



# PARAGUAY

## SELECTED ISSUES

June 2022

This paper on Paraguay was prepared by a staff team of the International Monetary Fund as background documentation for the periodic consultation with the member country. It is based on the information available at the time it was completed on May 27, 2022.

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May 27, 2022

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# FOREIGN EXCHANGE INTERVENTIONS IN PARAGUAY AND THEIR ROLE IN THE MONETARY POLICY FRAMEWORK

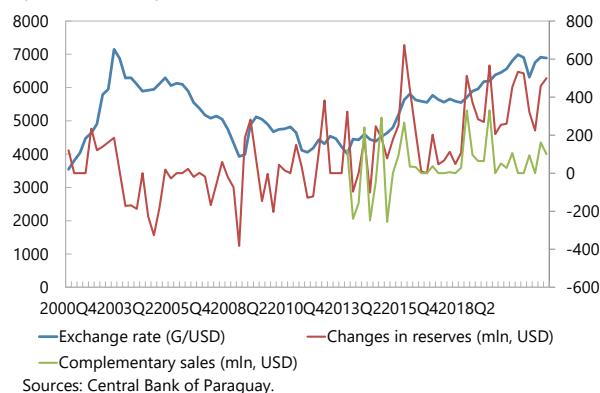
Limiting daily exchange rate volatility through foreign exchange interventions has become an important task within Paraguay's macroeconomic policy framework. Still, the exchange rate has been as flexible over longer time spans as in other EMEs. Transparent and well-communicated interventions since the adoption of the inflation targeting regime have been consistent with Paraguay's inflation targeting framework.

## A. Background

**1. The Central Bank of Paraguay (BCP) adopted an inflation targeting framework in 2011 and established a transparent and better communicated foreign exchange intervention (FXI) scheme in 2013.** Already in 2010, the authorities started to explore market-based mechanisms (e.g., auctions) to strengthen the transparency of FXI to avoid confusing signals on the course of monetary policy despite increased clarity on inflation targets. In 2013, the BCP implemented a more disciplined FX framework by pre-announcing an auction system for the sale of government U.S. dollar proceeds from two binational hydroelectrical companies and from external debt disbursements, including the nature, frequency, and size of those sales. This framework made a distinction between two mechanisms: the auction system for the sale of government revenues in U.S. dollars ("*ventas compensatorias*"), and the more formal FXI ("*ventas complementarias*").<sup>1</sup> The latter have been explicitly limited to offsetting excessive volatility and to enhance the BCP's credibility in pursuing its policies and its commitment to the inflation target.

**2. Since then, there have been only a few episodes when the BCP actively resisted large exchange rate movements.**<sup>2</sup> During 2014, the BCP allowed significant exchange rate movements, with a trough-to-peak span of almost 13 percent. In 2015, FXIs rose but the guarani still depreciated by 25 percent. During 2016 and 2017, the exchange rate appreciated only by about 1 and 2 percent, respectively, while official reserves increased by about US\$900 million and US\$1 billion, respectively. In 2018-19, with the economy hit by agricultural production and external financial shocks (the latter related to Argentina), international reserves declined slightly and the guarani fell by about 6 percent in 2018 and by 8 percent against the US dollar in 2019. With the onset of the pandemic, the exchange rate depreciated sharply by about 7 percent in 2020 and FX operations

Interventions (RHS) and Exchange Rate (LHS)  
(2000:Q4-2021:Q4)

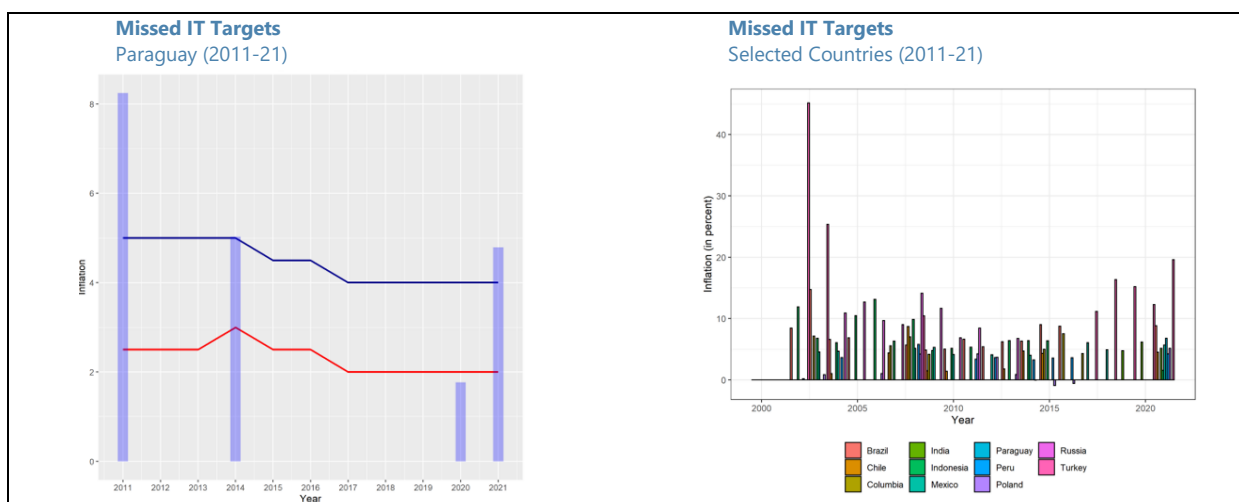


<sup>1</sup> For the purposes of cross-country comparisons, and because FXI data is not uniformly available for all the countries under study, we use the change in reserves both in US\$ terms and in percent of GDP as a proxy for FXIs (see Appendix I).

<sup>2</sup> See also "Box 2. Exchange Rate Flexibility in Paraguay" in IMF Article IV Report 12/211, 2012.

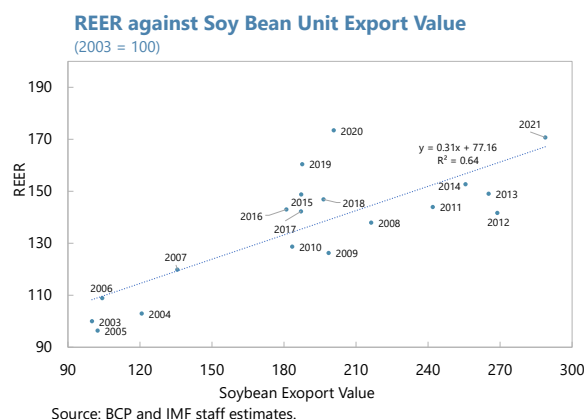
by the BCP stepped up to US\$1.7 billion (with *ventas complementarias* constituting US\$133 million). The BCP supported the guarani during 2021 by re-selling to the financial sector a large part (US\$1.5 billion) of its foreign exchange purchases from the government (with *ventas complementarias* increasing to US\$356 million). Net international reserves rose by US\$450 million to US\$9.95 billion that year. The guarani regained some strength in 2021, and by year-end it appreciated slightly by about 0.2 percent.

**3. Paraguay’s inflation has been more frequently within its target bounds compared to other countries in the region and other EMEs’.** In the beginning of 2017, the BCP lowered its inflation target from 4.5 to 4 percent and missed no targets until recently unlike Peru, Chile, Colombia, Brazil, Mexico, Indonesia, and even Poland. This has happened in the presence of FXIs to smooth excessive volatility in the exchange rate. The inflation performance changed with the pandemic, and Paraguay was among the countries missing its inflation target. Despite this, Paraguay’s overall performance has been better than Chile, Mexico, Poland, India, and Turkey. This suggests that FXIs have been effective as a complementary tool and have not distorted the workings of within the monetary policy framework in Paraguay.



## B. Drivers of the Exchange Rate in Paraguay and the Exchange Rate Flexibility

**4. Paraguay’s economy is subject to large shocks linked to its main commodity export product, soybeans.** Increases in the soybean export index have been associated with real and nominal exchange rate appreciations, and the adjustments have been fast. Episodes of large increases in soybean prices were generally associated with appreciations of the Guarani’s both in nominal and real terms in 2006, 2007 and 2014 (see Appendix III for a historical background).



**5. Daily exchange rate volatility in Paraguay has been low as the Central Bank of Paraguay (BCP) has mitigated FX risks by intervening in the foreign exchange market.** The guarani’s daily volatility is close to that of Peru’s and Uruguay’s currencies, the two most financially dollarized

economies in the region, but it is lower than that of the other major Latin American currencies. Its daily volatility is like that of several Asian currencies (especially China's), but it is lower than the volatility of major emerging European currencies (Appendix I).

**6. The guarani's quarterly volatility is, however, higher than the volatility of all the major Latin American currencies.** Its quarterly volatility is slightly higher than the Asian currencies' volatility but almost identical to that of Emerging European currencies (Appendix I).

**7. This divergence between daily and quarterly volatilities may reflect the success of FXI in containing even larger swings in the guarani.** In this context, Paraguay is acting like other highly dollarized economies and Asian economies for which the importance of exchange rates to macro stability is heightened. Empirical evidence suggests that daily FXIs affect exchange rates very rapidly, especially on the day after the announcements of the intervention programs, but don't have much effect on expectations of inflation (Pincheira, 2013).

### C. Foreign Exchange Interventions

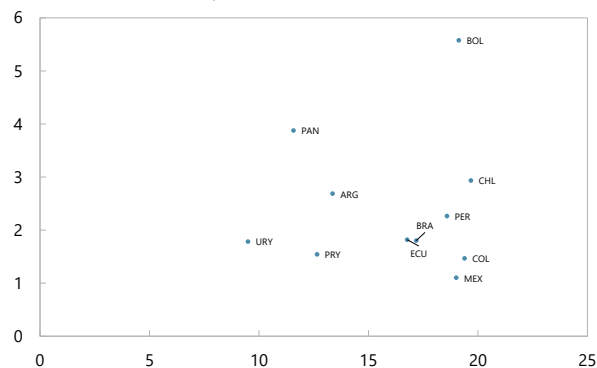
**8. Paraguay has intervened more than other Latin American countries in the region.** The quarterly change in international reserves in Paraguay (including in percent of GDP), which is used in this paper as a proxy for FXI in a cross-country perspective, is greater in Paraguay than in the major Latin American economies (Appendix I).<sup>3</sup> FXIs by the BCP under this definition have somewhat increased since the start of the pandemic (total interventions increased from US\$1.2 billion in 2019 to US\$1.7 billion in 2020 and to US\$1.5 billion in 2021). Those include complementary sales, which increased by about US\$220 million since 2020.

**9. The BCP intervenes less than Emerging European and Asian countries in relation to the size of their economies.** This trend (as a share of GDP) is observed even though Paraguay's interventions as a share of total reserves are higher than for most of the Asian countries and Poland (Appendix I).

**9. The guarani's flexibility is not more limited than in other regional EMEs.** Regional peers with higher volatility of export prices also show higher volatilities of their current accounts, except Mexico and Colombia. Paraguay is somewhat in the middle of the sample, with little evidence on guarani's inability to absorb real shocks.

**10. Paraguay's trade balance rapidly mirrors exchange rate movements, which reflects exchange rate flexibility and leads to low volatility of the external current account.** When exports fall, owing for example to bad weather or falls in commodity prices, the guarani's exchange rate

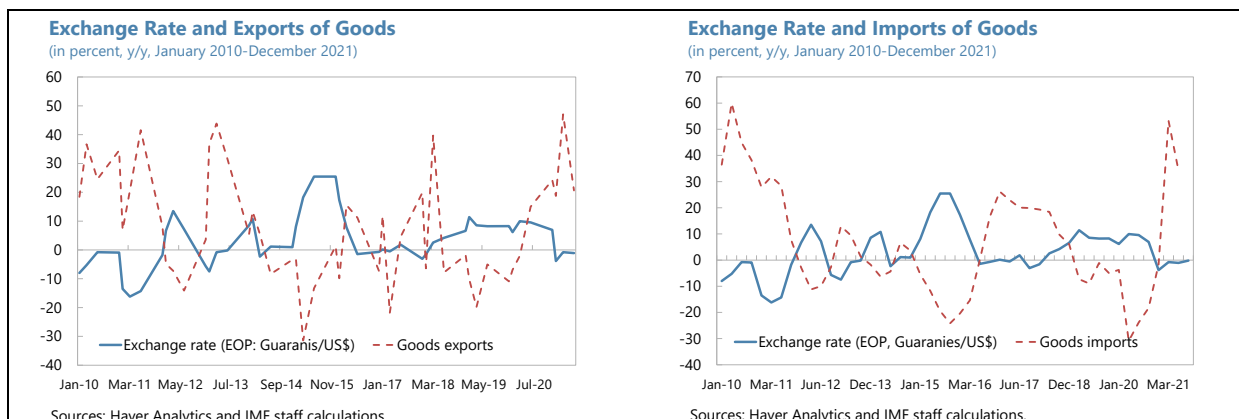
**Current Account (Y axis) and Export Price (X axis) Volatilities**  
(Standard Deviations, 2003-21)



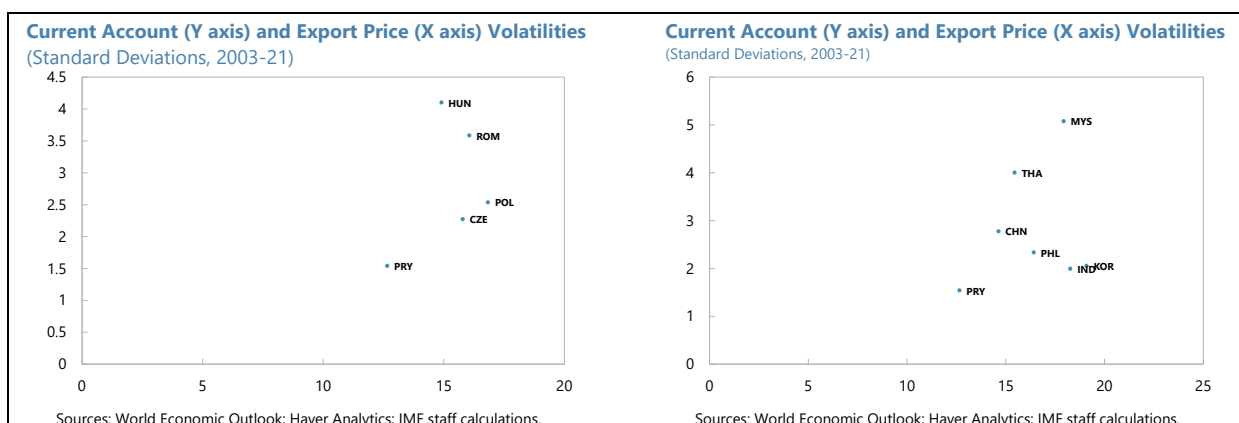
Sources: World Economic Outlook; Haver Analytics; IMF staff calculations.

<sup>3</sup> It is worth noting that this proxy has its limitations for financially dollarized countries where international reserves include reserve requirements in foreign currency that commercial banks have to constitute at the central banks as a share of their deposits in foreign currency.

depreciates, which also reduces imports. With falling exports leading to falling imports, the impact on the external current account balance is minor.



**11. Paraguay’s current account volatility is lower than that of selected emerging European and Asian and Paraguay’s export price volatility is also lower.** Measured in standard deviations of current accounts in percent of GDP, Paraguay’s lower current account volatility in the selected sample suggests that changes in its exchange rate is not significantly resisted by the BCP and implies lower FXIs relative to the size of the shocks. Having said this, the fact that Paraguay’s export value volatility is not as high as other countries in the sample should not be ignored.



## D. Inflation Targeting and Foreign Exchange Interventions

**12. The literature on inflation targeting frameworks suggests that IT countries should not (or barely) intervene in the FX market.** The inflation targeting framework implies that the monetary policy instrument, the policy rate, must be adjusted whenever the path of inflation diverges from its target. Considerations on how strong or weak the exchange rate is when inflation is outside the target range should not be embedded in the monetary policy setting as targeting the exchange rate may be at odds with targeting inflation. This notion extends the earlier concept of the impossibility of having capital mobility, a fixed exchange rate, and an independent monetary policy, the so-called “impossible trinity” (Obstfeld, Shambaugh and Taylor, 2005 and Aizenman, 2011). The exchange rate will absorb the real shocks hitting the economy, and the interest rate will simultaneously ensure the stability of output and inflation (Mishkin, 2000 and Svensson, 1999, 2000). For example, during the global financial crisis the central bank of Sweden significantly lowered policy rates, which led to currency depreciation,

improved Swedish competitiveness, and led to an increase in exports, restoring macroeconomic stability.

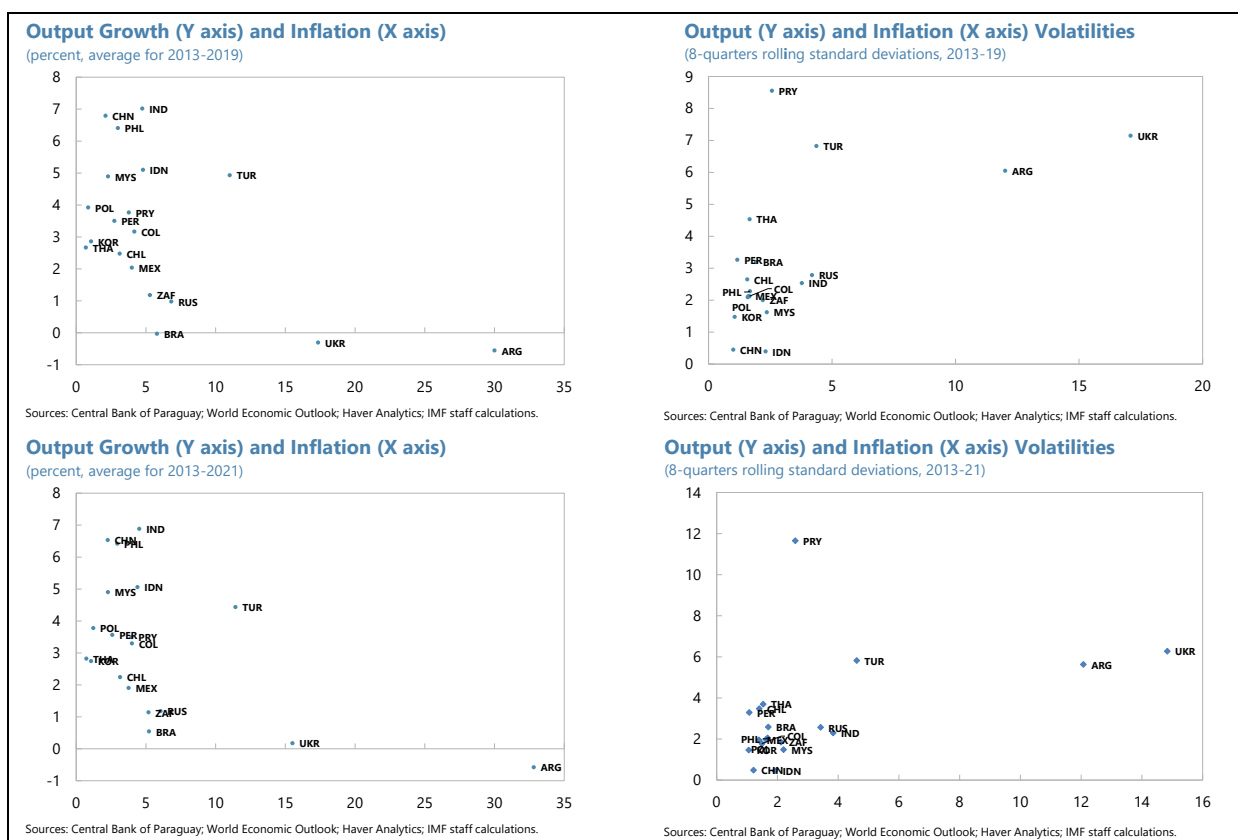
**13. Tolerating large swings in the exchange rate away from fundamentals may prove costly for EMEs.** In emerging economies, the exchange rate can play a greater role in the conduct of monetary policy, both as a tool and as a target. Thus, exchange rate channels in emerging economies with greater vulnerability to shocks, lower policy credibility, and underdeveloped domestic financial markets play an enhanced role. In the absence of a strong competitiveness channel and prevailing financial stability risks, lowering the policy rate could trigger unwanted inflation and even lead to a currency crisis. In the case of capital flow shocks to EMEs driven by global financial conditions, the necessary changes to the policy rate might be excessive, with larger adjustments in the real exchange rate compared with intervention cases. Thus, the attainment of price stability when refraining from interventions can be costly for competitiveness and lead to financial stability risks (Ostry, 2012).

**14. Choosing to intervene as part of the monetary policy response may depend on the types of shocks.** When a large depreciation is driven by a financial shock, it will lead to a surge in inflation. In the case of Paraguay in 2019, where a large source of non-real shocks was coming from Argentina, an FXI policy aimed at curbing large depreciations was a useful strategy and it was not at odds with inflation targeting and even contributed to stabilizing output and prices. The central bank could have also raised interest rates but raising interest rates might have intensified the shock and the impact on an already weak economy. Generally, in cases of demand shocks, the monetary policy response with policy rates and FXIs to curb excessive foreign exchange volatility is adequate to achieve both targets. In the case of supply shocks, exchange rate depreciation may need to be tolerated, as was seen during the pandemic. When a depreciation is a sign of a supply shock (such as oil price increases for importing countries and trading partners' recessions), it is accompanied by net export declines and domestic price increases. If it is a sign of a supply shock, then the interest rate may not be raised as much in the case of a demand shock, even if the price increase is the same magnitude, and depreciation may need to be allowed to increase exports.

**15. More recent literature has suggested that FXIs may be a useful instrument for inflation targeters.** Many EMEs inflation-targeting central banks have taken a more pragmatic stance by using FXIs and inflation targeting (Hoffman and others, 2020; Badescu, 2016; and BIS, 2013, among others). Especially after the global financial crisis (GFC), evidence has emerged that, unlike advanced countries, the EMEs have (i) greater exposure to external shocks and are less financially integrated in terms of capital mobility and asset substitutability; (ii) greater currency mismatches in domestic balance sheets and endogenous financial risks; (iii) high passthrough of the exchange rate to inflation; (iv) weaker competitiveness channel and the fear of trade contraction due to higher exchange-rate volatility; (v) limited inter-sectoral factor mobility and (vi) real (dollar invoicing of trade) frictions, making their macro stabilization more difficult. In these circumstances, the exchange rate may act as a shock amplifier rather than an absorber, and thus FXIs to curb large foreign exchange volatilities may be desirable. The empirical evidence shows that exceptional interventions may not conflict with an inflation target, and inflation expectations do not become unanchored with such interventions (Hofman and others, 2020; Kamil, 2008; and Pincheira, 2013).

## E. How Does Volatility of Economic Variables in Paraguay Compare with Other Countries?

**16. The adoption of an inflation targeting framework has served Paraguay well.** Inflation levels and volatility have decreased since the adoption of the IT regime (see also Appendix II for developments over time). Paraguay’s inflation following the framework’s adoption was lower than in Brazil, Mexico, and Colombia in the region and lower than in Indonesia and South Africa in other EMEs. Inflation volatility was higher than in the region, on average, but lower than in some other EMEs. However, we observe that Paraguay’s inflation and output performance have worsened with the pandemic, including the respective volatilities.



**17. Going forward, while public interventions are warranted to preserve macroeconomic stability, there might be a need to step up efforts to allow market participants to absorb FX risks.** The experience of the pandemic showed that FXIs by the BCP have been complementary to the monetary policy framework, but this tool may not be sufficient to resolve more recent inflationary pressures. In the future, more active monetary policy, together with allowing the private sector to absorb exchange rate risks gradually, may be needed to preserve macroeconomic stability.

## F. Conclusions

**18. The guarani’s daily exchange rate volatility has been low.** It has also been the lowest compared to other regional currencies and EMEs outside the region. By contrast, the guarani’s quarterly exchange rate volatility has been as high as the currencies of the comparator EMEs. Paraguay’s FXIs have resulted in more volatility when measured as a share of reserves compared to other countries in



the region. Still, there was less volatility when comparing them to Emerging European and Asian countries in relation to the size of their economies.

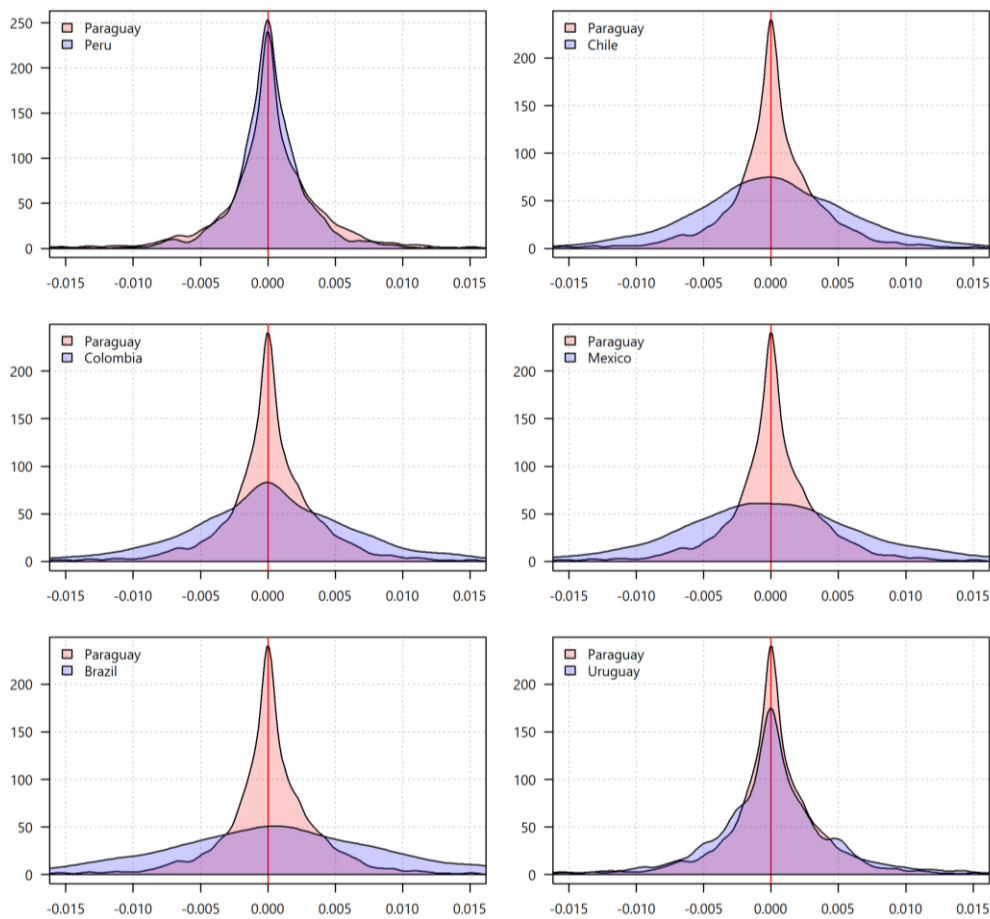
**19. Paraguay adopted a framework that takes into account the importance of exchange rate management for macroeconomic stability.** Hit by frequent regional financial shocks, Paraguay also has high financial dollarization, less developed and less integrated financial markets, and a weak competitiveness channel. Transparent and well-communicated interventions to curb excess volatility of its exchange rate have thus contributed to macroeconomic stability.

**20. The inflation targeting framework including some FXIs has been successful in Paraguay, though more recently inflation has increased sharply.** Compared to many Latin American and other EMEs, Paraguay's adherence to its inflation targets had been more successful and inflation volatility had significantly fallen over time. However, with the pandemic, the inflation performance has worsened. Limited discretionary interventions helped reduce large depreciation of the guarani and reduced excess exchange rate volatility complementing the macroeconomic stability and inflation targeting framework thus far.

## Appendix I. Daily Exchange Rate Volatility

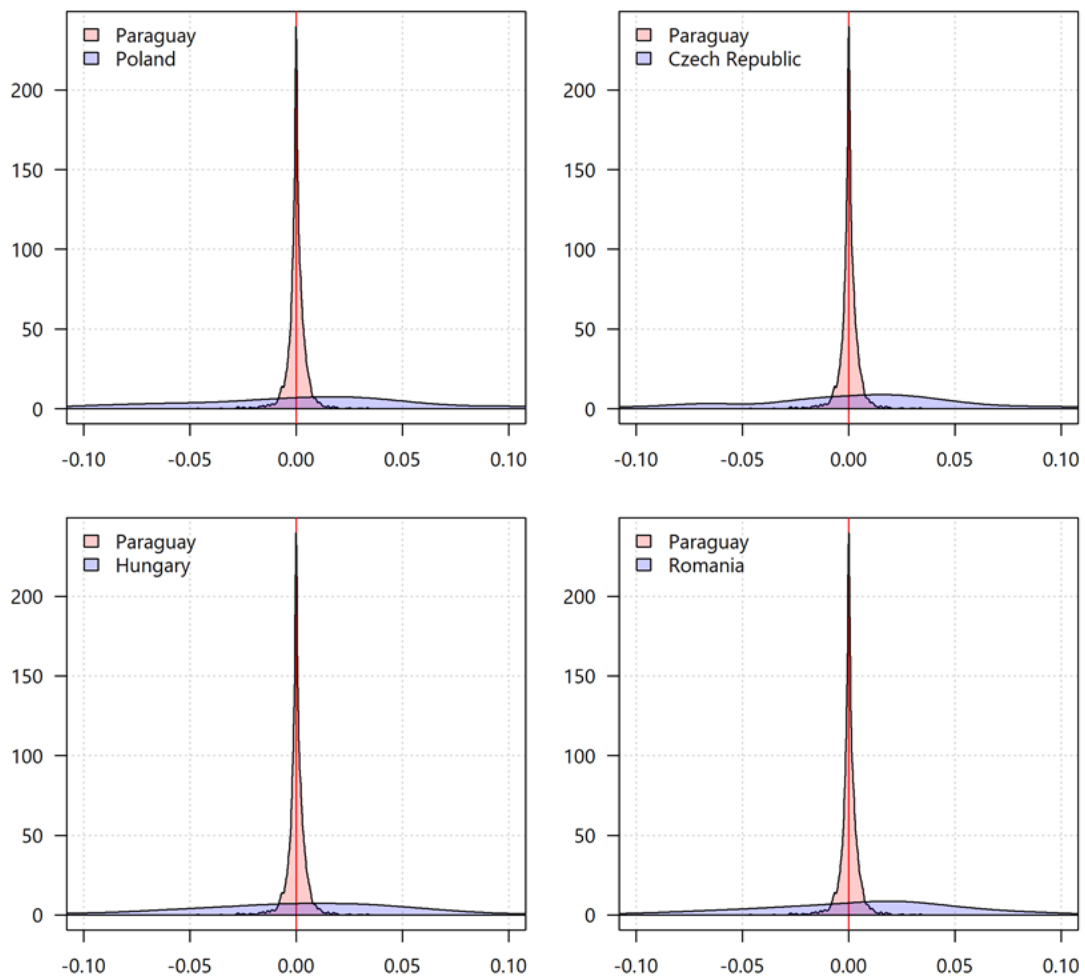
**Figure 1. Density of Exchange Rate Change vis-à-vis US Dollar**  
(2010-now Daily – Difference in logs)

*Paraguay's daily exchange rate volatilities are lower than in major EMEs in LATAM*



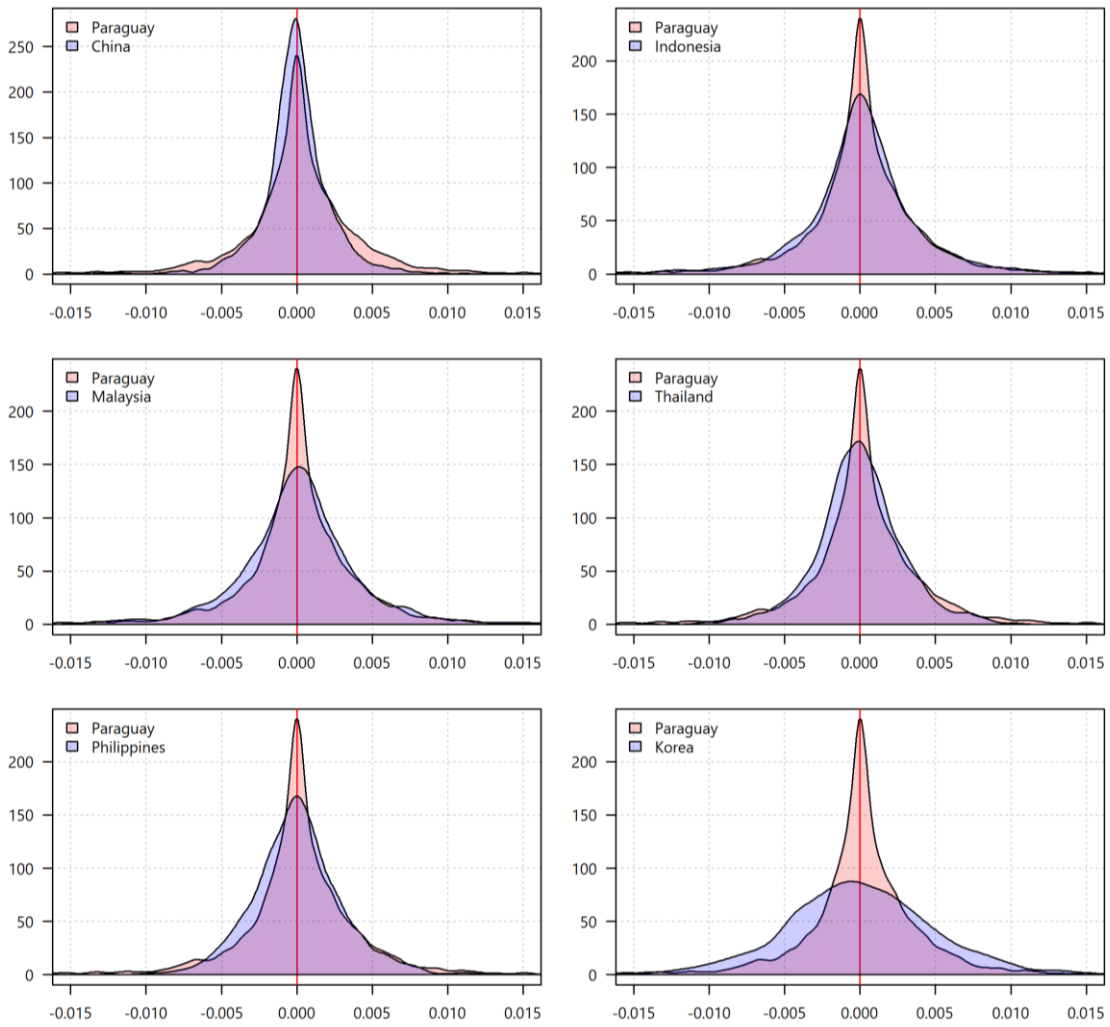
**Figure 2. Density of Exchange Rate Change vis-à-vis Euro**  
 (2010-now Daily – Difference in logs)

*Paraguay's daily exchange rate volatilities are lower than in major EMEs in Eastern Europe*



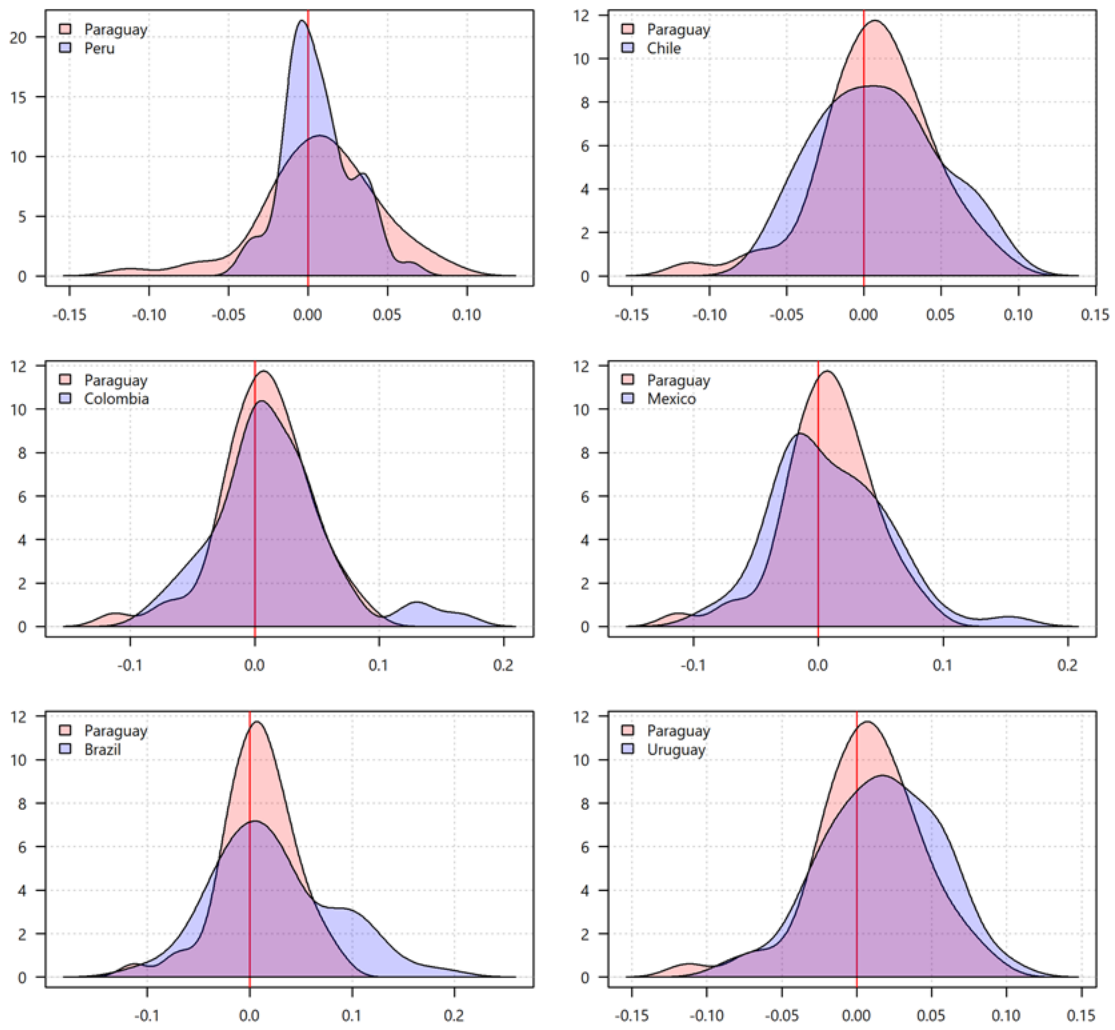
**Figure 3. Density of Exchange Rate Change vis-à-vis US Dollar**  
 (2010-now Daily – Difference in logs)

*Paraguay's daily exchange rate volatilities are lower than in major EMEs in Asia*



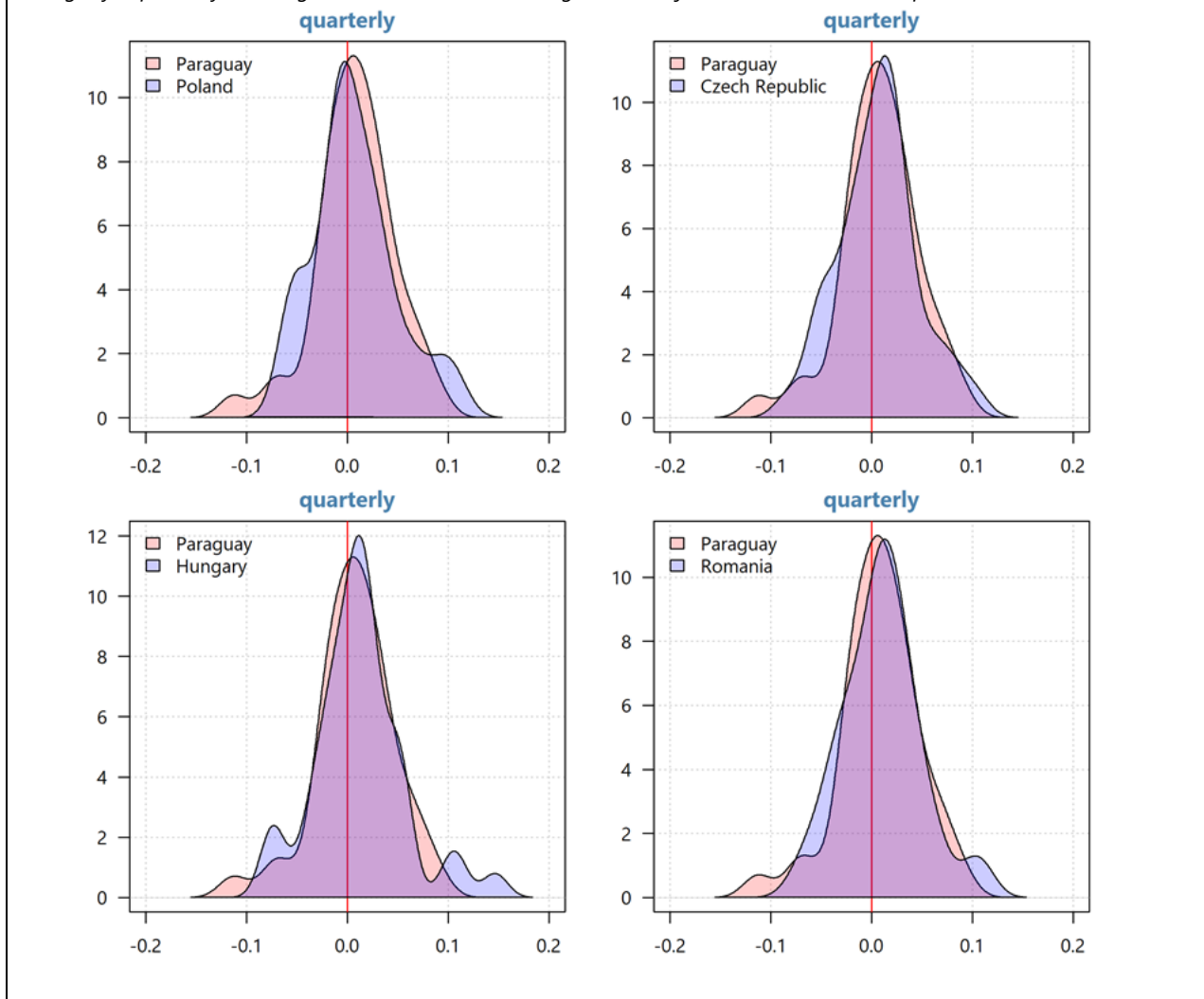
**Figure 4. Density of Exchange Rate Change vis-à-vis US Dollar**  
 (2010-now Quarterly – Difference in logs)

*Paraguay's quarterly exchange rate volatilities are as high as in major EMEs in LATAM*



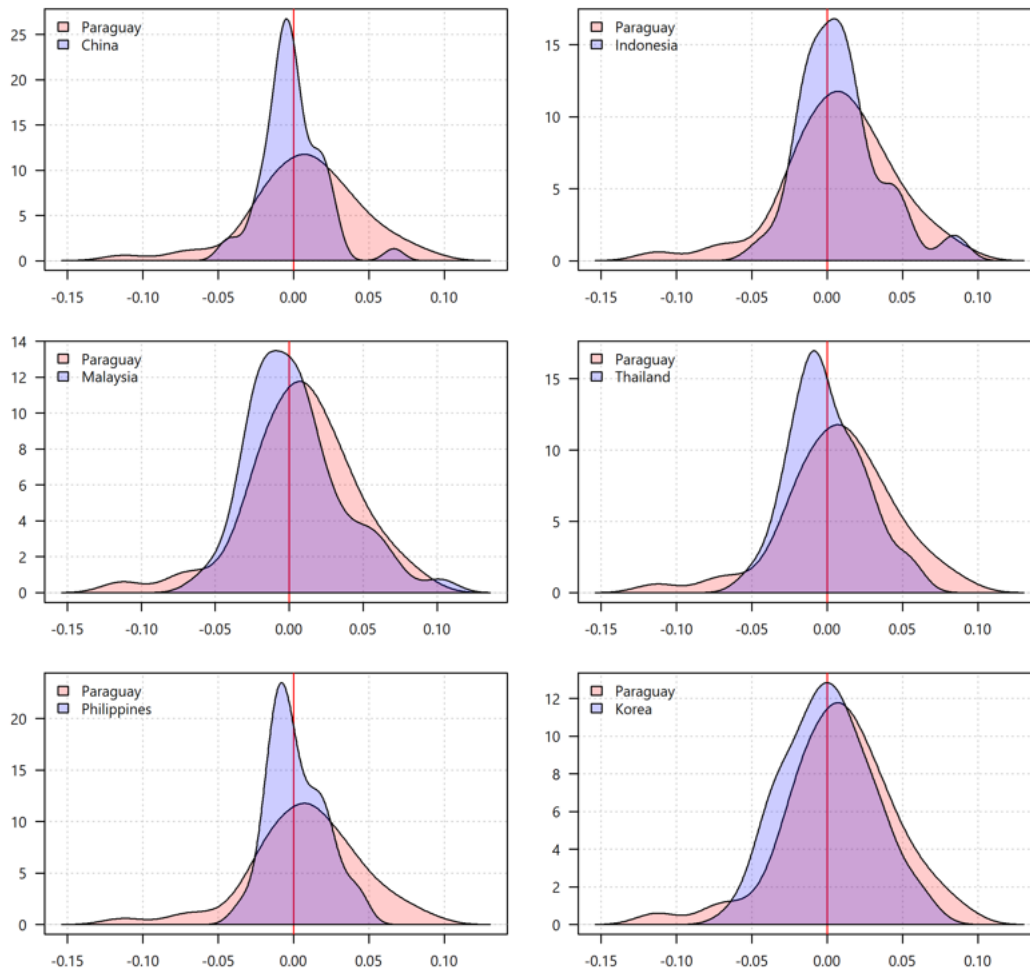
**Figure 5. Density of Exchange Rate Change vis-à-vis US Dollar**  
(2010-now Quarterly – Difference in logs)

*Paraguay's quarterly exchange rate volatilities are as high as in major EMEs in Eastern Europe (in dollar terms)*



**Figure 6. Density of Exchange Rate Change vis-à-vis US Dollar**  
(2010-now Quarterly – Difference in logs)

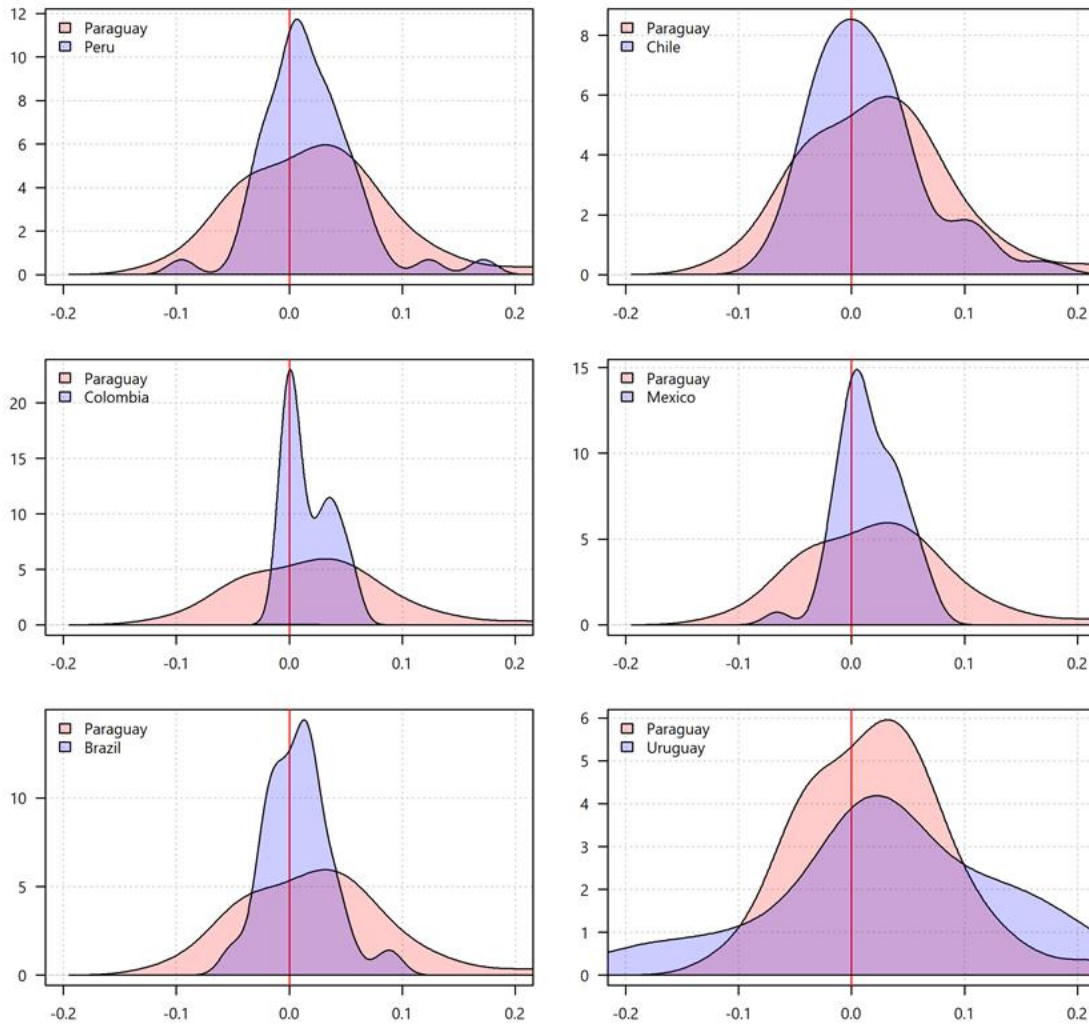
*Paraguay's quarterly exchange rate volatilities are as high as in major EMEs in Asia*



**Figure 7. Density of Quarterly Changes of Foreign Reserves: Paraguay Against Selected WHD Countries**

(2010-now, Difference in logs)

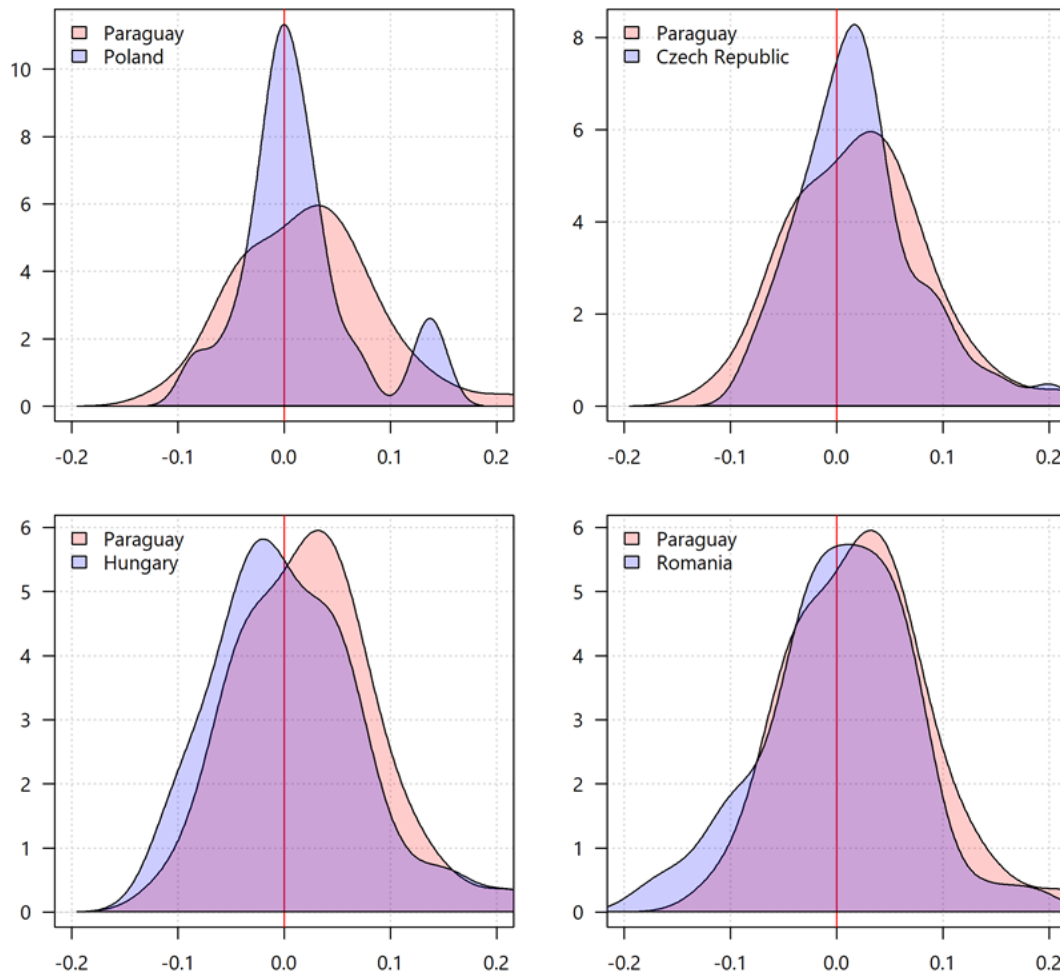
*Paraguay intervenes more than other Latin American countries.*





**Figure 8. Density of Quarterly Changes of Foreign Reserves: Paraguay Against Selected European Countries**  
 (2010-now – Difference in logs)

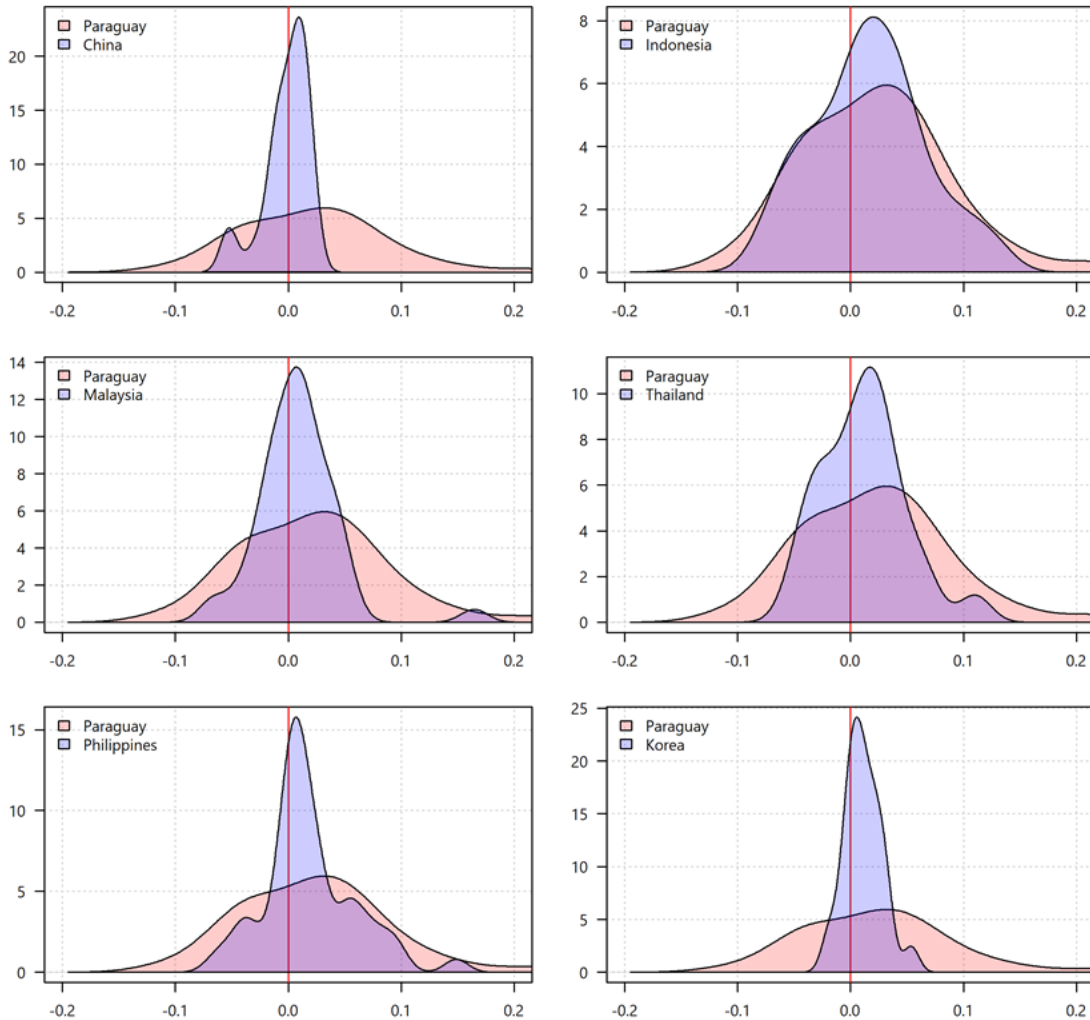
*Paraguay intervenes slightly less than Eastern European countries.*



**Figure 9. Density of Quarterly Changes of Foreign Reserves: Paraguay Against Selected Asian Countries**

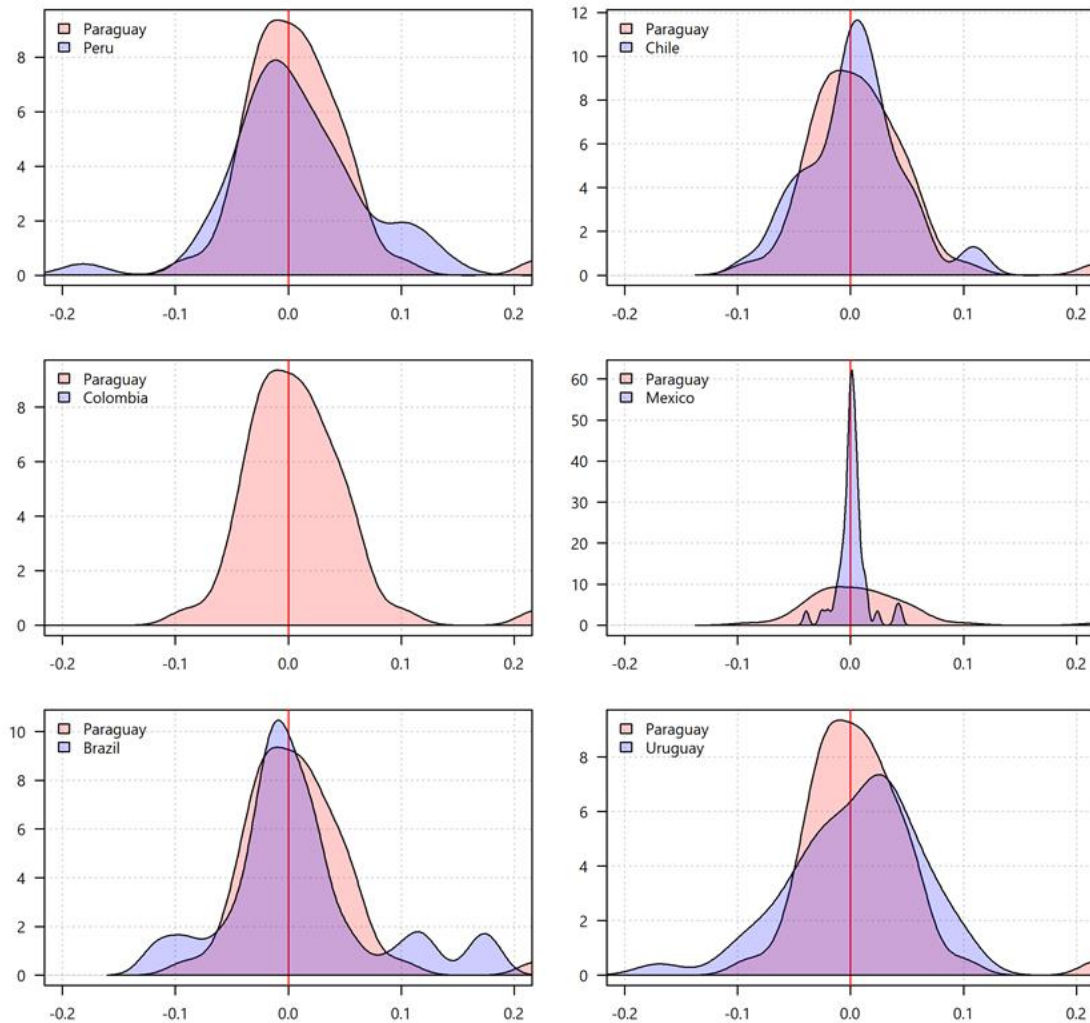
(2010-now – Difference in logs)

*The picture is mixed when comparing to Asian countries except China*



**Figure 10. Density of Quarterly Changes of Foreign Reserves: Paraguay Against Selected WHD Countries**  
(Differences in percent of GDP)

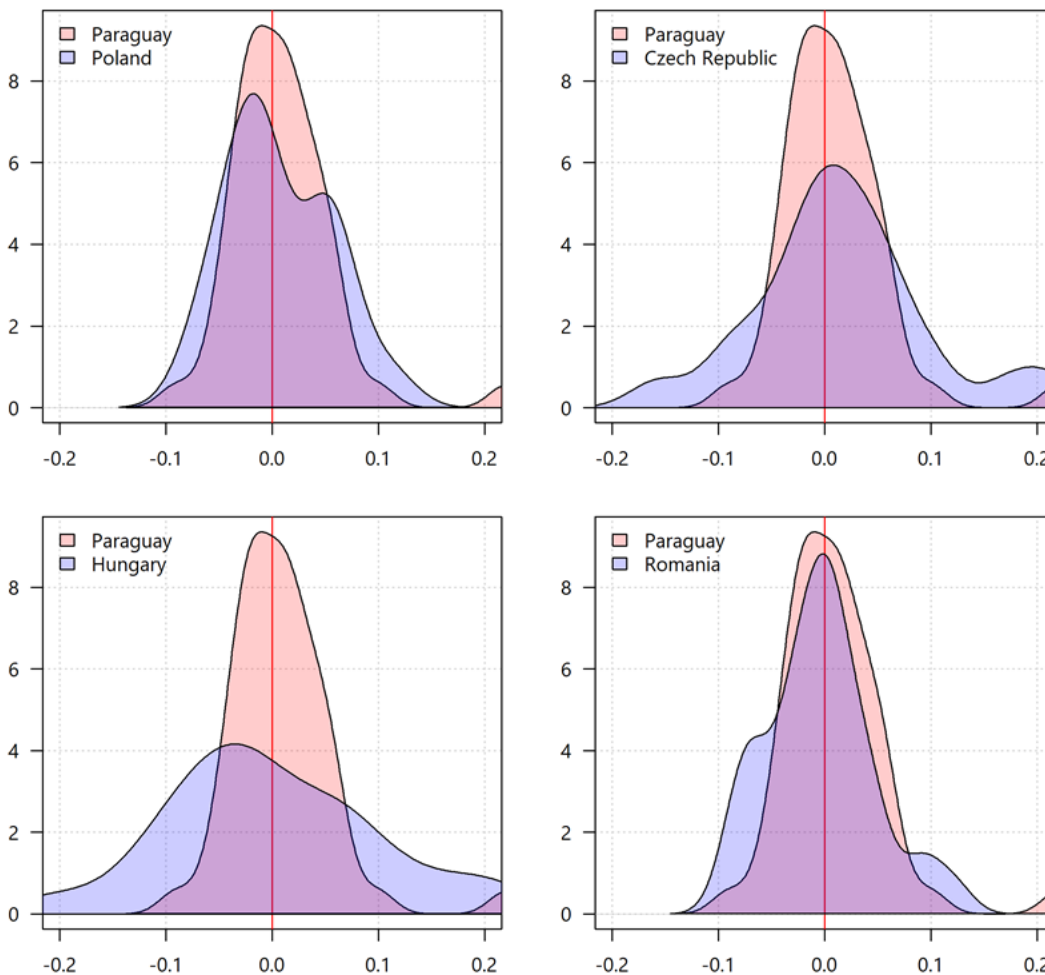
*Paraguay intervenes more than other Latin American countries measured by the size of the economies.*



**Figure 11. Density of Quarterly Changes of Foreign Reserves: Paraguay Against Selected European Countries**

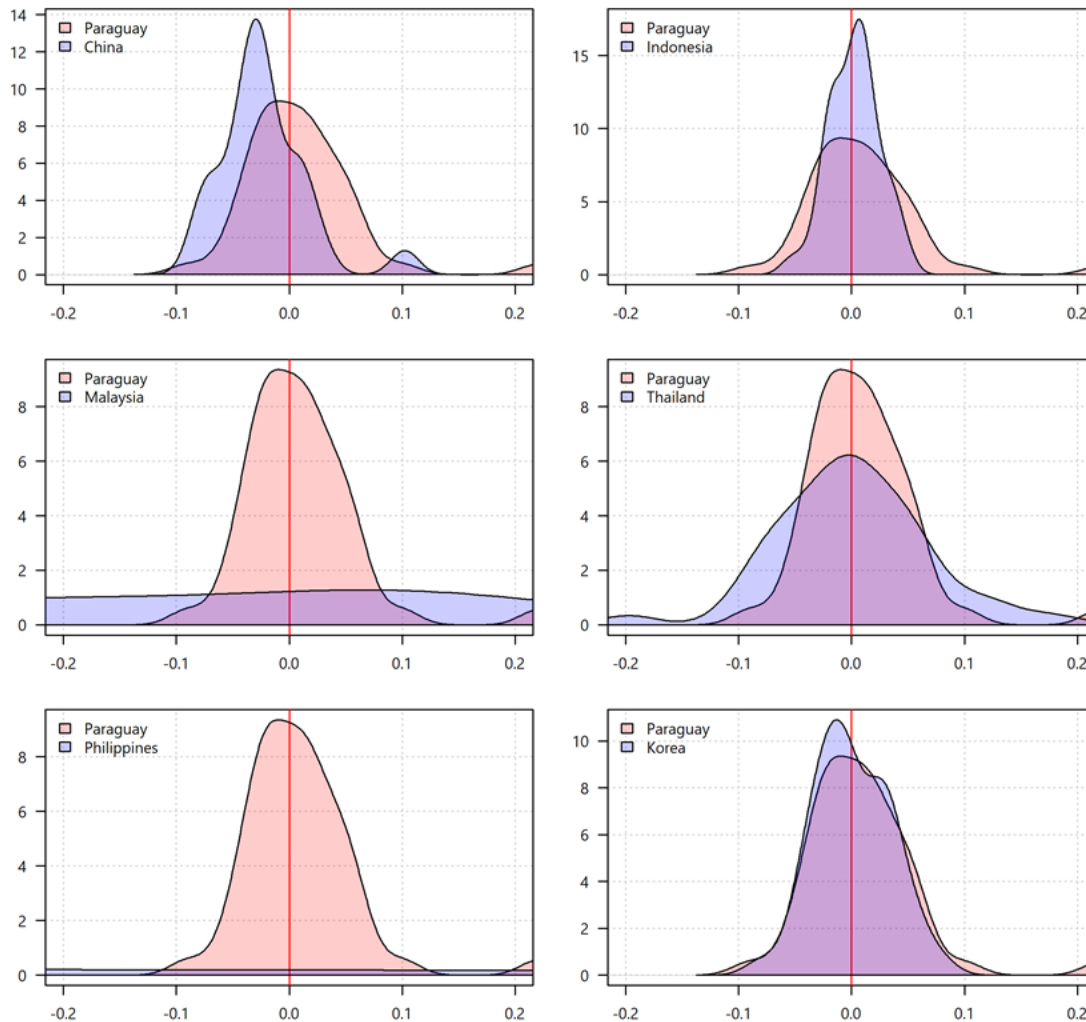
(Differences in percent of GDP)

*Paraguay interventions are only slightly different from major Eastern European countries measured by the size of the economies.*



**Figure 12. Density of Quarterly Changes of Foreign Reserves: Paraguay Against Selected Asian Countries**  
(Differences in percent of GDP)

*The picture is mixed when comparing Paraguay's interventions with other major Asian economies measured by the size of the economies.*

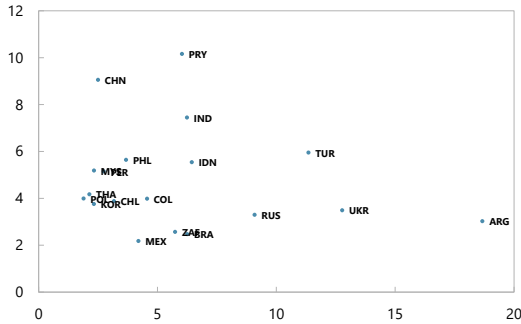


## Appendix II. Output and Inflation Volatilities: Paraguay Versus Other EMEs

**Figure 1. Output Volatility is Higher in Paraguay Compared to Other EMEs**

**Output Growth (Y axis) and Inflation (X axis)**

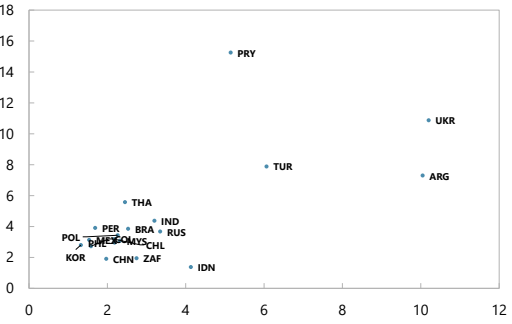
(percent, average for 2002-2019)



Sources: Central Bank of Paraguay; World Economic Outlook; Haver Analytics; IMF staff calculations.

**Output (Y axis) and Inflation (X axis) Volatilities**

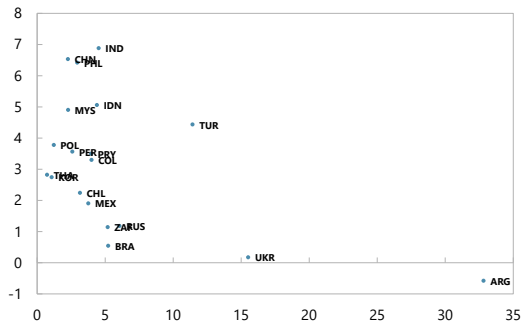
(8-quarters rolling standard deviations, 2002-19)



Sources: Central Bank of Paraguay; World Economic Outlook; Haver Analytics; IMF staff calculations.

**Output Growth (Y axis) and Inflation (X axis)**

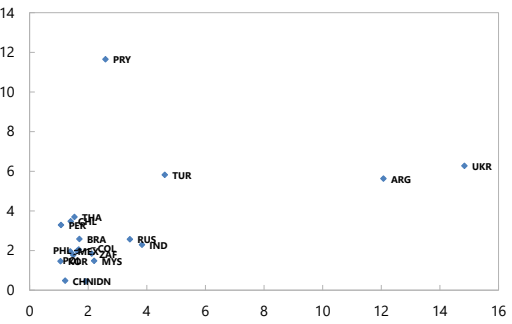
(percent, average for 2013-2021)



Sources: Central Bank of Paraguay; World Economic Outlook; Haver Analytics; IMF staff calculations.

**Output (Y axis) and Inflation (X axis) Volatilities**

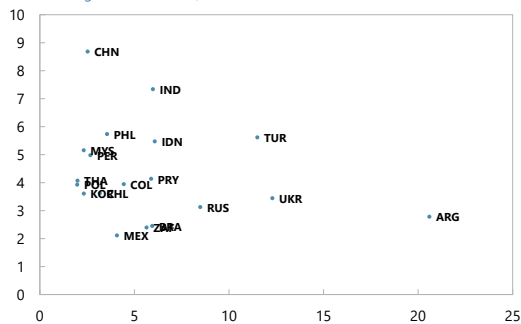
(8-quarters rolling standard deviations, 2013-21)



Sources: Central Bank of Paraguay; World Economic Outlook; Haver Analytics; IMF staff calculations.

**Output Growth (Y axis) and Inflation (X axis)**

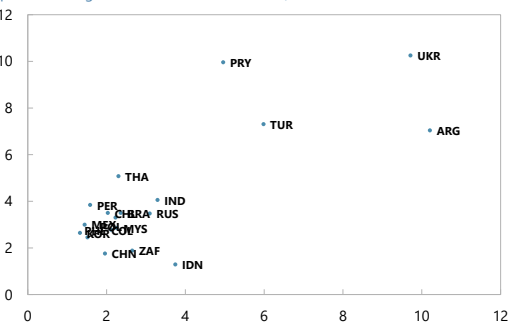
(percent, average for 2002-2021)



Sources: Central Bank of Paraguay; World Economic Outlook; Haver Analytics; IMF staff calculations.

**Output (Y axis) and Inflation (X axis) Volatilities**

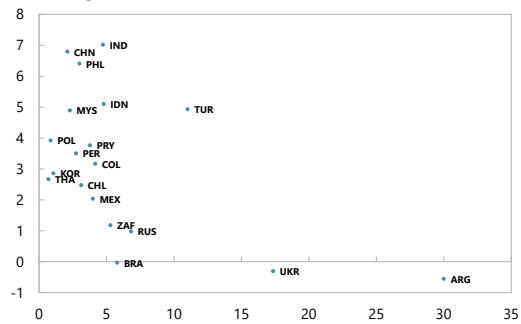
(8-quarters rolling standard deviations, 2002-21)



Sources: Central Bank of Paraguay; World Economic Outlook; Haver Analytics; IMF staff calculations.

**Output Growth (Y axis) and Inflation (X axis)**

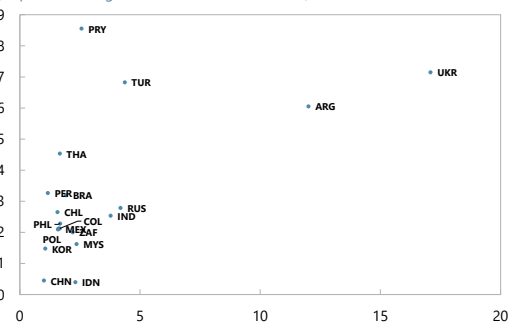
(percent, average for 2013-2019)



Sources: Central Bank of Paraguay; World Economic Outlook; Haver Analytics; IMF staff calculations.

**Output (Y axis) and Inflation (X axis) Volatilities**

(8-quarters rolling standard deviations, 2013-19)

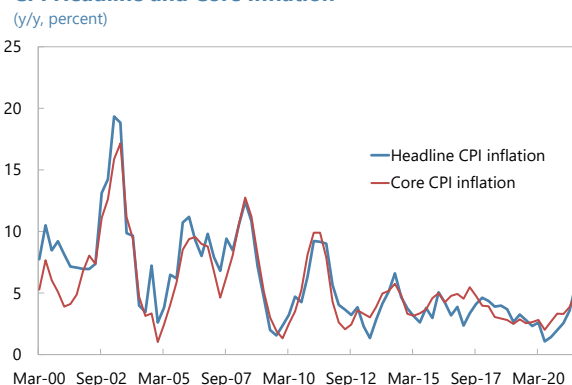


Sources: Central Bank of Paraguay; World Economic Outlook; Haver Analytics; IMF staff calculations.

## Appendix III. Overview Of Interventions in Paraguay Until the IT Regime in 2013

**1. Until 2001, Paraguay maintained an adjustable exchange rate peg regime and monetary policy used the exchange rate as an anchor.** This helped reduce inflation from about 40 percent in the 1990s to single digits in the mid-2000s. However, the widening public sector deficits led to a progressive loss of international reserves and to a higher frequency of exchange rate adjustments. With financial sector challenges and a run-on deposit associated with the closure of Banco Aleman, low levels of international reserves forced the authorities to combat inflationary pressures with rising interest rates while letting the exchange rate move. However, the BCP tried to intervene frequently to stem rapid depreciation of the Guarani.

**CPI Headline and Core Inflation**



Sources: Central Bank of Paraguay.

**2. After the abandonment of the crawling exchange rate regime in 2001, Paraguay was left without a clear monetary policy framework and intervened frequently.** The guarani depreciated by 34 percent during 2002, but in real effective terms the depreciation was only 2 percent due to declines in the Argentine peso and the Brazilian real. FXIs totaled US\$186 million in 2002. During 2003, the guaraní appreciated by 13 percent against the U.S. dollar and some reduction in the financial dollarization ratios from the high 80s to the mid-60s was registered. The ambiguity in the monetary policy objectives continued however in 2003 as the authorities were reluctant to abandon the de facto exchange rate targeting. Generally during this period, the banking system in Paraguay was also struggling with liquidity management as interventions have not been fully sterilized and were frequently used as liquidity management tools.<sup>1</sup>

**3. Through 2007, and further until 2011, the BCP accumulated international reserves despite the guarani's continued appreciation.** Improvements in the external position and the BCP's purchases of surplus foreign exchange from the binational hydroelectric plants led to an increase in international reserves of US\$400 million in 2006, despite an 18 percent appreciation of the guaraní. By end-2007, reserves reached a record level of about US\$2.4 billion. As interventions were only sterilized in part, currency growth also rose to double digits in 2007, creating a liquidity overhang. In 2011, the guarani appreciated by 10 percent (13 percent in real effective terms) compared to 2010 despite BCP's continued purchase of US dollars. The appreciation reflected mainly improved terms of trade, seasonal liquidation of export proceeds, and increased private capital inflows, especially FDI.

<sup>1</sup> The 2011 FSSR highlighted that the CBP frequently relied on exchange rate interventions to inject or withdraw liquidity, signaling targeting the exchange rate.

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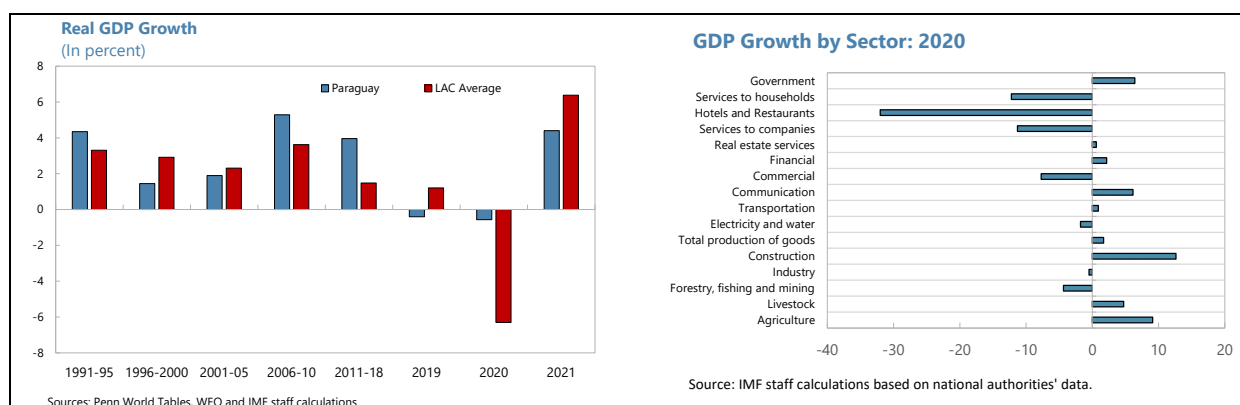


# EFFECTIVENESS OF SOCIAL ASSISTANCE PROGRAMS IN PARAGUAY DURING COVID-19 TIMES<sup>1</sup>

*Paraguay's social assistance programs were useful to mitigate the impacts of the COVID-19 pandemic shock on the vulnerable population. Among other measures, the country deployed a novel cash transfer program, "Pytyvõ," which targeted informal sector workers affected by the shock. Our analysis shows that it effectively prevented a larger erosion of poverty and inequality indicators. However, the results also show important opportunities to enhance the targeting strategy. The Pytyvõ program experience provides lessons on the benefit deployment in a timely matter and highlights the need for more efficient methods, such as implementing a beneficiary system that could be extended to existing or new social assistance programs.*

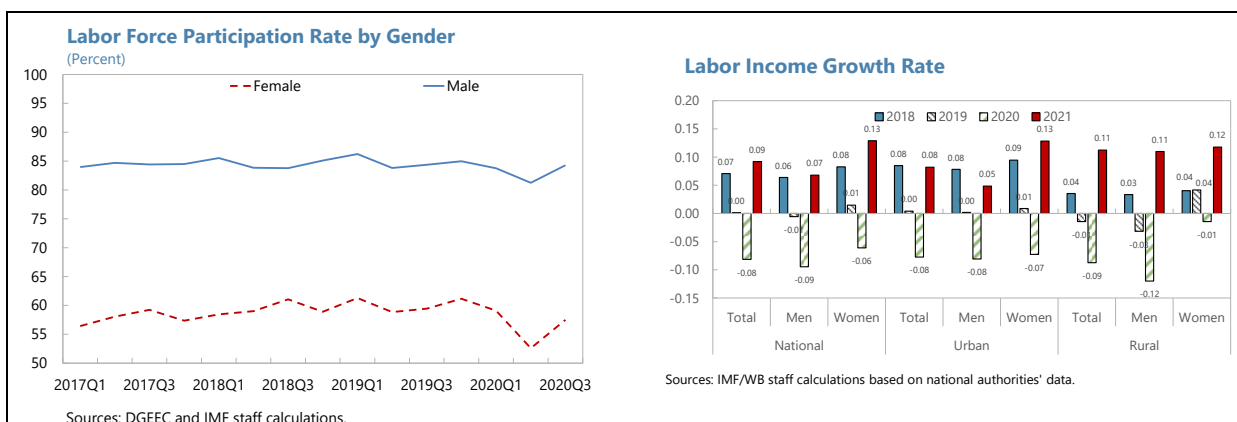
## A. Some Stylized Facts

**1. Paraguay's economy was hit hard by the COVID-19 pandemic in 2020.** While the aggregate contraction of the economy (at about -0.8 percent) was less severe than most countries in the region (LAC average contraction was about 6 percent), some sectors were disproportionately affected, such as hotels, services to households, and commerce services. The government's initial measures of mobility restrictions and lockdowns affected tourism and trade in the services sector limiting production in these sectors.

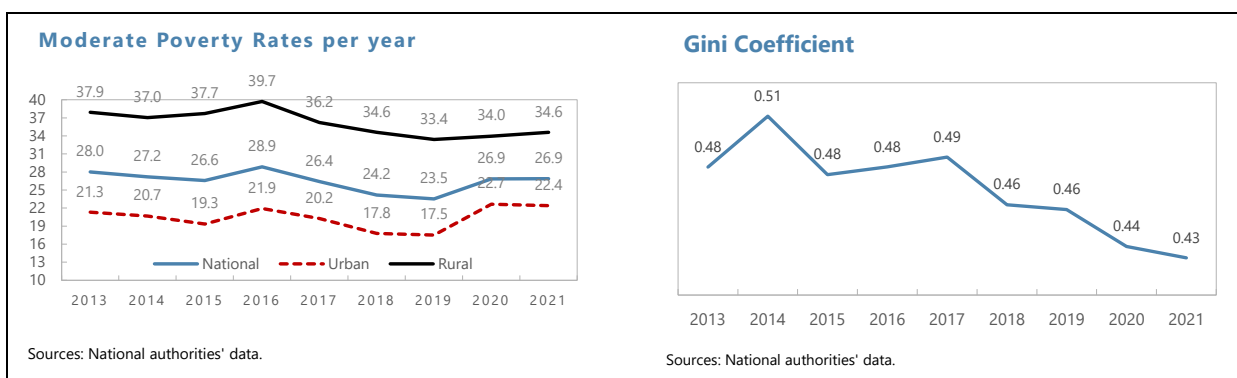


**2. Not surprisingly, lockdown measures and sluggish global economic activity negatively affected the labor market dynamics.** Labor force participation and employment shrank in 2020, while labor income levels fell across different sub-groups. The shock affected women disproportionately, as they moved more intensively to unemployment or inactivity, largely explained by the role of women in household care with children, elderly and sick members. As a result, the changes in labor income seemed higher for men.

<sup>1</sup> This analysis was prepared in collaboration with the Gustavo Canavire-Bacarreza (World Bank) and Fernando Rios-Avila (The Levy Economics Institute of Bard College).

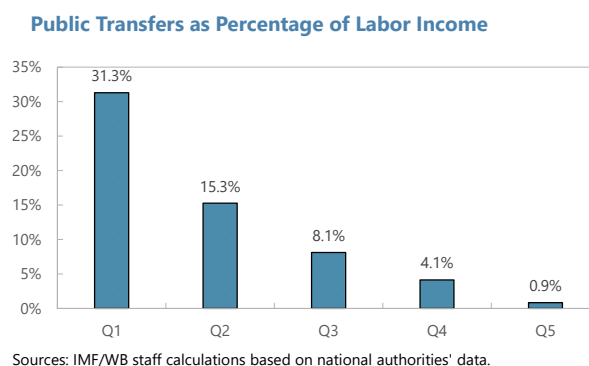


**3. Less favorable labor conditions led poverty indicators to retract some of the progress seen in previous years.** Paraguay showed significant declines in poverty rates since the beginning of the century, only slowing down after 2014. However, the Covid-19 pandemic reverted this trend, especially in urban areas where poverty increased significantly. This is partly explained by the behavior of labor incomes for urban workers, who were affected by harsher mobility restrictions and the consequent rapid decline in economic activity. Rural workers saw a slight increase in poverty rates in part explained by the behavior of the agricultural sector but also by the compensation they received through the transfer programs deployed by the government, which accounts for a larger share of rural labor incomes compared to the urban ones. At the same time, inequality continued to reduce during the pandemic, mostly due to a shift to less favorable conditions across the income distribution.



## B. Social Programs in Paraguay in Response to COVID-19

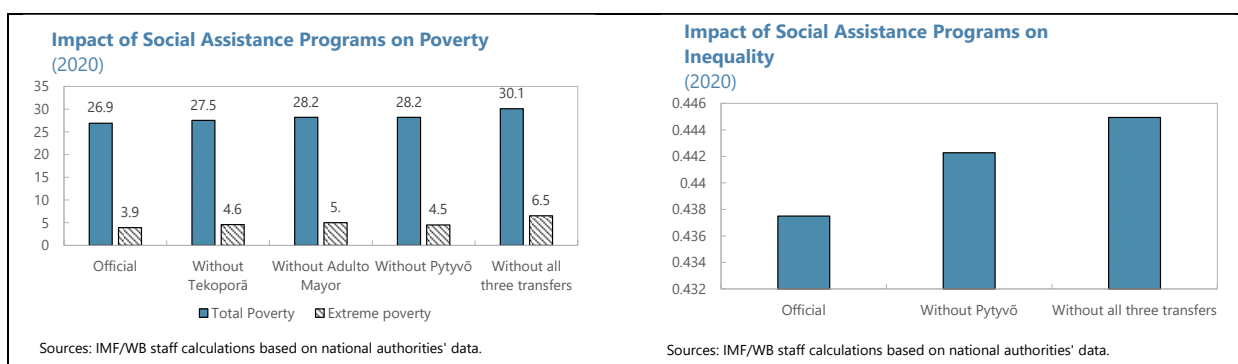
**4. The rapid implementation of new social assistance programs helped reduce the pandemic's large social cost on the most vulnerable.** As the health emergency developed, the government implemented an extensive program to reach households more vulnerable to the labor income shock. The most extended program, Pytyvõ, was implemented in mid-2020 and designed as a cash transfer for informal sector workers who lost their job. The first version of Pytyvõ was financed with 195 US million and distributed benefits to about 18 percent of the population.



Each beneficiary received 548 thousand guaranías (about 80 US dollars at the average 2020 exchange rate). Public cash transfers were important for those in the lowest part of the income distribution. They represented a large share of total income for those in the two lowest quintiles of the distribution (31.3 and 15.3 percent for the first and second quintiles, respectively), while they were not much significant for individuals in the upper part of the distribution (less than 1 percent for those in the fifth quintile).

### 5. Paraguay's public social assistance programs also prevented a higher erosion of poverty and inequality indicators due to the pandemic.

Pytyvõ and other already implemented social assistance programs effectively reduced the pandemic's impact on moderate and extreme poverty rates. Without Tekoporã (a social program for school-age kids, pregnant women, people with disabilities, and indigenous communities in poverty conditions), Adulto Mayor (a program for the elderly), and Pytyvõ, moderate and extreme poverty rates would have been reached 30.1 and 6.4 percent, respectively. That would have represented more than 60 percent more individuals in extreme poverty than the officially estimated figure for 2020. Concerning inequality, the impact of social programs was not that significant in absolute magnitude but still helped to contain a deterioration of the Gini coefficient. Pytyvõ and the other public social programs deterred inequality from reaching higher levels.



**6. Targeting informal sector workers to receive the program's benefits Pytyvõ was broadly adequate.** We analyzed the probability of receiving the Pytyvõ transfer for those individuals whose relative position in the income distribution shifted one or two quintiles (to the right or the left of the distribution) between 2019 and 2020. The results in table 1 show that among people with a job in 2019, the marginal effects on the probability of receiving Pytyvõ or Ñangareko assistance for those individuals who shifted one or two quintiles to the lowest part of the distribution are positive and significant (i.e., the probability of receiving Pytyvõ was higher for those individuals whose income was negatively affected during the pandemic). On the other hand, the marginal effect on the probability of receiving the transfer is not statistically different from zero for those whose income situation improved during the pandemic.

**Table 1. Marginal Effect on the Probability of Receiving Public Transfers In 2020**

Individuals whose income moved:	Total	Male	Female
2 quintiles to the left	0.114*** (0.0365)	0.0858* (0.0456)	0.168*** (0.0598)
1 quintile to the left	0.0652*** (0.0246)	0.0749** (0.0329)	0.0517 (0.0371)
No change	0	0	0
1 quintile to the right	0.0221 (0.0257)	0.0176 (0.0331)	0.0299 (0.0401)
2 quintiles to the right	0.0392 (0.0454)	0.0680 (0.0595)	-0.00367 (0.0696)

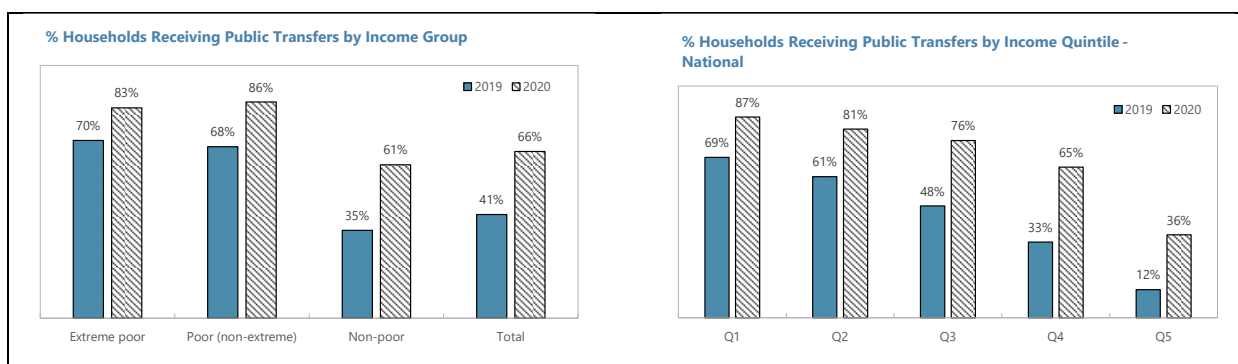
We report marginal effects on the probability of receiving public transfers in 2020.

The shifts from one quintile to another are computed by comparing the individual's relative position of the individual in the income distribution between 2019 and 2020.

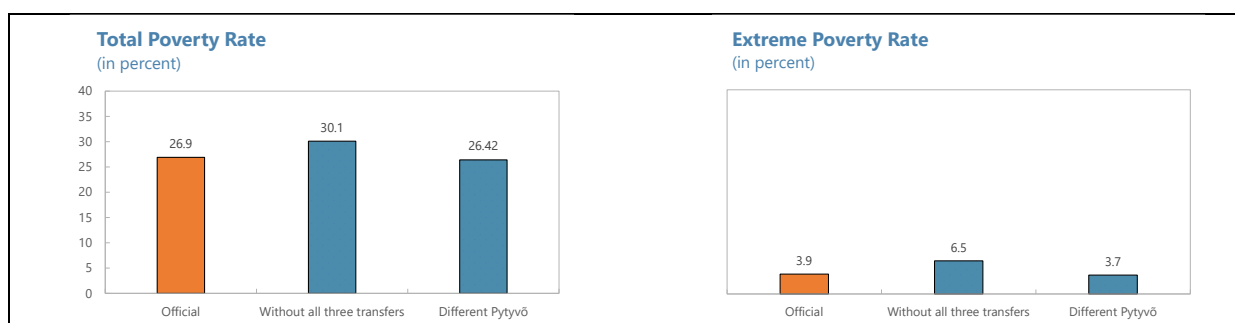
Standard deviation in parentheses.

Results were obtained using the panel dimension of household surveys (a subset of the total sample), and conditioning on people being employed in 2019.

**7. While the design of the Pytyvõ program allowed to reach a segment of the most vulnerable population by targeting informal sector workers, such a strategy could be fine-tuned. Broadly, Pytyvõ's resources benefited vulnerable households.** However, a non-negligible share was also assigned to non-poor and richer segments. Those conclusions are supported by comparing the share of households receiving public transfers in 2019 versus the share of households that received benefits in 2020. The participation of the latter group increased not only for the lowest quintiles and poor households but also for the highest-income and non-poor households.



**8. An optimized system of beneficiaries would help protect the most vulnerable households more efficiently.** The previous results suggest that there is scope to reallocate resources to households in the lowest part of the income distribution. To assess the potential gains of such a strategy, we calculate the impact of transferring the resources received by the fifth quintile of the distribution (the richest segment) across the beneficiaries of the four lower quintiles. The results of this simulation exercise (see charts below) show that both inequality and poverty indicators would be lower if a "different Pytyvõ" scheme had been used.

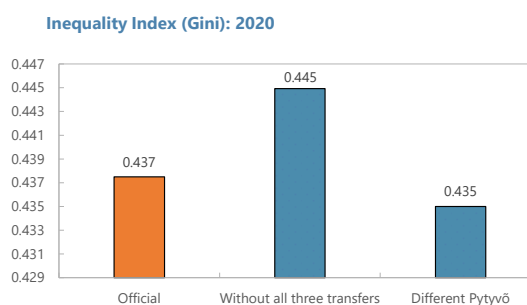


## C. Remarks and Policy Implications

**9. Social assistance programs can help reduce the impact of labor income shocks and protect the most vulnerable sectors from below-the-poverty line living conditions.** The program Pytyvõ, successfully implemented by the government in 2020 in response to the COVID-19 shock, effectively protected the most vulnerable segments of the population from falling below non-poverty income levels.

**10. The experience of the program Pytyvõ offers an opportunity to enhance the implementation of targeted social programs in Paraguay.** An optimized implementation of a system of beneficiaries should be prioritized to implement similar programs in the future or adjust the existing ones. This could be reached by modernizing processes for data management, targeting, application, and payment.

**11. In view of recurrent climate-related shocks and uncertain geopolitical situations affecting external prices and markets, optimizing the design of social assistance programs is key to optimizing fiscal resources' use while preserving social and economic stability.**



Sources: IMF/WB staff calculations based on national authorities' data.