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Exchange Rate Pass-Through to Inflation: Empirical Analysis for Southeast European Countries

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Abstract

The aim of this research article is to analyze the Exchange Rate Pass-Through (ERPT) and consumer prices for the case of Southeast Europe, considering eight transition economies. Monetary systems alongside trade openness of these economies are essential factors for macroeconomic stability. Therefore, this study utilizes a balanced panel dataset covering two decades and adopting a Fixed Effects econometric framework through which the effects of exchange rate fluctuations, real economic growth, and trade integration on the Consumer Price Index (CPI) are estimated. Also, diagnostic assessments, such as Multicollinearity and Panel Unit Root analyses are performed to ensure the consistency and efficiency of the model. The results indicate a significant correlation between delayed exchange rate fluctuations and inflation, further intensified by the structural reliance of these countries on international trade. Trade openness serves as a primary driver of external price shocks, indicating that inflation in the Western Balkans is predominantly an imported occurrence. The paper concludes with policy recommendations for regional central banks, highlighting the necessity for proactive monetary initiatives to alleviate the lagged impacts of currency fluctuation on consumer purchasing power.

Keywords: Exchange Rate Pass-Through, Consumer Price Index (CPI), Trade Openness, Imported Inflation, Monetary Policy.

Introduction

Inflation is the core macroeconomic indicator that shows the health of an economy. However, all economies and especially the small open economies, are often threatened by external factors (Capraru & Ihnatov, 2011; Pham Thi Tuyet Trinh & Nhan, 2023; Garrón et al., 2026). Thus, the motivation for this research was by the fact that small economies of Southeast Europe are becoming increasingly connected to global markets and they deeply depend on imports for many commodities, like energy and many other items. In this regard, the exchange rate does more than just show how much a currency is worth. It also plays a significant role in how foreign price changes affect the economy at home. As a result, Central banks need to understand Exchange Rate Pass-Through (ERPT) to make sound monetary policies and protect the purchasing power for the consumers.

The main problem that this study tries to reveal is how sensitive the prices are to changes in the value of the currency for the case of Southeast European countries. Different monetary systems set these countries apart. For example, Albania uses a freely floating exchange rate regime, Serbia a managed floating exchange rate regime, while Bosnia and Herzegovina operate under a currency board arrangement, with a strict fixed exchange rate regime and North Macedonia maintain a pegged (stabilized) exchange rate regime. At the other side, Montenegro and Kosovo have adopted the euro all on their own. Even though they are different, they are all built the same way. All these economies depend highly on imports (Sadiku et al., 2018). When the value of the local currency depreciates, the prices of foreign goods rise. It's important to know how long this process takes and how much of this cost is "passed through" to the end customer. By measuring this transfer, we can find out if inflation in the area is a local problem or a result of changes in the value of the world currency that can't be stopped. This study intends to give a full economic estimate of ERPT for the sampled economies. We also look at three other important indicators besides the Consumer Price Index (CPI), such as trade openness, reflecting to the integration to the world economy, Real GDP Growth (GDPG), which shows how much demand has changed, and the Official Exchange Rate (EXR).

Literature Review

Scholars discuss the exchange rate pass-through based on the "Law of One Price," which says that in a perfect market, the price of a good should be the same in every country when it is reflected in a single currency. But empirical study shows over

and over that this transmission is rarely full. Burstein et al. (2005) says that the main reasons ERPT is generally partial are fixed local prices and distribution costs that can't be traded. Because of this possible leakage, importers often have to deal with sudden changes in the value of the dollar in order to keep their market share. This is called "pricing-to-market" (Hahn, 2003).

Research also shows that emerging markets are more likely to be affected by changes in the value of the dollar than developed economies. In this viewpoint, Takatoshi & Kiyotaka (2007) emphasize that ERPT is always good and important for emerging economies. Ghosh (2013) at the other side, found that small countries are much more vulnerable. Comunale and Kunovac (2017) claim that in Central and Eastern Europe, inflation closely follows the exchange rate. This similarity between regions is important for our study because it shows that the Southeast European countries cluster is a separate economic unit with shared inflationary traits.

One of the most important aspects is the role of trade integration. An earlier study of McCarthy (1999) empirically has found that the pass-through is somewhat stronger in countries with a larger import share. Campa and Goldberg (2005) says that "import prices channel" is the main way that inflation gets passed on. They say that the amount of the pass-through depends on how much GDP is made up of goods. This is very relevant to our study because trade openness is a pretty good indicator of CPI levels.

The most recent empirical literature of Exchange Rate Pass-Through (ERPT) and its effects on inflation provides mixed results depending on the econometric framework used. For instance, Shah and Garg (2026) find that pricing strategies and economic shocks seriously shape exchange rate pass-through.

Research Methodology

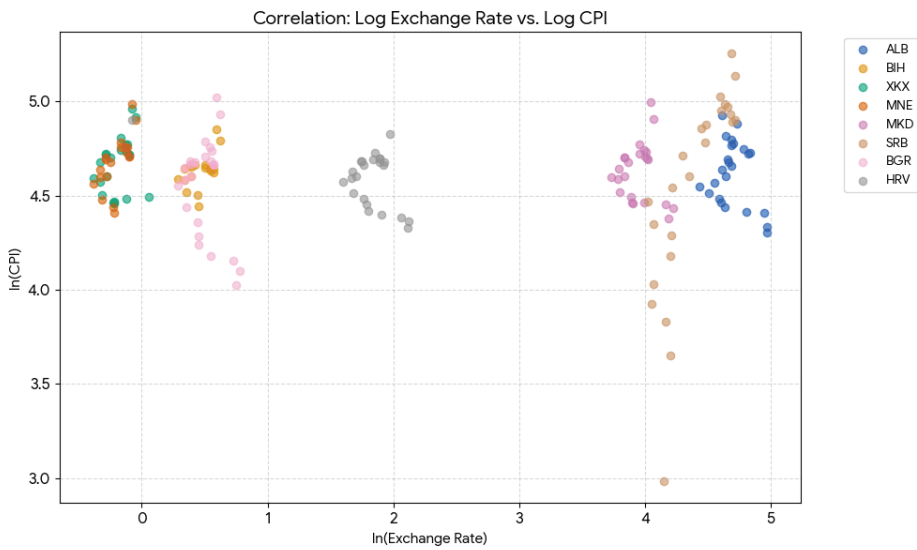
In this study the relationship between exchange rate, inflation, GDP growth and trade openness is investigated. It does this by using a balanced dataset of over 180 observations for eight Southeast European countries from 2000 to 2023. Real GDP growth is used as a variable to show how much demand there is in the country; trade openness to see how connected the country is to the world economy; and the lagged official exchange rate, which shows how prices are affected. A Variance Inflation Factor (VIF) test that verifies a lack of multicollinearity (mean VIF of 1.08), Levin-Lin-Chu unit root tests to confirm stationarity in logarithm transformed and differenced states, and a Hausman test that supports the use of a Fixed Effects (FE) model.

Empirical Results

Before presenting the results of regression analysis, the preliminary scrutiny of the variables is done to observe the trends and links among them.

Figure 1:

Correlation between exchange rate and CPI

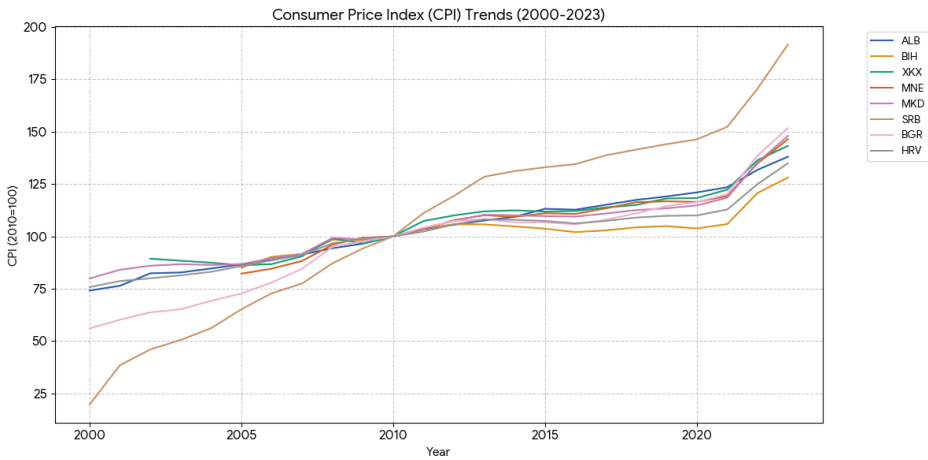


Source: Author's own

Figure 1 shows the correlation between Consumer Price Index (CPI) and exchange rate for each of the eight Southeast European countries. A positive relationship is obvious for almost all countries. There is some "visual evidence" of the Exchange Rate Pass-Through (ERPT) effect in the form of this scatter plot. The CPI also goes up when the value of the exchange rate increases, which means that the value of the local currency depreciates, meaning that the exchange rate can predict inflation for the region of Southeast Europe.

Figure 2:

Consumer Price Index over time (2000-2023)

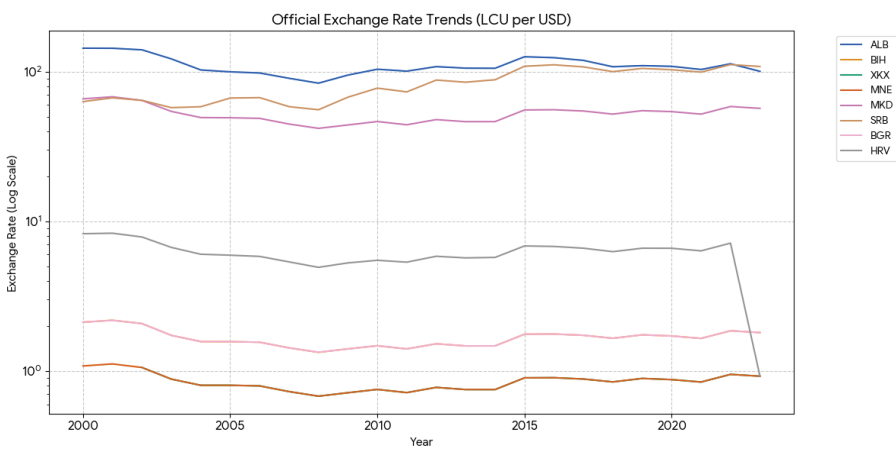


Source: World Development Indicators, World Bank

From Figure 2, it's clear that prices are steadily going up across the whole region. Several countries had a time of relative stability in the early 2000s. However, the sharp rise seen after 2020 is due to energy crises triggered by the wars, which caused inflationary shocks around the world. It is important for the security of the regional economy to figure out what is causing this trend, especially how devaluation of the currency is affecting prices.

Figure 3:

Official Exchange Rate trends (LCU per USD)



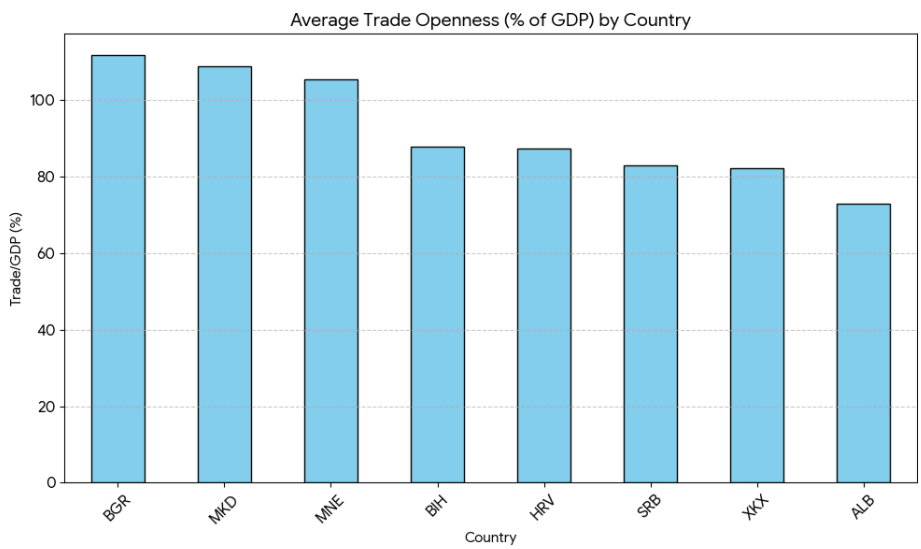
Source: Own calculation using the data from World Bank

Figure 3 uses a logarithmic scale to show the fluctuations of the exchange rates. The graph shows different times when currencies lost value, mostly during global financial crisis as well as the beginning years of energy crisis. The "shocks" that this study wants to find are these variations. Because of the way Exchange Rate Pass-Through works.

The exposure of each country to international trade is shown in Figure 4. All countries under analysis are very open. When it comes to external sector, countries with high trade openness are like "conductors" for inflation. This is because they import a lot of their consumer goods, so when the value of their currency changes, they "import" the price changes.

Figure 4:

Average Trade Openness (% of GDP) by Country



Source: Author's own

The correlation matrix shows that high prices are often found in regions with more integrated economies. This is because trade openness and price levels are strongly linked (0.523). The relationship between GDP growth and CPI is negative (-0.208), which means that higher inflation implies lower growth. There isn't much of a link between independent variables, so multicollinearity might not be a problem.

Table 1:

Correlation Matrix

This matrix shows the pure linear relationship between the variables before any extraneous factors are considered.

	ln_cpi	l1_ln_exr	gdpg	ln_trade
ln_cpi	1.000			
l1_ln_exr	0.022	1.000		
gdpg	-0.208	-0.016	1.000	
ln_trade	0.523	-0.259	0.047	1.000

Source: Author's own

Before the model was finalized, the following tests presented in Table 2 were run to make sure the efficiency and consistency of econometric results.

Table 2:

Summary of Diagnostic and Econometric Tests

Test Type	Null Hypothesis-H0	Result / Value	Conclusion
Hausman Test	Random Effects is preferred	Chi2 < 0.05	Fixed Effects (FE) is the preferred model.
Multicollinearity (VIF)	No multicollinearity	Mean VIF = 1.08	No evidence of multi-collinearity.
Stationarity (LLC)	Panels contain unit roots	p < 0.01	Data is stationary in first differences.
Wooldridge Test	No serial correlation	p = 0.003	Autocorrelation exists; Cluster robust stand-ard errors used.

Source: Author's own

The Hausman test shows that the Fixed Effects (FE) model is the best choice for this panel, considering that Chi2 is less than 0.05 and we reject the null hypothesis of random effects model preference. Wooldridge test suggests that that first-order serial correlation exists in the idiosyncratic errors. This implies that the residuals of the first-differenced model are significantly correlated with their lagged values, indicating that the original model's errors are autocorrelated. For this reason, clus-

ter-robust standard errors were used, and the variables were transformed into logarithmic. The stationarity tests were performed using the Levin-Lin-Chu unit root tests and non-stationary time series were transformed into stationary by considering their first difference.

Table 3 presents the regression results of fixed effects model, where the dependent variable is used the natural logarithm of consumer price index and as independent variables are used the natural logarithm of exchange rate with one-time lag, real GDP growth and the logarithm of trade openness.

Table 3:

Regression Results based on fixed effects model

Explanatory Variables	Coefficient	Robust Std. Err.	t-statistic	P-value
Exchange Rate Lag (L1. ln_exr)	0.2750*	0.1430	1.92	0.096
Real GDP Growth (GDPG)	-0.0221**	0.0057	-3.87	0.006
Trade Openness (ln_trade)	1.0120**	0.1800	5.62	0.001
Constant	-0.4306	0.9277	-0.46	0.657
R-squared (within)	0.6877			
Number of Obs / Groups	174 / 8			

Source: Author's own

The results show that the Exchange Rate Pass-Through (ERPT) rate is statistically significant at 10% significance level. Inflation goes up by 2.75 percent the next year for every 10 percent increase (depreciation) in the value of the local currency. This lag effect is very important because it shows that changes in the exchange rate influence consumer prices that are delayed. This effect takes about a year to spread through the economy. The coefficient of trade openness is highly statistically significant at 1% level and positively impacts the consumer prices index. This shows that Western Balkan countries "import" inflation from global markets meaning that as trade grows, the security of home prices depends on prices in other countries. On the other side, GDP growth is significantly negatively correlated with consumer prices, meaning that the average GDP growth in the Balkans is linked to lower prices, which goes against simple demand-pull ideas.

Conclusion

From this research was confirmed that Exchange Rate Pass-Through (ERPT) plays a relatively important role in Southeast European economies. The results showed that changes in the value of currency have an effect on buyer prices next year. The "slow-burn" effect means that when a currency falls in value, the economic effects don't really show up immediately, denoting that the higher prices of imported intermediate and final goods slowly make their way through the domestic supply chain. From an economic point of view, this shows that these economies are very vulnerable to shocks from outside the region. An important result is that the coefficient of trade openness is highly statistically significant. So, price stability in the area highly depends on volatility of global markets. The different effects on different national monetary regimes is an important aspect. For instance, Montenegro and Kosovo have "Euroized" their economies, meaning that inflation is mostly caused by how much the Euro can buy compared to other currencies. In the managed floating systems of Albania and Serbia, on the other hand, it is difficult for central banks to keep Lek and Dinar stable, respectively that is vital for maintaining the cost of living stable. This difference shows that even though the countries in the region may be close to each other geographically, the speed and severity of inflation transmission depend on how each country interacts regionally, with the Eurozone and the global dollar-denominated market. The "GDP Growth Paradox" in the regression results is also important from a supply-side point of view. In a lot of Southeast European countries, economic growth seems to slow down inflation rather than speed it up. In other words, these economies build a defense against rising prices as they modernize and make their production more efficient. In the long run, this means that structural changes that boost domestic production capacity are better than monetary intervention when it comes to protecting against imported inflation and this is especially important for policymakers. Thus, the results of this study stress that the exchange rate is the main "gatekeeper" for stable prices for Southeast European economies. It is very important to keep a stable and trustworthy currency regime because the area depends so much on imports and has a lot of trade exposure. Policymakers need to be aware that the pass-through effect takes time to show up and use forward-thinking monetary tactics. To really protect these economies from global shocks, the region needs to stop being a passive "price-taker" and start diversifying its trade sources and making its domestic supply lines stronger.

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