"Fear" of the free exchange rate – The case of Albania

MSc. Krista KOZMAI[1]

Department of Economics & Finance,
European University of Tirana, Tirana, Albania
kkozmai2@uet.edu.al

[1] Krista Kozmai, MSc has earned a Master's degree in Finance, and a Bachelor's degree in Finance at the European University of Tirana. During her academic years, she had a full scholarship and was awarded certificates of excellence. She was part of the "100 excellent students of the university" for the years 2018 and 2022. She had her first work experience at the beginning of the second year of her Master's studies in an Albanian company that offers fiscal and software solutions. She is currently working as a financier for a non-profit organization.

Abstract

The consumer society of nowdays would have struggled to exist in the last century; money, which today carries no intrinsic value (legal tender), used to hold value by being linked with precious metals. The exchange rates of each country's currency were determined by the quantity of precious metals each country possessed in tis central bank's coffers. After the collapse of the fixed-rate system, the determinants of exchange rates have been hard to find. Given that the continuous widening of the Albanian trade deficit, as well as the continuous strengthening of ALL against Euro, this study aims to investigate whether fundamental factors affect the ALL-EUR exchange rate, at all. In addition, this study examines whether this exchange rate has been influenced by the Bank of Albania's interventions in the (domestic) foreign exchange market. The study is based on a quantitative analysis, with secondary data obtained from INSTAT and the Bank of Albania. The data are quarterly and have been collected for a period of 14 and a half years, from the first quarter of 2008 to the second quarter of 2022. The graphical analysis and regression results showed that fundamental factors significantly affect the ALL-EUR exchange rate and that the interventions by the Bank of Albania, in the foreign exchange market, have not had a statistically significant impact on the (domestic) exchange rate.

Keywords: Money, exchange rate, fundamental factors, trade deficit, interventions in the foreign exchange market.

I. Introduction

In a small and open economy like Albania, the fundamental factors are those that should guide the supply and demand for currency in the foreign exchange market. The continuous strengthening of ALL[2] seems to be turning into a "Euro tax" for the average Albanian citizen. Given that Albania has a long history of trade deficit, but on the other hand, a currency that keeps getting stronger, the issue that is raised is what is the key determining factor affecting the ALL-EUR exchange rate. At the same time, Bank of Albania has pursued multiple interventions in the foreign exchange market, with the main purpose of increasing the foreign exchange reserve. Some authors consider those interventions as a "*fear*" of the free exchange rate and as a distortion of the real supply and demand of the market forces. Thus, the purpose of this study is to assess to what extent the EUR-ALL exchange rate is influenced by fundamental economic factors and if it has been affected by the interventions of the Bank of Albania, itself.

---

[2] Albanian currency – LEK - ALL.

The main objectives and goals of this study are:

- Finding out whether the fundamental factors have an impact on the ALL-EUR exchange rate.
- Discovering the direction and strength of the influence of fundamental factors on the exchange rate (exports, imports, FDI, interest rate, inflation, remittances, etc.)
- Examining whether the ALL-EUR exchange rate is affected by the Bank of Albania's interventions in the foreign exchange market.
- Discovering the factors that are causing a continuous strengthening of ALL against the Euro.
- Giving recommendations for an efficient monetary policy.

The research questions of this paper are:

- Do fundamental factors significantly affect the ALL-EUR exchange rate?
- Has the ALL-EUR exchange rate been affected by the Bank of Albania's interventions in the foreign exchange market?

The hypotheses of this paper are:

- Fundamental factors do not significantly affect the ALL-EUR exchange rate.
- The ALL-EUR exchange rate is significantly affected by the Bank of Albania's interventions in the foreign exchange market.

I.1. Methodology

In order to conduct the study, data with quarterly frequencies were collected from secondary sources, for a period of 14 and a half years, from the first quarter of 2008 to the second quarter of 2022, obtaining a total of 58 observations. The data were collected from the websites of Bank of Albania and Institute of Statistics (INSTAT). More specifically, the information from INSTAT was used for inflation, while Time Series Statistics and the Balance of Payments statement from the Bank of Albania were used for the rest of variables. Data for the qualitative binary variable were obtained from quarterly statements of the Bank of Albania, regarding interventions in the money and foreign exchange markets. The relationship of the variables has been examined with a multiple linear regression model, making the relevant tests for the validity of the model. These tests involve testing Gauss-Markov assumptions.

The dependent variable is the ALL-EUR exchange rate and the independent variables are the fundamental economic factors, such as: exports, imports, foreign direct investments, inflation, interest rates, and remittances from immigrants. A binary "dummy" variable is also included as an independent variable, in order to see whether the exchange rate has been affected by the Bank of Albania's interventions in the foreign exchange market.

II. Literature review

When it comes to floating exchange rate regimes, the answer initially seems simple: supply and demand for the currency also determine its price. This statement is true but complicated. Demand and supply in the foreign exchange market depend on interactions and conditions in other real and financial markets (Hacche, 1983).

II.1. Exchange rate determinants

The first theory that analyzes the determinants of exchange rates is considered that of Purchasing Power Parity (PPP). When the Gold Standard stopped working well and most of the world's countries were experiencing economic instability from World War I, Gustav Cassel argued that exchange rates between countries should reflect their level of inflation. Countries had to calculate the level of inflation since 1914 and use their inflation differentials to set an exchange rate that would allow purchasing power parity between different currencies (Rogoff, 1996). In its entirety, PPP says that a certain amount of a currency of any country should buy in international markets the same amount of goods that it buys in its own country. Thus, the nominal exchange rate between the two countries should be determined by their price level. Economists see this theory as a good descriptor of the economy in the long run (Taylor & Taylor, 2004). On the other hand, the Mundell-Fleming model, which assumes fixed prices in the short term, asserts that monetary policy is one of the main factors that determine the exchange rate (Mundell, 1963).

Other macroeconomic factors such as: exports, imports, trade balance, inflation, interest rate or even economic growth, are considered theoretically and empirically as main determinants of the exchange rate.[3] An increase in exports increases the demand for the domestic currency and causes its appreciation, while an increase in imports increases the supply of the currency and causes its depreciation (Levi, 2005). Interest rates affect investments and inflows and outflows of financing capital (Szulczyk, 2014). If a country has a higher interest rate than other

---

[3] For more empirical studies on exchange rate determinants see: Lane (1998), Clarida & Gali(1994), Chavan & Shafighi (2021), Kabi et al., (2014), My & Sayim (2016), Mirchandi (2013), (Tanku & Vika, 2019).

countries, it attracts foreign capital and consequently causes the local currency to strengthen. When the interest rate of a foreign country increases, the demand for the local currency by foreigners decreases and the supply for its sale by the locals also increases. As a result, the local exchange rate against the currency of the country with the highest interest rate depreciates (Madura, 2018). Economic growth leads to increased investments and exports. Exports, on the other hand, bring current account surpluses and pressure to strengthen the real exchange rate. This relationship is known as the Balassa-Samuelson hypothesis, which states that rapid economic growth is associated with the strengthening of the real exchange rate, due to the productivity differential between tradable and non-tradable sectors (Ito et al., 1997). Lane (1998) was of the same opinion. He argued that if the real exchange rate is not constant (as the PPP theory says), then economic growth can affect the real exchange rate and therefore the nominal exchange rate as well.

On the other hand, if we take a look at the historical aspect, we will also notice that monetary policy has always played an important role in determining the supply and demand of the currency in the market. When the Gold Standard was the most widely used monetary system, not all countries followed the so-called "rules of the game". Great Britain raised its interest rates when faced with current account deficits and coped with the fact that domestic prices would fall, but France and Belgium did not. In addition, many states intervened in the domestic market by buying and selling securities in order to maintain the money supply and the amount of gold in circulation (Bordo, 1981). Even during the Bretton Woods system, the main challenge of the system was maintaining credibility (Bordo, 1992). The following section expands on this point of view.

II.2. Reasons for "fear" of the free exchange rate

Most of the literature on this issue focuses on the differences between different exchange rate regimes. What are the desirable characteristics of fixed and flexible regimes? Fixed regimes provide exchange rate stability and ease of international trade while flexible exchange regimes provide the independence to pursue full employment policies. Both regimes have their downsides. In fixed regimes, the money supply is oriented toward maintaining the balance of trade equilibrium and the local economy is subject to business cycles from other economies. In flexible regimes, countries try to use competitive *beggar– thy-neighbour* devaluation policies (Bordo, 1992). In free floating regimes, countries with higher inflation rates than their trading partners often devalue their currencies to prevent a severe loss of competitiveness (Aziz & Caramazza, 1998). They try to calm market expectations about the exchange rate as expectations are seen as self-fulfilling (Mankiw, 2015). High exchange rate fluctuations motivate speculative behaviors from agents in

the market (Filardo et al., 2011). In addition, countries with high foreign debt do not prefer high fluctuations in the exchange rate, as they limit the ability of the Monetary Authority to be the "lender of last resort" (Calvo & Reinhart, 2000).

This side of the view has received a lot of attention in recent years, especially after the pioneering study of Calvo & Reinhart (2000). According to the authors, countries that claim to follow a floating exchange rate regime do not actually do so. Their main hypothesis was that lack of credibility in the monetary authority causes the monetary authority to fear "free swings" and to stabilize the exchange rate. In addition, the lack of credibility will show other symptoms such as mass dollarization of obligations and in emergency situations this will limit the bank's ability to act as a "lender of last resort" (Calvo & Reinhart, 2000). The authors examined 39 countries and analyzed monthly data of exchange rates, foreign reserves, monetary aggregates and interest rates. They argued that if countries had this "fear of floating" they would show high volatility of interes rates, foreign reserves or monetary aggregates and in turn, a stable exchange rate. They calculated the probability that the monthly percentage change of the variables would fall within a certain band[4] and then compared it to countries part of the "G-3"[5] benchmark.

For example, for the USA there was a 59% probability that the US$/DM exchange rate would fall in the band +/- 2.5%, while for Bolivia, Canada and India this probability was 94-96%. The probability of other countries averaged 79.27%. The result is very surprising given that developing countries are more prone to economic shocks. The opposite was for the changes in the foreign exchange reserve and the monetary base. In the case of the "G-3" countries, this probability was 62% and 74%, while the average of other countries was 34%. This high volatility means that countries are using these variables in order to stabilize their echange rate (Calvo & Reinhart, 2000). Other authors have disputed this approach.[6]

III. General analysis for Albania

Albania follows a free - floating exchange rate regime. The value of the local currency against foreign currency is determined by supply and demand in the foreign exchange markets. The Bank of Albania has always held the position that exchange

---

[4] The chosen band for the interest rate was +/- 25 basis points and +/- 50 bp. It was considered a narrow band because after the ERM crisis most EU countries set the exchange rate at the +/- 15% band. For the other variables, the chosen bands were +/- 1% and +/- 2.5%.

[5] USA, Japan, and Germany are chosen as benchmarks since their currency is considered to be close to a "pure float".

[6] Ball & Reyes (2004) found that the inflation targeting regime is distinct from fixed, free, managed free regimes or those who fear free floating. Countries with reliable inflation-targeting policies were found to be similar to countries with fluctuating regimes. These results were also found in the case of Turkey in the study of Vasif & Munise (2014).

rate fluctuations reflect the free movement of goods and capital and the financial transactions of Albania with its trading partners. As in any country in the world, the Central Bank is allowed to intervene in the foreign exchange market when it sees fit. The Bank of Albania claims that it intervenes, in order to adjust the exchange rate to the level determined by key macroeconomic factors, avoid disruptions and increase or decrease the foreign currency reserve (Bank of Albania, n.d).

III.1 Progress of the Lek - Euro exchange rate

The ALL-EUR exchange rate has experienced rapid appreciation over the past few years. Figure 3.1 presents the average exchange rate divided into six-month periods for the last 10 years.

FIGURE 3.1 Average ALL-EUR exchange rate
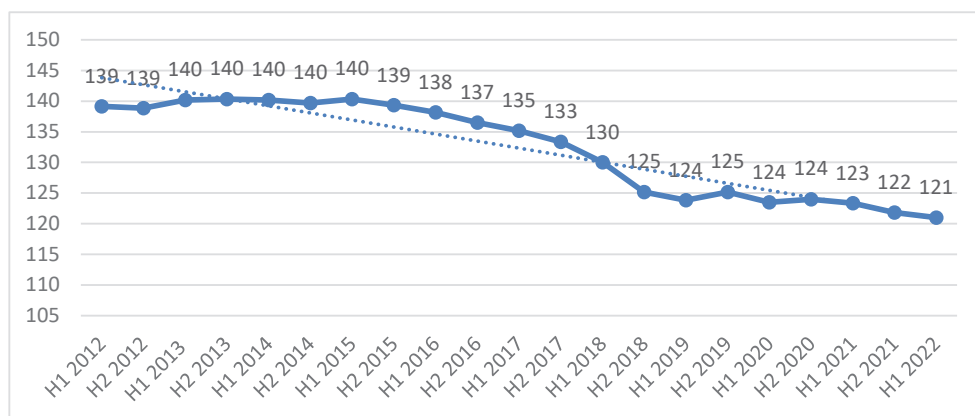
Source: Bank of Albania (2022)

We see that the local currency has strengthened compared to the euro. If we analyze demand and supply we face two options: either the demand for the local currency has increased, or its supply has decreased. The possibilities that the supply has decreased are few, since the country has been experiencing for years a deepening of the trade deficit. This strengthening cannot be fully explained from the demand either, because the trade deficit would have to be a colossal surplus, or primary and secondary incomes in the balance of payments show rapid growth rates, while we will see that they appear statistically normal.

In the graph, we notice that the exchange rate strengthens during the second half of each year. This period summarizes the effect of the summer season and the year-end holidays where many Albanian immigrants come to their homeland. Mainly they come from the EU countries and as a result they bring inflows of euro currency and cause the strengthening of the local currency. From the graph, we see a strong

strengthening of the local currency in 2017. One reason could be the psychological effect that was created in the market when Bank of Albania published the cooperation memorandum for the de-euroization of the economy (Bank of Albania, 2017). The market experienced this decision as a "war" against the euro. (Monitor, 2017).

III.2. Supply, Demand and the ALL-EUR exchange rate.

In the literature review section we mentioned that demand and supply are determined by other real and financial factors. A good part of them should appear in the Balance of Payments accounts. Figure 3.2 gives us a picture of the relationship between the current account of the balance of payments and the performance of the ALL-EUR exchange rate in Albania over the last 10 years. The data are expressed in millions of Euros. The current account line refers to the sum of other subcategories such as: net goods, net services and net income. Net goods refer to the trade balance, while net services include mostly tourist activity. Primary income is mainly income from work, while secondary income is mostly remittances from immigrants (Ruçi, 2006).

FIGURE 3.2 Current account flows
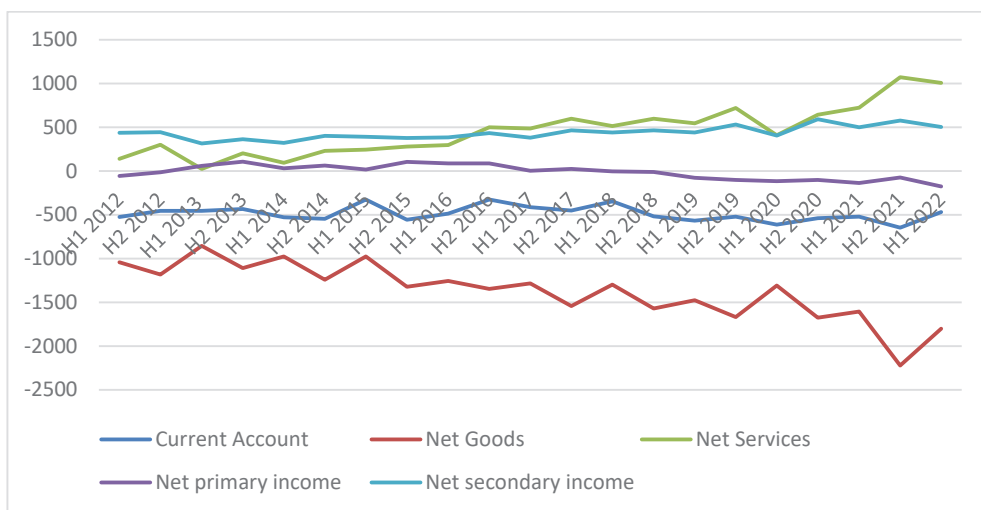
Source: Bank of Albania (2012-2022)

During these 10 years, the current account in Albania has only experienced a deficit, mainly as a result of the massive deficit of trade balance. A high current account deficit indicates that the country is sending more money abroad to buy goods, services or to pay for other countries than it is receiving for sales of its own goods and services. So, in countries with a current account deficit, the supply of the local currency should be high, and thus should exert downward pressure on the exchange rate. The opposite has

happened in Albania. The current account has been experiencing a negative balance for years, but on the other hand, the currency keeps getting stronger.

The current account curve follows the appropriate form to determine the exchange rate. During the second half of most years when the exchange rate strengthens, the current account deficit decreases. This is in line with the theory. A decrease in the current deficit comes as a result of a decrease in outflows for the purchase of imports, or an increase in inflows from increased exports, both of which strengthen the local currency. On the other hand, the line in its entirety does not explain the continued strengthening of the exchange rate.

The other lines of the chart also show us that the ALL-EUR exchange rate responds to demand and supply. For example, both the net secondary income curve and the net services curve rise during the second half of each year. We see that net services and secondary income have experienced the greatest growth during this decade. Both of these factors increase foreign exchange flows and affect the strengthening of the exchange rate. The net goods line moves in the opposite direction to what the theory says about exchange rates. When the trade deficit deepens, the exchange rate must depreciate, while in the case of Albania it appreciates. This may also be a consequence of the inverse relationship between them, that is, when the exchange rate is appreciated due to other stronger factors, it causes a deepening of the trade deficit.

Another important factor that affects currency flows is Foreign Direct Investment. In Albania, European Union countries account for 40% of the total stock of FDI (ODA, 2022). The figure below shows FDI over the past 10 years. The data are expressed in millions of Euros.

**FIGURE 3.3** Foreign direct investments
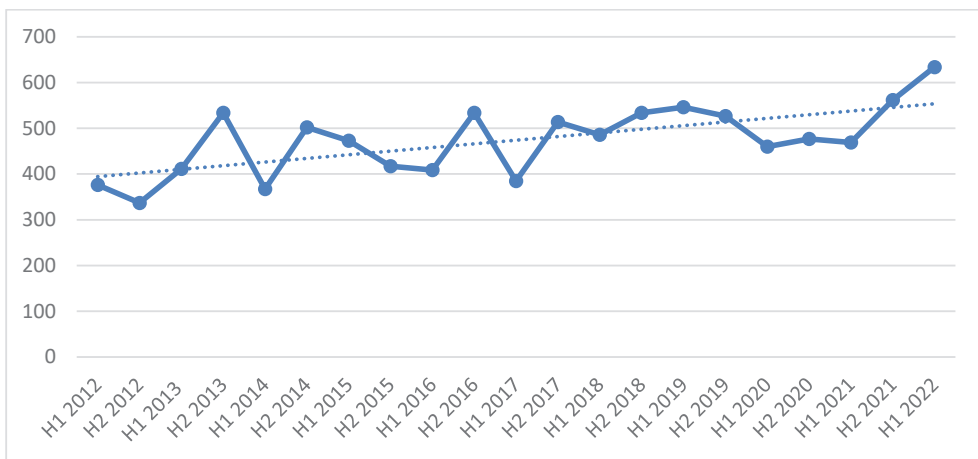
Source: Bank of Albania (2012-2022)

FDI has been increasing, but there have been numerous and deep periods of decline. From H1 2017 onwards we see an increasing trend of FDI. This period coincides with the strengthening of the local currency. The high and low points of the chart appear to follow a statistical trend. FDI reaches its peak during H1 2022, capturing a value of 634 million euros. In this period, the ALL-EUR exchange rate has also reached the minimum level. So this strengthening of the local currency may also have come as a result of the rapid growth of FDI in the first 6 months of 2022.

III.3. Money flows from illegal traffic

Many local economists judge the situation of continuous strengthening of ALL currency, as the cause of money coming from informal routes. Since the fundamental economic indicators cannot fully explain the appreciation of the local currency over the years, even after the purchases of the euro currency at auction by Bank of Albania, the only explanation remains that of informal flows (Zefi, 2021). Because these flows cannot be measured at reliable levels, an analysis can be done by looking at some other important variables. The following charts provide an overview of this issue.

FIGURE 3.4 Money outside banks
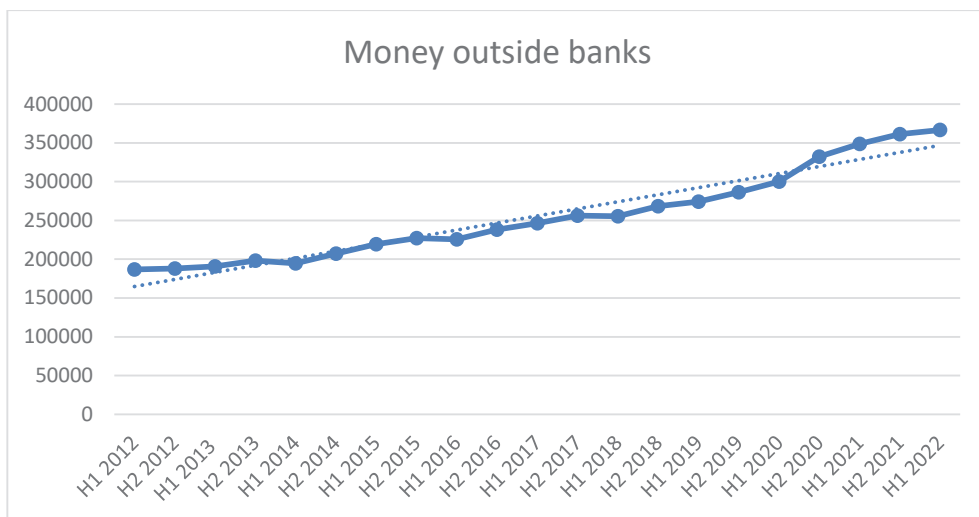
Source: Bank of Albania (2012-2022)

From 2012 to 2014, we see that this indicator has increased slightly, and in some segments, it has even decreased. After 2015, cash experienced relatively rapid growth. Since credit and deposit withdrawals have not shown any large fluctuations, this indicator shows the informal money that enters unmeasured at the border points. According to Xhepa (2020), there are two reasons for this phenomenon. The first theoretical reason

has to do with the fact that the preference to keep cash is great because the cost of keeping money in banks is high. But, according to him, the real reason for the growth of this indicator is more an indicator of the increase in informality and 'underground' payments, which includes the money that comes from illegal traffic (Monitor, 2020). From the graph, we see that the upward trend after 2015 coincides with the downward trend of the exchange rate, so the more the money outside banks has increased, the more the lek currency has appreciated compared to the euro.

Money outside banks is not the only indirect indicator of informal money flows. It is believed that this money is invested in real estate. Figure 3.5 provides an overview of this issue. The graph in the figure shows the value of new construction permits and the ALL-EUR exchange rate from 2006 to 2021. The value of construction permits is expressed in billion lek and this variable measures both the number of new permits and the corresponding areas during a year.

FIGURE 3.5 The construction sector and the Lek - Euro exchange rate
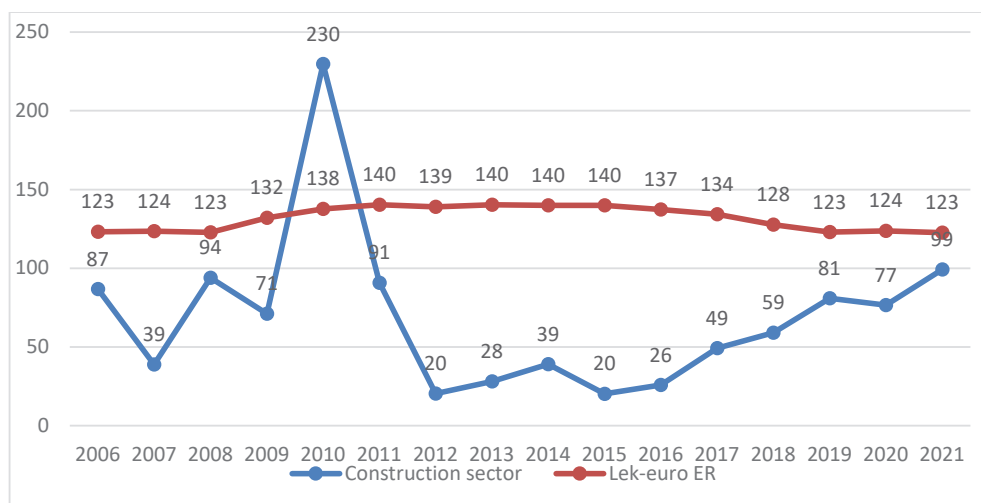
Source: INSTAT and Bank of Albania (2006-2021)

First, we see that from 2006 to 2007, building permits in value fall by 55% and the exchange rate depreciates by 0.8%. From 2007 to 2008, building permits increase by 141% and the exchange rate is estimated at 0.8%. From 2008 to 2009 permits are reduced by 24% and the exchange rate depreciates by a whopping 7.3%. This large devaluation may be due to the financial crisis. From 2009 to 2010, building permits increase by 223%, but the exchange rate depreciates. So, this year we cannot explain a logical connection between these two variables. In 2012, several political problems occurred in Albania and construction permits were blocked. We can see that during that period the exchange rate was at its highest levels, so the

Lek was depreciating. In the entirety of the graph, it is observed that since 2010 and later the relationship between the two variables is greatly strengthened. When constructions are at low levels, the exchange rate of the lek against the euro tends to depreciate. From 2010 to 2015, the ALL-EUR exchange rate has been at its highest levels, and construction at its lowest values. Also, from 2016 where we see a very rapid increase in construction, we also see the rapid strengthening of ALL.

In addition to the increase in money outside banks and building permits, we see another important factor. The credit given to the construction sector has the same levels, and in some cases it has even decreased. This situation shows that most constructions are being financed with money outside the banking system, which is not necessarily informal money (Meka, 2019). The table below gives an overview of this issue for the last five years. It presents building permits as number, area and value. It also provides new construction loans and the loan/construction permit value ratio to show the percentage of the construction permit value that is being financed by bank loans.

TABLE 3.1 Construction and construction credit

Period Sum Growth	Construc-tion permits (number)	Construction permits (m2)	Construction permits (billion ALL)	New loans for construction (billion ALL)	Loan/value of permits (%)	Construction loans/ business loans (%)
H1 2017	298	321251	25.2	11.9	47.4	12.1
H2 2017	521	272451	23.9	15.5	65.0	13.8
H1 2018	491	493839	21.6	9.7	44.7	10.8
H2 2018	703	948944	37.3	14.1	37.9	13.6
H1 2019	555	990784	42.0	9.7	23.1	11.4
H2 2019	245	462967	37.3	13.8	37.0	14.1
H1 2020	393	655939	28.2	9.5	33.9	12.7
H2 2020	568	952272	48.4	11.7	24.3	10.8
H1 2021	598	1143573	49.7	13.9	28.1	20.4
H2 2021	789	1108393	49.5	19.2	38.9	18.6
H1 2022	736	1575215	64.9	25.15	38.8	20.1
Sum	5897	8925628	428.0	154.3	-	-
Total Growth (%)	1878	2678	1601	1196	-	-

Source: INSTAT, Bank of Albania and authors' calculations (2017-2022)

In its entirety, the table shows us that from H1 2017 to the H1 2022, the number of new construction permits is 5897 permits. The area and corresponding values for these permits amount to 8,925,628 m² and ALL 428 billion. On the

other hand, the loan for the construction sector for this period is ALL 154.3 billion which means that only 36% of the total value of construction permits is financed by bank loans. In this time frame, the number of construction permits has increased by 1878%, the areas for the respective permits have increased by 2,678% and the value of construction permits has increased by 1,601%. New loans for the construction sector have increased by 1,196%.

What do these data tell us? We can note at least a combination of two other factors, in addition to the increase in money outside banks discussed in Figure 3.4. While construction permits grow quickly, credit for the construction sector grows slowly, so these permits are financed with money outside the banking system. If we look at the year-by-year changes in the table, we will notice that in most of the six-month periods, construction permits increase and construction loans decrease. For example, from H1 2018 to H1 2021, construction permits have increased, while the loan/permit ratio has decreased. This is also the period when the exchange rate experiences a rapid appreciation of 5.4%. Also, during this period Bank of Albania bought about EUR 700 million in the market, where only EUR 428 million were bought in 2018. The exchange rate could have strengthened further in the absence of that purchase. Above all, let's not forget that bank loans cover on average 38% of the value of construction permits and not their total cost, which can be several times higher.

III.4. Foreign exchange reserve and interventions in the foreign exchange market

In recent years the Central Bank of Albania has significantly increased interventions in the foreign exchange market with the aim of increasing the foreign exchange reserve. Foreign exchange reserve is the reserve in foreign currency held by the Central Bank for various reasons. Mainly, the reserve fulfills the demand for currency coming from importers, the needs of the state in cases of repayment of the external debt and enables the intervention of the Bank of Albania in the market, in order to prevent and mitigate strong movements of the exchange rate. The composition of the foreign exchange reserve in 2021 was: USD 17.0%; EUR 66.4%; GBP 2.1%; JPY 1.9%; AUD 1.0%; SDR 6.9%; Gold 2.9%; RMB 1.9% (Bank of Albania, 2021). Given that Albania is a country dependent on imports, a high level of foreign exchange reserves is vital for the economy. The reserve should be big enough to cover at least 4 months of imports. Currently, the foreign exchange reserve of the Bank of Albania covers twice the suggested minimum (Monitor, 2022).

In the study of Calvo & Reinhart (2000), the movements of foreign exchange reserves, interest rates, and monetary aggregates are seen as indirect ways to stabilize or influence the exchange rate. Even though the authors mention themselves that reserve changes are not always caused by the interventions in the market, the variable is still considered important to analyze the "fear" of floating. In this part of the paper, the

progress of the foreign exchange reserve of the Bank of Albania will be looked at in more detail, to understand if there is a connection between its movements, interventions in the market, and the exchange rate. Table 3.2 gives a clearer picture of the Bank of Albania's foreign exchange reserves. The data are expressed in millions of euros.

TABLE 3.2 Progress of the foreign exchange reserve

	Reserve balance at the end of the year	1. Annual increase/ decrease	1.1 From actions with MFE	1.2 From actions with banks	1.3 From purchases with banks or others	1.4 From invest-ments	1.5 Loss/ gain from fluctua-tions	1.6 From other outgoing flows
2012	1972.48	64.99	28.64	33.23	15.29	47.02	-40.86	-18.3
2013	2014.99	42.5	49.45	51.95	15.49	36.72	-92.09	-19.02
2014	2192.34	177.35	124.3	-51.17	17.2	31.86	71.54	-16.38
2015	2881.28	688.94	383.13	204.76	25.87	41.33	47.1	-11.3
2016	2944.13	62.85	-139.51	135.54	58	41.83	-18.45	-14.56
2017	2994.28	50.15	48.47	28.72	72.89	38.88	-133.38	-5.44
2018	3395.92	401.64	-15.21	-48.82	427.23	31.34	11.54	-4.44
2019	3359.71	-36.21	-324.23	65.48	157.08	32.51	37.77	-4.82
2020	3945.3	585.59	392.1	173.69	91.53	33.15	-65.41	-39.47
2021	4974.03	1028.73	642.44	42.12	292.01	18.86	45.94	-12.64
Sum	4974.03	3066.53	1189.58	635.5	1172.59	353.5	-136.3	-146.4
Weight on growth			39%	21%	38%	12%	-4%	-5%

Source: Bank of Albania and authors' calculations (2012-2021)

The table shows the balance of the foreign exchange reserve at the end of the year, the annual increase or decrease, and the corresponding actions that have influenced this increase or decrease. We can see that the effect that foreign reserve has on the exchange rate is quite unclear. During these 10 years, the movements of the variables are in the opposite direction from what the theory says. If the reserve had a significant effect on the exchange rate, the rapid growth of the reserve should have caused a depreciation of the local currency.

We can see that during these 10 years, the reserve has increased by EUR 3,066 million. The only reasonable suspicion seems to be that of auction purchases with banks and other institutions. These purchases have caused 38% of the growth of the reserve during this period. These interventions were planned and announced in advance. Direct interventions in the foreign exchange market have been rare. In total, there are four buying periods during 2018, and one selling case in March 2020.

These interventions were made in shock situations. In 2018, the economy was still experiencing the panic of de-euroization and a lot of euro currency was converted. In addition to that, the news of capital conversion from euro to lek of 2 big banks that were changing ownership had spread. In 2018 were converted around EUR 300 million of the capital of two commercial banks, Intesa SanPaolo and Venetto Bank (Telegraf, 2019). Given that the market is relatively small, such conversions are considered shock situations in the currency markets, so the Bank of Albania has been forced to buy euro currency in order to prevent the further strengthening of the local currency. The sale case was during the crisis of the Covid-19 pandemic when citizens increased their demand for goods in order to increase their stock. By doing so they increased the demand for imports, the supply of the local currency and then caused its devaluation. A sales intervention of EUR 20.4 million was enough to calm the situation and bring the currency back to its normal trend (Monitor, 2022).

IV. Empirical analysis

The graphical analysis showed us that the exchange rate responds significantly to the movements of supply and demand. On the other hand, the impact of the interventions of the Bank of Albania on the ALL-EUR exchange rate is still unclear. Thus this study will use the method of least squares to generate an estimated regression equation. The results are presented in the table below.

TABLE 4.1 OLS Results

Dependent Variable: LOG_ER
Method: Least Squares
Date: 03/20/23   Time: 17:26
Sample: 1 58
Included observations: 58

Variable	Coefficient	Std. Error	t-Statistic	Prob.
INTERVENTION_YES	-0.005738	0.004459	-1.286898	0.2041
LOG_REMITANCES	-0.082829	0.038691	-2.140798	0.0372
LOG_IR	0.035028	0.009632	3.636519	0.0007
LOG_INFLATION	-0.002742	0.004685	-0.585146	0.5611
LOG_IMPORTS	-0.116456	0.054777	-2.126012	0.0385
LOG_FDI	-0.001943	0.022488	-0.086422	0.9315
LOG_EXPORTS	0.057358	0.017130	3.348328	0.0016
C	2.513671	0.111501	22.54397	0.0000

R-squared	0.659172	Mean dependent var		2.121513
Adjusted R-squared	0.611456	S.D. dependent var		0.025010
S.E. of regression	0.015590	Akaike info criterion		-5.356989
Sum squared resid	0.012152	Schwarz criterion		-5.072790
Log likelihood	163.3527	Hannan-Quinn criter.		-5.246287
F-statistic	13.81450	Durbin-Watson stat		0.808007
Prob(F-statistic)	0.000000			

Source: Authors (2022)

In this model, R squared is 0.66 (66%), which means that 66% of the variation of the Lek - Euro exchange rate is explained by exports, foreign direct investments, imports, inflation, interest rate, remittances and "intervention_yes". The rest (34%) is explained by other factors that are not included in the model. We can see that the model passes the overall significance test, as Prob (F-statistics) is lower than the significance level (0.05). The F-test tests the significance of the population parameters and shows the significance of the model, that is if all the variables taken together are statistically significant. Also, the model has passed the Heteroskedasticity, Multicollinearity, and Normality tests. These tests are attached in Appendix 1.

The estimated regression equation in our case is as follows:

$$LogER = 2.513671 + 0.057358 LogExports - 0.001943 LogFDI - 0.116456 LogImports \\ - 0.002742 LogInflation + 0.035028 LogIR - 0.082829 LogRemitances \\ - 0.005738 Intervention\_Yes$$

Intercept or β0 has a coefficient of 2.513671. This means that in the absence of fundamental factors and the Central Bank's interventions, the exchange rate of the lek against the euro would be very strong.

Exports have a coefficient of 0.057358. This shows that holding other variables constant, a 1% increase in exports will lead to a depreciation of the exchange rate by 0.057358%. Theoretically, it is expected a negative relationship between exports and the exchange rate. The increase in exports means that there is more demand for the local currency and therefore it should cause it to appreciate. However, this result is not surprising since it was noticed in the graphical analysis that exports move in the opposite direction to what the theory says. The P value of the export variable is less than the significance level, so the variable is statistically significant and therefore the coefficient is significant.

FDI has a coefficient of -0.001943. Holding other variables constant, a 1% increase in FDI will decrease ER by 0.001943%. Although the direction is in line with that of to theory, the p-value of FDI is 0.9315. This means that changes in FDI do not influence changes in ER in our model.

Imports have a coefficient of -0.116456. Holding other variables constant, a 1% increase in imports would decrease the exchange rate by 0.116456%. As in the case of exports, this relationship contradicts the theory. An increase in imports increases the demand for foreign currency, which causes an increase in the supply of the domestic currency and ultimately a depreciation of the domestic currency. In this case, an increase in imports causes an appreciation of the ER. The p-value of imports is 0.0385, so the coefficient of imports is also significant.

Inflation has a coefficient of -0.002742. Keeping other variables constant, a 1% increase in inflation will result in a decrease of ER by 0.002742%. The increase

in inflation should cause a devaluation of the local currency, while in this case, it causes its appreciation. This could also happen because foreign countries may have experienced periods of higher inflation than our country or because other influencing forces of supply and demand have suppressed the effect that inflation could have on the exchange rate. However, the inflation coefficient is not statistically significant as it has a p-value of 0.5611.

The interest rate has a coefficient of 0.035028 and is significant at the 0.05 significance level. Holding other variables constant, a 1% increase in IR will result in a 0.035028% increase in ER. This is not in line with the theory. When the interest rate increases, the exchange rate tends to appreciate, while in this case, it depreciates. This may be a consequence of the euroization of the local economy, making Central Bank's policies ineffective in the market. When the interest rate of lek currency increases, individuals who have deposits in euros will first compare the exchange rate of the euro against the lek at the moment they secured the euro. If the actual exchange rate is much lower than that of the moment when individuals first secured euros, then they may hesitate to convert their euros due to devaluation losses and thus, not respond to the increase in the interest rate. Given that euro has been weakening fast in recent years, individuals do not convert their deposits of euros, hoping that the euro will increase in the future. To summarize, the increase in the interest rate may not have been effective to evaluate the exchange rate, because it has not increased enough compared to how much the euro has depreciated during the last five years.

Remittances have a coefficient of -0.082829 and this coefficient is significant with a p-value of 0.0372. Keeping other variables constant, a 1% increase in remittances will result in a 0.082829% decrease in ER. When remittances increase, the exchange rate appreciates. This result is in line with the theory. Foreign exchange inflows cause the local currency to appreciate. These flows come through the banking system or in cash. The cash remittances are measured by estimation methods so the amount of cash currency that enters the border points might be underestimated.

"Intervention__Yes" has a coefficient of -0.005738. This means that the exchange rate is on average 0.005738% lower in cases where there is intervention, compared to when there was no intervention, holding other variables constant. This "dummy" variable shows us that in the cases when the Bank of Albania intervened in the foreign exchange market, the exchange rate strengthened on average by 0.005738%, compared to when it did not intervene in the foreign exchange market. Thus we can say that the Bank intervened in periods when the lek was being appreciated. However, the p-value of this variable shows that it is not statistically significant.

V. Conclusions and Recommendations

Under a floating exchange rate regime, the exchange rate plays a fundamental role in the performance of the economy. More accurate decisions on monetary and national policy can be made by knowing how and to what extent fundamental factors determine the exchange rate. Thus, the Bank of Albania and the Albanian government should consider the following conclusions and recommendations.

V.1. Conclusions

Based on the analysis, it is concluded that the fundamental factors affect the ALL-EUR exchange rate and that this exchange rate has not been affected by the interventions of the Bank of Albania in the foreign exchange market. **Thus, both hypotheses of the paper are rejected.** In addition to these two conclusions, the study reaches several important findings, which are:

- Remittances are a major determining factor of the ALL-EUR exchange rate.
- Other factors stronger than the fundamental ones are causing the continuous strengthening of the local currency.
- The other fundamental factors influence the ALL-EUR exchange rate, but the direction of that influence is not always in line with the theory.
- In Albania, an increase in exports weakens the exchange rate and an increase in imports strengthens it. This may be due to an inverse relationship between the 2 variables, that the exchange rate strongly affects the balance of trade more than it is affected by it.
- The movements of foreign exchange reserves are not just a result of purchases in the foreign exchange market, but also a result of revaluations, debt inflows, relations with MFE, etc.

V.2. Recommendations

- If the deterioration of the trade balance is caused by the strengthening of the local currency, then the other strong factors that are causing that strengthening must be found and looked at very carefully.
- The Bank of Albania should continue to intervene in the foreign exchange market whenever it deems it appropriate, as these interventions do not affect the general movement of the exchange rate.

VI. Bibliography

Aziz, J. & Caramazza, F. (1998). Fixed or Flexible? Getting the Exchange Rate Right in the 1990s (p. 25). *Economic Issues.* International Monetary Fund.

Ball, Ch. P. & Reyes, J.A. (2004). Inflation Targeting or Fear of Floating in Disguise: A Broader Perspective. *SSRN papers.*

Bank of Albania (2012). Annual Report. Available at https://www.bankofalbania.org/Botime/ Botime_Periodike/Raporti_Vjetor/

_____(2013). Annual Report. Available at https://www.bankofalbania.org/Botime/ Botime_Periodike/Raporti_Vjetor/

_____(2014). Annual Report. Available at https://www.bankofalbania.org/Botime/ Botime_Periodike/Raporti_Vjetor/

_____(2015). Annual Report. Available at https://www.bankofalbania.org/Botime/ Botime_Periodike/Raporti_Vjetor/

_____(2016). Annual Report. Available at https://www.bankofalbania.org/Botime/ Botime_Periodike/Raporti_Vjetor/

_____(2017). Annual Report. Available at https://www.bankofalbania.org/Botime/ Botime_Periodike/Raporti_Vjetor/

_____(2018). Annual Report. Available at https://www.bankofalbania.org/Botime/ Botime_Periodike/Raporti_Vjetor/

_____(2019). Annual Report. Available at https://www.bankofalbania.org/Botime/ Botime_Periodike/Raporti_Vjetor/

_____(2020). Annual Report. Available at https://www.bankofalbania.org/Botime/ Botime_Periodike/Raporti_Vjetor/

_____(2021). Annual Report. Available at https://www.bankofalbania.org/Botime/ Botime_Periodike/Raporti_Vjetor/

Bank of Albania (2017) De-euroziaton package. Available at: https://www.bankofalbania.org/ Financial_Stability/De-euroization_Package/

Bank of Albania (2022) Bank of Albania Interventions In The Money Market. (Q1 2008-Q2 2022). Available at: https://www.bankofalbania.org/Markets/Operations_of_the_Bank_ of_Albania/Interventions_in_the_foreign_exchange_market/Deklarata_mbi_nderhyrjet_ ne_tregun_e_parase_dhe_ate_valutor_EN/

Bank of Albania (2022) Monetary and Financial Statistics. Monetary Aggregates 2012-2022. Banka e Shqipërisë. Available at: https://www.bankofalbania.org/Statistics/Monetary_ Financial_and_Banking_statistics/

Bank of Albania (2022) Monetary, Financial and Banking statistics, New loans to private non-financial corporations by economic activity(Nace-Rev.2). (2017-2022). Available at: https://www.bankofalbania.org/?crd=0,8,2,0,0,17021&uni=20221011193921951072341462254611&ln=1&mode=alone

Bank of Albania (2022) Official exchange rate (n.d). Available at: https://www.bankofalbania. org/Markets/Official_exchange_rate/

Bank of Albania (2022) Time Series – Exchange rates. Available at: https://www.bankofalbania. org/Statistics/External_sector_statistics/Exchange_rate/

Bank of Albania (2022). Calendar of interventions in the domestic foreign exchange market. Available at: https://www.bankofalbania.org/Markets/Operations_of_the_Bank_of_Albania/Interventions_in_the_foreign_exchange_market/Calendar_of_interventions_in_the_domestic_foreign_exchange_market.html

Bank of Albania (2022). Interest rates. Available at: https://www.bankofalbania.org/Markets/Interest_rates/

Bank of Albania (2022) Main data for Balance of Payments, 2008-2022. Available at https://www.bankofalbania.org/Statistics/External_sector_statistics/Balance_of_Payments/Main_data_for_Balance_of_Payments.html

Bordo, M. D. (1981). The classical gold standard: some lessons for today. *Canadian Parliamentary Review*, 63, 2-17.

Bordo, M. D. (1992). The Bretton Woods international monetary system: an historical overview. *NBER working paper series*.

Calvo, G. A. & Reinhart, C. M. (2000). Fear of floating. *NBER working paper series*.

Chavan, S. S. & Shafighi, N. (2021). Exchange Rate Determination in Asia. International Journal of Current Advanced Research. Vol. 10. No. 08.

Clarida, R. & Gali, J. (1994). Sources of Real Exchange Rate Fluctuations: How Important are Nominal Shocks? *NBER working paper series*.

Filardo, A., Ma, G. & Mihaljek, D. (2011). Exchange rates and monetary policy frameworks in EMEs. BIS Papers chapters. Bank for International Settlements. Vol. 57, pp.37-63.

Hacche, G. (1983). "The Determinants of Exchange Rate Movements". OECD Economics Department Working Papers. No. 7. OECD Publishing. Paris.

INSTAT (2006-2021). Databaza Statistikore. Ndërtimi. Treguesit tremujorë. Available at: http://databaza.instat.gov.al/pxweb/sq/DST/START__ND__NDQ/

INSTAT (2023) Databaza Statistikore. Indeksi i Çmimeve të konsumit (IÇK). Available at: http://databaza.instat.gov.al/pxweb/sq/DST/START__PR__PRCPI/

Ito, T., Isard, P. & Symansky, S. (1997). Economic growth and real exchange rate: an overview of the Balassa-Samuelson hypothesis in Asia. NBER working paper series.

Kabi, J., Nazrul, K. & Hossain, T. (2014). Determinants of Exchange Rate in Bangladesh: A Case Study. Journal of Economics and Sustainable Development.

Lane, P. R. (1998). What Determines the Nominal Exchange Rate? Some Cross Sectional Evidence, *Canadian Journal of Economics*, Canadian Economics Association, vol. 32(1), pages 118-138, February.

Levi, M.D. (2005). *International Finance* (4th ed.). Routledge

Madura, J. (2018). *International Financial Management*. 13th edition. Cengage Learning.

Mankiw, N. G. (2015). Macroeconomics (Albanian). Tiranë: Mediaprint

Meka, E. (2019). What's happening with EURO? Inverview with Fax News. Available at: https://www.youtube.com/watch?v=9xbLGEwIDSQ&t=1183s

Monitor (2017). Sejko "i shpall" luftë euros. Ja plani. Available at: https://www.monitor.al/sejko-shpall-lufte-euros-ja-plani/

Monitor (2020). Informaliteti dhe trafiqet: Paraja jashtë bankave arrin rekordin e 2.4 miliardë eurove në 2019-n.. Available at: https://www.monitor.al/informaliteti-dhe-trafiqet-paraja-jashte-bankave-arrin-rekordin-e-2-4-miliarde-eurove-ne-2019-n/

Monitor (2022). Euro shënon rritjen më të fortë ditore që nga fillimi i pandemisë, arrin nivelin më të lartë në katër muaj. Available at: https://www.monitor.al/euro-shenon-rritjen-me-te-forte-ditore-qe-nga-fillimi-i-pandemise-arrin-nivelin-me-te-larte-ne-kater-muaj/

Monitor (2022). Rezerva valutore kalon sërish pragun e pesë miliardë Eurove, qëndron pranë nivelit më të lartë historik. (Available at : https://www.monitor.al/rezerva-valutore-kalon-serish-pragun-e-pese-miliarde-eurove-qendron-prane-nivelit-me-te-larte-historik/

Mundell, R. A. (1963). Capital Mobility and Stabilization Policy under Fixed and Flexible Exchange Rates. *The Canadian Journal of Economics and Political Science*.

My, N. Q. & Sayim, M. (2016). The Impact of Economic Factors on the Foreign Exchange Rates between USA and Four Big Emerging Countries: China, India, Brazil and Mexico. *International Finance and Banking*.

Open Data Albania (2021) oreign Direct Investment Stock's Origin in Albania 2021. Available at: https://ndiqparate.al/?p=16055&lang=en

Rogoff, K. (1996). The Purchasing Power Parity Puzzle. *Journal of Economic Literature*.

Ruçi, E. (2006). Methodology of Balance of Payments. Available at:https://www.bankofalbania.org/rc/doc/Metodika_e_Bilancit_te_Pagesave_3219_1_6775.pdf

Szulczyk, K. N. (2014). Money, Banking, and International Finance. 2nd edition. *CreateSpace Independent Publishing Platform*.

Tanku, A. & Vika, I. (2019). What drives the real ALL-EUR exchange rate fluctuations? Bank of Albania.

Taylor, A.M. & Taylor, M. P. (2004). The Purchasing Power Parity Debate. *The Journal of Economic Perspectives*, Vol.18, no.4.

Telegraf (2019) Përplasja mes guvernatorit Sejko dhe ekspertëve. Available at: https://telegraf.al/speciale/2-17-miliarde-euro-qarkulluan-jashte-bankave-perplasja-mes-guvernatorit-sejko-dhe-eksperteve-xhepa-preci-buxhuku-dhe-bitaj-pas-renies-se-euros-fshihet-pastrimi-i-parave-te-krimit-dhe-korrupsionit/

Zefi, A. (2021). The impact of euroization in the Central Bank's monetary policy – The case of Albania. Doctoral thesis, UET. Available at: https://uet.edu.al/wp-content/uploads/2021/02/Altin-Zefi.pdf

Appendix 1. Regression tests

TABLE 1. Breusch-Pagan test

Heteroskedasticity Test: Breusch-Pagan-Godfrey
Null hypothesis: Homoskedasticity

F-statistic	0.809864	Prob. F(7,50)	0.5833
Obs*R-squared	5.906420	Prob. Chi-Square(7)	0.5507
Scaled explained SS	3.736310	Prob. Chi-Square(7)	0.8096

Test Equation:
Dependent Variable: RESID^2
Method: Least Squares
Date: 03/20/23   Time: 17:28
Sample: 1 58
Included observations: 58

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.001193	0.001996	-0.597975	0.5526
INTERVENTION_YES	5.71E-05	7.98E-05	0.715814	0.4774
LOG_REMITANCES	0.000180	0.000693	0.259408	0.7964
LOG_IR	0.000130	0.000172	0.754347	0.4542
LOG_INFLATION	-2.58E-05	8.39E-05	-0.307423	0.7598
LOG_IMPORTS	0.000553	0.000980	0.564309	0.5751
LOG_FDI	6.63E-05	0.000402	0.164733	0.8698
LOG_EXPORTS	-0.000372	0.000307	-1.213476	0.2306

R-squared	0.101835	Mean dependent var	0.000210
Adjusted R-squared	-0.023908	S.D. dependent var	0.000276
S.E. of regression	0.000279	Akaike info criterion	-13.40307
Sum squared resid	3.89E-06	Schwarz criterion	-13.11887
Log likelihood	396.6891	Hannan-Quinn criter.	-13.29237
F-statistic	0.809864	Durbin-Watson stat	1.106686
Prob(F-statistic)	0.583274		

Hypotheses:
H0: $\alpha1 = \alpha2 = \alpha3 = \alpha4 = \alpha5 = \alpha6 = \alpha7 = 0$ (homoscedasticity)
Ha: $\alpha1 \neq \alpha2 \neq \alpha3 \neq \alpha4 \neq \alpha5 \neq \alpha6 \neq \alpha7 \neq 0$ (heteroscedasticity)
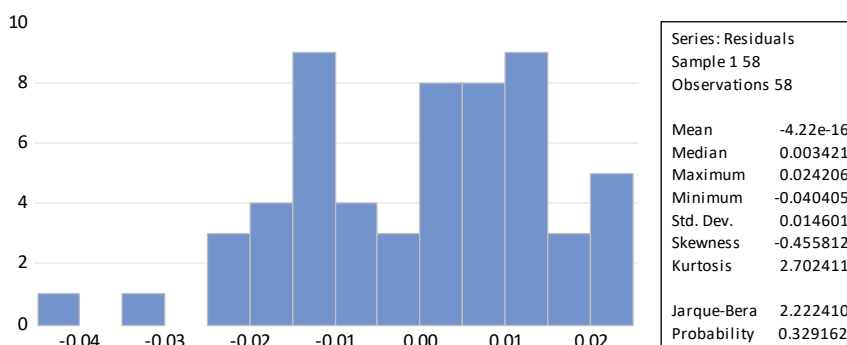
Criterion:
If p value > 0.05, H0 cannot be rejected and therefore it is accepted. So we have homoscedasticity.
If p value ≤ 0.05, we cannot accept H0 and consequently Ha is accepted.

Decision:
0.8096 > 0.05, we cannot reject H0 and accept it. This means that we have homoscedasticity or equal variance.

FIGURE 1. Jarque Bera normality test

Series: Residuals	
Sample 1 58	
Observations 58	
Mean	-4.22e-16
Median	0.003421
Maximum	0.024206
Minimum	-0.040405
Std. Dev.	0.014601
Skewness	-0.455812
Kurtosis	2.702411
Jarque-Bera	2.222410
Probability	0.329162

Source: Authors (2022)

Hypotheses:
H0: The distribution is normal.
Ha: The distribution is not normal.

Criterion:
If Prob > 0.05, we cannot reject H0 and it is accepted with a risk of 5%.
If Prob ≤ 0.05, we cannot accept the basic hypothesis and the alternative hypothesis is accepted with a risk of 5%.

Decision: 0.329162 > 0.05, we cannot reject the basic hypothesis. The basic hypothesis is accepted with a risk of 5%. So, we have normality of the residuals. Interpretations made from the regression equation are considered valid.

TABLE 2. Perfect Multicollinearity Testing

	Remitances	IR	Inflation	Imports	FDI	Exports	Intervention Yes
Remitances	1	0.022	-0.001	0.305	0.160	-0.175	0.184
IR	0.022	1	-0.083	-0.761	-0.393	-0.625	-0.116
Inflation	-0.001	-0.083	1	0.136	0.130	-0.048	0.002
Imports	0.305	-0.761	0.136	1	0.522	0.673	0.308
FDI	0.160	-0.393	0.130	0.522	1	0.291	0.152
Exports	-0.175	-0.625	-0.048	0.673	0.291	1	0.184
Intervention Yes	0.184	-0.116	0.002	0.308	0.152	0.184	1

Source: Authors (2022)