) |
| 2006-08 CAB (percent of GDP) | 12.8 (1.98)* | 17.5 (2.9)*** | 16.6 (2.5)*** | 19.9 (3.3)*** |
| ΔGCI 2008-09 to 2012-13 | 0.24 (1.98)* | 0.11 (0.8) | 0.2 (1.6) | 0.11 (0.87) |
| ΔTOT 2008 to 2013 | 0.24 (1.98)* | 0.11 (0.8) | 0.2 (1.6) | 0.11 (0.87) |
| ECA Dummy | -12.8 (-2.6)** | -13.7 (-2.8)*** | -13.7 (-2.8)*** | -13.7 (-2.8)*** |
| Asia Pacific Dummy | 2.1 (0.47) | 2.1 (0.47) | 2.1 (0.47) | 2.1 (0.47) |
| LAC Dummy | 2.3 (0.48) | 0.82 (0.17) | 0.82 (0.17) | 0.82 (0.17) |
| SSA Dummy | 0.8 (0.12) | -0.35 (-0.08) | -0.35 (-0.08) | -0.35 (-0.08) |
| Adj R² | 0.446 | 0.573 | 0.448 | 0.575 |
| Obs | 65 | 65 | 65 | 65 |

* P < 0.1, ** P < 0.05, *** P < 0.01
5. **What are the implications of hysteresis for fiscal policy as a tool of macroeconomic stabilization?**

The potential for steep recessions to have hysteresis effects on long-term potential output means that macroeconomic stabilization policies, such as countercyclical fiscal policy, have potentially greater benefits. To the extent that stabilization policies successfully dampen a recession, they will not only have short-term benefits for welfare but long-term benefits through higher potential output.

The efficacy of using fiscal policy as a tool of macroeconomic stimulus depends on two questions. First, how large are fiscal policy multipliers? Second, is there fiscal space for fiscal stimulus, i.e. can the fiscal stance be expanded without jeopardizing fiscal sustainability? The answers to these two questions are not independent of each other in that the fiscal multiplier may depend on whether or not a country has fiscal space and, if there are significant hysteresis effects, the size and sign of the fiscal multiplier can affect future fiscal sustainability.

The sign and size of fiscal multipliers have been the subject of a large body of empirical research, with varied findings. Not surprisingly, whether fiscal multipliers are positive and how large they are is conditional on the economic conditions in which fiscal policy is implemented, such as the state of the business cycle, structural characteristics of the economy, the perceived sustainability of fiscal policy, the nature of the fiscal policy measures implemented, in terms of components of the budget and the nature of accompanying monetary and exchange rate policies. Fiscal multipliers are more likely to be positive and large during recessions, when aggregate supply constraints do not bind, than during booms (Baum et al, 2012; Dell’Erba et al, 2018) and also because an initial increase in output could ease countercyclical financial frictions affecting the private sector (Canzoneri et al 2011). High levels of public debt may reduce fiscal multipliers, or even turn them negative, because of Ricardian equivalence effects and increased interest rates (Ilzetzki et al, 2011; Huidrom et al, 2020). Ramey (2011) reviews the literature on the government purchases multiplier in the United States and finds that most studies estimate it to be between 0.8 and 1.5, with the multiplier in a recession being closer to the top of that range. Kraay (2012) uses data on World Bank project disbursements to estimate the government expenditure multiplier in developing (mostly low income) countries and finds it to be only around 0.5. The IMF Fiscal Monitor (IMF, 2020) argues that public investment multipliers are larger during periods of high uncertainty about GDP forecasts, and that over the course of two years the public investment multiplier could exceed two. Chudzik et al (2021) use a global VAR model to quantify the impact on GDP of the discretionary fiscal measures implemented in response to the COVID-19 crisis and find that these measures were effective in reducing the contraction in real GDP in 2020, in both advanced economies and emerging markets.

The consequences for fiscal sustainability of implementing countercyclical fiscal policy is a concern for countries with high levels of public debt. If the impact of a recession on output was purely cyclical, a countercyclical policy during the recession would, ceteris paribus, lead to higher long-term public debt to GDP ratios compared to those which would prevail without the fiscal stimulus. However, if the hysteresis effects of recession are significant and the fiscal multiplier is positive, a temporary fiscal stimulus can improve public debt ratios over the long term, compared to what would happen without the stimulus, through its impact on long-term real output and thus budget revenue, even if it temporarily raises the public debt/GDP ratio. The
following exposition is adapted from De Long and Summers (2012) and Fatas and Summers (2017).

We assume that a one period fiscal expansion is implemented during a recession, which comprises an increase in government spending denoted by ΔG_t. The fiscal multiplier is denoted by U and hence one period cyclical GDP, denoted by Y^*_t increases thus: ΔY^*_t = UΔG_t. The rise in cyclical GDP, which reduces the negative output gap, lowers the negative hysteresis effects on future long-term potential output, denoted as Y_p, by a magnitude determined by the hysteresis parameter, η (discussed in section 2). Thus ΔY_p = ηΔY^*_t = ηUΔG_t.

The fiscal stimulus has two long-term effects on the fiscal balance, and thus on public debt. In the initial period, the fiscal balance is lowered by the increase in expenditure, but this is partly offset because the fiscal multiplier raises the budget revenue base. We denote the marginal budget revenue rate as Ʈ. The fiscal stimulus lowers the fiscal balance by ΔΔG_t = UΔG_t = U(1- Ʈ). The change in the fiscal balance changes the stock of public debt, denoted as D by an equivalent amount. Thus ΔD_t = ΔG_t – ƮUΔG_t = ΔG_t(1- Ʈ).

The increase in G is a one-off measure which we assume is permanently reversed in the following period, but that still leaves the economy with the higher level of public debt. The long-term cost to the budget is the annual interest paid on the increased debt; rΔD_t = rΔG_t(1- ƮU). However, long-term revenues will also be higher by ΔY_p = ηUΔG_t. Therefore, if ηUΔG_t exceeds r(1- ƮU)ΔG_t, the net impact of the fiscal stimulus on the fiscal balance over the long-term will be positive, ceteris paribus, allowing public debt to be reduced.

How likely is it that ηU > r(1 - Ʈ) in ECA transition EMDEs? We need to know the value of four parameters, two of which – the revenue rate and the interest rate - can be estimated from empirical data. We will assume a hypothetical economy, with values of parameters equal to the medians of the ECA transition EMDEs. We also assume that marginal revenue and interest rates are equal to average revenue and interest rates, which may not be a valid assumption for a country with an already high public debt to GDP ratio. The median average revenue rate (public revenue/GDP) for the ECA transition EMDEs is 34 percent and the median interest rate on government debt is 3.2 percent. For the fiscal multiplier we initially assume a value of 1.5, which is probably near to the top of the range of what is achievable in an EMDE even in a recession. The value of the hysteresis parameter is the most uncertain of all the relevant parameters. We assume a value of 0.65 based on the coefficients estimated in the regressions, including the regional dummy variables, in section 4. Table 3 shows what long-term impact a fiscal stimulus would have on the budget. For the purposes of exposition, we assume a fiscal stimulus equivalent to 3 percent of GDP.

---

3 This is calculated for each country by dividing interest paid in the budget by the stock of public debt, excluding guarantees, and averaging over 2017-19, using the data in the latest IMF country reports. Kazakhstan is excluded because the fiscal table in the latest IMF country report does not separately report interest payments and Uzbekistan is excluded because its interest rate appears unrealistically low, at 0.1 percent. The revenue rates are taken from the WEO database and are also averages of 2017-19.
Table 3: Comparison of long-term interest cost and revenue gains of a fiscal stimulus with positive fiscal multipliers and hysteresis parameters

| Parameters | $\Delta Y^c_t$ | $\Delta Y^p_t$ (% of $Y^c_t$) | $\Delta$ long-term interest costs (% of $Y^c_t$) | $\Delta$ long-term revenues (% of $Y_t$) | Net change in fiscal balance (% of $Y_t$) |
|------------|---------------|-------------------------------|---------------------------------------------|----------------------------------------|----------------------------------------|
| $\Delta G_t = 3\%$ of GDP $U = 1.5$; $\eta = 0.65$ $r = 3.2\%$; $\Upsilon = 34\%$ | 4.5\% | 2.9\% | 0.05\% | 1.0\% | 0.95\% |
| $\Delta G_t = 3\%$ of GDP $U = 1$; $\eta = 0.2$ $r = 3.2\%$; $\Upsilon = 34\%$ | 3\% | 0.6\% | 0.063\% | 0.2\% | 0.14\% |

$\Delta G_t$ denotes the size of one period fiscal stimulus, $U$ the fiscal multiplier, $\eta$ the hysteresis parameter, $r$ the interest rate on government debt, $\Upsilon$ the marginal budget revenue rate, $Y^c_t$ is cyclical GDP in the initial period and $Y^p_t$ is long-term potential output.

The middle row in table 3 shows the outcome for long-term interest costs and revenue gains given the parameters stated above. Long run budget revenues rise by 1.0 percent of the initial period GDP. Given the low interest rate on public debt, the long-term increase in interest expense is very small and much lower than the rise in budget revenues. The net long term gain to the annual budget is 0.95 percent of the initial period GDP. With these parameters, the long-term net gain to the budget is not very sensitive to the interest rate on government debt, which could rise to 10 percent and still leave interest costs much lower than revenue gains. Also, even if we assume that the fiscal stimulus has to implemented for two years to generate the gains to long-term potential output, the net gains to the budget would still be positive.

In the bottom row of table 3 we adopt a more conservative fiscal multiplier and hysteresis parameter, lowering the former to one and the latter to 0.2. This increases the long-term interest cost to the budget and cuts the revenue gains by almost 80 percent, but the latter still narrowly exceeds the former by 0.14 percent of GDP. However, with these parameters, a rise in the interest rate above 10 percent would reverse the net gains to the budget.

These estimates are very tentative and depend on the size of parameters which are uncertain. Nevertheless, in evaluating the costs and benefits to the economy and the risks to fiscal sustainability of implementing fiscal stimulus measures during recessions, it is necessary to take into account the possibility that these measures will have a long run impact on real output and thus on the budget revenue base.

6. Conclusions and policy implications

The ECA transition EMDEs are currently incurring an even more severe macroeconomic shock than that which they suffered in 2009 as a result of the GFC. The GFC induced recession was followed by a marked downturn in the trajectory of real output compared to what had been forecast immediately prior to the recession. Our econometric analysis of the post 2009 recession medium-term output performance of MICs indicates that the recession itself had significant hysteresis effects on the medium-term level of GDP in the subsequent four years. The experience of the GFC and its aftermath suggest that the much larger COVID-19 induced
recession could also have a deleterious long-term impact on output in the ECA transition EMDEs, through hysteresis and scarring.

The risk that the COVID-19 recession will have significant hysteresis effects places a premium on macroeconomic policies which can shorten the recession and quickly restore buoyancy to the economy. Because of constraints on private sector investment and consumption demand, at least part of the burden of macroeconomic stimulus will probably be borne by fiscal policy. ECA transition EMDEs have already implemented discretionary fiscal policies, with additional expenditures and measures to delay or defer taxes amounting to an average of 3.9 percent of GDP (see appendix table 2). Continued fiscal stimulus may be necessary in 2021 to boost economic recovery. Concerns about fiscal sustainability must be taken into consideration when planning fiscal policy responses to the crisis. However, unless fiscal multipliers and hysteresis effects are small, a fiscal stimulus implemented in a steep recession can actually improve long run fiscal sustainability through its positive long-term impact on the budget revenue base.

We should stress that this is not an argument for governments to run permanently larger fiscal deficits, which would clearly worsen public debt ratios, *ceteris paribus*. Any fiscal stimulus should be strictly temporary which means it should comprise measures which do not create permanent expenditure liabilities. It also needs to be carefully designed to maximize its multiplier affects, especially because of the peculiarities of this recession, with supply-side restrictions affecting some sectors of the economy because of social distancing, travel restrictions and other measures put in place to protect public health. To maximize multiplier effects, transfers to households, or tax cuts, should be focused on low income households who are more likely to be liquidity constrained, rather than broad based measures which would also benefit households with a higher marginal propensity to save. Measures to increase public spending should be focused on items which can be implemented quickly, such as maintenance and repair of public capital where a backlog of necessary work exists (IMF, 2020). If fiscal stimulus measures are well designed, so that they are both temporary and maximize the multiplier effects during the recession, they will help to mitigate risks to long-term fiscal sustainability.
References

Arulampalam, Wiji, Paul Gregg and Mary Gregory (2001), “Unemployment Scarring”, The Economic Journal, vol 111, no 475 (November), ppF577-F584.

Atoyan, Ruben (2010), “Beyond the Crisis: Revisiting Emerging Europe’s Growth Model”, Working Paper WP/10/92, International Monetary Fund.

Ball, Laurence (2014), “Long-term Damage from the Great Recession in OECD Countries”, European Journal of Economics and Economic Policy: Intervention, Vol 11, no 2, pp 149-60.

Barrell, Ray (2009), “Long-term Scarring from the Financial Crisis”, National Institute Economic Review, 210 (October), pp36-38.

Baum, Anja, Marcos Poplawski-Ribeiro, and Anke Weber (2012), “Fiscal Multipliers and the State of the Economy”, Working Paper WP/12/286, International Monetary Fund.

Bell, Brian, Mihai Codreanu and Stephen Machin (2020), “What can previous recessions tell us about the COVID-19 downturn?”, Paper no 007, Centre for Economic Performance.

Berglöf, Erik, Yevgeniya Korniyenko, Alexander Plekhanov and Jeromin Zettelmeyer (2009), “Understanding the crisis in emerging Europe”, Working Paper 109, European Bank for Reconstruction and Development.

Blanchard, Olivier J., Hamid Faruqee and Mitali Das (2010), “The Initial Impact of the Crisis on Emerging Market Countries”, Brookings Papers on Economic Activity, Spring, pp263-307.

Blanchard, Olivier, Eugenio Cerutti and Lawrence Summers (2015), “Inflation and Activity – Two Explorations and their Monetary Policy Implications”, Working Paper 21726, National Bureau of Economic Research.

Canzoneri, Matthew, Fabrice Collard, Harris Dellas and Behzad Diba (2012), “Fiscal multipliers in recessions”, Discussion Papers, No. 12-04, University of Bern, Department of Economics, Bern.

Cerra, Valerie, Antonio Fatás and, Sweta C. Saxena (2020), “Hysteresis and Business Cycles”, Working Paper WP/20/73, International Monetary Fund.

Chudik, A., K. Mohaddes and M. Raissi (2021), "Covid-19 Fiscal Support and its Effectiveness", Cambridge Working Papers in Economics 2116, Faculty of Economics, University of Cambridge.

Dell’Erba, Salvatore, Ksenia Koloskova and Marcos Poplawski-Ribeiro (2018), “Medium-Term Fiscal Multipliers during Protracted Economic Contractions”, Journal of Macroeconomics, Vol 56, pp35-52.

DeLong, J. Bradford and Lawrence H. Summers (2012), “Fiscal Policy in a Depressed Economy”, Brookings Papers on Economic Activity, 233-297.

Dieppe, Alistair, Sinem Kilic Celik and Cedric Okou (2020), “Implications of Major Adverse Events on Productivity”, Policy Research Working Paper 9411, World Bank.
Fatás, Antonio (2019), “Fiscal Policy, Potential Output and the Shifting Goalposts”, *IMF Economic Review* 67, pp584-702.

Fatás, Antonio and Lawrence H. Summers (2017), “The permanent effects of fiscal consolidations”, *Journal of International Economics*, 112 (2018) 238–250

Furceri, Davide, Sinem Kilic Celik, Joao Tovar Jalles and Ksenia Koloskova (2021), “Recessions and total factor productivity: Evidence from sectoral data”, *Economic Modelling*, 94, pp130-138.

Gallego, Sonsoles, Sándor Gardó, Reiner Martin, Luis Molina and José Maria Serena (2010), “The Global Economic and Financial Crisis – a Comparative Assessment of its Impact on the CESEE Region and Latin America”, in Peter Backé, Ernest Gnan and Philipp Hartmann (eds) Contagion and Spillovers: New Insights from the Crisis, SUEF Studies, Vienna, pp215-48,

Gennaioli, Nicola, Yueran Ma and Andrei Shleifer (2015), “Expectations and Investment”, *NBER Macroeconomics Annual*, Vol. 30, pp379-442.

Haltmaier, Jane (2012), “Do Recessions Affect Potential Output”, International Finance Discussion Papers no 1066, Board of Governors of the Federal Reserve System.

Hubbard, Glenn (1994), “Investment Under Uncertainty: Keeping One's Options Open”, *Journal of Economic Literature*, Vol. 32, No. 4, pp. 1816–1831

Huidrom, Raju, M. Ayhan Kose, Jamus J. Lim and Franziska L. Ohnsorge (2020) “Why do fiscal multipliers depend on fiscal positions?”, *Journal of Monetary Economics*, Vol 14, Oct.

Ilzetzki, Ethan, Enrique G. Mendoza and Carlos A. Végh (2011) “How Big (Small?) are Fiscal Multipliers?”, Working Paper WP/11/52, International Monetary Fund.

International Monetary Fund (2020), *Fiscal Monitor*, October, Washington DC.

Jordà Òscar, Sanjay R. Singh and Alan M. Taylor (2020) “Longer-Run Economic Consequences of Pandemics, Working Paper 26934, National Bureau of Economic research.

Laeven, Luc and Fabian Valencia (2013),“Systemic Banking Crises Database”, *IMF Economic Review*, Vol 61, No 2, pp225-70.

Kraay, Aart (2012), “How large is the Government Spending Multiplier: Evidence from World Bank Spending?”, *Quarterly Journal of Economics*, vol 127, pp829-887.

Koh, Wee Chian and Shu Yu (2020), “A Decade After the 2009 Recession; Macroeconomic Developments”, Policy Research Working Paper, 9290, World Bank.

Nguyen, Ha and Rong Qian (2013), “Demand Collapse or Credit Crunch to Firms? Evidence from the World Bank’s Financial Crisis Survey in Eastern Europe”, Policy Research Working Paper, 6651, World Bank.

Qureshi, Zia, Jose L. Diaz-Sanchez, and Aristomene Varoudakis (2014), “The Post Crisis Growth Slowdown in Emerging Markets and the Role of Structural Reforms”, Policy Research Working Paper, 7107, World Bank.
Ramey, Valerie A. (2011), “Can Government Purchases Stimulate the Economy”, *Journal of Economic Literature*, vol 49, pp673-685.

Rawdanowicz, Łukasz, Romain Bouis, Kei-Ichiro Inaba and Ane Kathrine Christensen (2014), “Secular Stagnation: Evidence and Implications for Economic Policy”, Economic Department Working Papers 1169, OECD.

Tumino, Alberto (2015), “The scarring effect of unemployment from the early '90s to the Great Recession”, ISER Working Paper Series, No. 2015-05, University of Essex, Institute for Social and Economic Research (ISER), Colchester.

World Bank (2021), *Global Economic Prospects January*, Washington DC.

World Economic Forum (2008), *Global Competitiveness Report 2008-2009*, Geneva.

World Economic Forum (2012), *Global Competitiveness Report 2012-2013*, Geneva.

Yagan, Danny (2019), “Employment Hysteresis from the Great Recession”, *Journal of Political Economy*, Vol 127, no 5, pp2505-2558.
Appendix Table 1: Changes in Real GDP, ECA Transition EMDCs, 2004-08, 2009, 2010, 2011-15, 2016-19 and 2020 (percent)

| Country                        | Pre-GFC | GFC | Post GFC | Pre-Covid-19 | COVID-19 |
|--------------------------------|---------|-----|----------|--------------|----------|
|                                | 2004-08 | 2009| 2010    | 2011-15      | 2016-19  |
|--------------------------------|---------|-----|----------|--------------|----------|
| Albania                        | 6.1     | 3.4 | 3.7      | 1.8          | 3.4      | -3.5 |
| Armenia                        | 11.7    | -14.2 | 2.2     | 4.4          | 5.1      | -7.6 |
| Azerbaijan                     | 21.5    | 9.4  | 4.8      | 2.1          | 0.2      | -4.3 |
| Belarus                        | 10.0    | 0.2  | 7.8      | 1.2          | 1.2      | -0.9 |
| Bosnia and Herzegovina         | 5.6     | -0.8 | 0.8      | 1.4          | 3.2      | -5.5 |
| Bulgaria                       | 6.6     | -3.4 | 0.6      | 1.8          | 3.5      | -3.8 |
| Croatia                        | 4.1     | -7.4 | -1.5     | -0.2         | 3.0      | -9.0 |
| Georgia                        | 8.0     | -3.7 | 6.2      | 5.0          | 4.4      | -6.1 |
| Hungary                        | 2.9     | -6.7 | 0.7      | 2.1          | 4.0      | -5.0 |
| Kazakhstan                     | 8.4     | 1.2  | 7.3      | 4.7          | 3.5      | -2.6 |
| Kosovo                         | 4.6     | 3.6  | 3.3      | 3.2          | 4.3      | -6.0 |
| Kyrgyz Republic               | 5.2     | 2.9  | -0.5     | 4.9          | 4.3      | -8.0 |
| Moldova                        | 6.1     | -6.0 | 7.1      | 3.8          | 4.2      | -7.5 |
| Montenegro                     | 6.2     | -5.8 | 2.7      | 1.8          | 4.2      | -15.2 |
| North Macedonia                | 5.3     | -0.4 | 3.4      | 2.5          | 2.5      | -4.5 |
| Poland                         | 5.2     | 2.8  | 3.6      | 3.0          | 4.5      | -2.7 |
| Romania                        | 7.9     | -5.5 | -3.9     | 3.0          | 5.1      | -3.9 |
| Russian Federation             | 7.1     | -7.8 | 4.5      | 1.9          | 1.6      | -3.1 |
| Serbia                         | 7.3     | -2.7 | 0.7      | 0.9          | 3.5      | -1.0 |
| Tajikistan                     | 8.0     | 3.9  | 6.5      | 7.0          | 7.2      | 4.5  |
| Ukraine                        | 6.6     | -15.1 | 4.1    | -2.1         | 2.9      | -4.2 |
| Uzbekistan                     | 8.1     | 8.1  | 7.3      | 7.5          | 5.5      | 1.6  |
| Median                         | 6.6     | -1.8 | 3.5      | 2.3          | 3.8      | -4.3 |

Source: World Economic Outlook Databases
Appendix Table 2: Summary of fiscal and quasi fiscal measures in response to COVID-19 crisis in ECA transition EMDEs (percent of GDP)

| Country                  | Above the line measures | Below the line Measures; liquidity support |
|--------------------------|-------------------------|--------------------------------------------|
|                          | Additional Spending     | Equity injections                          |
|                          | Accelerated Spending    | Guarantees                                 |
|                          | or foregone Revenue     | QFDs                                       |
|                          | or deferred Revenue     |                                            |
| Albania                  | 1.2                     | 1.7                                        |
| Armenia                  | 1.0                      | 0.0                                        |
| Azerbaijan               | 2.2                      | 2.7                                        |
| Belarus                  | 5.1                      |                                            |
| Bosnia and Herzegovina   | 4.4                      | 0.5                                        |
| Bulgaria                 | 2.6                      | 1.3                                        |
| Croatia                  | 6.4                      | 0.0                                        |
| Hungary                  | 4.0                      | 4.4                                        |
| Kazakhstan               | 2.4                      | 1.9                                        |
| Kosovo                   | 5.6                      | 2.9                                        |
| Kyrgyz Republic          | 6.1                      |                                            |
| Moldova                  | 2.2                      | 0.3                                        |
| Montenegro               | 8.0                      | 2.3                                        |
| North Macedonia          | 2.9                      | 2.9                                        |
| Poland                   | 7.7                      | 2.2                                        |
| Romania                  | 2.3                      | 0.2                                        |
| Russian Federation       | 2.9                      | 0.4                                        |
| Serbia                   | 5.6                      | 2.8                                        |
| Tajikistan               | 3.0                      | 0.5                                        |
| Ukraine                  | 3.4                      |                                            |
| Uzbekistan               | 3.7                      | 2.4                                        |
| Mean                     | 3.9                      | 1.3                                        |

These are measures which may be spread over 2020, 2021 and beyond.

Source: IMF Fiscal Monitor, October 2020