

## THE IMPACT OF THE „SUM“ EXCHANGE RATE ON OUTPUT IN THE REGIONAL

**Ortiqov Maxammadjon Adxamjon o‘g‘li**

Master graduate student of Tashkent State University of Economics.

### ANNOTATION

*In this a description of the research aimed at identifying and optimizing the study methodology of the dynamics of the exchange rate fluctuations and the factors affecting it is given. This research examines the regional heterogeneity of the impact of the ruble exchange rate dynamics on output. The research shows the regional heterogeneity of the influence of the exchange rate on the output, notes the possibility of both preserving and changing the nature of the said impact, depending on the general economic conditions.*

*Also, proposals and recommendations given on the method of regulating and organizing the formation of foreign exchange reserves in the Special Drawing Rights (SDRs), as well as the influence of international trade between countries on the dynamics of the exchange rate. In addition, information on measures taken by the Federal Reserve System to prevent sharp fluctuations of the U.S. dollar. Through the monetary policy models, the main macroeconomic indicators, namely: GDP, unemployment, interest rate, inflation, and etc., were adopted to apply the process of evaluating the impact directly on the exchange rate. Finally, we validate the model-implied co-movement trade between relative prices and technology differentials using a panel of cross industry-country data and industry prices.*

**Key words:** *Macroeconomic Indicators, Currency Intervention, Export and Import, Financial institutions, Real exchange rate, Geopolitical tensions, Monetary Policy, Foreign exchange market, International Investment position, SDR, International Monetary Fund, gross regional product.*

## **Introduction**

In open economies, of which Uzbekistan is one, development depends heavily on the international environment. Currency exchange rate plays a vital role in the impact of external factors on the national economy. Monetary and fiscal authorities can influence the exchange rate to some extent through reserve collection, public external debt management, establishing fiscal and other rules providing for interventions in the currency market. The national currency depreciation tends to accelerate inflation due to increased prices of imported goods. But, the direction of the relationship between the exchange rate and the economic activity is not that clear. Existing research shows that the effect of currency depreciation on the economy is far from certain.

The regional heterogeneity of the impact of the exchange rate on the output is of further interest. The Republic of Uzbekistan consists of 12 regions and one autonomous republic, varying in terms of economic development, sectoral specialisation, dependence on exports and imports. This results in the heterogeneous response of indicators of economic activity in various regions to the same external shock. However, with a set of specific internal characteristics, the regions are not fully independent economic systems: several macroeconomic factors that have formed for the country as a whole (interest rates, exchange rate, etc.) have impact on them.

This research is that the assessment of the impact of the exchange rate on output has been carried out for the regions of Uzbekistan, unlike most research, where the authors tend to examine the impact of the exchange rate for the country as a whole. Understanding how the exchange rate impacts the economy in the regional context will allow a finer assessment of the effect of currency shocks on Uzbekistan's economic growth, and shall enhance the calibration of monetary policy aimed at meeting the nation-wide inflation target objective.

## **Review of studies on the relationship between the exchange rate and output**

The impact of the exchange rate dynamics on the economic activity is considered in literature rather thoroughly, while the issue remains contentious and important subject of research. In many research works, their authors, using the example of certain countries, indicate the presence of a negative correlation between the exchange rate dynamics and economic growth, paying attention to the correlation between the 'weak' exchange rate and economic development. Many research works have noted a positive correlation between the exchange rate and economic growth, and questioned the appropriateness of measures aimed at the undervaluation of the exchange rate. A group of research works can be distinguished where the authors indicate that the effect of the exchange rate on output depends on the deviation of the exchange rate from certain 'equilibrium level' it is understood that excessive undervaluation or overvaluation of the national currency adversely affects the economy. And finally, in some research, the authors do not find a statistically significant relationship between the exchange rate and output.

The inconsistency of the results derives from the complexity of the impact of the exchange rate on the output, and each specific case requires detailed consideration. In this regard, many research works are conducted on data for a group of countries, where the authors focus on comparing a certain set of economic indicators that explain the differences. Another approach that allows to identify the key factors and channels of the impact of the exchange rate on the output is to study the economy of a particular country in the context of industries, regions or time periods.

The research of the European Central Bank experts calculates the impact of changes in the real exchange rate on output in 150 countries over 40 years. As a result of such an extensive research, the authors confirm the presence and significance of the exchange rate pass-through effect on the output, while it is noted that developing countries, unlike the advanced economies of the world, are more vulnerable to the impact of the depreciation/appreciation of the national currency on the dynamics of economic growth per capital.

For a long time, the dominant point of view in the economic literature has been that there is a negative correlation between the exchange rate dynamics and output. This point of view was based on the Mundell – Fleming model of an open economy. Under this model, the depreciation of the national currency leads to an increase in net exports and, Heterogeneity of the impact of the sum exchange rate on output in the regional context.

As a result, in total output. But, certain factors can reduce a positive impact of currency depreciation/devaluation. The final impact of changes in the exchange rate on the trade balance depends on the price elasticity of demand for exports and imports. Furthermore, the economy should have free production resources so that the rise in the cost of imported goods can encourage import substitution and the growth of domestic output. Otherwise, currency depreciation will accelerate inflation. Calvo, G. and Reinhart, C. based on the analysis of 96 cases of devaluation, conclude that it often has a negative impact on economic growth, especially in developing countries. The reason for such an impact, according to the authors, is a reduction in domestic demand and losses caused by an increase in the real value of existing liabilities denominated in foreign currency. As a result, the countries whose economy and production largely depend on imported equipment, technologies and raw materials are more vulnerable to the negative impact of devaluation. In their research, Eichengreen, B. and Hausmann, R. draw attention to the imperfection of the financial markets of developing countries: the lack of opportunities to borrow domestically for a long term and to borrow in national currency abroad leads to a mismatch in the currency of assets and liabilities. The underdevelopment of national financial markets also prevents entrepreneurs from effectively insuring currency risks. In this regard, the impact of the exchange rate on economic growth through the debt channel is of particular relevance to developing economies. Mohamed, O. et al. analyse the relationship between output and the exchange rate in seven developing countries: Ghana, Mexico, Malaysia, Pakistan, Philippines, Singapore, and South Africa. All the selected countries have gone through devaluation. Based on the results

of the research, the authors conclude that the devaluation has a generally negative long-term impact on economic growth in all the countries analysed, except Mexico. The research explains the positive effect for Mexico by the low level of external debt in foreign currency relative to GDP. In addition to the growth of debt burden, the authors identify two more reasons for the negative impact of devaluation on economic development in the countries considered:

- the inability to increase exports due to the lack of goods of proper quality;
- the lack of their own full substitutes for imported raw materials and goods.

Hence, the effect of the exchange rate in a particular country is determined by the specifics of its economy: the composition of exports and imports, the development of financial markets, the debt burden in foreign currency, and the availability of unused production resources. It should also be taken into account that economic environment is not static: the nature and degree of the impact of the exchange rate pass-through effect can change significantly under the influence of structural changes, for example, as a result of economic reforms (change of the exchange rate regime, introduction of fiscal rules, etc.), as well as under the influence of external factors (sanctions, interaction with economic unions). Thus, in their research of the impact of the exchange rate on the export industry of Turkey, Dincer, N. and Kandil, M. conclude that following the structural reforms in the Turkish economy, there is no positive effect of the currency devaluation on exports and economic growth, which was found earlier. Kartaev, F.S. based on the data for 176 countries, evaluates the efficiency of the implementation of the inflation targeting policy and draws attention to the significance of the current exchange rate regime: a hybrid version of inflation targeting, under which the monetary authorities manage the exchange rate, is more effective for encouraging output than pure inflation targeting, which assumes the regime of free floating of the national currency exchange rate.

The discussion of the regional differentiation of economic processes is also found in Uzbekistan studies, but the research concerning the relationship between the

exchange rate and the output in Uzbekistan pays more attention to sectoral differences. Central bank shows that there is no clear dominant influence of changes in the exchange rate in Uzbekistan: groups of industries that benefit and lose from the weakening of the exchange rate, as well as those that do not depend on this factor have been identified.

In another research, Boboqulov, T. analyse in detail the foreign trade orientation of industries. The authors have calculated the industry's real effective exchange rates (the structure of the currency basket is determined on the basis of data not on the total foreign trade turnover, but on the foreign trade turnover within the industry analysed). As a result, the authors show an important intersectoral difference in real effective exchange rates.

The results of the research by domestic authors suggest that there is a regional heterogeneity in the relationship between the exchange rate and the output in Uzbekistan due to Heterogeneity of the impact of the sum exchange rate on output in the regional context 9 April 2022.

### **Calculating of the regional heterogeneity of the relationship between the exchange rate and the output in Uzbekistan**

This research assesses the regional differentiation of the impact of the exchange rate on economic activity in the context of the federal districts and regions of Uzbekistan. In this regard, it is necessary to take into account the overall macroeconomic environment specific to Uzbekistan in general, and the economic specifics of each individual region. Furthermore, when starting to analyse the relationship between the exchange rate and the output, it is worth paying attention to the important changes in recent years and the emerging trends in the economy. It is this component that can adjust addressing the task at the current stage and make it possible to identify factors that were not noted in previous research.

The period from 2012 to 2018 is characterised for Uzbekistan by economic growth, which was in line with the global trend – a recovery from the global financial crisis of 2008–2009. In the second half of 2017, there was a significant depreciation

of the exchange rate of the Uzbekistan currency, at the same time, at the end of 2018, the Central bank decided to stop managing the sum exchange rate and switched to an inflation targeting policy. In this regard, it is advisable that this research consider the impact of the sum exchange rate on the regional output in the context of two periods: 2012–2017 and 2017–2018.

The period since 2017 was also marked by a number of new macroeconomic conditions for the Uzbekistan economy – a gradual reduction in interest rates and inflation: the weighted average actual overnight rate of the Uzbekistan interbank loans market dropped from 16.0% in January 2017 to 6.1% in December 2021, annual inflation in Uzbekistan for the same period fell from 15.0 to 12.4%, while the foreign currency reserves of the Republic of Uzbekistan reached a new maximum, amounting to about USD 34 billion as of 1 January 2022. In February 2017, fiscal rule-based operations started. Under the Fiscal Rule, the Ministry of Finance purchases foreign currency with gold and gas revenues received when gold prices are above the reference value.

A landlocked Central Asian country that shares its southern border with Afghanistan, the Republic of Uzbekistan shipped US\$14 billion worth of goods around the globe in 2021.

That dollar amount reflects a 39.2% increase from \$10.1 billion in 2017. Year over year, the overall value of Uzbekistan's exported products increased by 6.9% compared to \$13.1 billion for 2020.

Uzbekistan's top 5 most valuable exports are unwrought gold, cotton yarn, refined copper and unwrought alloys, petroleum gases, and ethylene polymers. Added together, that quintet of major Uzbekistani exports represents over half (53.3%) of Uzbekistan's overall shipments in 2021.

*Uzbekistan's Major Trading Partners.* The latest available country-specific data shows that 79.6% of products exported from Uzbekistan were bought by importers in: mainland China (16.7% of Uzbekistan's global total), Russia (16.3%), Turkey (15.7%), Kazakhstan (9.8%), Kyrgyzstan (7.4%), Afghanistan (4.7%),

*Tajikistan (3.1%), Ukraine (2.2%), Iran (1.6%), Pakistan (1.2%), Turkmenistan (0.9%) and Poland (0.8%).*

Uzbekistan's Top 10 Exports. The following export product groups represent the highest dollar value in Uzbekistani global shipments during 2021. Also shown is the percentage share each export category represents in terms of overall exports from Uzbekistan.

1. Gems, precious metals: US\$4.5 billion (32.3% of total exports)
2. Cotton: \$1.9 billion (13.7%)
3. Copper: \$1.2 billion (8.3%)
4. Mineral fuels including oil: \$883.4 million (6.3%)
5. Knit or crochet clothing, accessories: \$577.8 million (4.1%)
6. Fruits, nuts: \$511.8 million (3.6%)
7. Plastics, plastic articles: \$406.6 million (2.9%)
8. Vegetables: \$404.1 million (2.9%)
9. Vehicles : \$375.1 million (2.7%)
10. Fertilizers: \$347.1 million (2.5%)

Uzbekistan's top 10 exports accounted for 79.3% of the overall value of its global shipments. Fertilizers represent the fastest grower among the top 10 export categories, up by 127.7% from 2020 to 2021. In second place for improving export sales were vehicles via a 80.8% advance. Uzbekistan's shipments of copper posted the third-fastest gain in value, up by 60.6%. The leading decliner among Uzbekistan's top 10 export categories was gems and precious metals (down -23.9%), a product category dragged down by lower revenues from Uzbekistan's exports of gold.

From the more granular four-digit Harmonized Tariff System code level, unwrought gold represents Uzbekistan's most valuable exported product at 29.2% of the country's total. In second place were cotton yarn (11.4%) trailed by refined copper and unwrought alloys (5.3%), petroleum gases (5.1%), ethylene polymers



(2.2%), cars (2%), wheat or meslin flour (also 2%), copper wire (1.9%), nitrogenous fertilizers (1.7%), then fresh or dried grapes (1.5%).

**Products Generating Uzbekistan's Best Trade Surpluses.** The following types of Uzbekistani product shipments represent positive net exports or a trade balance surplus. Investopedia defines net exports as the value of a country's total exports minus the value of its total imports.

In a nutshell, net exports represent the amount by which foreign spending on a home country's goods or services exceeds or lags the home country's spending on foreign goods or services.

1. Gems, precious metals: US\$4.4 billion (Down by -24.8% since 2020)
2. Cotton: \$1.9 billion (Up by 61.9%)
3. Copper: \$1.2 billion (Up by 65%)
4. Knit or crochet clothing, accessories: \$552.5 million (Up by 25.2%)
5. Fruits, nuts: \$443.9 million (Down by -16.8%)
6. Fertilizers: \$323.5 million (Up by 429.4%)
7. Vegetables: \$321.7 million (Down by -8.8%)
8. Zinc: \$197.3 million (Up by 30.1%)
9. Knit or crochet fabric: \$179.7 million (Up by 80.8%)
10. Milling products, malt, starches: \$152.6 million (Up by 49.2%)

Uzbekistan has notably positive net exports in the international trade of gold. In turn, these cashflows indicate Uzbekistan's strong competitive advantages under the gems and precious metals category.

#### Products Causing Uzbekistan's Best Largest Trade Deficits

Uzbekistan incurred an overall -\$9.7 billion trade deficit for 2021, expanding by 41.9% from -\$6.8 billion in red ink one year earlier in 2020. Below are exports from Uzbekistan that result in negative net exports or product trade balance deficits. These negative net exports reveal product categories where foreign spending on home country Uzbekistan's goods trail Uzbekistani importer spending on foreign products.

1. Machinery including computers: -US\$4.1 billion (Down by -11.2% since 2020)

2. Vehicles: -\$1.7 billion (Up by 6.3%)
3. Pharmaceuticals: -\$1.57 billion (Up by 38.8%)
4. Iron, steel: -\$1.53 billion (Up by 33.3%)
5. Electrical machinery, equipment: -\$1.4 billion (Up by 32.0%)
6. Articles of iron or steel: -\$749.2 million (Up by 62.5%)
7. Wood: -\$669.4 million (Up by 19.0%)
8. Mineral fuels including oil: -\$657.6 million (Up by 45.7%)
9. Cereals: -\$654.4 million (Up by 13.4%)
10. Optical, technical, medical apparatus: -\$635.4 million (Up by 1.5%)

Uzbekistan has highly negative net exports and therefore deep international trade deficits under the machinery including computers product category. Not one Uzbekistani corporation ranks among Forbes Global 2000. Wikipedia lists exports-related companies from Uzbekistan. Selected examples are shown below.

- Avialeasing (cargo airliner)
- MAN Auto-Uzbekistan (vehicles)
- Navoi Mining and Metallurgy Combinat (uranium, precious metals)
- SamKochAvto (buses, trucks)
- Tashkent Aviation Production Assoc. (aircraft)
- Uzbekneftegaz (oil, gas)

In macroeconomic terms, Uzbekistan's total exported goods represent 4.7% of its overall Gross Domestic Product for 2021 (\$296.7 billion valued in Purchasing Power Parity US dollars). That 4.7% for exports to overall GDP in PPP for 2021 compares to 4.9% for 2020. Those percentages suggest a relatively decreasing reliance on products sold on international markets for Uzbekistan's total economic performance, albeit based on a short timeframe.

Another key indicator of a country's economic performance is its unemployment rate. Uzbekistan's unemployment rate averaged 9.5% in 2021, down from an average 10.531% one year earlier for 2020 according to International Monetary Fund statistics.

*See also* Gold Exports by Country, Grapes Exports by Country, India's Top Trading Partners, China's Top Trading Partners and Afghanistan's Top 10 Exports

## **Conclusion**

This study evaluates the impact of exchange rate dynamics on economic activity in the context of Uzbekistan regions using a structural vector autoregression. The results obtained confirm the hypothesis of the presence of a heterogeneous reaction of regional output to changes in the Uzbek sum exchange rate. The paper also revealed a change in the exchange rate pass-through effect on output as a result of a significant depreciation of the Uzbek sum and structural changes in the economy at the end of 2017. The strengthening of the Uzbek sum exchange rate in 2019 stimulated output in regions associated mainly with the manufacturing industry but at the same time negatively affected a number of regions with the predominance of the mining industry in the economy. In 2018–2020, the strengthening of the Uzbek sum exchange rate negatively affected the economic activity of regions where products are competitive in the domestic and foreign markets, and the production processes are based mainly on the domestic raw materials and technological base.

In general, the Republic of Uzbekistan shows a moderate level of influence of exchange rate on output. The obtained results make it possible to agree with the assertion that there is no unambiguous dominance of a positive or negative effect from the depreciation/devaluation of the exchange rate on the Uzbekistan economy. This supports the view that active intervention of the monetary authorities in the exchange rate is redundant. However, moderate volatility of the Uzbek sum exchange rate will help economic agents to better adapt to existing circumstances, expand the horizons of business planning, and contribute to the implementation of the inflation targeting policy followed by the Central bank, which in aggregate will create favourable conditions for the sustained and balanced economic growth.

It should be noted that the analysis of this paper takes into account a number of factors that accompanied exchange rate dynamics and caused structural changes in

the period under study. The results obtained should be extrapolated to other time periods and situations with some caution.

The quality of the assessment of the existing relationships can be improved by taking into account the specific features of regions and by individually approaching each case. This may require adding other variables and using a different calculation methodology, but shall require accumulation of additional historical data from the floating sum exchange regime era to render sufficiently robust results.

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