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Assessing the Spillover Effects of US Monetary and Fiscal Policy on Latin American Economies

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Abstract

This paper characterizes the dynamic effects of monetary and fiscal policy shocks originating in the U.S on Latin American economic and financial variables. It does so by identifying shocks occurring during the period from 2004 to 2023 and analyzing the reactions of economic activity, inflation, monetary policy rate behavior, currency depreciation, stock market performance, and changes in government bonds in Latin America.

The results consistently show that Latin American economies react to the identified shocks, with significant heterogeneity on a country-by-country basis. In general, this heterogeneity is more pronounced in the effects of fiscal policy shocks, while the reactions to monetary policy shocks display the expected effects according to classical Keynesian theory.

Zusammenfassung

Dieses Papier charakterisiert die dynamischen Auswirkungen von monetären und fiskalischen Politikschocks, die ihren Ursprung in den USA haben, auf wirtschaftliche und finanzielle Variablen in Lateinamerika. Es tut dies, indem es Schocks identifiziert, die im Zeitraum von 2004 bis 2023 auftreten, und die Reaktionen der wirtschaftlichen Aktivität, der Inflation, des Verhaltens der Geldpolitik, der Währungsabwertung, der Aktienmarktperformance und der Veränderungen bei Staatsanleihen in Lateinamerika analysiert.

Die Ergebnisse zeigen konsistent, dass die lateinamerikanischen Volkswirtschaften auf die identifizierten Schocks reagieren, wobei eine signifikante Heterogenität von Land zu Land besteht. Im Allgemeinen ist diese Heterogenität bei den Auswirkungen von fiskalischen Politikschocks stärker ausgeprägt, während die Reaktionen auf geldpolitische Schocks die erwarteten Effekte gemäß der klassischen keynesianischen Theorie zeigen.

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Introduction

Monetary and fiscal policy are fundamental tools employed by governments to manage and stimulate their local economies. According to Keynesian economics, governments play a crucial role intervening to stabilize economic cycles and promote growth, particularly during downturns, through monetary policy (adjusting interest rates and money supply) and fiscal policy (taxation and government spending). This approach aims to achieve economic stability and growth by influencing demand. In the academic literature, the evaluation of the impact and effectiveness of these policies is typically confined within the national borders, focusing on their impact on domestic economic indicators. However, in the case of the United States, the effects of its policies extend far beyond its borders, creating ripple effects on the global economy.

The impact of U.S policies on the global economy can be multifaceted, involving a variety of mechanisms. Notably, the influence on interest rates, channeled through credit spreads, and its consequential effects on debt financing; the repercussions on inflation, whether through alterations in tax policies or the transmission via currency depreciation; and the influence over asset prices, linked with investment cycles and market sentiment, are just a few of the channels through which U.S policies can influence economic and financial performance of different countries.

Latin American economies emerge as particularly susceptible to the influence of U.S. monetary and fiscal policies. The historical, economic, and geopolitical ties that bind the region with the United States render it highly responsive to shifts in policy stances. As such, an in-depth examination of the effects of these policies on local economic behavior and financial metrics provides invaluable insights for policymakers and capital market participants. Thus, this research seeks to systematically assess the spillover effects of US monetary and fiscal policies on Latin American economies.

Research Questions and Objectives

The aim of this study is to provide a comprehensive analysis of the influence that monetary and fiscal policy measures in the U.S. have in both economic performance and financial markets in a sample of Latin American countries. From an economic point of view, the aim is to analyze the reaction of variables such as inflation, economic growth, and local currencies to policy measures in the U.S. Additionally, the analysis of the monetary policy stances of both the Federal Reserve and local central banks could provide an insight into potential linkages of these two variables. Finally, going further in the asset pricing channel, the objective is to measure the reaction of local market assets such as government bonds and stocks to policy shocks.

As will be seen in the literature review, some of these relationships have been evaluated in the past in the context of particular events such as the taper tantrum or the covid 19 crisis. Additionally, the focus is for the most part on asset prices and the reaction to

monetary policy announcements. However, in recent years fiscal policy measures have been widely used by different countries as tools to provide incentive to the economy in the face of the shock of the pandemic and related lockdowns. Thus, by including this new dimension to the analysis, this study could provide additional insights into the relationship and effectiveness of the diverse types of policies and provide evidence for local monetary and fiscal authorities to better understand how to design and implement local measures in the presence of spillover effects.

Literature Review

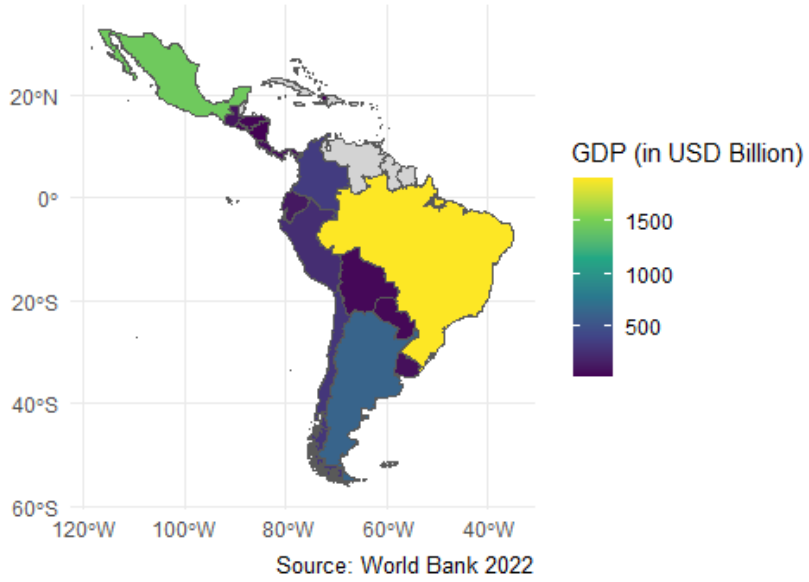
In exploring the dynamics of U.S. monetary policy spillovers on emerging market economies (EMEs), recent research has revealed multifaceted channels through which these effects manifest. Kalemli-Özcan (2019) asserts that the spillovers operate predominantly via alterations in risk premia, emphasizing the heightened vulnerability of emerging market economies relative to advanced economies due to their country-specific risk factors. Ahmed, Coulibaly, & Zlate's (2017) examination of the 2013 taper-tantrum episode reveals that emerging market economies endowed with stronger economic fundamentals experienced diminished financial market deterioration, underscoring the pivotal role of domestic economic conditions in mitigating external shocks originating from U.S monetary policy shifts. Further nuances are introduced by Hoek, Kamin & Yoldas (2022), who discern variations in spillover impact based on the source within U.S. policy, suggesting that heightened rates stemming from robust U.S growth have limited consequences on emerging market economies' financial markets, while those resulting from a hawkish Federal Reserve or inflationary pressures are markedly more disruptive. Expanding the focus beyond monetary policy, Engler, Piazza, & Sher (2023) highlight the substantial influence of U.S economic news, particularly pertaining to employment and economic activity, in shaping financial conditions in emerging markets.

This collective body of literature not only advances our understanding of the intricate mechanisms of U.S. monetary policy transmission but also underscores the nuanced factors contributing to the resilience or vulnerability of emerging economies in the face of global economic developments. Nevertheless, a notable gap in the literature is identified, as the current focus predominantly centers on the impact of monetary policy on financial markets. To address this gap and contribute to the evolving discourse, this study proposes to expand the analytical framework by incorporating the dimensions of fiscal policy measures and assessing their impact on economic performance in Latin American countries. Through this extension, this study aims to provide a more comprehensive understanding of the field, aligning it with current trends in policy design and offering a holistic perspective on the complex interplay between global economic forces and emerging market economies.

Data

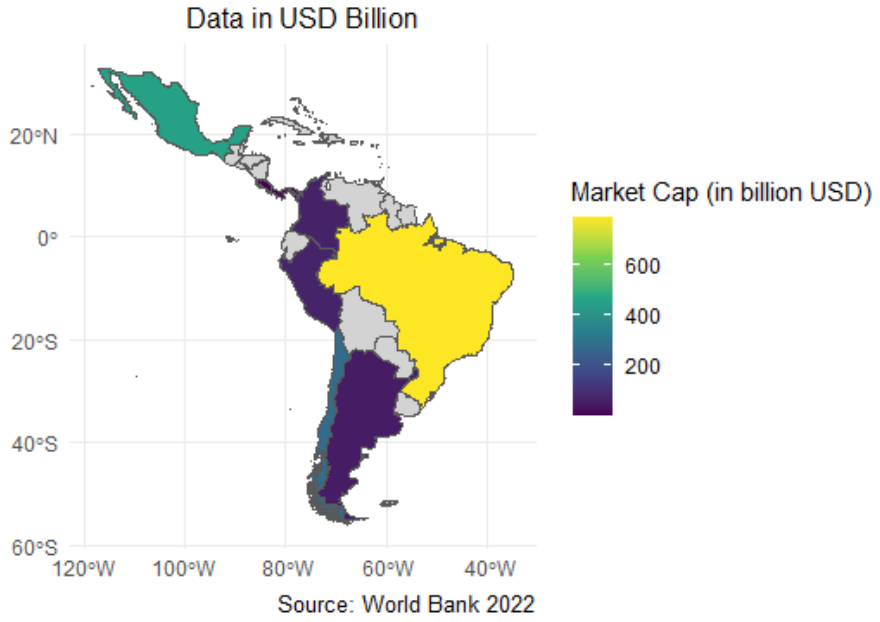
The main focus of this paper is to test whether U.S monetary and fiscal policy shocks affect a set of economic and financial variables in Latin American countries. The sample of countries to be used in the study is limited by the availability of sufficient information, primarily on financial assets, and the relevance and comparability of countries within the region. In this context, Figure 1 plots the 2022 GDP of the region. As can be observed, two main economies standout by their size: Brazil and Mexico. These are the only two countries that surpass the trillion-dollar mark with a GDP of 1.92 and 1.46 trillion dollars, respectively. Following these two main economies, there is a group of countries with middle sized economies. In this group Argentina is the largest economy with a GDP of 631 billion dollars, followed by Colombia (344 USD Billion), Chile (301 USD Billion) and Peru (242 USD Billion). The remaining countries have smaller sized economies under 115 billion dollars.

Fig. 1: Latam GDP



In addition to economic activity, the sample selection must account for the size and depth of the local financial markets. In this regard, Figure 2 plots the market capitalization of the local stock market for Latin American economies in 2022. It can be observed that there is a high correlation between the size of the economy and the size of the stock market. In this context, Brazil and Mexico are again the biggest markets in the region with a market capitalization of 794 and 454 billion dollars, respectively. Interestingly, Chile comes in third in this category with a market size of 285 billion dollars, showcasing a relatively more developed stock market than other countries with bigger economies like Colombia (68 USD billion) and Argentina (53 USD billion). Finally, Peru (71 USD billion) and Panama (16 USD billion) complete the sample of countries with active stock markets in the region, highlighting the lack of development in the capital markets in large parts of the region.

Fig. 2: Latam Market Capitalization



Taking into account the relevance of each economy relative to the region, the comparability of the particular countries, and the financial market development of each country, the sample is set to comprise the five largest countries with sufficient data available: Brazil, Chile, Colombia, Peru, and Mexico.

I used DataStream as the main source of information. DataStream compiles information from local central banks and other statistical and economic authorities. Using this source, I created the main database containing information on inflation, monetary policy rate, GDP, local currency against the U.S. dollar, 10-year government bond yield, and local stock indices for the period between Q1-2004 and Q4-2023.

Additionally, during the identification of U.S monetary policy shocks, some variables of U.S. economic data were used according to the models that will be described in the following section. These variables include the federal funds rate, inflation rate, and quarterly U.S real GDP. The source of this data is the Saint Louis Federal Reserve Database, which uses data from the Bureau of Economic Analysis and the Board of Governors of the Federal Reserve System.

Finally, in the section on the identification of U.S. fiscal policy shocks, additional data on government spending and net taxes is used in the SVAR setup. The source for the missing variables is the Quarterly National Income and Product Accounts. Following the definition of Blanchard & Perotti (2002), I defined government expenditure as the sum of purchases of goods and services by the government at federal, state, and local levels. Net taxes are constructed as the sum of personal tax and non-tax receipts, indirect business taxes, corporate taxes, net transfer payments, and contributions to the social security system minus net interest paid by the central government. The data is seasonally adjusted by the source.

Empirical Design

This section describes the methodological approach and is divided into three subsections. The first two sections describe the identification strategy for U.S monetary and fiscal policy shocks. The third section is centered on the main objective of the study: using the identified shocks from the first two sections to analyze the effect of these on the economic performance and financial markets of the countries in the sample.

Identification of U.S Monetary Policy Shocks

Following the methodology proposed by Iacoviello & Navarro (2019), I identify the monetary policy shock as the residual of a regression of the federal funds rate on a set of controls as well as lagged values of the rate itself. The model is as follows:

$$fr_t = \phi + \theta Z_t + u_t$$

Where fr_t is the federal fuds rate and Z_t is a set of control variables that include lagged values of the same rate, contemporaneous and lagged inflation values, log U.S GDP and a quadratic time trend. The number of lags used in the specification is four periods following the information criterion test. In this model the monetary policy shock is captured then by the residual term u_t.

Using data covering the period between 2001 and 2023, the model was computed, and the residuals are plotted in Figure 3. As can be observed, the biggest negative shock was in the offset of the 2008 financial crisis. Reasonably, during this period of time the Federal Reserve reduced rapidly the monetary policy rate in order to provide stimulus to an economy in recession, bringing the rate close to the zero lower bound. Additional periods with the presence of negative shocks are seen in the mid-2000s and during the 2022 Covid pandemic.

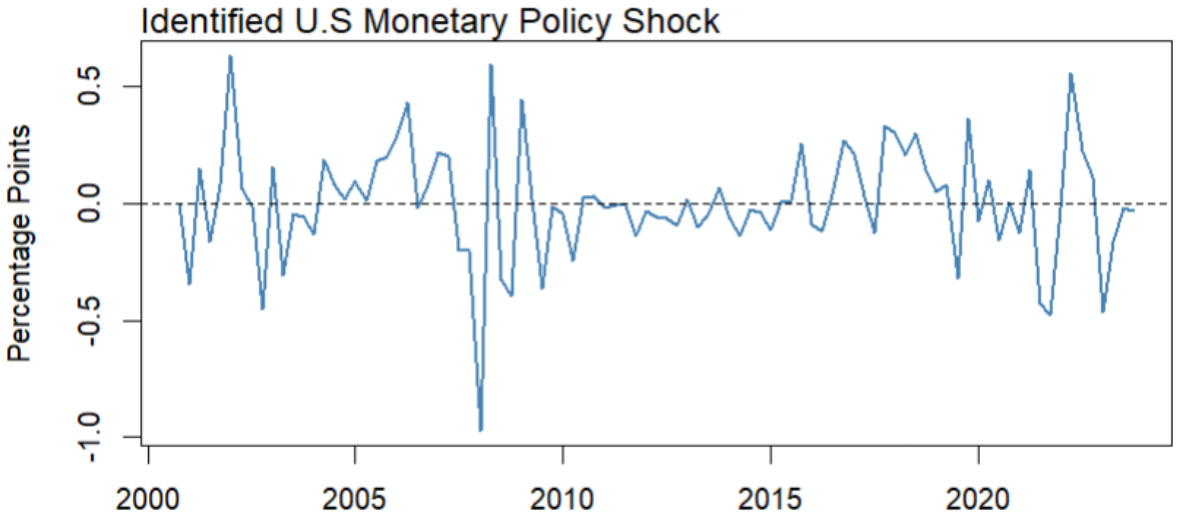


Fig. 3: Identified monetary Policy shock. Calculated as the residual of a regression of the Federal Funds Rate on contemporaneous and lagged values of log U.S GDP, inflation, and lagged values of the Federal Funds Rate.

Identification of U.S Fiscal Policy Shocks

For the identification of fiscal policy shock in the U.S I follow the procedure by Blanchard & Perotti (2002). The method is based on the use of a structural VAR model analyzing three main variables: quarterly GDP, government spending and taxes. The reduced form model is as follows:

$$Y_t = C(L)Y_{t-1} + U_t$$

Where $Y_t \equiv [\, T_t, G_t, X_t]'$ is a vector containing logarithms of net taxes, government spending and GDP, respectively. $C(L)$ corresponds to the lag polynomial, in this case using a five-quarter set up following the results of the information criterion test. Finally, $U_t \equiv [\, t_t, g_t, x_t]'$ is the vector of reduced form residuals, which have non-zero cross correlations. These reduced form residuals U_t, correspond to unexpected movements in the variables of interest, and can be interpreted as linear combinations of the structural shocks that we are interested in for the main analysis. The system can be written as follows:

$$t_t = a_1 x_t + a_2 x_t^g + e_t^t$$

$$g_t = b_1 x_t + b_2 x_t^t + e_t^g$$

$$x_t = c_1 t_t + c_2 g_t + e_t^x$$

Where e_t^t, e_t^g and e_t^x are the uncorrelated structural shocks of the system. In the case of the present paper the focus will be on the identified structural shock on taxes e_t^t. As reference, the first equation can be read as the unexpected movements on taxes at time t (t_t) being explained by three effects: the response to unexpected movements in GDP ($a_1 x_t$), the reaction to structural shocks to government spending ($a_2 x_t^g$), and the mentioned structural shock on taxes (e_t^t). The remaining equations have a similar interpretation for unexpected movements in government spending (g_t) and unexpected movements in GDP (x_t).

To proceed with the identification of the system above to get the structural shocks, restrictions need to be imposed. At minimum, three restrictions are required following the criterion *n(n-1)/2* where *n* is the number of variables in the reduced form VAR. Following the reasoning from Blanchard & Perotti (2002), the first restrictions are related to the parameters a_1 and b_1. These parameters account for two effects: The automatic and discretionary reactions of both taxes and spending to unexpected movements in economic activity. The identification assumption used by the authors is that discretionary adjustments to fiscal policy reasonably take more than one quarter to be implemented so discretionary within quarter adjustments would not be possible. Thus, the assumption is that the parameters a_1 and b_1 only capture the automatic responses of fiscal variables to unexpected events on GDP. The key factor for this assumption to hold is the use of quarterly data.

As the next step, the parameters a_1 and b_1 can be obtained as the elasticities of output to net taxes and government spending, respectively. Following the argument from the

authors, I set the value of b_1 as zero, as there is no evidence of an automatic relationship from GDP to government spending.

The elasticity of net taxes to GDP is then constructed following the methodology implemented by the OECD as seen in Giorno, Richardson, & Roseveare (1995). The procedure consists of calculating individual elasticities for four tax categories with respect to economic activity: personal income taxes, corporate income taxes, indirect taxes, and social security contributions. Additionally, transfers are included in the process with a negative sign to account for subsidies and to get net taxes as the result. Finally, the elasticity is simply calculated as the weighted sum of the individual elasticities as per the following formula:

$$a_1 = \sum_i \eta_{T_i,B_i}\, \eta_{B_iX}\, \frac{T_i}{\bar{T}}$$

Where η_{T_i,B_i} corresponds to the elasticity of each type of tax *i* to its own base B_i, and η_{B_iX} denotes the elasticity of tax base B_i to GDP.

After getting the values for parameters a_1 and b_1, it is possible to get the cyclically adjusted reduced form residuals, defined as follows:

$$t' \equiv t_t - a_1 x_t$$

$$g' \equiv g_t - b_1 x_t = g_t$$

The cyclically adjusted residuals t' and g' are no longer correlated with the error term e_t^x, so they can be used as instruments in a regression of GDP on t_t and g_t to get estimates for the parameter values c_1 and c_2. Finally, the remaining parameters to be identified are a_2 and b_2. The parameters are calculated based on the principle of recursive ordering where only one of the two variables is allowed to have a contemporaneous effect on the other (i.e $a_2 = 0$, $b_2 \neq 0$). Blanchard & Perotti (2002) argue that there is no theoretically funded reason to select one over the other so they proceed to estimate both alternatives getting similar results. Following the steps from the authors, I focus on the specification with $a_2 \neq 0$, $b_2 = 0$.

Estimation of Effects on Sample of Countries

In the last step, I compute the dynamic responses of the countries in the sample to the U.S monetary and fiscal policy shocks identified in the previous steps using the local projection method proposed by Jordà (2005). The basic idea is to compute impulse responses by estimating a number of individual regressions at different time horizons according to the following model:

$$y_{t+h} = \alpha_h + \beta_h u_t + \lambda_h(L)_{Xt-1} + \varepsilon_{t+h}$$

Where y_{t+h} is the variable of interest in period t and h represents the horizons of evaluation. The variables of interest are a sample of both economic and financial indicators including: 10-year government bond yield, local stock market index, local currency against US dollars, economic activity measured by log real GDP, and inflation. The main variable of interest is u_t, which measures the impact of either the monetary policy shock or the fiscal shock. $\lambda_h(L)$ is a lag operator. The number of selected lags is four periods following the information criterion test and common practice in related literature. Finally, X_t is a set of controls which include the exogenous variable of interest and a quadratic time term.

Results

In this section I will present the results of the analysis going through each of the variables of interest and evaluating the impact of U.S fiscal and monetary policy shocks for each of the countries via impulse response function graphs and providing some insight into the possible explanation for the main trends (or lack thereof) at the regional level.

In general, the graphs describe the quarterly response of the variables of interest to a positive one standard deviation impulse in either the monetary policy or fiscal policy shocks. The window of evaluation is in all cases six quarters and the shaded areas denote the 90% confidence intervals using Newey-West standard errors robust to heteroskedasticity and autocorrelation.

It is important to clarify at this point that, as was described in the shock identification process, fiscal policy in the context of this study refers to shocks to net taxes (tax revenue from federal and local governments minus transfers). In this sense, a positive shock can be understood as a contractionary policy stance from the government that either increases tax revenue (via higher tax rates, tariffs etc.) or reduces the amount of transfers from the government to the general population. In the case of monetary policy shocks, the interpretation is more straightforward as this is simply read as increases in the U.S monetary policy rate.

10 Year Government Bond Yield

Figure 4 depicts the impulse response functions for the countries in the sample to a one standard deviation positive shock in U.S. fiscal policy. The results generally reflect a contemporaneous increase of between 10 and 25 basis points in the yield of most of the countries in the sample (except for Peru). As the yield represents the discount rate of the future cash flows of a given bond, an increase in these rates implies a reduction in the prices of the respective bonds. These results align with the traditional Keynesian view that contractionary policy measures decrease demand (in this case for risky instruments), causing a risk-off trend in Latin American bond markets, resulting in higher yields and declining government bond prices.

Regarding the response of bond yields to a one standard deviation shock to the U.S. monetary policy rate, the reaction is more heterogeneous. As seen in Figure 5, only the Mexican bond yield follows the expected path of devaluation given a contractionary monetary policy stance in the U.S. The response in the first three quarters is an increase of around fifteen basis points. However, for most of the other countries, there is no significant response in bond yields during the initial periods. Interestingly, in the third and fourth quarters following the shock, Peruvian and Chilean bonds have an increase in value.

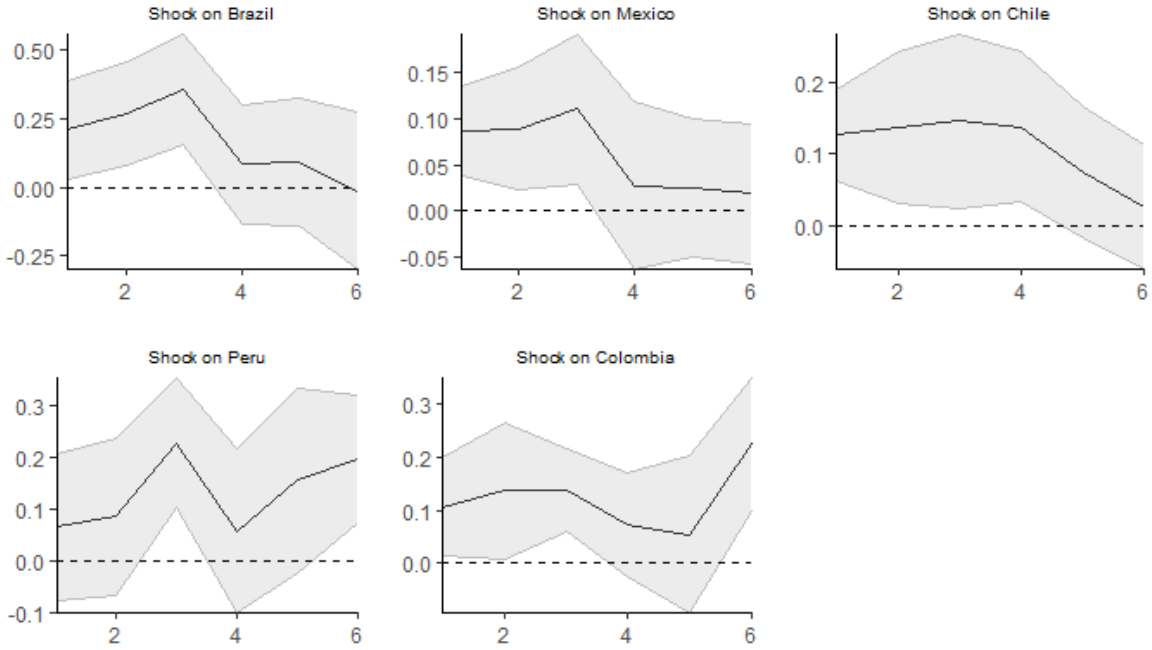


Fig. 4 Dynamic Response of Bonds to a shock in U.S. fiscal policy. Shaded areas denote 90% confidence intervals using Newey-West standard errors robust to heteroskedasticity and autocorrelation.

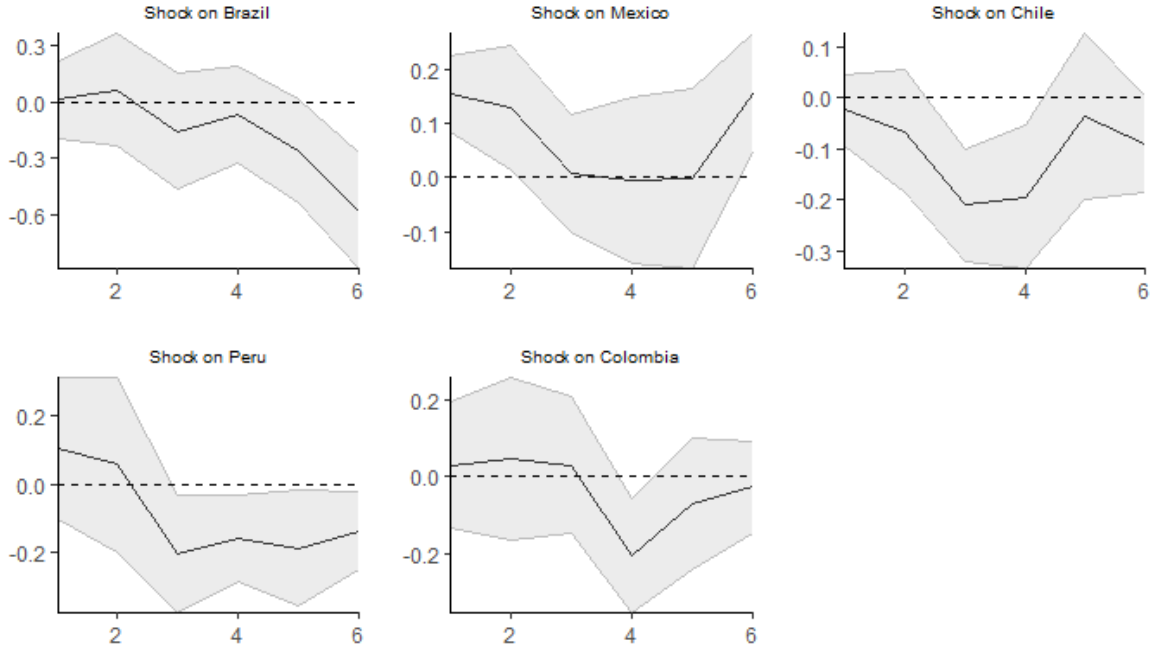


Fig. 5 Dynamic Response of Bonds to a shock in U.S. monetary policy. Shaded areas denote 90% confidence intervals using Newey-West standard errors robust to heteroskedasticity and autocorrelation.

Monetary Policy Rate

In this section, I will analyze the response of the local monetary policy rate of each Latin American country to the identified U.S shocks. Figure 6 depicts the impulse responses of local monetary policy rates in the sample of Latin American countries to a one standard deviation impulse in the U.S. fiscal policy measure. For most countries, the reaction is positive, ranging between 0.1% and 0.25%. This reaction appears to be prevalent over time, with some countries even exhibiting a growing effect.

This interesting result could be related to net taxes increasing in the U.S. due to higher tariffs or increased taxes on exporting products. Such an effect could raise inflation in countries with high imports from the U.S, potentially leading to increases in interest rates to tackle the resulting inflation.

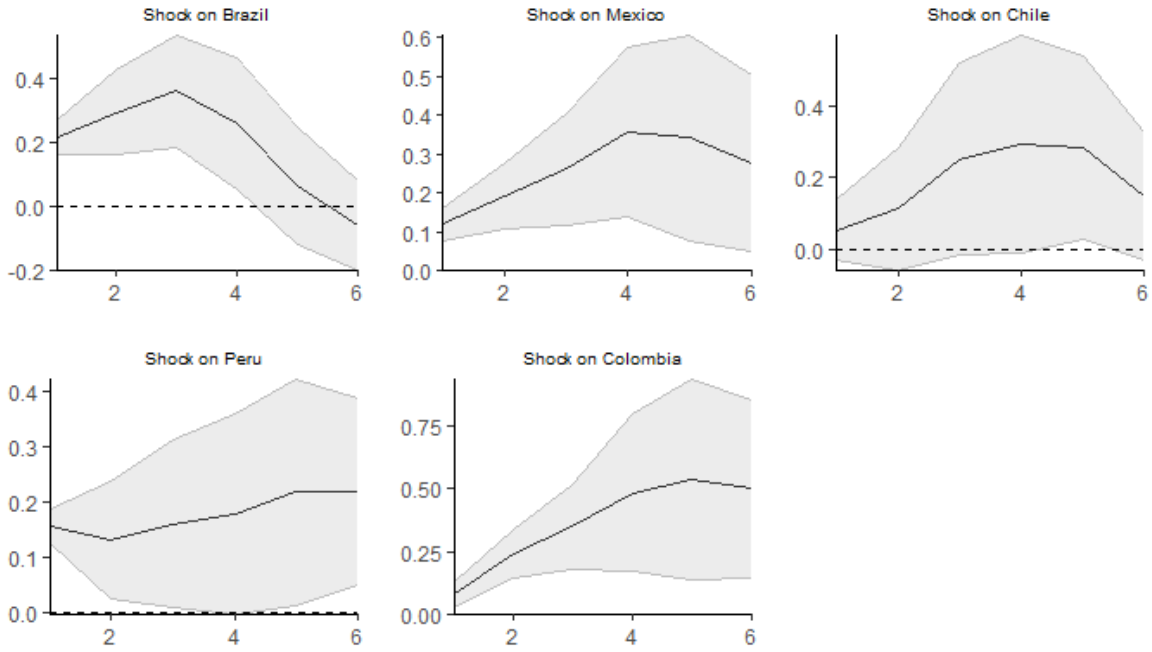


Fig. 6 Dynamic Response of Monetary Policy Rate to a shock in U.S. fiscal policy. Shaded areas denote 90% confidence intervals using Newey-West standard errors robust to heteroskedasticity and autocorrelation.

Additionally, Figure 7 describes the reaction of the local monetary policy rate in the sample of Latin American countries to a monetary policy shock in the U.S. The results are predominantly homogeneous across the sample. In general, it appears that local monetary authorities do not follow movements from the Federal Reserve. These results align with traditional economic theory and Taylor Rules, which suggest that monetary policy responds to local economic activity and inflation.

In the following section, we will analyze the response of inflation to U.S. shocks, which will help clarify the channel through which external shocks affect local monetary policy.

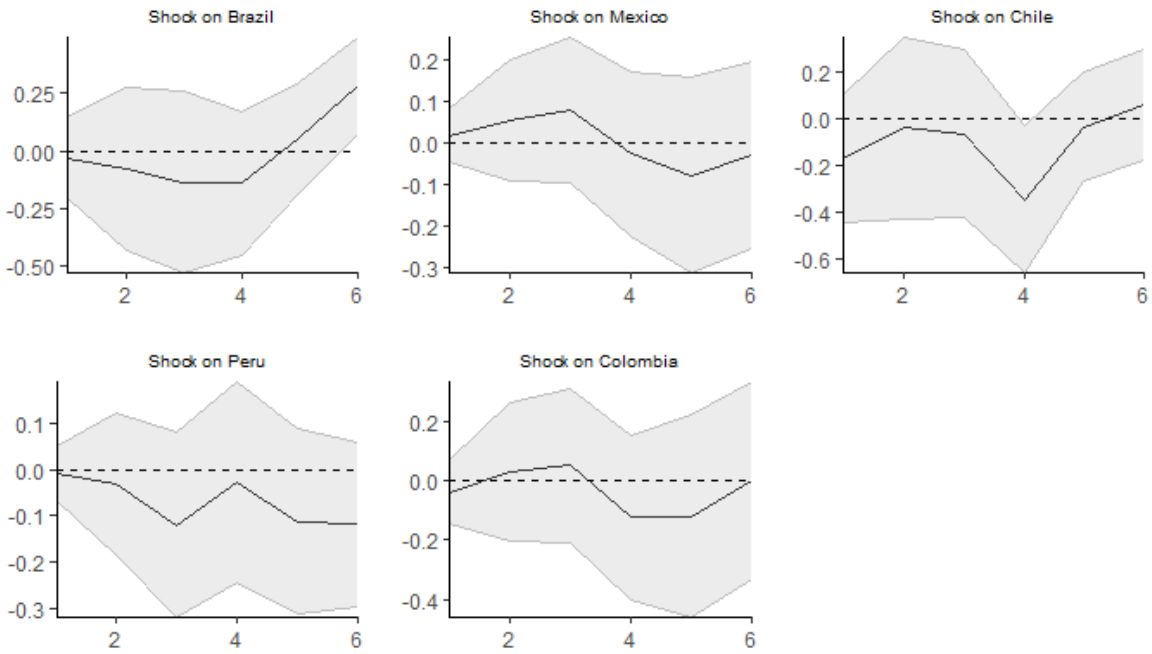


Fig. 7 Dynamic Response of Monetary Policy Rate to a shock in U.S. monetary policy. Shaded areas denote 90% confidence intervals using Newey-West standard errors robust to heteroskedasticity and autocorrelation.

Inflation

Closely related to the previous section, which evaluated the response of the local monetary policy rate, this section is dedicated to the reaction of inflation. Firstly, Figure 8 plots the impulse response of inflation for each country in the sample to a one standard deviation shock to U.S. fiscal policy. It can be observed that, in the cases of Brazil and Colombia, inflation increases by around 0.3% contemporaneously with the shock, and the effect slowly decreases over the following three to four quarters. Similarly, Mexico presents a delayed increase in inflation in the third quarter after the shock, of around 0.1%. For the rest of the countries, there is no statistically significant evidence of an impact.

Interestingly, the three countries that experience an increase in inflation are also the ones more sensitive in terms of the monetary policy rate reaction to a fiscal policy shock, as seen in the previous section. This, to some extent, validates the theory that the reaction is explained by increases in taxes on exporting goods in the U.S. or increases in tariffs, resulting in inflation in the importing Latin American countries, subsequently leading to an increase in the monetary policy rate as a reaction.

Figure 9 depicts the impulse response function of inflation in the countries in the sample to a one standard deviation shock in the U.S. monetary policy rate. In this case, Brazil, Chile, and Peru follow the expected results of a decrease in inflation following an increase in the monetary policy rate, demonstrating spillovers from foreign policymaking. Most notably, Brazil experiences a decrease of up to 0.6% in the window between the first and fifth quarters following the shock, while Chile and Peru show a negative effect during the fourth quarter, with a more muted decrease of 0.1% in inflation. The rest of the countries exhibit no statistically significant effect.

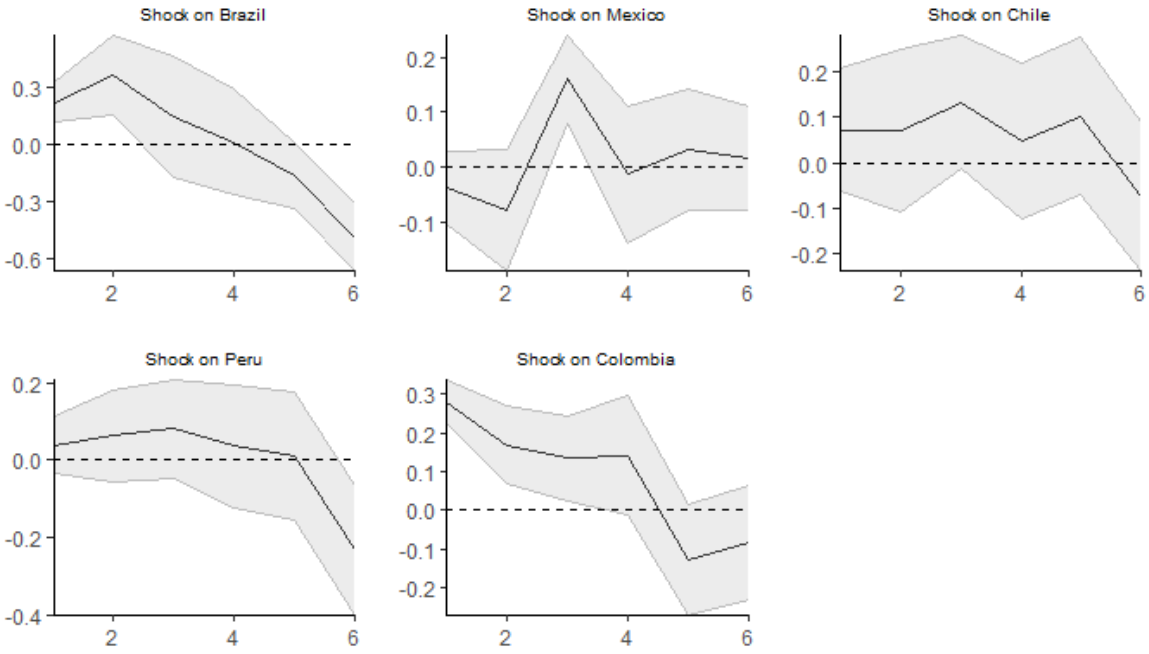


Fig. 8 Dynamic Response of Inflation to a shock in U.S. fiscal policy. Shaded areas denote 90% confidence intervals using Newey-West standard errors robust to heteroskedasticity and autocorrelation.

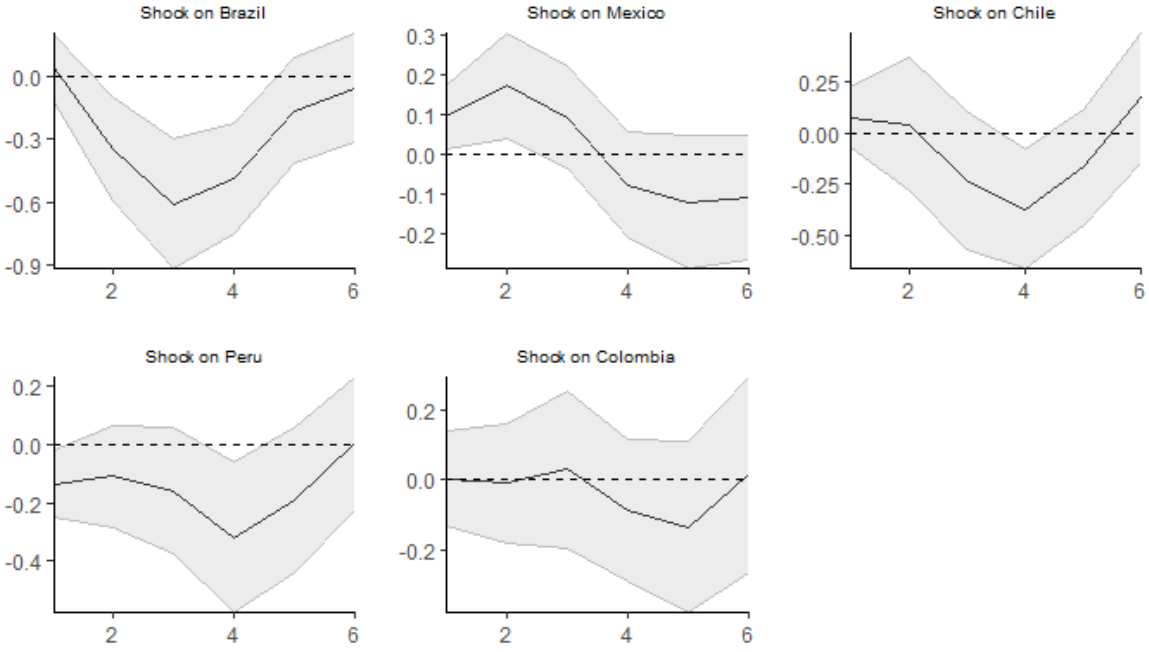


Fig. 9 Dynamic Response of Inflation to a shock in U.S. monetary policy. Shaded areas denote 90% confidence intervals using Newey-West standard errors robust to heteroskedasticity and autocorrelation.

Currencies

To evaluate the behavior of Latin American currencies, they were standardized to a base of one hundred to make the results comparable and to provide a meaningful measure of their reaction to the shocks of interest. In this context, values lower than the base indicate an appreciation of the local currency against the U.S. dollar, while values higher than the base indicate a depreciation of the local currency.

Regarding the results, Figure 10 depicts the impulse response function of each Latin American currency in the sample to a one standard deviation shock in U.S. fiscal policy. Interestingly, countries such as Mexico, Chile, and Peru exhibit currency appreciation. Most notably, in the case of Mexico, the impact is a 2% gain in the Peso relative to the U.S. dollar. This behavior is sustained for four quarters. Similarly, the Chilean Peso appreciates by approximately 2.5%, but the effect diminishes after two quarters. Finally, the Peruvian Sol presents a more muted effect with an appreciation of less than 0.5% and the effect is only present during the fourth quarter after the shock.

In general, the appreciation of certain currencies as a result of a shock in U.S. taxes can be explained by the same channels discussed in previous sections. Specifically, increases in net taxes in the U.S. related to tariffs on export goods. With higher prices, the demand for these goods in Latin America would decrease, subsequently slowing the demand for U.S. dollars and causing an appreciation of the local currency.

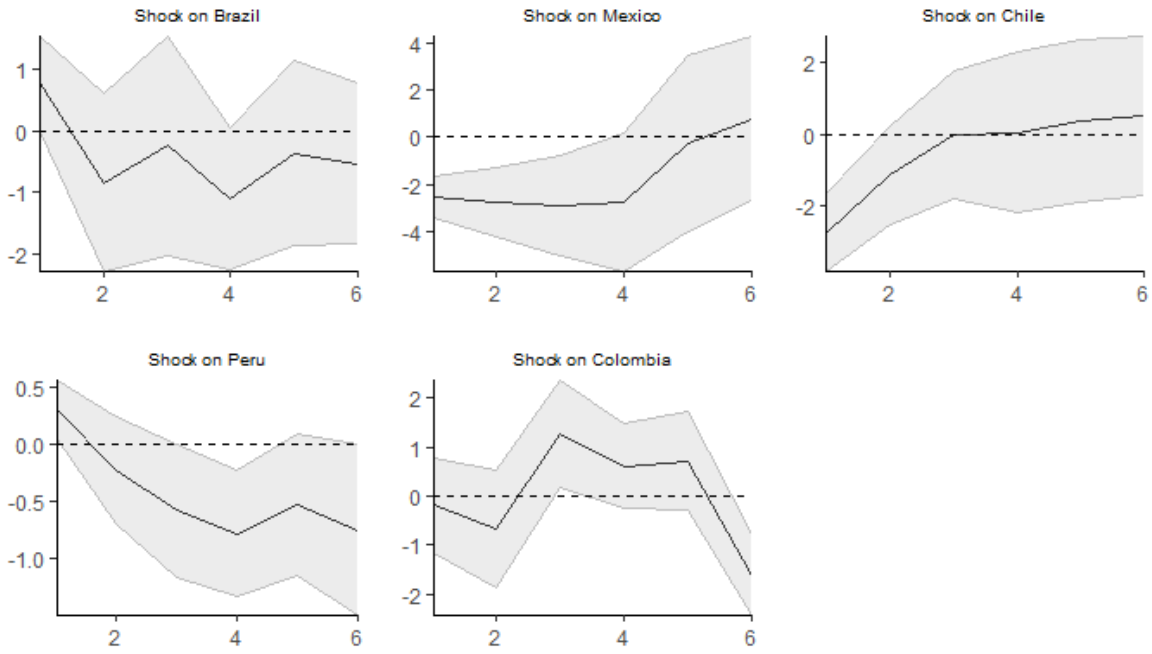


Fig. 10 Dynamic Response of Currencies to a shock in U.S. fiscal policy. Shaded areas denote 90% confidence intervals using Newey-West standard errors robust to heteroskedasticity and autocorrelation. All currencies normalized to base 100.

Figure 11 plots the impulse response functions for the currencies of the countries in the sample to a one standard deviation shock in U.S. monetary policy. The results show that the Brazilian Real and the Peruvian Sol are the two most sensitive currencies to movements in the Federal Funds Rate. The Real devalues by up to 3% with respect to the American Dollar two quarters after the initial shock, while the Peruvian Sol loses between 0.5% and 1%, with the effect being sustained for up to three quarters. The Mexican and Chilean Pesos reflect a depreciation only in the third quarter, but economically, the impact is not significant.

These results align with expectations based on Keynesian economics. An increase in the monetary policy rate in the U.S. limits the supply of Dollars to the market, increasing its value against other currencies. Other channels, such as the effect of policy rate movements on risk premia and carry trades (via sovereign spreads), could also be influencing the observed behavior.

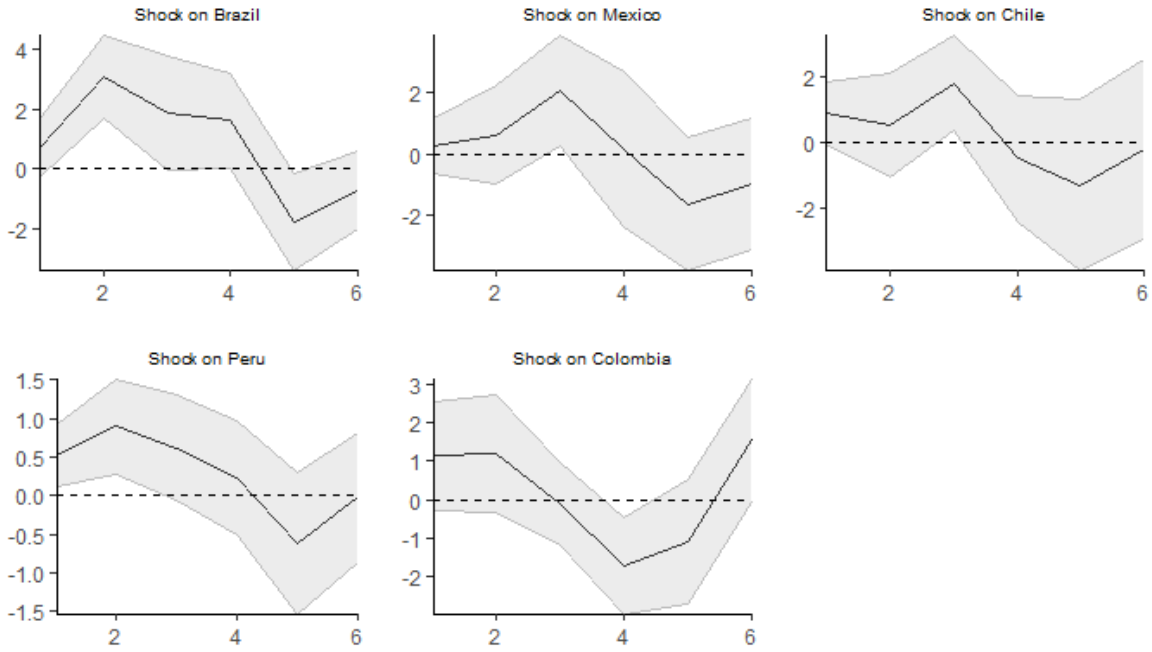


Fig. 11 Dynamic Response of Currencies to a shock in U.S. monetary policy. Shaded areas denote 90% confidence intervals using Newey-West standard errors robust to heteroskedasticity and autocorrelation. All currencies normalized to base 100.

Stock Indices

Similar to the previous section, the behavior of the local stock indices was normalized to a base of 100 to facilitate the interpretation of results. In this case, however, values higher than the base represent increases in the local stock market value, while values lower than the base imply decreases in market capitalization.

With this in mind, Figure 12 plots the impulse response function of each local stock market to a one standard deviation shock to U.S. fiscal policy. As shown, the majority of

the markets exhibit no statistically significant reaction to the shock. A notable exception is the Mexican market, where the local index shows an economically significant increase of approximately 9% contemporaneously with the U.S. fiscal shock.

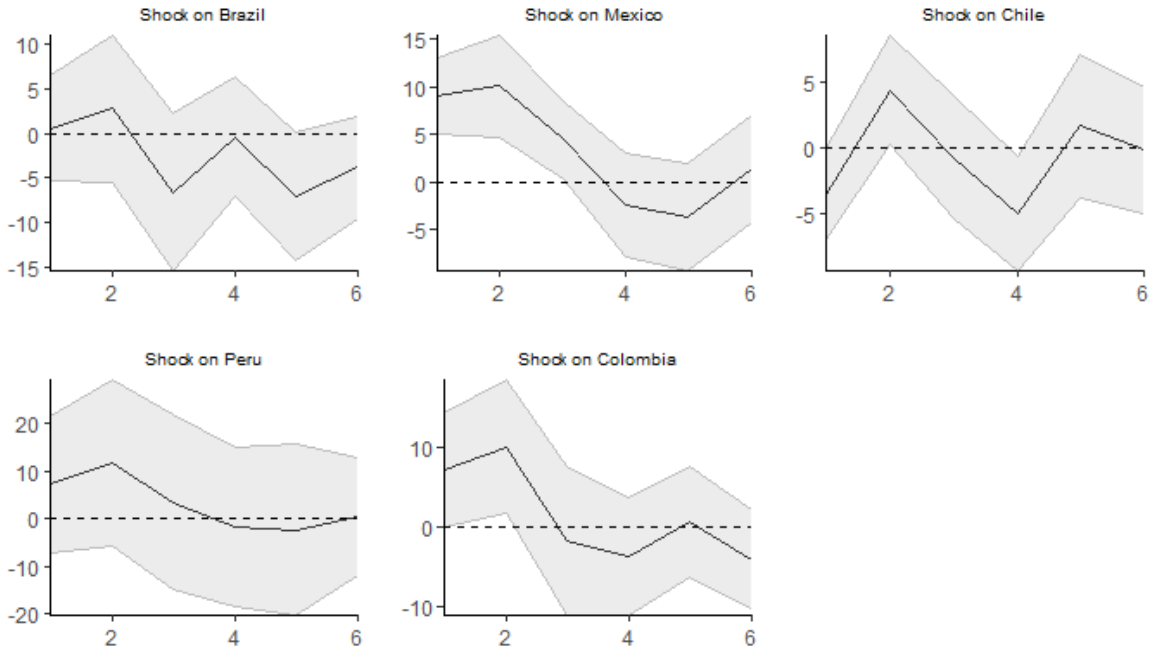


Fig. 12 Dynamic Response of Stock Indices to a shock in U.S. fiscal policy. Shaded areas denote 90% confidence intervals using Newey-West standard errors robust to heteroskedasticity and autocorrelation. All indices normalized to base 100.

Figure 13 plots the impulse response functions of the local stock markets to a shock in U.S. monetary policy. The results indicate a decline in stock prices in most of the countries in the region following increases in the Federal Funds Rate. Most notably, the Mexican index decreases by around 6% following the shock, with the effect being prevalent for the first two quarters. Interestingly, the Brazilian, Peruvian, and Colombian indices reflect a loss of value between 6% and 10% only during the second quarter after the shock.

Generally, the results align with Keynesian theory, which predicts decreases in demand following contractionary monetary policy measures from the central bank. As with the previous results related to financial asset valuation, a more in-depth examination of the channels that explain this behavior and the heterogeneity in sensitivity across the region is required to better understand the phenomena.

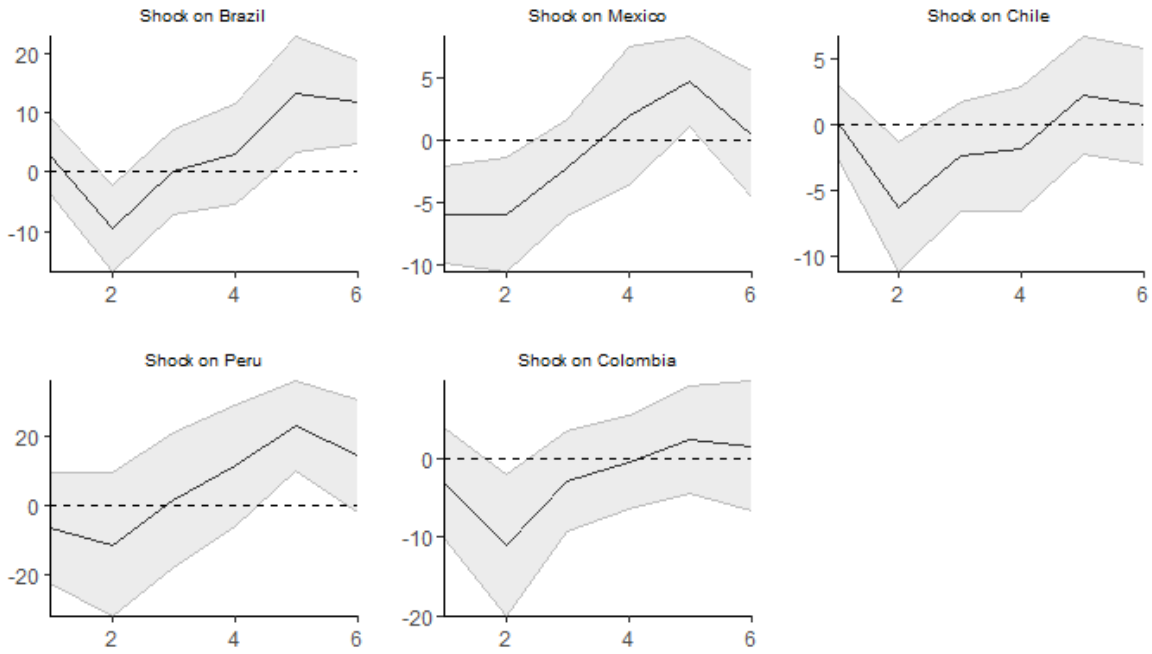


Fig. 13 Dynamic Response of Stock Indices to a shock in U.S. monetary policy. Shaded areas denote 90% confidence intervals using Newey-West standard errors robust to heteroskedasticity and autocorrelation. All indices normalized to base 100.

GDP

The last section of the results evaluates the responses of real GDP of each of the Latin American countries in the sample to the identified shocks. Firstly, Figure 14 plots the responses to a one standard deviation shock to U.S fiscal policy. Interestingly, the shock has a positive and statistically significant effect across the region. For all the countries under evaluation the impact is an increase of between 1% and 3% in economic activity contemporaneously to the shock with the effect losing prevalence during the three subsequent quarters.

Finally, Figure 15 depicts the response of local GDP to a one standard deviation shock on U.S monetary policy. In this point it is clear that there is no statistically significant impact given an innovation in the monetary policy rate in the U.S. Only in Brazil, in the third quarter after the shock there exists a negative effect on economic activity, but the magnitude of the reaction is not economically relevant for the purposes of this study.

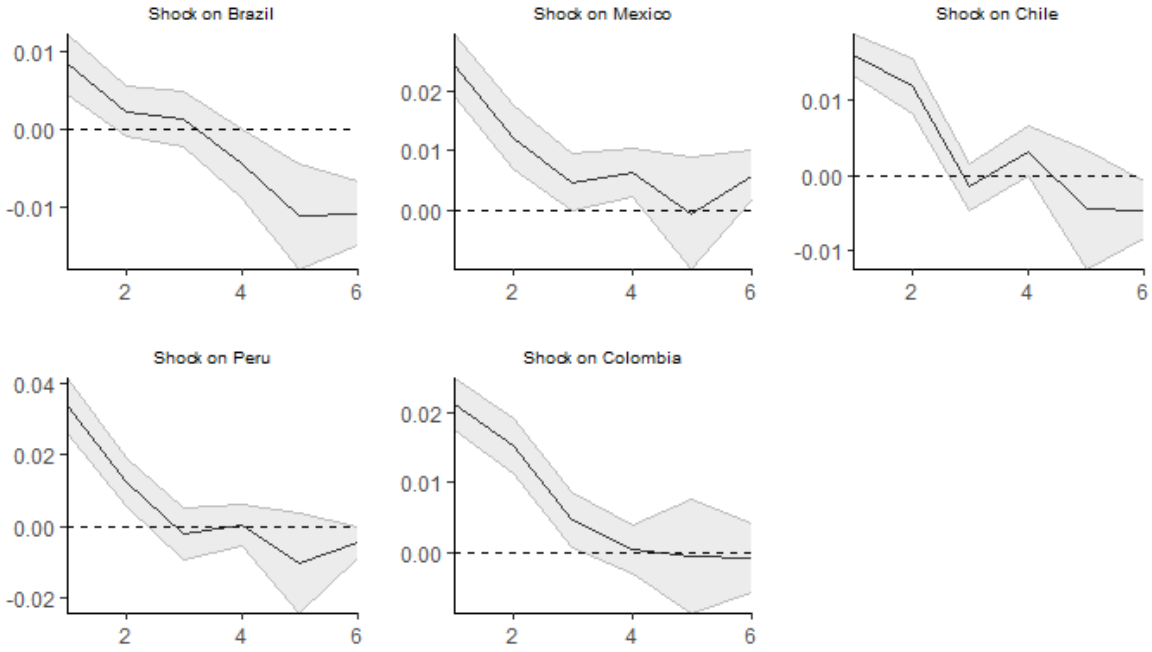


Fig. 14 Dynamic Response of GDP to a shock in U.S. fiscal policy. Shaded areas denote 90% confidence intervals using Newey-West standard errors robust to heteroskedasticity and autocorrelation.

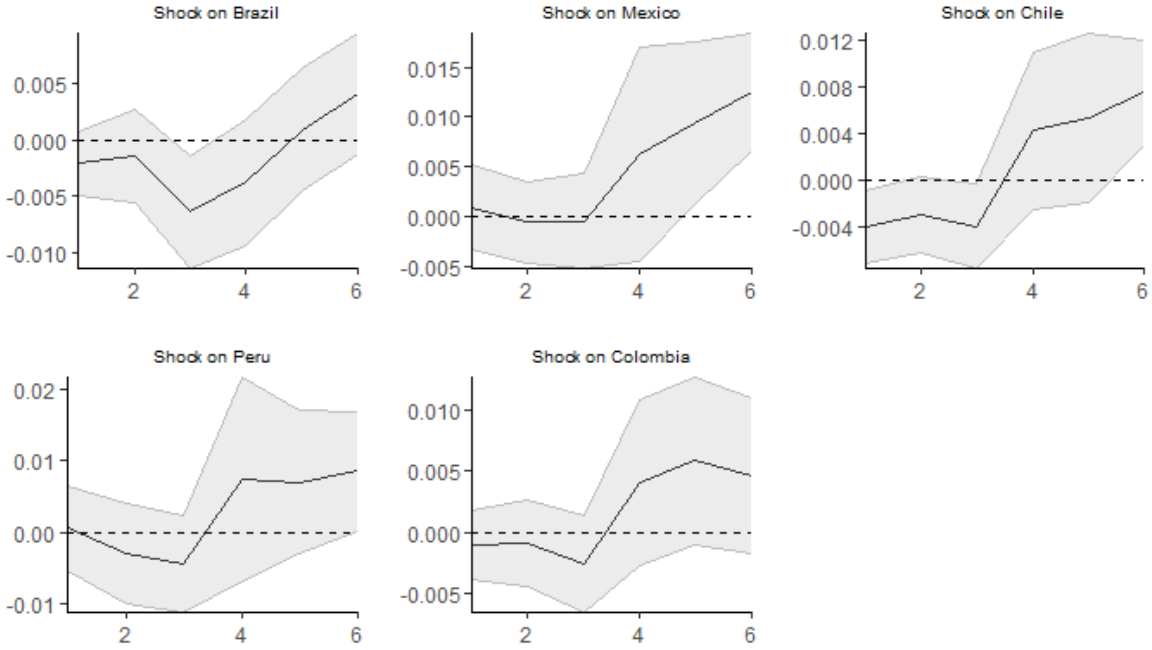


Fig. 15 Dynamic Response of GDP to a shock in U.S. monetary policy. Shaded areas denote 90% confidence intervals using Newey-West standard errors robust to heteroskedasticity and autocorrelation.

Conclusions

The aim of this study was to provide a comprehensive analysis of the influence that U.S monetary and fiscal policy measures have on Latin American economic behavior and financial market conditions. The findings suggest that there is sufficient evidence to support the claim that such effects exist. However, there is a significant amount of country-specific heterogeneity, which challenges the presence of region-wide effects.

For most of the results analyzed, the response of the variables under study aligns with the expected path predicted by traditional Keynesian economics, as detailed in the results section. However, in the case of some fiscal shocks, unexpected results were observed. This behavior may be related to a key limitation of the identification strategy: fiscal shocks were understood as changes in net taxes. This simplification facilitated the identification process but excluded a key component of fiscal policy: government purchases. Consequently, the results should be interpreted with caution, as the full impact of U.S fiscal policy is not fully accounted for.

The fact that the results support the existence of spillover effects from U.S. policy shocks in the region highlights the need for further research on a larger scale, including different regions and a broader range of variables. Additionally, exploring the channels at play would deepen the understanding of the relationships between the variables and provide clearer insights into the reasons for the heterogeneity of the results.

Bibliography

Ahmed, S., Coulibaly, B., & Zlate, A. (2017). International financial spillovers to emerging market economies: How important are economic fundamentals? *Journal of International Money and Finance, 76*, 133-152.

Albagli, E., Ceballos, L., Claro, S., & Romero, D. (2019). Channels of US monetary policy spillovers to international bond markets, 134(2). *Journal of Financial Economics*, 447-473.

Blanchard, O., & Perotti, R. (2002). An empirical characterization of the dynamic effects of changes in government spending and taxes on output. *the Quarterly Journal of economics*, 117(4), 1329-1368.

Curcuru, S., Kamin, S., Li, C., & Rodriguez, M. (2018). International spillovers of monetary policy: Conventional policy vs. quantitative easing. *International Finance Discussion Paper*, (1234).

Engler, P., Piazza, R., & Sher, G. (2023). Spillovers to Emerging Markets from US Economic News and Monetary Policy. *International Monetary Fund*.

Giorno, C., Richardson, P., & Roseveare, D. (1995). Estimating potential output, output gaps and structural budget balances.

Hoek, J., Kamin, S., & Yoldas, E. (2022). Are higher US interest rates always bad news for emerging markets? *Journal of International Economics*, 137, 103585.

Iacoviello, M., & Navarro, G. (2019). Foreign effects of higher US interest rates. *Journal of International Money and Finance*, 95 232-250.

Jordà, Ò. (2005). Estimation and inference of impulse responses by local projections. *American economic review, 95(1)*, 161-182.

Kalemli-Özcan, Ş. (2019). US monetary policy and international risk spillovers (No. w26297). *National Bureau of Economic Research*.