



Universidad de
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Cyclical Meets Rigidities

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“Ciclicalidad y rigideces”

Resumen

La academia económica suele advertir sobre los peligros de la prociclicidad en el gasto público. Sin embargo, la materialización de estos riesgos depende de las asimetrías en el grado de ciclicidad a lo largo del ciclo económico. Los gobiernos incurren en déficits solo si no logran reducir el gasto durante las recesiones tanto como lo aumentan en expansiones. Este estudio explora estas asimetrías en el contexto de los bienes y servicios, y compensaciones a empleados, los componentes del consumo público, para un amplio panel de economías avanzadas y emergentes. Realizamos nuestro análisis empírico utilizando regresiones de panel y validamos nuestros resultados con un instrumento de crecimiento ponderado de los principales socios comerciales, enfocándonos en identificar asociaciones en lugar de establecer relaciones causales. En las economías avanzadas, el crecimiento del producto está asociado a un pequeño efecto positivo en el consumo público. En contraste, en las economías emergentes, el crecimiento del producto está vinculado a un efecto positivo más que proporcional en los bienes y servicios, mientras que se vuelve acíclico durante las recesiones, exhibiendo un comportamiento semiprocíclico en general. Además, la compensación a empleados en los mercados emergentes está relacionada a un aumento menos que proporcional durante las expansiones económicas, lo que indica posibles rigideces asociadas a esta categoría. Este fenómeno, referido como "rigidez a la baja" en el consumo público, no solo abre la puerta al estrés fiscal durante las recesiones económicas, sino que también conduce a un crecimiento sostenido en el tamaño del Estado.

Palabras clave: Ciclo económico; ciclicidad; rigidez a la baja; consumo público; compensación a empleados; bienes y servicios; reglas fiscales

“Cyclicalidad Meets Rigidities”

Abstract

Economic academia often warns against the dangers of procyclicality in public spending. However, the realization of these risks depends on asymmetries in the degree of cyclicity throughout the business cycle. Governments incur deficits only if they fail to reduce spending during downturns as much as they increase it during preceding booms. This study explores these asymmetries in the context of goods and services and compensation to employees, the components of public consumption, for a large panel of advanced and emerging economies. We conduct our empirical analysis using panel regressions, and validate our results with a trade-weighted growth instrumental variable, focusing on identifying associations rather than establishing causal relationships. In advanced economies, output growth is associated to a small positive effect on public consumption. In contrast, in emerging economies, output growth is connected to a more than proportional positive effect on goods and services, while becoming acyclical during recessions, exhibiting an overall semi-procyclical behavior. Furthermore, compensation to employees in emerging markets is related to a less than proportional increase during economic expansions, indicating possible rigidities associated with this category. This phenomenon, referred to as "downward rigidity" in public consumption, not only paves the way for fiscal stress during economic downturns but also leads to sustained growth in the size of the state.

Keywords: Business Cycle; Cyclicalidad; Downward Rigidity; Public Consumption; Compensation to Employees; Goods and Services; Fiscal Rules

Códigos JEL: E320; E620; H500

1. Introduction

Emerging markets often grapple with fiscal challenges that can unexpectedly initiate during periods of economic prosperity. In these "good times" buoyed by robust economic growth, public revenues surge, while financing costs remain relatively low due to renewed market confidence. Consequently, emerging markets loosen the constraints on their spending. However, beyond the immediate effects of these procyclical policies—such as increased economic volatility (Kaminsky, Reinhart and Végh 2005) and the potential for expanded provision of essential public goods—an underlying concern arises. Emerging markets often allocate resources towards public spending components that are difficult to reverse when economic conditions deteriorate, resulting in a phenomenon known as "ratchet effect" (Hercowitz and Strawczynsk 2004) or "downward rigidity". In this paper, we concentrate on public consumption, which encompasses two components: expenditures related to public employment (which includes wages, salaries and social contributions) and the procurement of goods and services.

One prominent example of the phenomenon we examine is the sustained increase in government expenditure dedicated to public employees. Intuitively, episodes of economic contractions or expansions should not drastically alter the number of analysts, security personnel, or nurses working for the public sector. However, exceptions do exist. Economic crisis caused by extraordinary circumstances, such as the COVID-19 pandemic or wars, may lead governments to allocate more resources to health or military personnel. Under normal conditions, however, economic contractions should not significantly change the labor production function in the state, especially given the inherent rigidities of employment. Consequently, once governments expand the number of employees or increase their compensation, it becomes challenging to revert to previous levels. Moreover, as these cyclical increases in public consumption persist, the size of the public sector steadily grows, subsequently limiting crucial fiscal space when economic downturns finally hit.

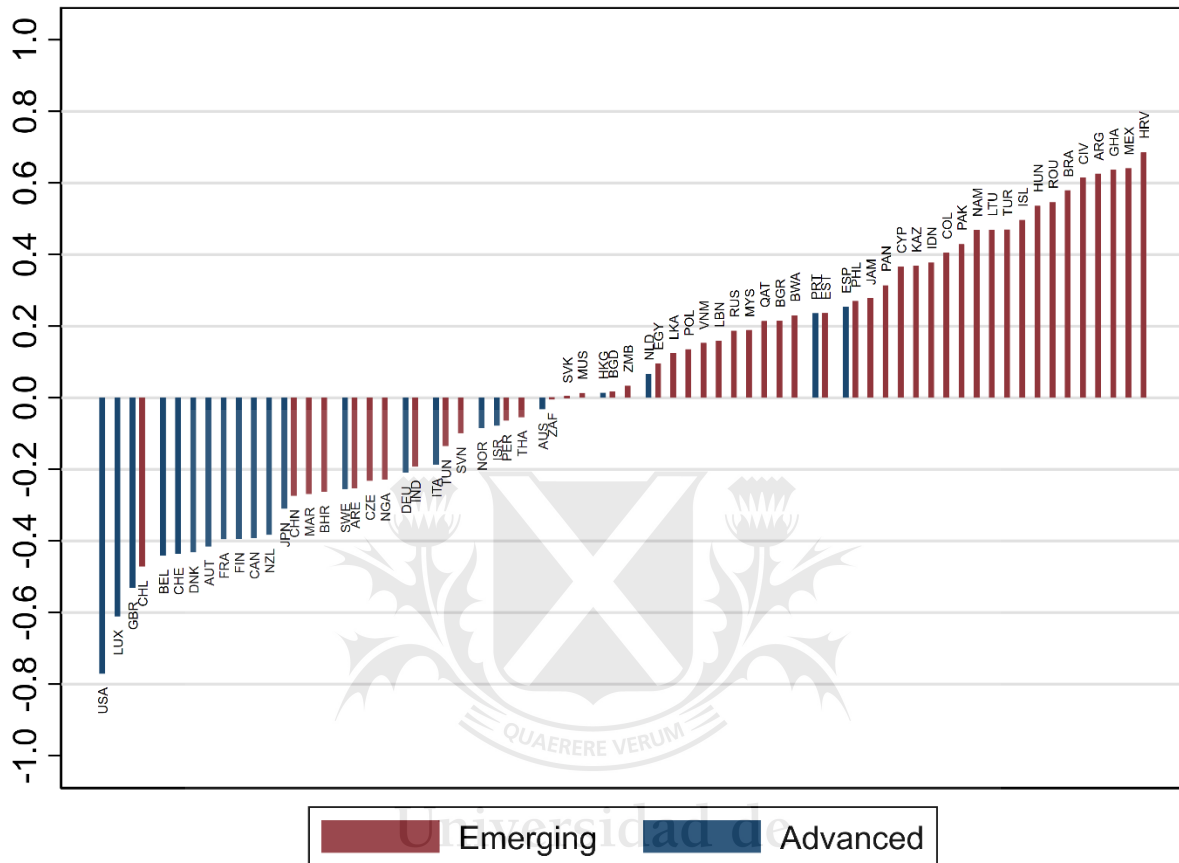
Adding to the predicament, emerging markets grapple with significant inefficiencies in public goods provision (Izquierdo, Pessino and Vuletin 2018). Ineffective spending on public education or healthcare, for instance, contributes to low labor productivity and diminishes the future

economic returns necessary for repaying the initial expenditures. Therefore, the combination of inefficient and semi-procyclical, public consumption (increasing in good times and remaining constant in bad times) sets the stage for fiscal stress even before the onset of a recession.

The fiscal behavior of emerging markets, characterized by procyclical tendencies, has been widely discussed in the public finance literature as the "original sin" responsible for their fiscal woes (Gavin and Perotti 1997; Tornall and Lane 1999; Kaminsky, Reinhart and Végh 2005; Talvi and Végh 2005; Mendoza and Oviedo 2006; Alesina, Campante and Tabellini 2008; Ilzetzki and Vegh 2008). Contrary to standard Keynesian recommendations for stabilizing the economic cycle, empirical studies have revealed that overall primary spending in emerging markets shows a counterintuitive positive correlation with the state of the business cycle. This means that spending increases during good times and decreases during bad times. As a result, instead of creating buffers during good times to mitigate the negative cycle during bad times, emerging countries amplify the contraction of the cycle.

Figure 1, building on previous research by Kaminsky, Reinhart and Végh (2005) and later by Frankel, Vegh and Vuletin (2013), illustrates the correlation between the cyclical component of general government primary expenditure (total government expenditure excluding interest payments) and the cyclical component of aggregate output (GDP) for 71 countries (22 advanced and 49 emerging) from 1980 to 2018. In the figure, red bars represent emerging economies, while blue bars represent advanced economies. A positive correlation between the cyclical components of primary government expenditure and GDP indicates procyclical fiscal policy, whereas a negative correlation indicates countercyclical policy. As shown, most advanced economies display countercyclicality, with exceptions such as Portugal and Spain, which exhibit spending patterns more akin to emerging markets. Conversely, emerging markets generally display procyclical fiscal policies.

Figure 1: Correlation Between Cyclical Components of General Government Primary Expenditure and Gross Domestic Product



Source: Authors' calculations based on World Economic Outlook database 2019.

Notes: The cyclical components have been estimated using the Hodrick-Prescott Filter with a lambda parameter equal to 6.25. The classification of emerging and advanced economies is provided in the appendix. ARG = Argentina, AUS = Australia, AUT = Austria, BHR = Bahrain, BGD = Bangladesh, BEL = Belgium, BWA = Botswana, BRA = Brazil, BGR = Bulgaria, CAN = Canada, CHL = Chile, CHN = China, COL = Colombia, HRV = Croatia, CYP = Cyprus, CZE = Czech Republic, CIV = Côte d'Ivoire, DNK = Denmark, EGY = Egypt, EST = Estonia, FIN = Finland, FRA = France, DEU = Germany, GHA = Ghana, HKG = Hong Kong SAR, China, HUN = Hungary, ISL = Iceland, IND = India, IDN = Indonesia, ISR = Israel, ITA = Italy, JAM = Jamaica, JPN = Japan, KAZ = Kazakhstan, LBN = Lebanon, LTU = Lithuania, LUX = Luxembourg, MYS = Malaysia, MUS = Mauritius, MEX = Mexico, MAR = Morocco, NAM = Namibia, NLD = Netherlands, NZL = New Zealand, NGA = Nigeria, NOR = Norway, PAK = Pakistan, PAN = Panama, PER = Peru, PHL = Philippines, POL = Poland, PRT = Portugal, QAT = Qatar, ROU = Romania, RUS = Russia, SVK = Slovak Republic, SVN = Slovenia, ZAF = South Africa, ESP = Spain, LKA = Sri Lanka, SWE = Sweden, CHE = Switzerland, TWN = Taiwan, THA = Thailand, TUN = Tunisia, TUR = Turkey, ARE = United Arab Emirates, GBR = United Kingdom, USA = United States, VNM = Vietnam, ZMB = Zambia.

This procyclicality has typically been attributed to "inherited initial conditions," such as political distortions, weak institutions, limited financial depth, and imperfect access to international credit markets (Velasco 1999; Tornall and Lane 1999; Talvi and Végh 2005; Gavin, Hausmann et al. 1996; Gavin and Perotti 1997; Riascos and Vegh 2003; Caballero and Krishnamurthy 2004). Frankel, Vegh and Vuletin (2013) demonstrate that institutional frameworks characterized by property rights protection, control of corruption, higher bureaucratic quality, and a strong law and order tradition, have enabled some developing countries to break free from procyclicality in the previous decade. Céspedes and Velasco (2014), using alternative proxies for institutional quality, find consistent evidence in a sample of 60 resource-rich countries. Alesina, Campante and Tabellini (2008) establish a positive correlation between measures of corruption and procyclical fiscal policy. Combes, Renard and Tapsoba (2019) document the significance of institutional quality, such as reduced corruption and increased government efficiency, in preventing procyclical behavior in China's provinces.

Nonetheless, procyclical behavior, if symmetrical across the cycle, may not necessarily lead to fiscal unsustainability because the bonanza cycles are financed with increased public revenues and the retrenchments are aligned with the moments of contraction. However, emerging markets face a unique challenge as discretionary public consumption exhibits downward rigidity during recessions. This arises from the difficulty of cutting back on public goods and services provision, and compensation to public employees. Emerging markets face an additional challenge as spending expansions often rely on increasing public wages or the number of employees, which have their own structural rigidities.¹

While the overall cyclicity of public spending has been extensively studied, the asymmetrical responses of public consumption to the economic cycle have received limited attention. Among the few studies exploring these issues, Balassone and Francese (2004) find evidence in OECD countries of significant asymmetry in the reaction of fiscal policy to positive and negative cyclical

¹ Formally, we usually think of public spending rigidities as limits to modifying the level or structure of expenditure over a period imposed by institutional decrees (Echeverry, Bonilla and Moya 2006; Cetrángolo, Jiménez and Ruiz Del Castillo 2010).

conditions, with budgetary balances deteriorating in contractions and not improving in expansions. This asymmetry appears to have contributed significantly to debt accumulation. Similarly, Hercowitz and Strawczynsk (2004) find that the prolonged rise in the spending-to-output ratio is partially explained by cyclical upward ratcheting due to asymmetric fiscal behavior. These authors also analyzed cyclical changes in the composition of government spending, as well as a possible link between cyclical ratcheting and government weakness. For developing countries, Carneiro and Garrido (2016) investigate the extent to which countries behave procyclically or countercyclically in different phases of the business cycle, and find a causal link between stronger institutions and less procyclical fiscal policy, even after controlling for the endogeneity of institutions and other determinants of fiscal policy. Balassone and Kumar (2007) find evidence of exuberance in government expenditures during the boom phase of an economic cycle. They conclude that procyclicality may reflect an inaccurate assessment of the cycle, particularly in emerging markets during downturns.

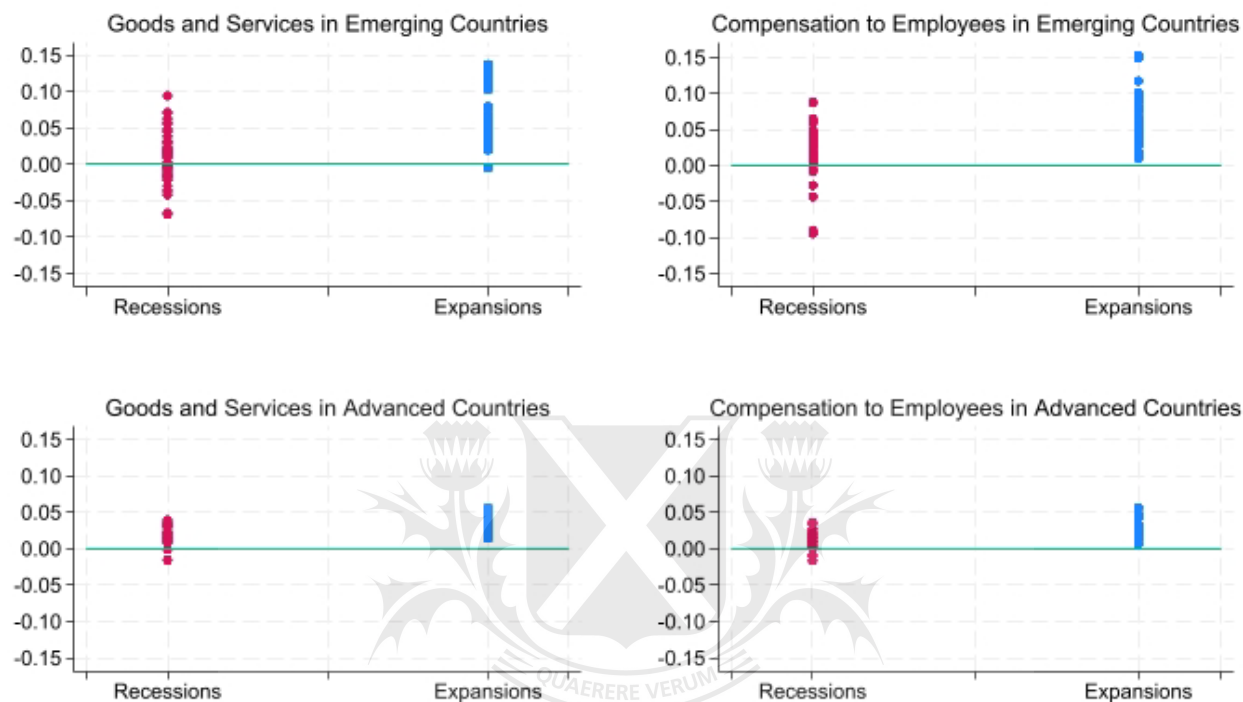
The asymmetric cyclical behavior of public consumption is showcased in figure 2 below. In the figure, we compare the average annual growth rates of public spending on salaries, and goods and services, across the business cycle for both emerging and advanced economies.² Each point represents one country.

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² Recessions are country specific and are obtained from a transition function z_{it} for each country that ranges between 0 (largest expansion) and 1 (deepest recession). We define recessions as values where $rec \geq 0.5$ and expansions those episodes where $rec < 0.5$. See econometric section for details on this function.

Figure 2: Average Annual Growth of Government Consumption Components Across the Business Cycle

Percent



Source: Authors' calculations based on World Economic Outlook database 2019.

We observe that, on average, emerging economies exhibit significantly higher growth rates in both spending categories compared to advanced economies. This contrast is especially pronounced during periods of expansion, where emerging economies typically increase expenditure by a maximum of 15 percent, while advanced economies limit their spending growth to a maximum of 5 percent. Furthermore, when analyzing the behavior of both groups during recessions, the differences remain evident. Advanced economies tend to experience near-zero growth rates during economic downturns, whereas emerging economies present growth rates ranging from minus 5 to positive 10 percent. This highlights the asymmetry in public consumption within emerging economies, where the substantial overspending during expansions is not matched by a proportional retrenchment during contractions. In contrast, advanced economies exhibit more consistent spending behavior throughout the economic cycle.

Public consumption expenditures play a crucial role in facilitating the provision of essential public goods such as education, healthcare, law enforcement and defense. Therefore, it is not apparent why governments would adjust the number of teachers, doctors, police officers, or military personnel in response to fluctuations in the business cycle. In theory, these decisions should be driven by societal preferences and the unique characteristics of the public goods production function. In fact, that is what we observe among advanced economies, where growth of public spending appears to be very similar throughout varying business cycles. The only visible changes over time should reflect the long-term trend of the increasing share of the public sector in the national product as countries develop (Wagner 1958).

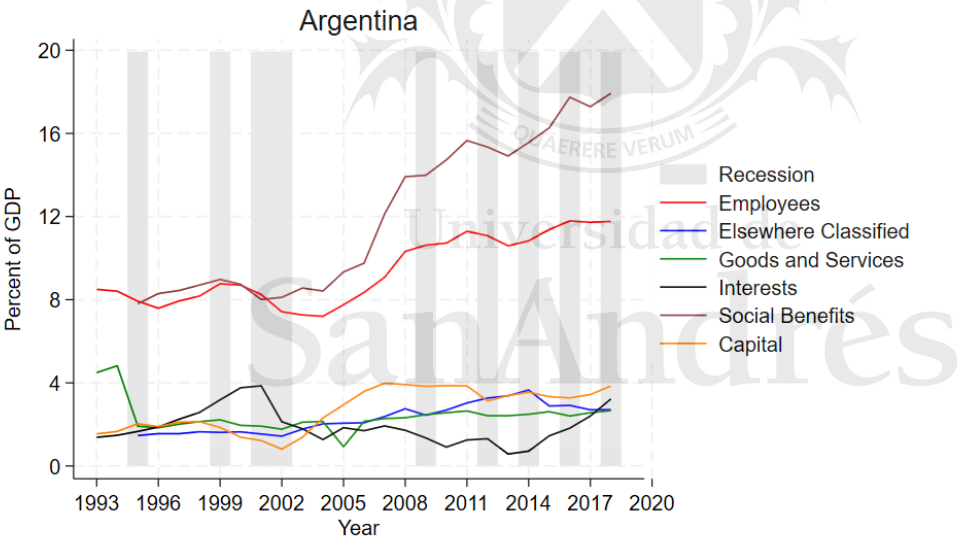
However, emerging markets' behavior looks quite different. Emerging economies are procyclical in good times but, then, those are not followed by a retrenchment that is enough to cover the overspending during expansion. Once again, political economy arguments offer insights into why certain expenditures exhibit stronger cyclical responses compared to others, shedding light on the underlying dynamics of public spending. While public spending rigidities are commonly associated with institutional constraints, such as contractual obligations, entitlements, and interest payments; it can also be subject to other serious forms of rigidities. Institutional weaknesses and political economy factors can compromise the ability or willingness of governments to apply discretionary cuts to public consumption and the provision of essential public goods. Tornall and Lane (1999) developed a model where several political groups compete for fiscal resources. Using the well-known consequences of the problem of the common pool (Ostrom 2015), the authors show how this competition leads to a "voracity effect", defined as a disproportioned response of public spending to exogenous shocks in the economy, such as unexpected windfalls from commodity exports. Similarly, Talvi and Végh (2005) proposed a model where political actors increase the pressure directed to public spending during periods of economic bonanza. Meanwhile, Lane (2003) shows how procyclical tendencies of emerging countries may grow with the number of political actors with distinct goals and constituencies. Divergent political views and policy objectives among political groups may also contribute to overspending during economic booms (Humphreys and Sandbu 2007; Ilzetzki 2011).

This downward rigidity in public consumption makes emerging markets "semi-procyclical" rather than fully procyclical. This behavior not only subjects the size of the public sector to cyclical fluctuations, but also prevents these economies from effectively self-insuring against fiscal limitations during downturns. This is particularly costly for economies with significant tax base volatility and limited access to international credit during recessions (Riascos and Vegh 2003; Gavin et. al 1996; Talvi and Végh 2005).

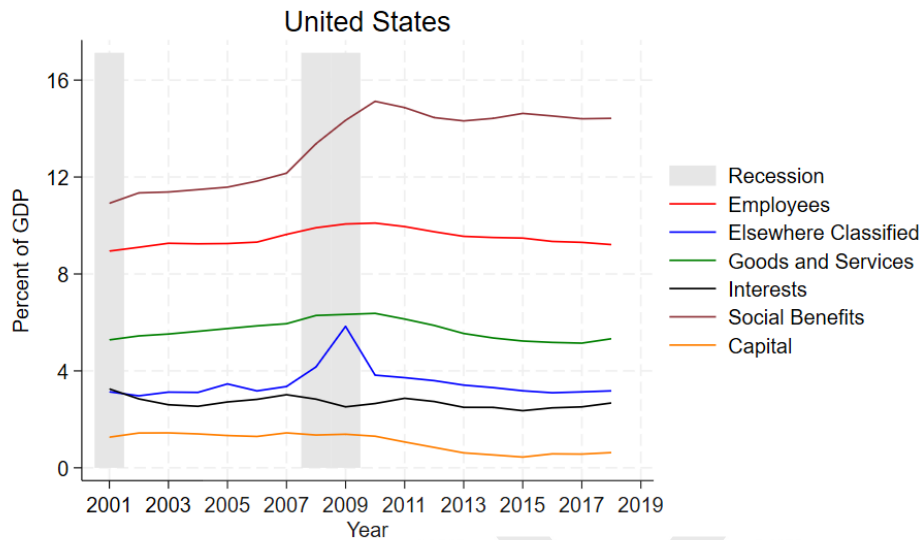
To illustrate these cases with specific examples, Figure 3, panels a and b, depict the evolution of various categories in general government total expenditure. Argentina serves as a prime example of the issue we are describing, especially concerning the employees' category.

Figure 3. Evolution of Total Government Expenditure for Argentina and United States

a. Panel A



b. Panel B



Source: Authors' calculations based on World Economic Outlook database 2019.

Note: The ratios are calculated using the seasonally adjusted real GDP from the database. The transformation is performed using the Hodrick-Prescott filter with a lambda equal to 6.25. This approach is used to avoid cyclical components in the analysis. The recession periods are defined using the criteria from Auerbach and Gorodnichenko (2011), employing the same variable *rec* described in the econometric section, but using the deviation of the output growth rate from its trend for each year. Moreover, contrary to the rest of the paper, we extract the trend using the Hodrick-Prescott filter with a very high smoothing parameter ($\lambda = 10,000$) so that the trend is very smooth. We then normalize the deviation for each country and assign it to the *rec* variable, defining a recession as values higher than 0.7. In this way, we can capture variations in the usual growth rate for each country and identify the exact year of contraction. The marked recessions for the United States coincide with those published by the Federal Reserve.

Here, we can observe that during the bonanza times due to the commodities supercycle of the 2000s, Argentina increased the share of GDP dedicated to public employee expenditure from 7.4 percent in 2002 to 10.6 percent in 2009. Once it reached that level, it did not increase significantly in the following years; however, the size in the GDP never reverted to the pre-expansion period. On the other hand, the United States presents a different picture. While the components of expenditure remain practically constant during years of expansion, increases occur during crises only to be contracted afterward, except for the case of social benefits, which, after the 2009 crisis, never returned to their original level. As a result, the United States has the capacity to perform countercyclical fiscal policy without risking financial stability, as it is able to expand and then contract to achieve fiscal soundness. In contrast, Argentina experiences a fiscal frenzy during good

times that is not followed by retrenchment or mild reduction, but rather a continuation of the ascending trend, or at best, a plateau. In this way, over ten years, Argentina's spending on social benefits increased from 14 percent of GDP to 18 percent in 2018.

This analysis is closely related to the fiscal multiplier literature, as it examines the interaction between government expenditure and aggregate output. However, our work does so from the reverse perspective, focusing on how the state of the economy influences government spending. As noted earlier, just as the cyclical literature shows that various factors, such as the state of the business cycle or a country's institutional development, shape the direction and intensity of these interactions, a similar pattern appears with fiscal multipliers. For instance, works like Auerbach and Gorodnichenko (2011) highlight the asymmetric behavior of multipliers across different phases of the business cycle, while recent works, such as Barnichon, Debortoli, and Matthes (2022) link the multiplier's magnitude to the direction of the fiscal intervention.

This paper aims to shed light on the asymmetric behavior of public consumption throughout the business cycle within emerging markets. Section 2 begins by discussing our datasets and variables of interest. In the same section, we proceed by regressing growth rates of real government consumption categories on real GDP growth, a recession and expansion variable, and some controls. In Section 3, we conduct a series of robustness checks to ensure the reliability of our results. In Section 4, we develop a policy discussion that addresses the implications of these findings and explores potential remedies for the challenges posed by semipro-cyclical public spending in emerging markets. We conclude in Section 5 with some final remarks and reflections.

2. Data and Estimation

We analyze asymmetric cyclical behavior in emerging and advanced economies using the IMF's World Economic Outlook dataset from April 2019.³ We chose this dataset over newer versions due to its detailed disaggregation of government expenditure, which is no longer available in more

³ The estimations were conducted using Stata 18. Replication do-files are available upon request.

recent publications. The panel dataset spans from up to 1980 to 2018 and includes 71 countries from various regions and income classifications. The frequency of the data is annual. Our findings contrast evidence from up to 49 emerging economies and 22 advanced countries. A comprehensive list of these countries is provided in Table A1 in the appendix. The dataset includes observations for 2886 country-year pairs for our variables of interest. However, our panel data is unbalanced (different start and end dates), but it does not exhibit gaps. Specifically, real GDP growth is 93 percent complete. The completeness of expenditure components is somewhat lower, with public consumption growth at 48 percent, compensation to employees growth at 51 percent, and goods and services growth at 49 percent. The countries with the highest number of missing values include Vietnam, Lithuania, Sri Lanka, Malaysia, and Nigeria. Despite these missing values, the overall dataset provides sufficient coverage for analyzing the relationships across emerging and advanced economies.

The baseline specification is a panel data model with fixed effects at the country level. We chose this method because it is a solid approach to address omitted variable bias by controlling for variation between units. This allows us to control for time-invariant characteristics specific to each country, ensuring that the estimates are not biased by variables that remain constant over time. Additionally, we include two lags: one for total public expenditure and another for the dependent variable, to capture the persistence of public spending patterns and reduce potential sources of bias. However, one limitation is that while the fixed-effects model can control for time-invariant factors, it does not account for time-varying unobserved heterogeneity, which might affect the results. To address this, we decided to include an instrumental variable regression to reduce the risk of bias and corroborate our baseline estimates.

We employ a non-linear econometric model to estimate the elasticities of public consumption relative to aggregate output throughout the business cycle, following works such as Auerbach and Gorodnichenko (2011). Table 1 presents descriptive statistics for the growth rates of the specific categories of public spending under analysis, as well as the real GDP used in our regressions.

Table 1. Descriptive Statistics

Advanced Economies					
Variable	Obs	Mean	Std. Dev.	Min	Max
Real GDP Growth	836	.024	.022	-.086	.126
Compensation to Employees Growth	469	.018	.028	-.166	.129
Goods and Services Growth	471	.023	.039	-.16	.255
Emerging Markets					
Variable	Obs	Mean	Std. Dev.	Min	Max
Real GDP Growth	1740	.038	.049	-.548	.368
Compensation to Employees Growth	922	.044	.097	-1.234	.748
Goods and Services Growth	861	.04	.172	-.914	1.411

Source: Authors' calculations based on World Economic Outlook database 2019.

We can observe that, regarding GDP growth, while emerging markets show a higher average rate for the period considered, they also exhibit greater dispersion. This observation is consistent with existing literature (Vegh et al. 2018), which suggests that emerging markets exhibit more pronounced economic fluctuations, experiencing both more severe downturns and more robust upswings compared to advanced economies, which typically demonstrate lower but more stable growth rates over time. Similarly, for compensation to employees, we observe the same pattern: the growth rate in this category is 2.4 times higher in emerging markets compared to advanced economies, and this higher rate is associated to greater variability. Additionally, on average, the growth of the goods and services category is 1.7 times higher in emerging markets than in advanced economies, and this category demonstrates more dispersion.

Our basic least squares dummy variable (LSDV) specification follows:

$$Y_{i,t} = \alpha_i + \beta_1 X_{i,t} + \beta_2 X_{i,t} * Rec_{i,t} + \theta V_{i,t-1} + \mu_{i,t} \quad (1)$$

Where $Y_{i,t}$ is a vector of the growth rate of public spending components for country i and time t , $X_{i,t}$ represents the growth rate of real output, and $Rec_{i,t}$ is a country-specific continuous transition function ranging between 0 (largest expansion) and 1 (deepest recession). Drawing from Auerbach and Gorodnichenko (2010), the function is defined as:

$$Rec_{i,t} = \frac{e^{-\gamma z_{i,t}}}{1+e^{-\gamma z_{i,t}}} \quad (2)$$

Here, $z_{i,t}$ is a normalized variable that measures the state of the business cycle. It is calculated using a 3-year moving average of the growth rate of real output and then normalized so that $E(z_i) = 0$ and $Var(z_i) = 1$ for each country i . The intuitive reason for using this nonlinear transition function for the recession variable is that we aim to normalize the state of output across all countries in our sample. In other words, we want a country's economic performance to be more reflective of the deviation of its moving average from its historical average. This way, we achieve a more comparable notion of what a particular growth rate means. For instance, growing at 2 percent in a country like China, which typically experiences higher growth rates, is not the same as in a country that, on average, has lower growth rates. Finally, $V_{i,t-1}$ is a set of controls including the lag of total public expenditure and the lag the dependent variable. To uncover differences across different country groups, we split the sample between advanced economies and emerging markets.

Table 2. Baseline Specification (Fixed Effects) for Dependent Variable Expense in Goods and Services Growth

	(1) Emerging economies	(2) Advanced economies
Real GDP Growth * Exp	1.60 [0.218]***	0.48 [0.183]**
Real GDP Growth * Rec	0.38 [0.366]	-0.36 [0.214]
Lagged Goods and Services Growth	-0.22 [0.095]**	0.12 [0.092]
Lagged General Government Expense Growth	0.02 [0.058]	0.13 [0.079]
Constant	0.00 [0.009]	0.01 [0.004]***
Observations	817	432
R-squared	0.089	0.078
Number of countries	40	18
Country Fixed Effect	Yes	Yes

Source: Authors' calculations based on World Economic Outlook database 2019.

Note: Robust standard errors in parentheses. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

Columns (1) and (2) in Table 2 show the results for the baseline specification with fixed effects for the dependent variable, growth of expense in goods and services. The results indicate that the growth rate of goods and services expenditure is significantly higher in emerging economies compared to advanced economies during periods of large expansions (when Rec tends to 0 and Rec tends to 1). Specifically, the association between Real GDP Growth and the growth of goods and services expenditure in emerging economies appears to be approximately 3.3 times stronger than in advanced economies during economic upswings. In other words, in advanced economies, a 1 percent increase in output is associated to a less than proportional increase in goods and services expenditure compared to emerging economies. This seems to indicate a more stable relationship between output growth, and goods and services expenditure growth, smoothing government consumption across the cycle.

Conversely, during significant recessions (when Rec tends to 1), the relationship between output growth and the growth of goods and services expenditure appears to be non-significant for both groups. This suggests an overall procyclical but asymmetric pattern, where expenditure growth tends to be more responsive to GDP growth during expansions and much less so during recessions. This is particularly evident in emerging economies, where the association between output and expenditure growth appears to be more than proportional.

Table 3. Baseline Specification (Fixed Effects) for Dependent Variable Compensation to Employees Growth

	(1) Emerging economies	(2) Advanced economies
Real GDP Growth * Exp	0.92 [0.145]***	0.34 [0.124]**
Real GDP Growth * Rec	0.34 [0.218]	-0.15 [0.125]
Lagged Compensation to Employees Growth	-0.06 [0.088]	0.26 [0.066]***
Lagged General Government Expense Growth	0.07 [0.039]*	0.07 [0.086]
Constant	0.02 [0.006]**	0.01 [0.003]**
Observations	873	432
R-squared	0.086	0.128
Number of countris	42	18
Country Fixed Effect	Yes	Yes

Source: Authors' calculations based on World Economic Outlook database 2019.

Note: Robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1

Columns (1) and (2) in Table 3 show the results for the baseline specification with fixed effects for the dependent variable, the growth of compensation to employees. The estimates suggest that GDP growth is more strongly associated with the growth of employees' compensation in emerging economies compared to advanced economies during expansions. Specifically, the association between GDP growth and compensation growth in emerging economies appears to be approximately 2.7 times stronger than in advanced economies.

Unlike the previous estimations for goods and services, the association between output growth and expenditure during expansions appears to induce a less than proportional response for both groups. This suggests a rigidity associated with this category of government expenditure. One might infer that this rigidity is due to the fact that wages, salaries, and social contributions are harder to modify across different stages of the business cycle.

Moreover, it is worth noting that the association between GDP growth and compensation to employees growth, during expansions, is much smaller compared to its relationship with goods and services. This, again, highlights a more stable and less cyclical nature of employees'

compensation growth, potentially due to structural factors within government expenditure that make these components less flexible.

3. Robustness Analysis

As in Jiatao et al. (2021), fixed effects estimations are usually applied in panel data to account for issues related to omitted variables. The problem that arises is that the results might be biased because of dynamic endogeneity. In dynamic panel regressions, the main concern is that the present value of an independent variable is influenced by previous values of the dependent variable, leading to biased and inconsistent estimates. It is also possible to suffer from a biased coefficient from reverse causality between public spending and aggregate output. In an attempt to address these potential issues with our basic econometric approach, we add another specification to our sensitivity analysis.

Given the similarities in causality between the fiscal multiplier and cyclical literature, it is important to discuss the different identification assumptions used in each approach. Fiscal multiplier studies identify the impact of public spending on growth by leveraging exogenous shocks to government expenditures. In contrast, our method focuses on capturing the effect of output growth on spending growth by addressing endogeneity concerns through the assumption that each country's output growth can be instrumented using the growth of its main trading partners. This approach allows us to explore a different type of shock.

We employ an external instrument to conduct a dynamic panel instrumental variable (IV) regression with the same two lags we included in the baseline estimation: general government expense growth and the dependent variable growth. We wish to instrument the independent variable real GDP growth to tackle endogeneity concerns. Our primary instrument is the trade-weighted average of real output growth among the main trade partners of each country. The approach involved selecting the top 10 trading partners for each country and year, based on the percentage of exports they represent, with a minimum threshold of 30 percent of total exports to ensure that the selected counterparts reflect a significant portion of the country's trade. These export shares were then used to weight the growth rates of these key partners, resulting in an instrumental variable that captures the average of a country's most relevant partners' economic

growth. This proxy for external demand serves as an effective instrument, as it captures a significant portion of the variation in output growth for most countries. In addition, we believe that main trading partners' growth affects government spending, but mainly through the output channel. Moreover, it is difficult to conceive how the output of trade partners could influence the domestic decisions of public spending by other means.

Table 4. Robustness Checks for Dependent Variable Expense in Goods and Services Growth

	(1) Emerging economies	(2) Advanced economies
Real GDP Growth * Exp	1.58*** (0.53)	0.63*** (0.14)
Real GDP Growth * Rec	0.29 (0.40)	-0.45*** (0.17)
Lagged Goods and Services Growth	-0.22*** (0.07)	0.07 (0.06)
Lagged General Government Expense Growth	0.01 (0.09)	0.19** (0.09)
Observations	810	418
Number of countries	40	18
Adjusted R-squared	0.036	0.052
Country Fixed Effect	Yes	Yes

Source: Authors' calculations based on World Economic Outlook database 2019.

Note: Robust standard errors in parentheses. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

The robustness analysis conducted using dynamic panel IV methods generally corroborates the baseline findings regarding the growth of expenses on goods and services as the dependent variable. Both the baseline and robustness estimations reveal that the association between GDP growth and expenditure growth is more pronounced in emerging economies compared to advanced economies during periods of expansion. Furthermore, the magnitude of the elasticities remains consistent across both groups. Notably, in advanced economies, the elasticity of GDP growth becomes significantly negative during recessions, but less than 1, indicating that governments tend to adopt a moderately countercyclical fiscal policy for this expenditure component.

Table 5. Robustness Checks for Dependent Variable Compensation to Employees Growth

VARIABLES	(1) Emerging economies	(2) Advanced economies
Real GDP Growth * Exp	0.92*** (0.16)	0.34*** (0.10)
Real GDP Growth * Rec	0.29 (0.24)	-0.16 (0.14)
Lagged Compensation to Employees Growth	-0.06 (0.08)	0.29** (0.12)
Lagged General Government Expense Growth	0.07 (0.05)	0.03 (0.06)
Observations	866	418
Number of countries	42	18
Adjusted R-squared	0.034	0.082
Country Fixed Effect	Yes	Yes

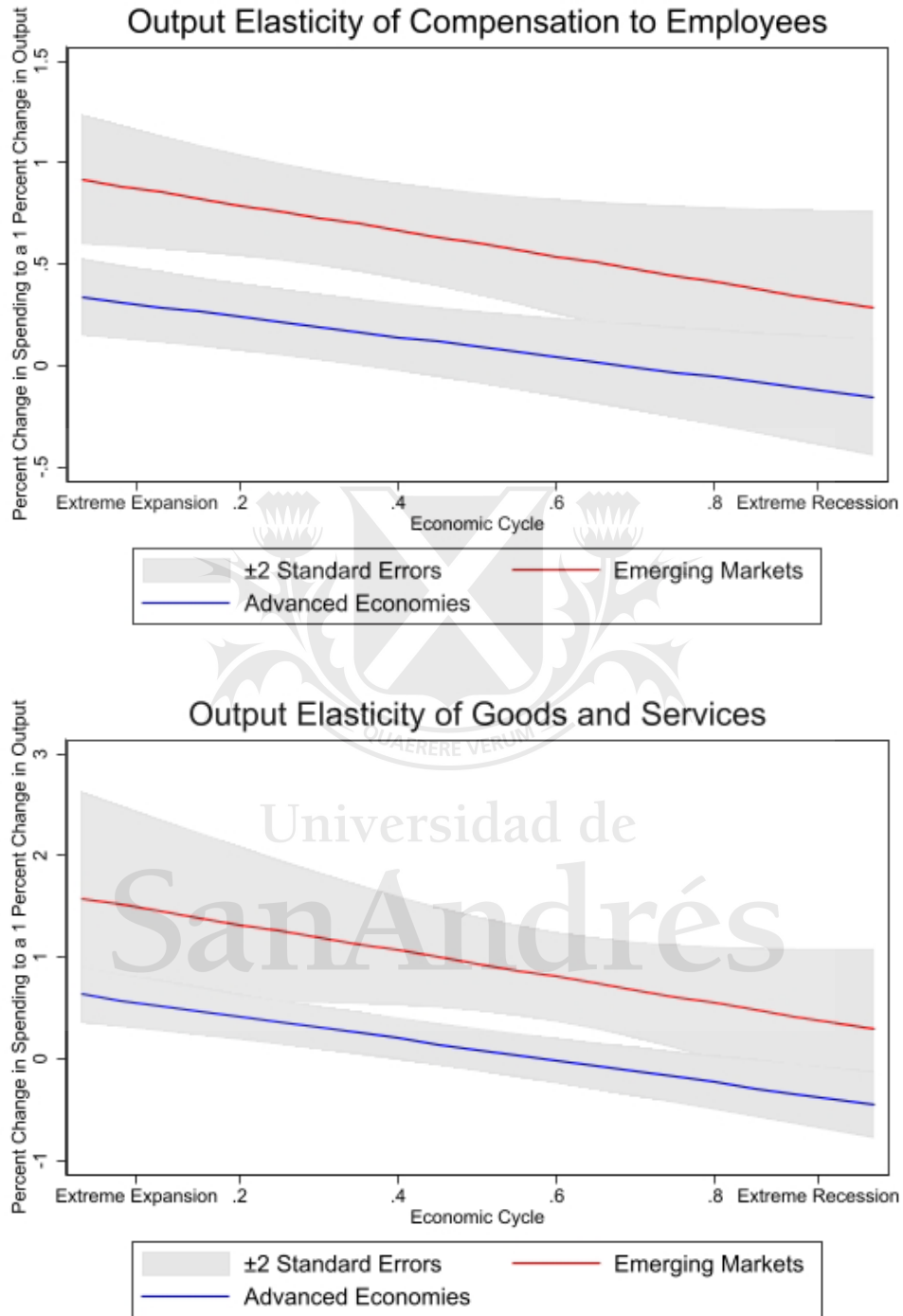
Source: Authors' calculations based on World Economic Outlook database 2019.

Note: Robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1

The robustness estimations for compensation to employees' growth as a dependent variable, reinforce the baseline results. In both the baseline estimations and the robustness checks, we can argue that the elasticity associated with real GDP growth is higher for emerging than for advanced economies in identical magnitudes. Additionally, the coefficient associated with the interaction between GDP growth and the variable Rec remains insignificant

Taking advantage of the continuous nature of our business cycle proxy, we use the estimates from our IV specification to visualize the output elasticities of public consumption across varying degrees of economic recessions and expansions. Figure 4 below depicts the output elasticities of compensation to employees and purchases of goods and services at different stages of the business cycle for advanced economies and emerging markets.

Figure 4: Output Elasticities of Public Consumption Components Over the Business Cycle



Source: Authors' calculations based on World Economic Outlook database 2019.

In both figures, advanced economies tend to maintain moderate spending during economic expansions, with retrenchment during downturns being statistically insignificant for expenditure in compensation to employees, in particular. In contrast, spending decisions in emerging markets are significantly more responsive to short-term economic conditions. In these economies, periods of growth lead to substantial increases in components of public consumption. Conversely, contractions do not result in reductions in spending, suggesting a form of downward spending rigidity and contributing to the semi-procyclicality of public consumption.

Additionally, it is important to note that variations in the compensation to employee's category are generally more constrained around zero compared to goods and services. This underscores the potential rigidity in managing employee-related expenditures, both in terms of headcount and salaries.

4. Policy Discussions

Public consumption in emerging markets is inefficient, semiprocyclical, and downwardly rigid, which limits fiscal space and hampers the potential for countercyclical policies during economic downturns. To address fiscal sustainability concerns, policymakers worldwide have increasingly favored the implementation of fiscal rules. As of 2021, approximately 105 economies have adopted at least one fiscal rule (Davoodi et al. 2022). These rules impose long-term constraints on fiscal policy by setting numerical limits on budgetary aggregates. The most common types of fiscal rules are budget balance rules (BBRs) and debt rules (DRs). BBRs are constitutional or statutory rules that restrict states from spending more than their revenue collection. DRs establish debt limits based on the government's repayment capacity, considering the ratio of debt service to revenues.

Major crises, such as the 2008 financial collapse and the subsequent commodity slowdown, or the COVID-19 crisis, have motivated revisions in fiscal rule design to enhance effectiveness and compliance. These upgrades include incorporating escape clauses, establishing stronger legal foundations (such as constitutional amendments), improving formal enforcement by integrating rules into annual budget preparations and medium-term fiscal frameworks, and increasing the focus on stabilization by making rules sensitive to business cycle fluctuations (Debrun et al. 2018).

Apart from budgeting inefficiencies leading to excess rigidities during downturns, the key difference between emerging markets and advanced economies lies in their approach to managing public consumption during upturns. Advanced economies tend to spend moderately, aligning with structural income trends and generating fiscal savings that can be utilized during downturns.

Recent studies demonstrate that fiscal rules contribute to enhanced debt sustainability by improving fiscal balances and reducing fiscal policy procyclicality (Badinger and Reuter 2017; Caselli and Reynaud 2020; Forni and Bonfatti 2017; Grembi, Nannicini, and Troiano 2016; Hatchondo, Roch, and Martinez 2012). However, the effectiveness of these rules largely depends on compliance levels.

Chile, among emerging markets, is often mentioned as a success story with its well-implemented and closely monitored structural balanced budget rule since the early 2000s (Céspedes, Parrado and Velasco 2014; Frankel 2011; Fuentes, Schmidt-Hebbel and Soto 2021; Lam et al. 2023). The rule's effectiveness is attributed to its design, which includes a defined escape clause for countercyclical policies and the presence of an independent body of fiscal experts monitoring its implementation. Additionally, Chile's establishment of a stabilization fund using copper earnings provides additional public savings during times of need.

Compliance rates with fiscal rules witnessed a sharp decline after the COVID-19 pandemic. More than half of the countries with DRs exceeded the prescribed restrictions, while 90 percent of the countries with BBRs failed to meet the rule limits in 2020 (Davoodi et al. 2022). The design of the rules significantly influences compliance rates. Clear implementation procedures, enforcement mechanisms, consequences for noncompliance, and defined authorities for corrective actions leads to higher compliance. Also, despite their prevalence among emerging markets, poorly defined escape clauses in fiscal rules can undermine their effectiveness, allowing countries to deviate from the rules during challenging times (Gbohoui and Medas 2020). Such deviations can introduce moral hazard and contribute to downward rigidity during economic downturns.

Finally, while the right combination of fiscal rules can mitigate the procyclicality of public consumption, they may still impose constraints on the public sector's response to large and unexpected economic shocks, such as the COVID-19 pandemic. For this reason, it is important to introduce flexibility into the design of rules that enables governments to have the capacity to act countercyclically during economic downturns. In addition, fiscal rules should include a “growth-friendliness” dimension to fiscal objectives in order not to hurt long-term growth as a result of fiscal retrenchments on public investment (Ardanaz et al. 2021).

5. Conclusions

This paper studies the dynamics of public consumption within emerging and advanced economies focusing on the asymmetric responses to the business cycle. Our analysis reveals significant differences in fiscal behavior between the two groups, with implications for fiscal policy. We explore this idea empirically using panel regressions and then validate our results with an instrumental variable regression.

The results display that in advanced economies, public consumption is associated to moderate growth during economic expansions. Conversely, in emerging economies, output growth is connected to a more pronounced positive effect on both components of public consumption, which becomes acyclical during recessions. Moreover, the elasticity observed in goods and services for both groups diminishes when employee compensation is the dependent variable, highlighting the rigidities inherent in this category.

The policy implications are that, in order to mitigate the procyclical and inefficient nature of public consumption, emerging markets need to enhance their fiscal frameworks. Improved medium-term fiscal planning, overseen by independent fiscal institutions, can provide the necessary oversight. Incorporating fiscal rules can help stabilize public spending and reduce fiscal vulnerabilities.

In conclusion, our paper contributes to the literature by challenging the common assumption that public expenditure is flexible. Instead, we provide evidence that the issue is not simply the procyclical nature of public consumption, but its rigidity in certain components. We show that

periods of economic boom lead to an increase in public spending, which then becomes difficult to reduce during downturns. Addressing this rigidity is crucial for achieving fiscal sustainability in emerging markets, requiring reforms that ensure public expenditure adjusts more effectively to economic cycles.



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5. Appendix

Table A1. Classification of Countries Included in the Analysis

Advanced Economies

Australia
Austria
Belgium
Canada
Denmark
Finland
France
Germany
Hong Kong SAR, China
Israel
Italy
Japan
Luxembourg
Netherlands
New Zealand
Norway
Portugal
Spain
Sweden
Switzerland
United Kingdom
United States



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Emerging Markets

Argentina
Bahrain, Kingdom of
Bangladesh
Botswana
Brazil
Bulgaria
Chile
China, P.R.: Mainland
Colombia
Croatia
Cyprus
Czech Republic
Côte d'Ivoire
Egypt

Estonia
Ghana
Hungary
Iceland
India
Indonesia
Jamaica
Kazakhstan
Lebanon
Lithuania
Malaysia
Mauritius
Mexico
Morocco
Namibia
Nigeria
Pakistan
Panama
Peru
Philippines
Poland
Qatar
Romania
Russia
Slovak Republic
Slovenia
South Africa
Sri Lanka
Taiwan, China
Thailand
Tunisia
Turkey
United Arab Emirates
Vietnam
Zambia



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6. References

- Alesina, Alberto, Filipe R. Campante, and Guido Tabellini. 2008. "Why is Fiscal Policy Often Procyclical?" *Journal of the European Economic Association* 1006–1036.
- Alesina, Alberto, Reza Baqir, and William Easterly. 2000. "Redistributive public employment." *Journal of Urban Economics* 219-241.
- Ardanaz, Martín, Eduardo Cavallo, Alejandro Izquierdo, and Jorge Puig. 2021. "Growth-friendly fiscal rules? Safeguarding public investment from budget cuts through fiscal rule design." *Journal of International Money and Finance* Volume 111, 102319.
- Arellano, Manuel, and Stephen Bond. 1991. "Some tests of specification for panel data: Monte Carlo evidence and an application to employment equations." *The Review of Economic Studies* 277-297.
- Auerbach, Alan J., and Yuriy Gorodnichenko. 2010. "Measuring the Output Responses to Fiscal Policy." *NBER working paper series*, Augusto: no. w16311.
- Auerbach, Alan J., and Yuriy Gorodnichenko. 2011. "Fiscal Multipliers in Recession and Expansion." *National Bureau of Economic Research* no. w17447.
- Badinger, Harald, and Wolf Heinrich Reuter. 2017. "The Case for Fiscal Rules." *Economic Modelling* Volume 60 334-343.
- Balassone, Fabrizio, and Manmohan Kumar. 2007. "Cyclicality of fiscal policy." In *Promoting fiscal discipline*, by Manmohan S. Kumar and Teresa Ter-Minassian, 19-35. Washington D.C.: International Monetary Fund.
- Balassone, Fabrizio, and Maura Francese. 2004. *Cyclical Asymmetry in Fiscal Policy, Debt Accumulation and the Treaty of Maastricht*. Rome: Bank of Italy.
- Barnichon, Regis, Davide Debortoli, and Christian Matthes. 2022. "Understanding the Size of the Government Spending Multiplier: It's in the Sign." *The Review of Economic Studies* 87–117.
- Caballero, Ricardo J., and Arvind Krishnamurthy. 2004. "Fiscal Policy and Financial Depth." *National Bureau of Economic Research Working Paper* 10532.
- Carneiro, Francisco, and Leonardo Garrido. 2016. "New Evidence on the Cyclicality of Fiscal Policy." *World Bank Policy Research Working Paper* No. 7293.
- Caselli, Francesca, and Julien Reynaud. 2020. "Do fiscal rules cause better fiscal balances? A new instrumental variable strategy." *European Journal of Political Economy* Volume 63, 101873.
- Céspedes, Luis Felipe, and Andrés Velasco. 2014. "Was this time different?: Fiscal policy in commodity republics." *Journal of Development Economics* 92-106.
- Céspedes, Luis Felipe, Eric Parrado, and Andrés Velasco. 2014. "Fiscal Rules and the Management of Natural Resource Revenues: The Case of Chile." *Annual Review of Resource Economics* Vol. 6: 105-132.
- Cetrángolo, Oscar, Juan Pablo Jiménez, and Ramiro Ruiz Del Castillo. 2010. *Rigidities and Fiscal Space in Latin America: a Comparative Case Study*. Serie Macroeconomía del Desarrollo, Santiago: Economic Commission for Latin America and the Caribbean (ECLAC).

- Combes, Jean-Louis, Mary-Françoise Renard, and Sampawende J.-A. Tapsoba. 2019. "Provincial public expenditure in China: a tale of pro-cyclicality." *Economic Change and Restructuring* 19-41.
- Davoodi, Hamid, Paul Elger, Alexandra Fotiou, Daniel Garcia-Macia, Andresa Lagerborg, Raphael Lam, and Sharanya and Pillai. 2022. *Fiscal Rules Dataset: 1985-2021*. Washington, DC: International Monetary Fund.
- Debrun, Xavier, Andrew Hodge, Victor Duarte Lledo, and Catherine A Pattillo. 2018. *Second-Generation Fiscal Rules: Balancing Simplicity, Flexibility, and Enforceability*. Washington, DC: International Monetary Fund.
- Echeverry, Juan Carlos, Jorge Alexander Bonilla, and Andrés Moya. 2006. *Institutional Rigidities and Budget Flexibility: Origin, Motivation, and Effects on the Budget*. Public Policy Management and Transparency Network: Effectiveness in Development and Result-based Budgetary Management, Washington: Inter-American Development Bank (IADB).
- Forni, Lorenzo, and Andrea Bonfatti. 2017. "Fiscal Rules to Tame the Political Budget Cycle: Evidence from Italian Municipalities." *IMF Working Papers* Volume 2017: Issue 006.
- Frankel, Jeffrey A. 2011. "A Solution to Fiscal Procyclicality: The Structural Budget Institutions Pioneered by Chile." *Cambridge, United States: National Bureau of Economic Research* NBER Working Paper 16945.
- Frankel, Jeffrey A., Carlos A. Vegh, and Guillermo Vuletin. 2013. "On graduation from fiscal procyclicality." *Journal of Development Economics* 32-47.
- Fuentes, J. Rodrigo, Klaus Schmidt-Hebbel, and Raimundo Soto. 2021. *Fiscal Rule and Public Investment in Chile*. IDB WORKING PAPER SERIES N° IDB-WP-1189, Washington DC: Inter-American Development Bank.
- Gavin, Michael, and Roberto Perotti. 1997. "Fiscal Policy in Latin America." *NBER Macroeconomics Annual Volume 12* 11-61.
- Gavin, Michael, Ricardo Hausmann, Roberto Perotti, and Ernesto Talvi. 1996. "Managing Fiscal Policy in Latin America and the Caribbean: Volatility, Procyclicality, and Limited Creditworthiness." *IDB Working Paper No. 269*.
- Gbohoui, William, and Paulo Medas. 2020. *Fiscal Rules, Escape Clauses, and Large Shocks*. Special Series on Fiscal Policies to Respond to COVID-19, Washington DC: International Monetary Fund.
- Grembi, Veronica, Tommaso Nannicini, and Ugo Troiano. 2016. "Do Fiscal Rules Matter?" *American Economic Journal: Applied Economics* 8, no. 3 1–30.
- Hatchondo, Juan Carlos, Francisco Roch, and Leonardo Martinez. 2012. "Fiscal Rules and the Sovereign Default Premium." *IMF Working Papers* Volume 2012: Issue 030.
- Hercowitz, Zvi, and Michel Strawczynsk. 2004. "Cyclical Ratcheting in Government Spending: Evidence from the OECD." *The Review of Economics and Statistics* 353–361.
- Humphreys, Macartan, and Martin E. Sandbu. 2007. "The Political Economy of Natural Resource Funds." In *Escaping the Resource Curse*, by Macartan Humphreys, Jeffrey D. Sachs and Joseph E. Stiglitz, 194-233. New York: Columbia University Press.
- Ilzetzi, Ethan. 2011. "Rent-seeking distortions and fiscal procyclicality." *Journal of Development Economics* 30-46.
- Ilzetzi, Ethan, and Carlos A. Vegh. 2008. "Procyclical Fiscal Policy in Developing Countries: Truth or Fiction?" *NBER Working Paper No. 14191*.
- IMF. 2018. "Second-Generation Fiscal Rules: Balancing Simplicity, Flexibility, and Enforceability." *International Monetary Fund*.

- Izquierdo, Alejandro, Carola Pessino, and Guillermo Vuletin. 2018. *Better spending for better lives: how Latin America and the Caribbean can do more with less*. Washington: Inter-American Development Bank.
- Jiatao, Li, Ding Haoyuan, Hu Yichuan, and Wan Guoguang. 2021. "Dealing with dynamic endogeneity in international business research." *Journal of International Business Studies* 339-362.
- Kaminsky, Graciela L., Carmen M. Reinhart, and Carlos A. Végh. 2005. "When it Rains, it Pours: Procyclical Capital Flows and Macroeconomic Policies." *NBER Macroeconomics Annual 2004* Volume 19.
- Lam, W. Raphael, Yongquan Cao, Andresa Lagerborg, and Alessandro Scipioni. 2023. *Chile: Fiscal Considerations in Managing Stabilization Funds*. Technical Assistance Report, Washington DC: International Monetary Fund.
- Lane, Philip R. 2003. "Business Cycles and Macroeconomic Policy in Emerging Market Economies." *International Finance* 89-108.
- Mendoza, Enrique G., and P. Marcelo Oviedo. 2006. "Fiscal Policy and Macroeconomic Uncertainty in Developing Countries: The Tale of the Tormented Insurer." *NATIONAL BUREAU OF ECONOMIC RESEARCH*.
- Ostrom, Elinor. 2015. *Governing the Commons - The Evolution of Institutions for Collective Action*. Cambridge: Cambridge University Press.
- Riascos, Alvaro, and Carlos A. Vegh. 2003. "Procyclical Government Spending in Developing Countries: The Role of Capital Market Imperfections."
- Rodrik, Dani. 2000. "Institutions for high-quality growth: what they are and how to acquire them." *Studies in Comparative International Development* 3-31.
- Talvi, Ernesto, and Carlos A. Végh. 2005. "Tax base variability and procyclical fiscal policy in developing countries." *Journal of Development Economics* 156-190.
- Tornall, Aaron, and Philip R. Lane. 1999. "The Voracity Effect." *American Economic Review* 22-46.
- Vegh Gramont, Carlos Alberto, Guillermo Javier Vuletin, Daniel Riera-Crichton, Juan Pablo Medina, Diego Friedheim, Luis Francisco Morano Germani, and Lucila Venturi Grosso. 2018. *From Known Unknowns to Black Swans : How to Manage Risk in Latin America and the Caribbean (English)*. Washington, D.C.: World Bank Group.
- Velasco, Andrés. 1999. "2. A Model of Endogenous Fiscal Deficits and Delayed Fiscal Reforms." In *Fiscal Institutions and Fiscal Performance*, by edited by James M. Poterba and Jurgen von Hagen, 37-58. Chicago: University of Chicago Press.
- Wagner, Adolph. 1958. "Three extracts on public finance." In *Classics in the theory of public finance*, by Richard A. Musgrave and Alan T. Peacock, 1-15. London: Palgrave Macmillan UK.