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The Role of Institutional Quality on the Effects of Fiscal Stimulus*

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March, 2020

Abstract

This paper provides evidence on the effect of fiscal stimulus on economic activity in countries with different degrees of institutional quality. The identification strategy makes use of data on military expenditure to instrument government consumption using local lineal projections as presented in Jordà (2005). Based on a panel of 113 countries during the period 1988-2017, the analysis finds evidence that an increment of 1 percent in government consumption yields a sizable, persistent, and stable increase in economic activity of 0.9 percent in countries with higher institutional quality. In contrast, for countries with lower institutional quality, the effect is smaller (0.4 percent) and more short-lived.

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1 Introduction

The effect of a fiscal expansion on output is one of the most debated topics in macroeconomics. The notion in policy circles that government spending has a positive effect dates from the Great Depression. It was developed further in The General Theory by Keynes (1936), applied as recently as during the global financial crisis in 2008 and the Covid pandemic in 2019-2020. Even though the discussion on the sign and size of the fiscal multiplier is far from settled, one consensus has emerged: the effect of fiscal stimulus is not invariant – that is, there are country-specific characteristics that make the response of economic activity to fiscal expansions larger or smaller.

Some of these characteristics include whether countries are operating in normal times or in periods of economic distress (Auerbach and Gorodnichenko, 2012, 2017; Bachmann and Sims, 2012; Ramey and Zubairy, 2018); the degree of procyclicality in government spending during recessions or expansions (Riera-Crichton et al., 2014, 2015); whether countries have monetary policy space or are constrained by the zero lower bound (Miyamoto et al., 2018); countries' different levels of public debt (Ilzetzki et al., 2013; Corsetti et al., 2012); different degrees of countries' trade openness (Barrell et al., 2012; Ilzetzki et al., 2013); and whether countries have fixed or flexible exchange rates (Sheremirov and Spirovska, 2019). One dimension that remains unexplored is the role that institutional quality plays in the response to fiscal stimulus.

This paper tests the idea that institutional quality provides an economic framework that may make fiscal expansion (i.e., increases in government consumption) more effective. This idea builds first on Acemoglu et al. (2001), who state that countries with better institutions will use physical and human capital more efficiently to achieve greater levels of income. Second, it builds on Rodrik (2008), who points out that better institutions help maintain macroeconomic stability.

Using a panel of 113 countries during the period $1998 - 2017$, the analysis finds that countries with better institutional quality react more positively to fiscal stimulus (measured in terms of elasticities). More specifically, an increase of 1 percent in government consumption yields an increase of economic activity of 0.9 percent in countries with higher institutional quality, and 0.4 percent in countries with lower institutional quality. The impact in countries with higher institutional quality is not only larger, but also longer lasting and stable: three years after the initial stimulus, the cumulative impact on economic activity remains significant, at around 0.9 percent. On the other hand, the impact on economic activity at longer horizons in countries with lower institutional quality is more volatile, and by the fourth year after the initial stimulus, the impact can potentially dissipate.

We acknowledge the existence of a tight association between economic development and institutional quality. However, the mechanisms through which institutional quality operates are not limited to the degree of development. When we focus exclusively on non-advanced economies, the response to fiscal stimulus is still larger in countries with higher institutional quality in the short run.

The responses to changes in fiscal stimulus are estimated using local linear projections as in Jordà (2005), combined with instrumental variables. We instrument government consumption with military-spending shocks. We collect data on output, government spending, public investment, military spending, presidential elections, institutional quality, private investment and wars. These data allow for capturing the variability along the institutional quality dimension.

Following the work of Cavallo et al. (2017), *institutional quality* is defined by the sum of *bureaucracy, corruption, government stability, investment profile, and law and order*. Countries with higher (lower) institutional quality are those above (below) the median of the average distribution in the sample. Each component aims to capture direct or indirect constraints on the ability of fiscal stimulus to foster economic activity.

A strong, technical and independent *bureaucracy*, makes the selection of projects with low returns less likely. Lower levels of *corruption* might result in better allocation of resources. *Government stability* reduces sources of uncertainty associated with investment or consumption decisions. A better *investment profile* provides an environment more conductive to business operations. *Law and order* (as reflected in the the quality of contract enforcements, property rights and the enforcement of rules in society) might reduce corruption problems.

This paper relates to several strands of literature. First, it is closely related to the literature on fiscal multipliers. This literature presents some mixed evidence regarding the short and medium-term response of output to a public spending shock. Perotti (2005) estimates a structural vector autoregression model for a sample of five member countries of the Organisation for Economic Co-operation Development and reports small and decreasing government spending multipliers. Ilzetzki et al. (2013) study the size of the fiscal multiplier using quarterly data for 44 countries. They report that the size and sign of the multiplier depend on country specific characteristics, such as exchange rate flexibility, the level of development, trade openness and the level of indebtedness. They also find that the public investment multiplier is positive, significant and greater than one in developing countries. Pessino et al. (2018) present evidence that the public investment multiplier is positive, significant and much greater than one for countries with a low stock of public capital, but

not significant for countries with a high initial stock of public capital. They also find that the overall spending multiplier is not significant in countries where the efficiency of public expenditure is low, as rated by the World Economic Forum.

This paper is also related to the literature on the role of institutions. One important focus in this literature has been on corruption. Tanzi and Davoodi (1997) shows that greater corruption hurts growth through higher levels of public investment with lower quality and productivity. Shankha and Era (2011) build an endogenous growth model and argue that the effect of public investment on growth is determined by the quality and efficiency of public capital, which is affected by corruption. Mauro (1995) controls for the simultaneity of institutions and economic growth, and provides evidence that corruption decreases private investment, lowering economic growth. Haque and Kneller (2012) present causal evidence that corruption increases public investment but hampers growth by reducing its return. Esfahani and Ramirez (2003) estimate a structural model and find a significant positive effect of infrastructure investment on GDP growth. They also find a significant positive effect of institutions on infrastructure accumulation. IMF (2016) argues that corruption can distort the selection of public investment projects, increase costs and result in poor outcomes.

The paper is organized as follows. Section 2 discusses the identification strategy and the data used to estimate the effect of fiscal stimulus on economic activity in countries with different degree of institutional quality. Section 3 outlines the empirical methodology, presents the results for government consumption. And section 4 concludes.

2 Methodology

2.1 Identification Strategy

This section examines how institutional quality shapes the effects of a fiscal expansion in economic activity. The challenge in measuring such effects relies on the identification of exogenous policy shocks, since observed movements in fiscal stimulus may simply be an automatic response to current economic conditions. We follow the identification strategy detailed in Hall (2009) and Sheremirov and Spirovska (2019) which assumes that changes in military expenditures are not associated with fluctuations in economic activity (i.e., exogenous) at an annual frequency and are mainly driven by geopolitical factors.

According to Miyamoto et al. (2019), the use of military expenditures as an instrument for government expenditure is based on two main rationales. The first is the availability of military

expenditure data for a large number of countries with numerous episodes of significant variation over time. In the context of this paper, this variability in the data allows for capturing the responses to fiscal stimulus for countries with different degrees of institutional quality. The second rationale relates to the size of changes in military expenditure. These changes tend to be large, suggesting that they are not necessarily driven by countercyclical reasons. Collier (2006) finds evidence that the history of domestic and international conflicts, arms races with neighboring states, and vested interests of the military, are the main determinants of changes in military expenditure.

While this strategy has been extensively used to analyze the impact of fiscal stimulus in advanced economies (Hall, 2009; Barro and Redlick, 2011; Ramey, 2011), its implementation for non-advanced countries requires additional considerations. First, military expenditure can respond to internal conditions in economies where conflicts take place on domestic soil or in the proximity of their borders. Second, in economies facing internal conflicts changes in government administration can influence the allocation of military expenditure. And third, we expect the association between military expenditure and economic growth to be smaller in countries where such expenditure is associated with arms imports. In order to address these issues, all our model specifications control for the presence of conflicts and for the date when presidential elections take place. Additionally, we perform some robustness checks that exclude countries that have experienced prolonged internal conflict or countries that are large arms importers.

2.2 Data

The analysis in this paper is conducted for a panel of 113 countries during the period 1988-2017. We have excluded countries with less than 15 observations on military expenditure which is the more restrictive variable in the sample.

The data on *real GDP* and *government spending* are taken from the National Accounts Main Aggregates Database, compiled by the United Nations Statistics Division. *Government consumption* is proxied by general government consumption expenditure. All series are in 2011 real U.S dollars.

The data on *military expenditure* are from the Stockholm International Peace Research Institute (SIPRI), which compiles official data from national governments and international organizations to generate series of total military expenditures. Military expenditure encompasses all spending on current military forces and activities such as personnel payments, procurement, operations, military research and development, and construction. Data on *presidential elections* are from Cruz et al.

(2017). This dataset includes (among other things) the month and year when presidential elections are held in the countries in the sample.

To compute the series of conflicts and wars used as control, we collect data from the UCDP/PRIO Armed Conflict Dataset, which is a joint project between the Uppsala Conflict Data Program (UCDP) and the Centre for the Study of Civil War at the International Peace Research Institute in Oslo (PRIO).[1] The dataset lists state-based armed conflicts defined as contested incompatibilities concerning governments and/or territories where the use of armed force between two parties results in at least 25 battle-related deaths in a calendar year (Gleditsch et al., 2002; Pettersson et al., 2019). Based on this definition, *conflicts* are classified as episodes when the number of battle-related deaths is between 25 and 999; and *wars* are defined as when there are at least 1,000 battle-related deaths in a given year.

We use the International Country Risk Guide (ICRG) dataset to build the *institutional quality* measure. This dataset includes an annual assessment of risk for a sample of 166 countries along several dimensions from 1980 to 2017. The ICRG assigns points to each category based on a common questionnaire, assuring comparability across units and time. The scoring system is designed in a way that a higher score implies a lower risk. Following Cavallo et al. (2017) institutional quality is defined as the sum of *corruption, investment profile, government stability, bureaucracy and law and order*.[2] The choice of the components to compute the institutional index aims to capture the main factors that the long-run growth literature has identified as the culprits for low quality and inefficient public expenditure. The quality of institutions metric monotonically increases in the score – that is, institutional quality improves as the score is higher.[3]

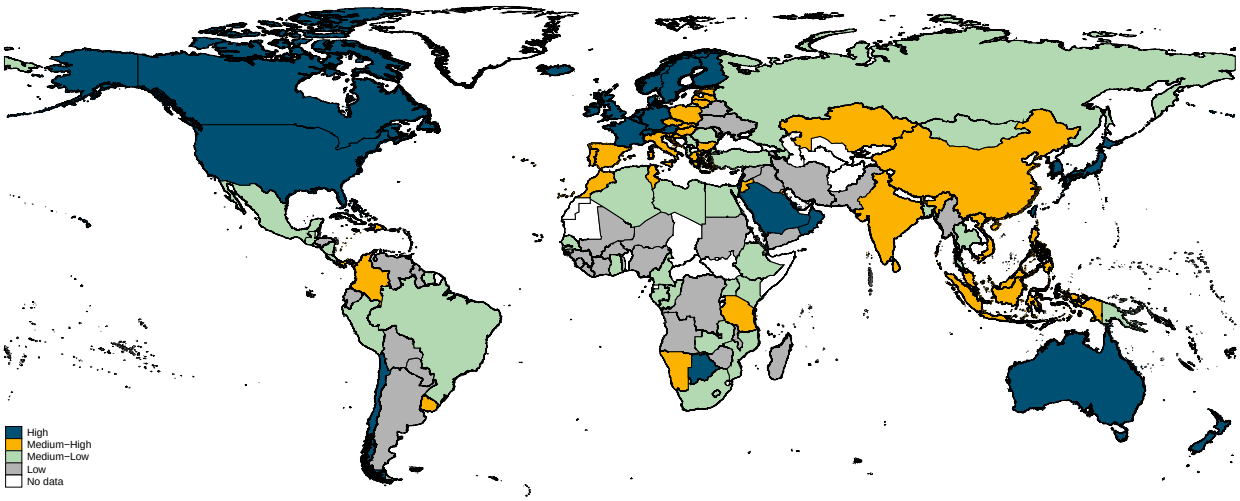
The index includes those elements that could make the public sectors project selection process inefficient. Although most of the literature focuses on the effects of corruption on investment and growth, we have included additional variables to capture important direct or indirect deterrents for fiscal stimulus. Observance of the law and the strength of the judiciary are elements that could inhibit corruption. A strong, technical and independent bureaucracy makes the selection of projects with low returns less likely. A government's stability and investment profile affect investor and consumer confidence, and thus the potential amplification of fiscal stimulus on economic activity.

[1] This dataset is available at http://www.pcr.uu.se/research/ucdp/datasets/.

[2] An alternative measure is computed by weighting each series based on the eigenvalues of the first principal component. The results are detailed in Table 2.

[3] *Investment profile* presents an assessment of factors affecting the risk of investment in a country such as: contract viability, expropriation, profits repatriation and payment delays. *Government stability* is an assessment of the ability of the government to carry out its programs and stay in office.

Figure 1: Institutional Average Index, 2010-2017



Source. Authors' calculations based on data from ICRG.
Note. Institutional quality corresponds to the sum of corruption, investment profile, government stability, bureaucracy and law and order. The series are normalized such that max=1.

Figure 1 shows the distribution among regions of the institutional quality metric for the period 2010-2017. In this figure, countries are grouped by percentiles of their index, and presented in four main categories: countries above 75th percentile (High), countries between 50th and 75th percentile (Medium-High), countries between 25th and 59th percentile (Medium-Low) and countries below the 25th percentile (Low). For the purpose of this paper, countries above the 50th percentile (High and Medium-High) in the historical distribution of institutional quality are considered as countries with a high (H) degree of institutional quality, while countries below the 50th percentile (Medium-Low) are considered as having a low (L) degree of institutional quality.

With the exception of North America and Europe, there are not clusters of institutional quality supported by the data anywhere else in the world. Africa, Asia and Central and South America exhibit a large dispersion in their degrees of institutional quality. This large variation within non-advanced economies is exploited in Section 3.1.1 of this paper in order to study the role of economic development in our findings.

3 Fiscal Stimulus and Institutional Quality

To compute the response of economic activity to fiscal stimulus, we employ the local-projection method presented in Jordà (2005) combined with instrumental variables. This approach allows

for an efficient estimation of multiple parameters and greater flexibility to fully exploit the time and cross-sectional dimension of the data. In particular, we estimate the following model:

$$y_{i,t+h} = \alpha_i^h + \gamma_t^h + \mu^h g_{i,t+h} + \gamma^h \mathbf{z}_{it} + \phi^h(L)\mathbf{x}_{i,t-1+h} + \epsilon_{i,t+h} \tag{1}$$

for $h = 1, \ldots, H$, where i and t index countries and years, respectively. This specification follows Gordon and Krenn (2010) and Ramey and Zubairy (2018) with one important distinction: all variables in equation (1) are measured in logs. The reason behind this methodological change is twofold: first, the estimation of the model in logs is more stable and robust to the choice of alternative modelling assumptions (e.g., variables used to normalize all series). Second, logarithmic transformation reduce the size of the standard errors providing a more accurate set of point estimates. Thus, the coefficient μ^h can be interpreted in terms of the elasticity between fiscal stimulus and economic activity.

The parameters α and γ in equation (1) correspond to country and time fixed effects, and y_{it} is the log of the sum of real GDP in U.S dollars normalized by trend GDP from period t to $t+h$. Trend GDP is approximated by a quadratic polynomial at the country level. The vector of controls $\mathbf{x}_{i,t}$ includes lags of real GDP, government spending and military expenditure, with all variables normalized by trend GDP and in logs. The vector $\mathbf{z}_{i,t}$ includes contemporaneous controls such as a dummy variable for wars and presidential elections. $\phi^h(L)$ collects the coefficients associated with the vector $\mathbf{x}_{i,t-1}$ and its corresponding lags. And γ^h collects the coefficients for the vector of variables $\mathbf{z}_{i,t}$

The variable g_{it} corresponds to the fiscal stimulus variable. It is the log of the sum from period t to $t+h$ of government consumption. These variables are normalized by trend GDP. This variable is instrumented with the log of military spending $g_{i,t}^m$ normalized by trend GDP as well. Standard errors are consistent with the presence of autocorrelation and heteroskedasticity (HAC). In addition, inference robust to the presence of weak instruments is also discussed following Anderson and Rubin (1949). This test is performed on the assumption that there was no instrument relevance problem for the model where invariant elasticities are computed.

To distinguish the impact of fiscal stimulus for countries with different degrees of institutional quality, we extend the previous framework to allow state-dependence in the elasticities computed, as follows:

$$\begin{aligned} y_{i,t+h} &= \mathbb{1}_{i\in H}\left(\alpha_i^{h,H} + \gamma_t^{h,H} + \mu^{h,H} g_{i,t+h} + \gamma^{h,H}\mathbf{z}_{it} + \phi^{h,H}(l)\mathbf{x}_{i,t-1+h}\right) \\ &+ (1 - \mathbb{1}_{i\in H})\left(\alpha_i^{h,L} + \gamma_t^{h,L} + \mu^{h,L} g_{i,t+h} + \gamma^{h,L}\mathbf{z}_{it} + \phi^{h,L}(l)\mathbf{x}_{i,t-1+h}\right) + \epsilon_{i,t+h} \end{aligned} \tag{2}$$

where $\mathbb{1}_{i\in H}$ is a dummy variable that indicates whether the country has a high degree of institutional quality. In this specification the definition of all variables remain unaltered. The only difference is that the variable $\mathbb{1}_{i\in H} \times g_{i,t}$ is instrumented with $\mathbb{1}_{i\in H} \times g^m_{i,t}$, and $(1 - \mathbb{1}_{i\in H}) \times g_{i,t}$ is instrumented with $(1 - \mathbb{1}_{i\in H}) \times g^m_{i,t}$. This approach allows for quantitatively and statistically comparing the elasticity for countries with high institutional quality $(\mu^{h,H})$ vis-à-vis countries with low institutional quality $(\mu^{h,L})$.

3.1 Government Consumption

Column (1) of Table 1 reports the results of estimating equation 1 – that is, the invariant elasticity of economic activity to changes in government consumption for the entire sample available. On impact, an increase in government expenditure of 1 percent has a significant effect on economic activity of 0.52 percent. After the first and second year, the cumulative effect is significant at around 0.502 percent. We report the *F*-statistic for the regression using the entire sample.[4] Regarding the relevance of the instrument, Olea and Pflueger (2013) point out that for serially correlated errors, the effective *F*-statistic can be higher than the usual rule of thumb of 10.[5]

Columns (2) and (3) in Table 1 report the results for equation 2 in terms of the cumulative responses on economic activity by different degrees of institutional quality. On impact, the response to fiscal stimulus is positive and statistically different from zero in countries with high as well as low institutional quality. However, the point estimates for economies with better institutional quality are considerably higher. Countries with high institutional quality exhibit an increase of 0.9 percent in economic activity in response to an increase in government consumption of 1 percent. In contrast, the response in countries with lower-quality institutional is more nuanced as economic activity increases by just 0.4 percent.

In addition, as shown in Figure 2, in countries with high institutional quality the effect of fiscal stimulus is stable, persistent and significant at longer horizons. In contrast, countries with low institutional quality have a higher variance in the response at longer horizons. In such cases, the effect of a fiscal stimulus dissipates after four periods.[6] In summary, better institutional quality affects the response of economic activity to fiscal stimulus, not only in magnitude, but also in the stability and persistence generated by the initial push.

[4] This includes countries with data on military expenditure, but no data on institutional quality.

[5] Appendix Table A reports confidence intervals robust to the presence of weak instruments.

[6] When considering period-by-period, the response on economic activity tends to increase in economies with better institutional quality, while it decreases for countries with a low, as reported in Table 5 in appendix A.

Table 1: Cumulative Responses
Dependent Variable: Government Consumption

	Full Sample	Institutional Quality		P-value
		High	Low	
	(1)	(2)	(3)	(4)
On impact	0.525^{***} (0.12) $[22.76]$	0.902^{***} (0.24)	0.516^{***} (0.16)	HAC: 0.186 A-R: 0.206
First year	0.502^{***} (0.11) $[20.82]$	0.940^{***} (0.25)	0.449^{**} (0.14)	HAC: 0.089 A-R: 0.099
Second year	0.503^{***} (0.14) $[16.70]$	0.950^{***} (0.26)	0.470^{**} (0.21)	HAC: 0.150 A-R: 0.227
Third year	0.503^{***} (0.16) $[11.21]$	0.891^{***} (0.26)	0.484^{*} (0.29)	HAC: 0.275 A-R: 0.433

Note: High: defines countries above the median of the distribution of institutional quality. Low: defines countries below the median of the distribution of institutional quality. HAC Standard errors are reported in parenthesis. A-R stands for Anderson and Rubin (1949) tests. F-tests are reported in brackets. *** (**) [*] denotes significance at the 1 (5) [10] percent level.

Column (4) in Table 1 reports the p-values for the test that estimates differ across groups. The p-values presented are based on HAC standard errors, as well as the ones based in Anderson and Rubin (1949), which are robust to the presence of weak instruments. Irrespective of the methodology used to compare the estimates, we find the difference to be statistically significant at the 10 percent level only for the cumulative effect in the first year. This is probably driven by the higher dispersion exhibited in the responses of countries with low institutional quality.

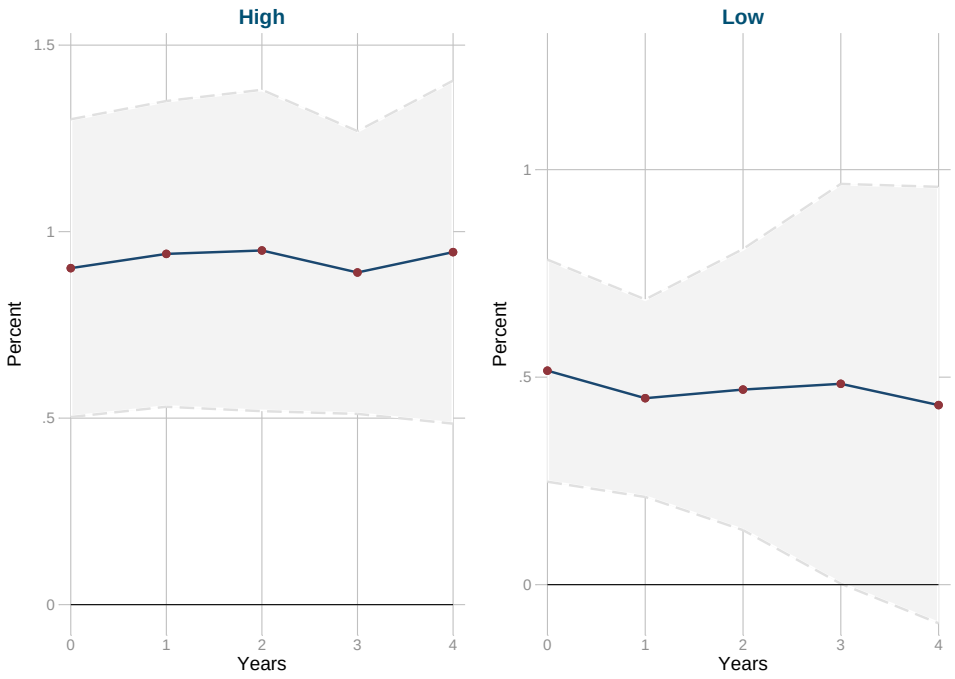
3.1.1 Robustness Checks

In this section we run a battery of tests to validate the main results of the paper under alternative definitions of variables of interest, alternative assumptions and different groupings of countries.[7]

Non-Advanced Economies. One potential concern is that responses to fiscal stimulus in countries with different degrees of institutional quality mainly reflect their stage of economic development. Sheremirov and Spirovska (2019) point out that fiscal multipliers in advanced economies

[7] Country classifications included in this section are described in Appendix B.

Figure 2: Response of Economic Activity to a Shock in Government Consumption



Source. Author's own calculations.

are more than twice as large as they are in developing economies.[8] However, not all differences in institutional quality are attributable to income. In columns (1) and (2) of Table 2, we estimate the model presented in equation 2, but excluding advanced economies from the sample.

The evidence shows that within non-advanced economies, point estimates for countries with better institutional quality are larger than in countries with lower levels of institutional quality. On impact, an increase in 1 percent in government consumption fosters economic activity by 0.6 percent in countries with higher institutional quality, and by 0.45 percent in countries with lower quality. Column (3) reports the p-values for the test of differences between point estimators. We cannot reject statistically the equality of the two elasticities.

Prolonged Conflicts. In countries with prolonged civil conflicts, military expenditure might respond to variables beyond geopolitical considerations. Thus, to further assess the usefulness of military expenditure as an instrument for government consumption, we exclude from the sample all countries with at least 10 years of internal civil conflicts.

[8] Although they do not find evidence that multipliers for both groups are statistically different.

Columns (4) and (5) in Table 2 report the results after excluding countries with prolonged conflicts. The point estimates depict larger differences between the two groups of countries. In column (4), we present the estimates for countries with good institutional quality. On impact, these countries respond by more than the change in fiscal stimulus. In particular, economic activity increases by 1.4 percent with a 1 percent increase in government consumption. The cumulative effect by the end of the first year is 1.36 percent and by the end of the second year around 1.34 percent. All these effects are significant at 99 percent of confidence.

In the case of countries with lower institutional quality, column (5) in Table 2 shows that an increase in government consumption of 1 percent fosters economic activity on impact by 0.6 percent. By the end of the first year, the cumulative effect is still around 0.6 percent. However, after two years there is no significant impact on economic activity.

In summary, the estimates for countries with better institutional quality are larger and statistically significant relative to countries with lower institutional quality. Based on HAC p-values reported in column (6) in Table 2, we also conclude that the elasticities computed between both groups on impact and by the end of the first year are statistically different.

Military Imports. For a fraction of countries in the sample, arms imports represent a large share of military expenditure. For those countries the effect on economic activity may be mediated by changes in the trade balance and not by domestic absorption. To assess the potential effect of imports on the main result of this paper, we exclude the 15 largest arms importers in the world from the sample.[9]

Columns (7) and (8) in Table 2 presents the results excluding the largest arms importers. The elasticity of countries with better institutional quality falls on impact from 0.9 to 0.7 percent. However, the point estimates are still larger than those for countries with low institutional quality. The cumulative effect after two years of the shock remains around 0.7 percent and 0.4 percent for countries with high and low levels of institutional quality, respectively. Based on the results reported in column (9), we cannot statistically reject the equality of elasticities in both groups.[10]

Institutional Quality Measures. In order to assess how these results are driven by the methodo-

[9] This information is obtained from http://armstrade.sipri.org/armstrade/page/toplist.php.

[10] Following Miyamoto et al. (2019) in an additional exercise (not tabulated), we excluded countries for which the share of imports over military expenditure exceeds 25 percent in an average year. Such countries include: Bahrain, Canada, Cape Verde, Egypt, Georgia, Guyana, Israel, Jordan, Laos, Luxembourg, Mexico, Seychelles, Singapore and United Arab Emirates. We did not find substantial differences with the results presented in this section.

Table 2: Alternative Sample
Dependent Variable: Government Consumption

	Non-Advanced		P-value	Civil War		P-value	Arms importers		P-value
	High	Low		High	Low		High	Low	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
On impact	0.64^{***}	0.456^{***}	HAC: 0.493	1.463^{***}	0.623^{***}	HAC:0.058	0.753^{***}	0.507^{***}	HAC: 0.365
	(0.23)	(0.15)	A-R: 0.473	(0.38)	(0.23)	A-R: 0.114	(0.21)	(0.16)	A-R: 0.380
First year	0.704^{**}	0.407^{***}	HAC: 0.403	1.360^{***}	0.601^{***}	HAC: 0.053	0.791^{***}	0.438^{***}	HAC: 0.166
	(0.33)	(0.13)	A-R: 0.307	(0.32)	(0.23)	A-R: 0.156	(0.21)	(0.14)	A-R: 0.186
Second year	1.033	0.391^{**}	HAC: 0.446	1.338^{***}	0.883	HAC: 0.532	0.741^{***}	0.469^{**}	HAC: 0.337
	(0.83)	(0.16)	A-R: 0.196	(0.40)	(0.61)	A-R: 0.633	(0.19)	(0.21)	A-R: 0.410

Note: High: defines countries above the median of the distribution of institutional quality. Low: defines countries below the median of the distribution of institutional quality. HAC Standard errors are reported in parenthesis. A-R stands for Anderson and Rubin (1949) tests. F-tests are reported in brackets. *** (**) [*] denotes significance at the 1 (5) [10] percent level.

logical approach emphasized in this paper, we identify institutional quality based on the average distribution of the last 10 years and using the first principal component for the indicators of *bureaucracy, corruption, government stability, investment profile*, and *law and order*. The results are reported in Table 3.

Institutional quality is a variable that changes slowly over time, but the historical average (1988-2017) may not be capturing the current institutional environment in each country. Columns (1) to (2) in Table 3 report the results when we consider only the average of the last 10 years of the institutional quality index to classify countries in the sample.

Column (1) shows that the multiplier for countries with high institutional quality is larger than that obtained in our baseline model in Table 1. On impact, a 1 percent increase in government consumption stimulates economic activity by 1.36 percent. The cumulative effect is of 1.53 percent and 1.72 percent by the end of the first and second year, respectively. All estimates are significant at 99 percent of confidence.

Column (2) highlights the results for countries with low institutional quality in the last 10 years. The elasticity to changes in government consumption is 0.46 percent on impact, 0.39 percent for the first, and 0.4 percent for the second year. Similar to the case of countries with high institutional quality the results are significant at 1 percent. Based on the p-values reported in column (3), we can conclude that the responses for countries with higher institutional quality are not only larger, but statistically different from those for countries with lower quality. These differences between elasticities hold at all different horizons considered.

So far, we have given the same weight to all five components of the institutional index because we did not find reasons to consider one component of the index more important than the others.

Table 3: Alternative Institutional Quality Definitions
Dependent Variable: Government

	Last-10yrs		P-value	Inst. Quality - PC		P-value
	High	Low		High	Low	
	(1)	(2)	(3)	(4)	(5)	(6)
On impact	1.359^{***}	0.455^{***}	HAC: 0.024	0.976^{***}	0.514^{***}	HAC: 0.145
	(0.38)	(0.13)	A-R: 0.006	(0.27)	(0.16)	A-R: 0.145
First year	1.532^{***}	0.394^{***}	HAC: 0.027	1.009^{***}	0.456^{***}	HAC: 0.081
	(0.50)	(0.12)	A-R: < 0.001	(0.29)	(0.14)	A-R: 0.070
Second year	1.722^{**}	0.403^{***}	HAC: 0.095	1.022^{***}	0.480^{**}	HAC: 0.134
	(0.78)	(0.15)	A-R: 0.033	(0.30)	(0.20)	A-R: 0.181

Note: High: defines countries above the median of the distribution of institutional quality. Low: defines countries below the median of the distribution of institutional quality. HAC Standard errors are reported in parenthesis. A-R stands for Anderson and Rubin (1949) tests. F-tests are reported in brackets. *** (**) [*] denotes significance at the 1 (5) [10] percent level.

However, to assess whether the results reported are robust to alternative weighting schemes, we use the weight obtained from the eigenvalues of the first principal component of the series. Columns (4) and (5) in Table 3 report the results from this weighting scheme.[11]

Column (4) presents the elasticities for countries with higher institutional quality, and column (5) presents the elasticities for countries with lower quality. The results are robust to the choice of different weighting schemes. In this particular case, the responses on impact are similar to those presented in the baseline scenario. However, the response after one year for countries with higher institutional quality is larger than the change in government consumption. Column (6) reports the p-values for the test for the difference of elasticities between groups. Similar to the baseline scenario, we can conclude that by the end of the first year, the cumulative impact of the elasticities are not only larger but also statistically different in countries with higher institutional quality.

4 Concluding Remarks

Fiscal multipliers are an important part of any post-crisis economic recovery. But, how fiscal stimulus boosts economic activity seems to rely heavily on several circumstances. The effects can be dampened or amplified by the presence and conjunction of several macroeconomic factors, such as: exchange rates, levels of public debt, and degrees of development, among others. This paper

[11] Based on this approach we give higher weights to bureaucracy and law and order and a much lower weight to government stability.

has explored one additional dimension: institutional quality. Countries with lower levels of corruption and bureaucracy, with higher government stability, with respect for law and order and with a better investment profile can obtain larger gains from fiscal stimulus. These gains translate into larger effects of fiscal policy and more long-lasting and stable effects over time.

These results have important implications in a world with high financing needs, limited fiscal space and increasing levels of debt, as in the context of the Covid-19 pandemic. There is room to enhance the role of fiscal policy by increasing its effectiveness through improvements in the institutional framework. But, at the same time, policymakers need to be careful when advocating for higher government expenditure to boost economic activity in environments with poor institutions, since the positive output effects might not fully materialize.

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A Robust Confidence Intervals and Noncumulative Responses

Table 4: Robust Confidence Intervals
Dependent Variable: Government Consumption

	Baseline	Institutional Quality	
		High	Low
	(1)	(2)	(3)
On impact	[0.057, 0.992]	[-0.005, 1.859]	[-0.143, 1.188]
First year	[0.005, 1.019]	[-0.012, 1.939]	[-0.239, 1.092]
Second year	[-0.131, 1.044]	[-0.481, 2.503]	[-0.438, 1.309]

Note: High: defines countries above the median of the distribution of institutional quality. Low: defines countries below the median of the distribution of institutional quality.

Table 5: Non-Cumulative Responses
Dependent Variable: Government Consumption

	Full Sample	Institutional Quality		P-value
		High	Low	
	(1)	(2)	(3)	(4)
On impact	0.525^{***} (0.12) [22.76]	0.927^{***} (0.24)	0.516^{***} (0.26)	HAC: 0.186 A-R: 0.206
First year	0.512*** (0.13) [15.03]	0.952*** (0.26)	0.434** (0.17)	HAC: 0.097 A-R: 0.136
Second year	0.457*** (0.15) [8.78]	1.012** (0.42)	0.424** (0.21)	HAC: 0.208 A-R: 0.201

Note: High: defines countries above the median of the distribution of institutional quality. Low: defines countries below the median of the distribution of institutional quality. HAC Standard errors are reported in parenthesis. A-R stands for Anderson and Rubin (1949) tests. F-tests are reported in brackets. *** (**) [*] denotes significance at the 1 (5) [10] percent level.

B Country Groups

Advanced. The countries classified as advanced economies are: Australia, Austria, Belgium, Canada, China, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Ireland, Israel, Italy, Japan, Korea, Latvia, Lithuania, Luxembourg, Malta, Netherlands, New Zealand, Norway, Portugal, Singapore, Slovak Republic, Slovenia, Spain, Sweden, Switzerland, the United Kingdom and the United States.

Civil War. The countries with at least 10 years of civil war that are considered in the analysis are: Algeria, Burundi, Chad, Colombia, Ethiopia, India, Indonesia, Iran, Israel, Nepal, Peru, Philippines, Russia, Thailand, Turkey and Uganda.

Arm Importers. The 15 countries with the largest arms imports are: Algeria, Australia, China, Egypt, India, Indonesia, Korea, Morocco, Pakistan, Saudi Arabia, Singapore, Turkey, United Arab Emirates, United States and Vietnam.