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NEW RELATIONSHIP BETWEEN NATIONAL CURRENCY RATE AND INFLATION

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ABSTRACT

The exchange rate and inflation indicators reflect how expensive or cheap this monetary resource will be for society or business entities. Given Georgia's transitional and open economy, which is also dependent on imports and the national currency is pegged to the US dollar with a floating exchange rate, the price of these resources is volatile over time. The given dynamics in the last 30 years are typical for both standard and crisis periods. To define economic stability, we will use the following indicators within the scope of this work – Gross Domestic Product (GDP), inflation and national currency exchange rate. We need to focus on the last two indicators for the sake of this research. For individuals and legal entities, these data are essential for their short, medium and long-term activities – accumulation and spending of monetary resources, purchases, sales, demand allocations, etc. The study considers two major crises, which Georgia went through in the form of a typical crisis with the 2008 Russia-Georgia war. It continues as an atypical crisis due to the COVID-19 pandemic and the Russia-Ukraine war. Both events significantly impacted on our country's inflation rate and the national currency exchange rate. Accordingly, it will be interesting to determine what kind of correlation was revealed in the first crisis and what new correlation was formed within the second indefinite crisis. As a result of regression and correlation analysis, it has been determined what contribution the monetary policy rate had in managing the mentioned crises and how much it helped Georgia's economy. In particular, the influence of the monetary policy rate on the exchange and inflation rates has been studied.

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Introduction.

Establishing a stable economic situation remains a constant challenge for Georgia after gaining independence in 1991, which is why we started to establish financial institutions and monetary policy instruments in the 90s of the last century, the "helmsman" of which was the National Bank. The latter strives for economic stability and price control with its monetary policy. However, the last three decades have not been easy for Georgia. Our economy has come under three massive crises, two of which we have already partially overcome. The third, caused by the newly started Russia-Ukraine war, will put us in front of still undefined challenges.

Therefore, Georgia needs to draw up and use the right management policy in a crisis to maintain the economy's stability to a certain extent under frequent dangerous situations.

One of the dominant monetary policy instruments – the monetary policy rate, which affects both inflation and exchange rates, the two leading indicators of economic stability - has a huge contribution to the mentioned process. By changing the monetary policy rate, the National Bank can indirectly influence both indicators, thus preventing their deterioration and bringing them closer to the target indicator during the stabilization period. This effect presents the actual issue, the study of which will help us better deal with the crisis.

II. Literature Review

The monetary policy carried out by the National Bank with its direct and indirect regulation instruments is still disputed, but common trends can still be identified and objectively evaluated. It should also be noted that the different conclusions of the scientists' views are related to the country's socioeconomic as well as political situation; for example **(Mosiashvili et al.: 2022)** investigated that the country's monetary authorities are rightly trying to alleviate devaluation and inflationary "pressure", for which they use foreign exchange interventions and periodic changes in the monetary policy rate. However, these measures did not produce the expected results for both the public and the business sectors.

(Abuselidze:2017) believes that various countries effectively use the method of inflation targeting, but the question is how acceptable it is for the Georgian reality because there is a high dependence on imports and the dollarization of the economy. As high inflation or deflation can harm a nation's long-term economic growth potential, inflation is a crucial economic indicator. **(Abuselidze, 2019)**

According to paper when global oil prices rise (sectoral inflation - rising prices in one sector raise prices in another), fuel prices in Georgia and, eventually, the consumer price index rise, tightening monetary policy will have no effect on international oil prices and will only restrict the local economy, causing slowing and rising unemployment. As a result, central banks typically shouldn't be required to react to this kind of supply shock. **(Abuselidze, 2022)**

(Eradze:2022), who investigated the impact of the inflation target rate on dollarized economies, believes that the use of the inflation target rate was an ineffective strategy for the dollarized economy of Georgia.

(Tsinaridze et al.:2021a) emphasize the consideration of the Taylor-type function of the monetary policy reaction when deciding on the monetary policy rate, as a result of which they conclude that the policy rate is mainly dependent and responsive to the deviation from the target inflation rate and the GDP gap (difference between full employment GDP and current real GDP).

(Tsinaridze et al.:2021b) studied the methodology of determining the monetary policy rate and the role of the National Bank in maintaining price stability, after which it was concluded that as a result of the increase in the monetary policy rate, the attempt to drive down prices and the increase in interest rates on loans become even more stressful for businesses and the population.

III. Research Metodology

Determining the correlation between the dynamics of the GEL exchange rate and inflation in relation to the monetary policy rate and forming a new relationship is impossible without analyzing the current situation. It is essential to evaluate all the determinants related to the impact of the monetary policy rate on the main macroeconomic parameters of the national economy. In this regard, it is crucial to quantitatively evaluate the statistical data of the impact of the GEL exchange rate, inflation, and monetary policy instrument on the monetary policy, on the one hand, and, on the other hand, in relation to it - regression analysis. In the process of research, this allows us to evaluate the existing strategy and tactics of inflation targeting, the economic and financial indicators during typical and atypical crisis periods, to what extent they are in synthesis with the existing reality, and at the same time, if they are in full compliance with the tools of monetary and credit policy of classical economic theory.

The theoretical and methodological basis of the research is the collection, comparison, qualitative analysis, and quantitative research of Georgia's financial and economic indicators during the recent crisis periods. Scientific papers, textbooks, Georgian and foreign scientific articles, indicators, reports and studies of the National Bank of Georgia, the Ministry of Finance of Georgia, and the National Statistics Service of Georgia were used for this work. An econometric analysis was carried out based on the quantitative data collection (establishing correlation and drawing up a linear regression equation).

IV. Discussion And Results

One of the main problems for the economy of Georgia is inflation, the increasing rate of which prevents the establishment of economic stability in the country. The role of the National Bank in eliminating this problem is to use monetary policy and its instruments effectively.

The 2008 Russia-Georgia August War was an armed conflict that lasted 16 days. This event is a very painful part of our country's recent history and had severe economic consequences. In the international arena, an even more difficult situation was added: the financial crisis of 2008.

It was a challenging period for the banking sector, as credit was completely stopped for a while, followed by a "bank holiday" that lasted for a week. The panic caused by the war affected deposits, as the population began actively withdrawing them **(Kovzanadze et al., 2014),** and for commercial banks, deposit liabilities decreased by 12.8% in August alone. Also noteworthy is that the dollarization rate of deposits increased to 61.2% in one month. One of the negative events was also the increase of overdue loans by 13.4 million GEL.

„The conduct of monetary policy in the Covid-Pandemic conditions proved to be special, According to numerous experts and organizations, the global economic recession caused by the Covid-Pandemic has equaled the global financial crises. In such conditions, when the world is trying to deal with the virus, it seems that the management of state economic parameters and monetary policy are a secondary category, but in reality, monetary policy makers during this period constantly tried to pursue policies that would stimulate the economy and economic agents, including Georgia". **(Tsinaridze et al.:2021a)**

Since panic among the population, supply chain disruptions, and war led to an economic decline and an increase in the inflation rate (in August, it was 3.4%), the National Bank was forced to introduce certain benefits. In particular, it reduced the monetary policy rate from 12% to 11%, and in September, to 10%. For commercial banks, the mandatory liquidity norm was reduced to 20% and the minimum reserve requirements to 5%. **(Kovzanadze et al., 2014)**

The ongoing processes in Georgia were unknown, and no one knew that blow the country's economic and financial apparatuses would receive. Therefore, it made no sense to predict economic growth. Despite the challenging course of the war, Georgia could avoid a severe financial crisis and maintain relative, maximum stability in the long term with the help of quick and correct actions and international assistance. The crisis resulted from the combined impact of the war and the global financial crisis, which Georgia went through with the help of external partners.

However, we had a relatively different situation during the last different type of crisis that started in 2020. The coronavirus pandemic had utterly changed the economic agenda for the world, overturning globalization and seemingly returning us to a time when there was no active foreign trade between countries. Border closures, business shutdowns, and remittances cut off have affected both developed and developing countries.

Below is a diagram of the GEL exchange rate, according to which the Lari has certainly depreciated against the USD, but after March 27, it experienced a significant decline, which is the result of the correct policy of the National Bank.

Based on this, it can be said that the National Bank correctly used the levels at its disposal and did not allow a sharp increase in economic indicators in the country in a short time, which would be disastrous for our country. It is also essential that these actions remain active and measures are taken to deal with the relevant challenge.

In 2022, when the fifth pandemic wave ended in February, and the world slowly announced the post-pandemic phase, we faced a new challenge – on February 24, the Russian Federation began military aggression against Ukraine. The armed conflict of the neighbouring countries is significant for us because we import certain goods from both countries.

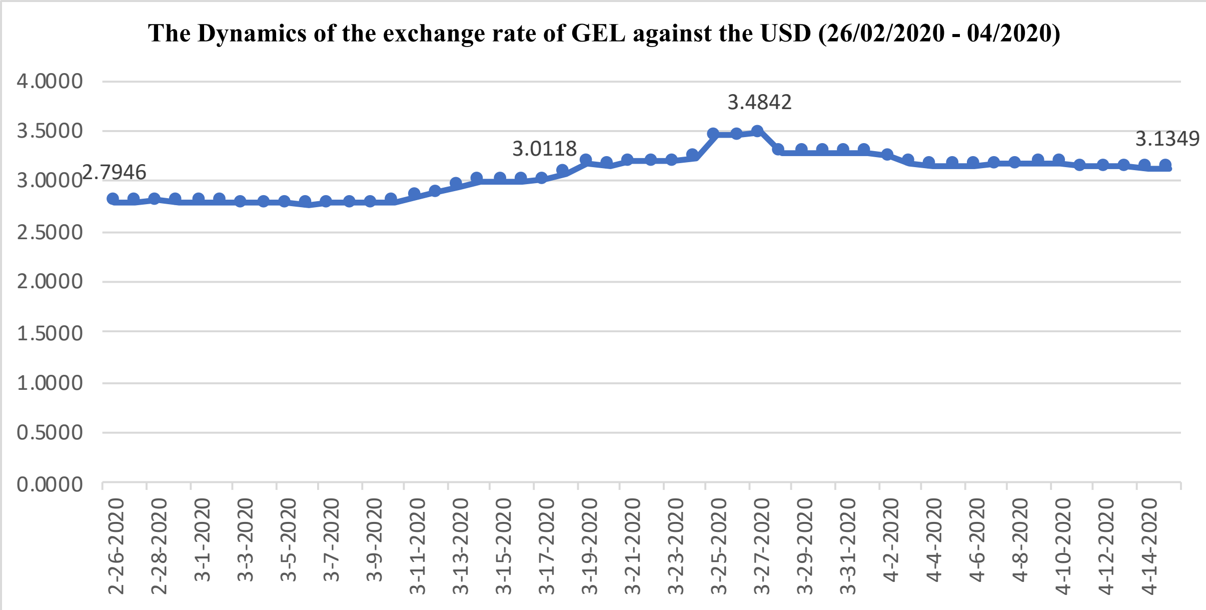

Fig. 1
Source: The National Bank of Georgia

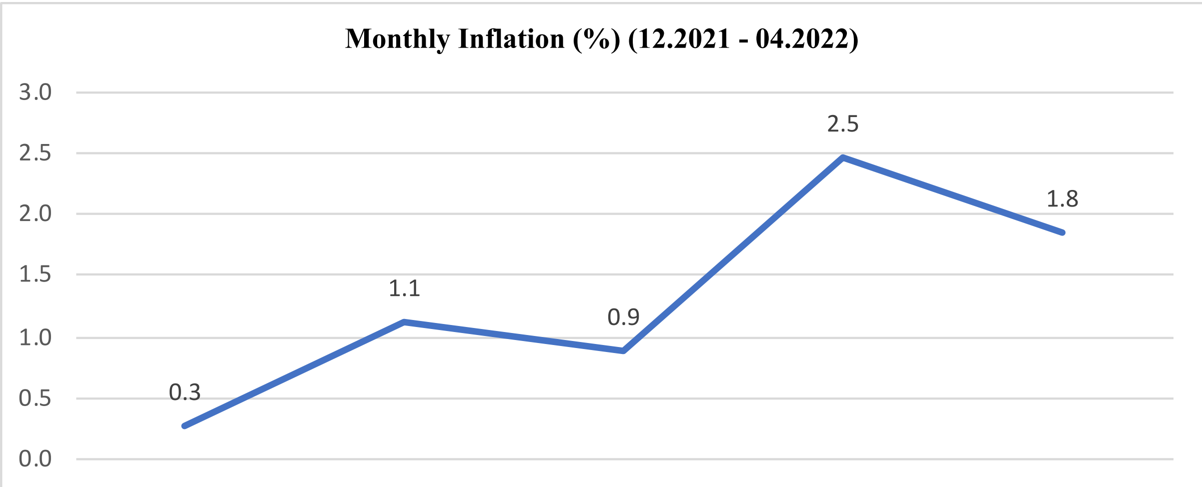

Fig. 2
Source: The National Bank of Georgia

Although the banking and financial sector was not affected by these events as much as in the case of the previous crisis, negative changes are still noticeable. For example, the monthly inflation rate in March increased to 2.5% while maintaining a low rate.

Also, as can be seen from the diagram, the official daily GEL exchange rate has increased, reaching the mark of 3.4 against the USD. The devaluation of the GEL to this level has not happened since the beginning of the pandemic in 2020, which caused panic among the population. However, due to the quick actions of the National Bank of Georgia, the exchange rate stabilized over time. As of May 25, it has fallen below the mark of 3.

Many factors affect the current exchange rate, but we will study its relationship with the monetary policy rate and the export-import differential for this work. To analyze the influence, of course, we will use correlation. The impact of each indicator on the exchange rate during two crisis situations will be discussed for the research, the dynamics will be analyzed, and relevant conclusions will be drawn.

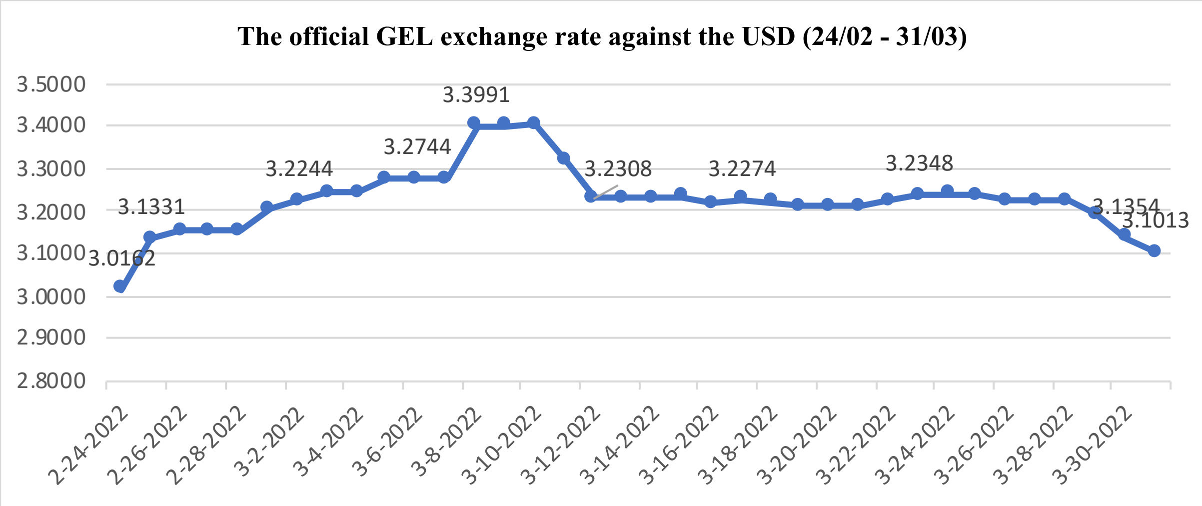

Fig. 3
Source: The National Bank of Georgia

First of All, let's start by discussing **the crisis caused by the 2008 Russia-Georgia war.**

- The effect of the monetary policy rate on the exchange rate:

Table 1.

The dynamic of monetary policy and exchange rates (06/08 – 06/09)		
	The monetary policy rate (%)	Exchange rate
June-2008	12	1.4281
July-2008	12	1.4096
August-2008	11	1.4123
September-2008	10	1.4050
October-2008	10	1.4127
November-2008	9	1.5827
December-2008	8	1.6554
January-2009	8	1.6677
February-2009	7	1.6739
March-2009	6.5	1.6729
April-2009	6	1.6650
May-2009	6	1.6489
June-2009	6	1.6540

Source: The National Bank of Georgia

According to this table, Georgia faced the 2008 war crisis with a monetary policy rate of 12% and has lowered it over time. Within one year, the monetary policy rate decreased by 50% - from 12% to 6%. This reduction is caused by the actions taken by the National Bank of Georgia during that period.

The dynamics of the exchange rate are clear. However, it should be noted that its sharp increase occurred after November 2008. It is an interesting fact that during August and September, the daily exchange rate was updated quite rarely and remained at the same rate for several days. This can be explained by the state of emergency that was in the country. However, the fact is clear that the GEL depreciated by 15.8% in one year.

Table 2.

Correlation between monetary policy and exchange rates		
	Monetary policy rate	*Exchange rate*
Monetary policy rate	1	
Exchange rate	-0.905716095	1

Source: Compiled based on our research

This table shows the correlation between the monetary policy rate and the exchange rate. As it turned out, it is about -0.91. This is a strongly negative correlation, which means that with an increase in the refinancing rate, a decrease in the exchange rate is expected. As seen from Table 3, this happened because an increase followed the decline in the monetary policy rate in the exchange rate. Based on the theory already discussed, this is expected because a reduced monetary policy rate can release monetary resources through the banking system.

- The effect of the export and import gap on the exchange rate:

Table 3.

Dynamics of export and import gap and exchange rate (06/08 – 06/09)		
	Export and Import gap	Exchange Rate
June-2008	-350,725,877.61	1.4281
July-2008	-381,607,759.70	1.4096
August-2008	-357,301,526	1.4123
September-2008	-273,270,005.10	1.4050
October-2008	-434,451,081.98	1.4127
November-2008	-382,064,604.77	1.5827
December-2008	-368,337,145.70	1.6554
January-2009	-207,568,720	1.6677
February-2009	-200,551,915	1.6739
March-2009	-205,841,281	1.6729
April-2009	-423,769,274	1.6650
May-2009	-220,287,810	1.6489
June-2009	-320,013,546	1.6540

Source: Ministry of Finance of Georgia, National Bank of Georgia

The table represents the difference between exports and imports, which is actually the country's trade balance. It appears to be negative throughout the period taken from 2008-2009. The difference is relatively reduced in September 2008 and the first half of 2009, which can be connected with the limited foreign trade relations that took place in the given period.

Table 4.

Correlation between export and import gap and exchange rate		
	Export and import gap	*Exchange rate*
Export and import gap	1	
Exchange rate	0.465226295	1

Source: Compiled based on our research

The given table represents the correlation between the two quantities which is 0.465. This means an average positive correlation exists between the decrease in the export-import gap and the exchange rate. This is a wrong attitude because it implies that the devaluation of the GEL will follow the gap reduction. In general, this difference means that the growth rate of imports is higher than that of exports, which brings foreign currency into the country, thus reducing the demand for GEL. Therefore, if the demand for GEL decreases, it depreciates the exchange rate. It is possible to connect this omission with the peculiarity of the crisis and many other factors affecting the GEL exchange rate. Finally, as the correlation analysis showed, the change in the monetary policy rate has the strongest impact on the exchange rate.

During the **2020 COVID-pandemic crisis**, the impact of similar indicators on the currency exchange rate looks like this.

Table 5.

	Monetary policy rate	Exchange rate	Export and import gap
January-2020	9	2.8829	-314,485,193.20
February-2020	9	2.8516	-376,179,945.30
March-2020	9	3.0407	-355,259,494.80
April-2020	8.5	3.1717	-170,959,177.70
May-2020	8.5	3.1980	-223,221,641
June-2020	8.25	3.0419	-252,254,416
July-2020	8.25	3.0628	-310,807,702.90
August-2020	8	3.0735	-283,808,498.20
September-2020	8	3.1723	-270,643,712.10
October-2020	8	3.2177	-330,014,465.30
November-2020	8	3.3087	-309,053,029.50
December-2020	8	3.2864	-392,223,443
January-2021	8	3.2973	-277,377,795.60

Source: Ministry of Finance of Georgia, National Bank of Georgia

With the help of this table, we can discuss the developments in 2020. Compared to the previous crisis, it is clear that all the data have increased relatively. However, the course of the crisis led to some changes.

Globalization process has helped to strengthen demand-supply circle among the countries, ensuring their participation in international trade and foreign economic affairs. Processes following coronavirus and especially, virus-preventing measures, forced countries to engage in economic isolation, which in their turn damaged globalization-led economic connections. **(Tsinaridze et al.:2020)**

The monetary policy rate, which has remained stable at 9%, has been declining under the lockdown, accompanied by various banking system reforms and incentives. As it turned out, the National Bank carried out the same actions as during the 2008 war - it reduced the monetary policy rate.

In terms of the exchange rate, we had a rather difficult picture because already in 2018, when relations with the Russian Federation were relatively strained, the GEL began to depreciate due to the imposition of certain restrictions by the neighbouring state. However, the pandemic intensified this phenomenon, and for the first time in the history of the GEL, it exceeded the 3.0 mark against the dollar. On March 27, 2020, a historical maximum was recorded - 1 dollar equalled 3.4842 GEL. The exchange rate was maintained at a value higher than 3 GEL throughout 2020. This was expected because public confidence in the GEL was significantly weakened, the dollarization of loans was relatively high, and the trade balance was characterized by negative trends, reducing the demand for the GEL.

The change in the difference between exports and imports was also not stable. During the pandemic, when foreign trade was generally restricted, a significant decrease in the negative trade balance gap can be seen, which could be considered a positive fact if not for the worsening of this gap during the period when the restrictions were relatively relaxed. The lockdown and various international restrictions imposed as a result of the pandemic had the power to improve our trade balance, albeit in the short term.

It can be said that the dynamics of the given indicators are similar to the data of the 2008 war, although the actions of the National Bank were much more sophisticated. It is also necessary to consider that after 12 years, Georgia became more actively involved in foreign trade. Therefore the GEL exchange rate became more sensitive to external shocks.

Table 6.

Correlation between the indicators and exchange rate	
	Exchange rate
Monetary policy rate	**-0.774317175**
Export and import gap	**0.207246599**

Source: Compiled based on our research

The table presents the correlation relationship between a specific indicator and the exchange rate. It will be interesting to discuss how much this relationship has changed compared to similar data from 2008-2009.

The relationship between the monetary policy and exchange rates is -0.77, which is strongly negative. Therefore, if the monetary policy rate increases, the value of the exchange rate will decrease. In 2020, Georgia faced a similar challenge - avoiding the collapse of the banking sector. However, the central bank took more experienced and practical steps in this case. It is also worth noting that, compared to 2008, the correlation weakened by 0.13 points, which means that the monetary policy rate has relatively less influence on the exchange rate change. This is logical since the crisis caused by the coronavirus is very specific, non-economic and was accompanied by much more peculiar factors beyond the financial.

As for the relationship between the difference between exports and imports and the exchange rate, it was 0.21, which weakened by 0.26 points compared to the similar relationship observed in 2008-2009. Again, this is not a logical result because, as we mentioned, reducing the gap should lead to strengthening the GEL. However, the weakening of the positive relationship indicates that the trade balance has a better effect on the exchange rate of the GEL than it was during the crises of 2008-2009. The specific character of this connection can be explained by the unique nature of the pandemic and its non-economic nature.

Finally, it can be said that according to our analysis, the crisis caused by the COVID pandemic showed similar results as in 2008-2009. The main weakening and changes in certain relationships are explained by the fact that the pandemic is not an economic crisis but an atypical one. In Georgia, the coronavirus created a massive challenge for the healthcare sector, which was transferred to the economic sector as a lockdown. The added factors reduced the impact of the existing factors on the exchange rate. However, the result is similar because the Georgian lari was still devalued, the foreign debt was growing proportionally, the National Bank of Georgia controlled the monetary policy rate, and the inflow of remittances into our country was also characterized by changing dynamics.

As for the crisis with an unknown development, which was caused by **the Russia-Ukraine war in 2022**, the influence of several indicators on the GEL exchange rate looks like this:

Table 7.

	Monetary policy rate	Exchange rate	Export and import gap
October2021	10	3.1399	-430,104,782
November-2021	10	3.1374	-409,077,433.40
December-2021	10.5	3.0987	-470,420,552.80
January-2022	10.5	3.0803	-365,168,794.30
February-2022	10.5	3.0081	-405,870,997.50
March-2022	11	3.2421	-549,670,474.60
April-2022	11	3.0663	-459,723,124.90

Source: Ministry of Finance of Georgia, National Bank of Georgia

This table represents the period before and during the war crisis. Since a Russia-Ukraine military confrontation is still a 4-month event and it is not known how long it will last, it is appropriate to be guided by the available data.

The change in the monetary policy rate in the given period is very interesting because, unlike all other crises, it is characterized by an increasing trend in this case. In December, the National Bank stated that they are increasing the inflation rate and the desire to get closer to the target inflation rate. "According to the preliminary assessment of the National Bank of Georgia, the contribution of exogenous factors to the annual inflation of November is equal to approximately 9 pp... Although the exchange rate is relatively stable at the annual level, according to the data of November, the annual rate of imported inflation was equal to 18 percent." **(National Bank of Georgia, 2021)**

It is also worth noting that the monetary policy rate was raised again by 0.5 basis points in March 2022. The National Bank again explains this decision by the high level of inflation and the expected shocks that will follow the current crisis and sanctions. As of today, as seen in the table, the monetary policy rate maintains the 11% mark. **(National Bank of Georgia, 2022)**

The exchange rate has an interesting dynamic because it stabilizes in a given period. We had the most critical period in March 2022, when the war that started in February caused panic among the population of Georgia. At that time, the dollar was still approaching the maximum value recorded in 2020. On March 10, the exchange rate of the GEL was recorded at 3.4019. However, the monthly average exchange rate for May 2022 is 2.9922 ***(considering the data of May 25).***

The table represents the correlation between the mentioned indicators and the exchange rate in 2021-2022.

The difference between export and import has increased sharply compared to the previous period, which is undoubtedly a negative fact for our trade and payment balance. This indicates that the growth rate of imports in Georgia exceeds that of exports. This can be logical since the country is limited in exports to such an essential partner as Ukraine.

Table 8.

Correlation between the indicators and exchange rate	
	Exchange rate
Monetary policy rate	**0.086392702**
Export and import gap	**-0.68139722**

Source: Compiled based on our research

The monetary policy rate and exchange rate are very interesting. As we know, during the previous two crises, there was a strong negative relationship between the mentioned indicators. However, the data change developed due to the Russia-Ukraine war made this relationship positive. Although 0.09 is a very weak positive correlation, it still indicates that an increase in the monetary policy rate also increases the exchange rate mark. This gives us reason to wonder why there is such a correlation.

As for the dependence on the difference between exports and imports and the exchange rate, it has changed dramatically compared to the previous two crises. It weakened a lot; it even became averagely negative. In this case, this connection is completely logical because it focuses on the positive impact of reducing the negative trade balance on the exchange rate. As we have already mentioned, our country may face significant problems in import and export chains, although this is expected to be reflected in the trade balance and exchange rate after May 2022.

Accordingly, this analysis shows that the monetary policy rate and other factors had an interesting impact on the exchange rate. Specifically, the dynamics of the monetary policy rate have a positive effect on the exchange rate because the strengthening of the GEL, caused by the effective, correct steps of the National Bank, is evident. Although the increase in the monetary policy rate can increase the cost of bank loans, it has a positive effect on the GEL. However, according to some economists, an active increase in the refinancing rate is not advisable. As a positive factor, we can single out that the National Bank does not aspire to release reserves, as happened during the pandemic.

Ultimately, we can positively assess the importance of the monetary policy rate in the exchange rate change as one of the factors determining economic growth. Of course, all three mentioned crises are fundamentally very peculiar, and the National Bank had to resort to different levers in order not to allow significant economic or financial indicators to deteriorate.

V. The Interpretation Of The Results.

Inflation is vital for our country because its growth indicators have been relevant for years. Inflation is a decrease in the purchasing power of money when a certain amount of money can be used to buy fewer goods or services after a certain period. It is closely related to the exchange rate, gross domestic product, prices, etc.

As part of the study, we will take the monetary policy rate and several other indicators to estimate their impact on inflation. These indicators are the monetary policy rate, the exchange rate, and oil prices in barrels and wheat in bushels.

First, let us start again with the crisis of 2008-2009:

Table 9.

The dynamic of the indicators (06/08 – 06/09)					
	Monetary policy rate	Inflation	Exchange Rate	The price of oil barrel (barrel/USD)	Wheat bushel price (bushel/USD)
June-2008	12	-0.1	1.4281	140.290	843.50
July-2008	12	-1.2	1.4096	124.580	783.75
August-2008	11	3.4	1.4123	115.890	779.25
September-2008	10	-0.8	1.4050	100.640	680.00
October-2008	10	-0.5	1.4127	67.810	536.25
November-2008	9	0.7	1.5827	54.430	542.50
December-2008	8	-0.4	1.6554	44.600	610.75
January-2009	8	1.4	1.6677	41.680	568.00
February-2009	7	-1.3	1.6739	44.760	510.50
March-2009	6.5	-0.4	1.6729	49.660	532.75
April-2009	6	0.5	1.6650	51.120	524.25
May-2009	6	1.2	1.6489	66.310	637.25
June-2009	6	0,0	1.6540	69.890	511.25

Source: National Bank of Georgia, Trading Economics

This table presents the dynamics of several indicators during the 2008-2009 crisis. We will consider the dynamics of each data before moving on to examine the correlation.

The inflation rate was quite variable in the given period. For accuracy, we have taken monthly inflation. Inflation seems to have been growing at a relatively high rate during this period, and the highest level was recorded in August. This is to be expected because a crisis, especially international, is usually followed by a decrease in the purchasing power of money.

The prices of oil and wheat decreased significantly during this period. This phenomenon mainly depends on external shocks, in particular the world oil shock of 2007-2008, which was caused by a reduction in oil production and demand, as well as the impact of the crisis of the "Great Recession" **(Hamilton, 2009).** A falling dollar and panic buying of food also led to a wheat price crisis in 2008. **(Staff, 2011)**

Table 10.

The correlation between the indicators and inflation (06/08 – 06/09)	
	Inflation rate
Monetary policy rate	0.004567
Exchange rate	-0.00952
Oil price	0.067227
Wheat price	0.192497

Source: Compiled based on our research

The table presents the impact of various indicators on inflation during the war and crisis of 2008.

The relationship between the monetary policy rate and inflation appears to be 0.005, which is a weak correlation. For a given number, the two quantities have almost no effect on each other. Theoretically, the increase in the inflation rate should be followed by the strengthening of the exchange rate, therefore, the decrease in inflation. This omission can be explained by the nature of the crisis, hostilities, and too many external shocks. However, we should also not exclude the actions of the National Bank and international aid, which allowed the government to maintain prices.

There is a weakly negative effect between the exchange rate and inflation, -0.010. This means that if the GEL depreciates, inflation will decrease to some extent. This is not logical because the devaluation of the GEL directly affects the purchasing power of money. The exchange rate was growing in the given period, although inflation was not characterized by similar proportionality.

According to the given table, the change in the price of oil and wheat has a positive correlation with the inflation rate. The price of wheat has a stronger influence. It is logical that the increase in the prices of these products, which we actively import, will necessarily lead to an increase in the prices in the country itself, and vice versa. However, considering various subsidies, this change was not so visible. It is undoubtedly due to the peculiarity of the course of the crisis.

Accordingly, during the 2008-2009 Russia-Georgia war crisis, the reduction in oil and wheat prices had the strongest impact on inflation. Although there was a war in the country, the population was in a panic, and the banking sector was barely able to continue working; the actions of the state, as well as many financial aid and subsidies from the world, allowed us to avoid inflation. Of course, we are talking about monthly inflation. Therefore, the low variability of this indicator can be explained by this. Also, it is difficult to see the relationship between the monetary policy rate and inflation only considering the given crisis. As it turned out, inflation was affected by many factors, and the crisis was so peculiar that the correct attitude could not be reflected.

Table 11.

The dynamic of the indicators (01/2020 – 01/2021)					
	Monetary policy rate	Inflation	Exchange Rate	The price of oil barrel (barrel/USD)	Wheat bushel price (bushel/USD)
January-2020	9	0.7	2.8829	51.560	555.690
February-2020	9	0.3	2.8516	44.760	524.850
March-2020	9	0.7	3.0407	20.480	562.250
April-2020	8.5	0.9	3.1717	18.840	524.250
May-2020	8.5	0.2	3.1980	35.490	521.000
June-2020	8.25	-1.4	3.0419	39.270	489.250
July-2020	8.25	-0.5	3.0628	40.270	530.750
August-2020	8	0	3.0735	42.610	543.000
September-2020	8	0.7	3.1723	40.220	578.000
October-2020	8	0.8	3.2177	35.790	598.500
November-2020	8	0.9	3.3087	45.340	580.250
December-2020	8	-1	3.2864	48.520	640.500
January-2021	8	1.1	3.2973	52.200	663.000

Source: National Bank of Georgia, Trading Economics

In order to better study the research question, this time, we will consider the crisis caused by **the 2020 coronavirus pandemic** and the events that took place at that time.

The dynamics of the national currency exchange rate and inflation rate are still the same as described in the previous subsection. The National Bank of Georgia reduced the monetary policy rate to support the banking sector, and the exchange rate was characterized by an increasing trend due to the pandemic shock.

The inflation rate in this period was relatively increasing every month. This was expected in 2020, as resources were becoming more expensive and the demand for products was also growing. The country tried to ensure price stability by supporting business activity and subsidies.

The price of oil and wheat followed a similar trend as during the 2008 crisis. The external shock, increased demand for various products and the worldwide lockdown created specific conditions. The oil price has decreased sharply, as the demand for it has decreased significantly while the supply has increased. **(Johnston, 2022)** Similar factors also caused the price of wheat to decrease. Ultimately, the problematic nature of the pandemic, the shutdown of businesses and the halting of life have negatively affected the prices of these products.

Table 12.

The correlation between the indicators and inflation (01/2020 – 01/2021)	
	Inflation
Monetary policy rate	0.153006
Exchange rate	0.14338
Oil price	-0.15938
Wheat price	0.317194

Source: Compiled based on our research

The given table represents the correlation between the mentioned indicators and inflation. We will study and characterize each of them and compare it with the similar indicator of the previous crisis.

The relationship between the monetary policy rate and inflation is weakly positive, which means that an increase in the monetary policy rate will lead to an increase in inflation, and vice versa. However, by this logic, when the monetary policy rate was cut, it should have caused inflation to fall when inflation steadily rose. Just as we described during the previous crisis, in this case too, the given result is not logical due to the pandemic crisis's unique nature and its non-economic features. A decrease in the inflation rate should follow an increase in the refinancing rate. However, the increase in food prices was so significant that it led to an increase in inflation, as explained and demonstrated earlier.

There is a weak but positive correlation between the GEL exchange rate and inflation during this crisis, unlike in 2008. This is expected because the devaluation of the GEL will partially lead to an increase in prices and a decrease in the purchasing power of money. The pandemic contributed to the given condition in this case.

The relationship between the price of oil and wheat and the inflation rate has changed significantly compared to the previous crisis. In 2020, there is a negative correlation between oil prices and inflation, which is not logical for the reasons already mentioned. However, increased wheat prices are directly proportional to inflation, and there is a strong relationship between them on average. In this case, we can say that the change in the price of wheat has a much more significant impact on inflation because there was much more demand for food and wheat products during the pandemic.

In the end, it can be said that the features of the pandemic appeared again concerning inflation when the relationship between the monetary policy rate and the mentioned indicator is quite strange. It can be said that the reduction of the monetary policy rate did not have the desired results and was not the right policy in terms of inflation targeting, which is the main task of the National Bank's monetary policy. The rest of the indicators' influence is logical and agrees with the conditions of the pandemic and war crisis.

After that, we will discuss the deepening crisis **of 2022 as a result of the Russia-Ukraine war.** There is still not enough information about this period, so we again took several months of older data to compare them and establish the correct dynamics.

As seen from the table, the National Bank of Georgia decided to increase the monetary rate during this crisis to prevent the exchange rate increase, which was quite successful. The increase in the monetary policy rate and the currency interventions caused the GEL not to depreciate, which is a positive fact.

Table 13.

The dynamic of the indicators (10/2021 – 04/2022)					
	Monetary policy rate	Inflation	Exchange Rate	The price of oil barrel (barrel/USD)	Wheat bushel price (bushel/USD)
October2021	10	1.3	3.1399	81.780	772.750
November-2021	10	0.6	3.1374	65.850	773.750
December-2021	10.5	0.3	3.0987	74.880	770.750
January-2022	10.5	1.1	3.0803	86.490	760.500
February-2022	10.5	0.9	3.0081	93.500	917.000
March-2022	11	2.5	3.2421	98.520	1002.000
April-2022	11	1.8	3.0663	102.940	1055.750

Source: National Bank of Georgia, Trading Economics

However, if we focus on the dynamics of the inflation rate, we will notice that it is characterized by growth. While the increase in the monetary policy rate should have resulted in the containment of inflation, it did not, which is explained by the increase in the price of oil and wheat, which led to the same price dynamics. It is also worth noting that the restriction of imports from Ukraine will lead to the search for alternative chains in the future, leading to an increase in the price of raw materials.

The price of oil and wheat appeared to have also increased due to the Russia-Ukraine war, sanctions and supply chain restrictions, as the Russian Federation is known to be one of the leading exporters of oil. As one of the leading exporters of wheat, Ukraine cannot continue the process, which also causes shock changes in the price of wheat. Therefore, the mentioned trend is logical. This also leads to a significant increase in bread and fuel prices in Georgia, which is quite alarming.

Table 14.

The correlation between the indicators and inflation (10/2021 – 04/2022)	
	Inflation
Monetary policy rate	0.657737049
Exchange rate	0.53513534
Oil price	0.775585568
Wheat price	0.744927898

Source: Compiled based on our research

The table represents the correlation of the monetary policy rate, exchange rate, and oil and wheat prices to the inflation rate under the conditions of the Russia-Ukraine crisis of 2022.

In this case, too, there is a positive correlation between the monetary policy rate and the inflation rate, and it is also quite strong. This is confirmed by Table 19, as inflation also increased along with the increase in the monetary policy rate. However, as in the discussion and analysis of previous crises, the logic is lost since the increase in the monetary policy rate is aimed at reducing inflation. As mentioned earlier, the increase in inflation is related to many other factors, while the increase in the refinancing rate had a much different purpose.

On average, there is a strong positive correlation between the exchange rate and inflation. This should generally mean that as the exchange rate has strengthened over time, the inflation rate should have also decreased, which in fact, did not happen. The inflation rate in the conditions of this crisis is so dependent on other non-financial factors that the reduction of the exchange rate could not have the effect it needed for our country's economy.

The relationship between oil, wheat prices and inflation was very strong on both indicators. As already mentioned, oil and wheat prices have increased due to the Russia-Ukraine war, which could lead to a global economic shock if alternative supply options are not found in the short term. The rates of inflation in Georgia are quite increasing due to these conditions.

Ultimately, under the given crisis, many factors impacted the growth of inflation in Georgia, although an interesting attitude appeared with the monetary policy rate. It can be said that the refinancing rate did not affect correcting the situation, which is not suitable for the economy of a country like Georgia. In all three crises, the monetary policy rate coped better with exchange rate adjustments than inflation.

Finally, as it turned out, inflation, as one of the main problems of the Georgian economy, depends on many factors and different crises affect it with different strengths. However, all of them led to an increase in inflation over a period, which once again underlines the sensitivity of our money's purchasing power to external shocks.

The monetary policy rate in the conditions of these crises did not have a clear and effective result. In terms of inflation targeting, it was not the right move to reduce it during the first two crises, when it failed to stabilize either the exchange rate or inflation. Accordingly, it will be interesting to discuss the relationship between inflation, exchange rate and monetary policy rate in the conditions of the Georgian economy.

As we know, the crisis caused by the Russia-Ukraine armed conflict is a new phenomenon, and it is difficult to predict its duration and outcome, just as it was during the pandemic. However, during this crisis period, a significant change in supply chains must be made if the world wants to stop the Russian Federation from sanctions and gain economic independence from it and support Ukraine. First, this affects Georgia as a neighbour and trade partner of both states in conflict, taking into account the complex and virtuous economy we have.

The next part of our research is to determine what we can expect if this uncertain relationship between inflation, monetary rate policy, and the monetary policy rate does not change for the better. Accordingly, we assume that the correlation dependence during the 2022 crisis is the same, and we analyze the possible development scenarios.

A simple linear regression will help us in conducting the analysis. This is a continuation of the correlation. Suppose correlation helps us determine what the relationship between two quantities is qualitative. In that case, regression allows us to take a step forward and make a prediction based on the current dynamics of how this data will develop. A simple linear regression is expressed by the equation:

$$Y = b_1x + b_0 + \varepsilon$$

In the given equation, x is the independent variable that affects Y, the dependent variable. Coefficients b_1 and b_0 are regression coefficients that determine the value of the dependent variable, and ε is a random deviation, error in dependence.

Accordingly, within the scope of this study, we will take one independent quantity - monetary policy rate, and dependent quantities - exchange and inflation rates. Based on the existing dynamics, we should derive the indicators ε, b_1 and b_0 utilizing Excel functions and compile the equation.

These indicators take the following form:

Table 15.

Variables in a simple linear regression equation				
Y	**x**	**b_1**	**b_0**	ε
Exchange rate	Monetary policy rate	0,01555	2,947125	0,007463699
Inflation	Monetary policy rate	1,2	-11,3857	0,432618

Source: Compiled based on our research

Accordingly, the equation of the exchange rate as a dependent variable, in this case, takes the following form:

$$Y = 0.01555x + 2.947125 + 0.007463699$$

And in the case of the inflation rate as a dependent variable:

$$Y = 1.2x - 11.3857 + 0.432618$$

After that, we have to consider the change in the exchange rate and the inflation rate if the monetary policy rate changes. For greater precision, let's assume that today's refinancing rate, 11%, varies by ±3. As a result of entering the data in table No. 16, we will get specific values, which we will discuss later.

Table 16.

Forecasting impact of refinancing rate change on exchange rate and inflation		
Monetary policy rate	**Exchange rate** ($Y = 0.01555x + 2.947125 + 0.007463699$)	**Inflation** ($Y = 1.2x - 11.3857 + 0.432618$)
14	3,1723	5,8
13	3,1567	4,6
12	3,1412	3,4
11	3,1256	2,2
10	3,1101	1,0
9	3,0945	-0,2
8	3,0790	-1,4

Source: Compiled based on our research

The given table presents the results of the research. As it turned out, if the National Bank of Georgia increases the monetary policy rate, this will increase both the exchange rate and the inflation rate. Also, if, on the contrary, the monetary policy rate decreases, the other two data will decrease.

As has already been mentioned several times, the theory of operation of this monetary policy instrument is the opposite - an increase in the monetary policy rate leads to a decrease in the inflation rate and a strengthening of the exchange rate and vice versa. It is also quite strange that the increase in the monetary policy rate, according to the given function is followed by the devaluation of the GEL when the opposite picture is found in practice.

This illogical result again confirms the significant impact of external shocks on these two indicators. In our opinion, the relationship of the monetary policy rate with them, due to the profoundly commercial character of the given crisis, is very weak.

VI. Conclusions.

The main goal of the National Bank is price stability, and for this, it uses the inflation targeting regime. Consequently, the role of the instruments at its disposal, especially the monetary policy rate, in fulfilling the goal is drastically reduced. This is a thought-provoking issue that needs to be reviewed by the National Bank of Georgia. How targeted is the increase in the monetary policy rate during the given year? In our opinion, reviewing the monetary policy strategy and the regime will be helpful for the National Bank to face future challenges with ease and efficiency so that the economic stability of Georgia is not under threat.

As it turned out, during the crisis of 2008, the reduction of the monetary policy rate was followed by a similar exchange rate dynamic. At that time, there was also an increase in the inflation rate, which, as we mentioned, was largely dependent on external shocks and the crisis in trade relations. In 2020, the unpredictable pandemic led to a sharp increase in the exchange rate, in response to which the National Bank made foreign exchange interventions and released reserves. At the same time, the inflation rate also increased to some extent.

In February-April 2022, there was a change in the use of the monetary policy rate – the National Bank increased it, which resulted in the strengthening of the exchange rate. However, rising oil and wheat prices and changes in foreign trade chains have significantly affected inflation, which is currently on the rise. As we have already mentioned, the full impact of the crisis on our country's economy became more evident after May.

In order to determine how the research indicators would change with the change in the monetary policy rate, we conducted a regression study, which gave us a disturbing picture – if the monetary policy rate increases, the exchange rate and inflation will follow the same trend, and vice versa. Of course, this result is illogical based on practical and theoretical examples.

Ultimately, based on our analysis, we can conclude that the impact of the monetary policy rate on the given indicators and, ultimately on the economy is very unclear. In our opinion, the National Bank of Georgia needs to consider that both the exchange rate and inflation are affected by unfavourable changes in foreign trade chains.

The effectiveness of the inflation targeting regime is questionable for modern Georgia, which is entirely dependent on imports, and an increasing trend characterizes its negative trade balance. We also use the floating exchange rate regime, and although it helps us absorb external shocks, the exchange rate of GEL against the USD has not fallen below the 2.7-2.8 level in the last two years.

Accordingly, we consider revising the monetary policy regime and instruments, adapting them to current crises as much as possible. This will help Georgia better manage its exchange rate and inflation, a long-standing public concern. It will also increase our country's standard of living and economic stability.

REFERENCES

1. Abuselidze, G. (2017). Inflation Influence on Economic Development of the Country and Main Directions of Overcoming It. Recent Advances in Information Technology, Tourism, Economics, Management and Agriculture, pp. 560-567.
2. Abuselidze, G. (2019). Modern challenges of monetary policy strategies: inflation and devaluation influence on economic development of the country. Academy of Strategic Management Journal, 18(4), 1-10.
3. Abuselidze, G. (2022). The Influence of Changes in Oil Prices at the Inflation Levels: A Correlation-Regression Analysis. Lecture Notes in Computer Science, 13376, 45–57.
4. Eradze I. (2022). Financialisation of monetary policy in a dollarised economy: the case of Georgia. *Cambridge Journal of Economics*, 46(5). https://doi.org/10.1093/cje/beac019
5. Kovzanadze I.; Kontridze G. (2014). Modern banking: theory and practice. Tbilisi, 2014. ISBN 978-9941-0-6639-9
6. Mosiashvili V.; Bibiluri A. (2022). Impact Of Refinancing Rate On Internal Investment Volume", Turiba University, XXIII Conference COMMUNICATION AND DEVELOPMENT OF INTERDISCIPLINARY COMPETENCES IN THE DIGITAL AGE, Riga, April 20–21, ISSN 1691-6069. available at: https://www.turiba.lv/storage/files/konference-xxiii-2022_1.pdf#page=95 (accessed: November 2022)
7. Hamilton, D. J. (2009). Causes and Consequences of the Oil Shock of 2007-08. available at: https://www.brookings.edu/wp-content/uploads/2016/07/2009a_bpea_hamilton-1.pdf (accessed: November 2022)
8. Staff, R. (2011). Factbox: 2008 food price crisis – what caused it? (10 June, 2011). available at: https://www.reuters.com/article/us-climate-crops-price-factbox-idUSTRE7590IJ20110610 (accessed: November 2022)
9. Johnston, M. (2020). What Happened to Oil Prices in 2020 (22 February, 2022). available at: https://www.investopedia.com/articles/investing/100615/will-oil-prices-go-2017.asp (accessed: November 2022)
10. Tsinaridze, R.; Beridze, L; Tsetskhladze, L. (2021a). Refinansing Rate And Its Impact On The Country's Economy In The Context Of The Covid Pandemic. Economic Profile 22(2). https://doi.org/10.52244/ep.2021.22.03
11. Tsinaridze, R.; Beridze, L; Ananidze, G.; Shainidze, D. (2021b). The role of the refinancing rate in exchange rate regulation. Business and Legislation (2). available at: https://b-k.ge/arqivi/2021-tseli-n01-biznesi-da-kanonmdebloba-2/ . 63-69.
12. Tsinaridze, R., & Tsetskhladze, L. (2020). The major vectors of Georgia's customs policy in the post-coronavirus rehabilitation process. Ecoforum Journal, 9(3). 1-8.
13. The National Bank of Georgia, "The National Bank of Georgia increases the monetary policy rate by 0.5 percentage points to 10.5 percent" (December 8, 2021). https://cutt.ly/82hNFb2
14. The National Bank of Georgia, "The National Bank of Georgia increases the monetary policy rate by 0.5 percentage points to 11 percent" (March 30, 2022). https://cutt.ly/42hNHLS