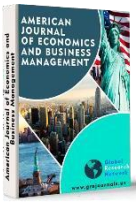

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Article

Empirical Analysis of The Impact of Commercial Bank Loans on Foreign Trade – In Case of Uzbekistan

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Abstract:. This study investigates the impact of commercial bank loans on the growth of foreign trade in Uzbekistan using a Vector Autoregression (VAR) model based on quarterly data from 2005 to 2024. The analysis considers key macroeconomic indicators, including bank loan volume, long-term interest rates, money supply, inflation, and the national currency exchange rate. The results reveal that an increase in commercial bank loans positively influences export growth, while higher long-term interest rates negatively affect exports. Additionally, growth in money supply and depreciation of the national currency support export expansion, whereas inflation shows no significant impact. The study excludes short-term loans and non-monetary gold exports due to their limited relevance to export-driven production and macroeconomic effects. Overall, the findings confirm the important role of commercial banks in promoting foreign trade and highlight the need for effective monetary and credit policies to support export performance in Uzbekistan.

Keywords: banking system, bank loan, VAR, interest rates, money supply, inflation, exchange rate, export, trade balance.

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1. Introduction

Financial support for international trade has a long history. Archaeologists have discovered evidence confirming the financial support of foreign trade in Mesopotamia even in the pre-Christian era. Since ancient times, when financing foreign trade, credit or loans were provided to buyers or sellers based on exchange documents.

Until now, all societies with a legal foundation have defined the rights and obligations of those engaged in foreign trade through a number of legal provisions. Human history has witnessed the movement towards interstate harmonization of the rights and obligations of these foreign trade participants. Even now, these efforts have not ceased. In particular, the United Nations Commission on International Trade Law, established in 1966, is carrying out various activities to harmonize solutions to issues related to international trade, associated transactions, international transportation of goods, international commercial arbitration, international payments, e-commerce, and cross-border payments. This commission has recommended "model" laws, which many countries have incorporated into their legislation.

International trade theories attempt to answer why countries trade with each other, why trade is conducted with specific countries, and what factors influence international trade. In general, there are 7 theories of international trade, which we will present below in the sequence of their historical development.

Mercantilist Theory. The theory of mercantilism is considered the oldest theory of international trade. Mercantilists were strong supporters of international trade. This theory was systematically developed in the 15th century by the Italian economist Antonio Serra and was developed and practiced for more than 300 years. According to mercantilist theory, countries should increase exports as much as possible and reduce imports as much as possible.

The theory of absolute advantage. The founder of this theory was Adam Smith, who drew attention to the shortcomings of mercantilist theory. He introduced the concept of free trade, which completely rejects mercantilism. According to the theory of absolute advantage, the country that can effectively produce goods using the same factors of production has an absolute advantage over other countries. The theory states that countries should specialize in producing products where they have an absolute advantage, and not attempt to produce products where they are dependent on others. Countries with an absolute advantage should export the products they specialize in. It also states that countries should import products in which they are not specialized and do not have an absolute advantage.

The theory of comparative advantage. Adam Smith's theory of absolute advantage is challenged by David Ricardo's theory of comparative advantage. In his opinion, countries do not need to have an absolute advantage to participate in foreign trade; it is sufficient to have a comparative advantage in production compared to other countries.

The Heckscher-Ohlin Factor Endowment Theory. Swedish economists Eli Heckscher in 1919 and Bertil Ohlin in 1933 developed the factor endowment theory, further refining Ricardo's theory of comparative advantage. This theory is also known as the Heckscher-Ohlin model, which states that countries should produce and export products that utilize factors of production which are abundant in their country.

International Product Life Cycle (IPLC) Theory. The international product life cycle theory was developed by Raymond Vernon in 1966. He explained the stages of how a certain new product becomes popular in the domestic market, begins to find customers in foreign markets and becomes an export, and finally, how this product may eventually be imported back into the domestic market.

National Competitive Advantage Theory: Porter's Diamond. In 1990, Michael Porter introduced the theory of national competitive advantage, which explained how countries can succeed in international competition. Porter's main goal was to determine what factors lead to a particular firm gaining a competitive advantage in the market or country. By studying hundreds of industries in 10 countries, he identified 4 factors that help enterprises achieve a competitive advantage.

New Trade Theory. The New Trade Theory was developed by Paul Krugman in the late 1970s. In his theory, Krugman introduces the concepts of economies of scale and first-mover advantage, which, in his view, play a crucial role in the success of companies in the international market.

2. Materials and Methods

Literature review

Financing of inter-company trade is widely used in both developing and developed countries. Trade credit agreements are associated with the sale and purchase of goods and services. If we look at the long history of trade credit development, we can see that manufacturers have paid special attention to its role in financing short-term trading activities. Many theories have emerged regarding why companies finance trade, with some exploring trade creditors, borrowers, or both. The results of these theories have also been empirically investigated, and numerous studies can be found on the subject. For instance, empirical research conducted by Petersen and Rajan (1997) [1], García-Teruel and Martínez-Solano (2010) [2], and Long et al. (1993) [3] can be cited as examples.

Trade credit can be implemented in various forms. When a company delivers goods and services to a client without immediate payment, it is essentially extending credit to the client (accounts receivable or supplier credit). If a company does not make payment after receiving a product, it is taking credit from the supplier, which is called accounts

payable [4,5,6]. Additionally, if a buyer pays for a product fully or partially before it is delivered, the buyer is providing credit to the company [7,8]. In some literature, this practice is also referred to as reverse trade credit [9,10]. Full payment for trade credit before the delivery of goods is a rare occurrence in practice. Compared to traditional credit, trade credit is a limited form of financing, as it is tied to the sale of goods or services [11]. While commercial banks lend funds, companies lend products [12]. According to standard accounting rules, trade credit is reflected in the current assets of a company's balance sheet as accounts receivable and in current liabilities as accounts payable. Therefore, a given company can simultaneously be both a provider and recipient of trade credit, and this can be modeled as follows.

If a supplier provides trade credit, they consider themselves to be at high risk. If the buyer makes the payment in advance, the buyer considers themselves to be at high risk [13]. In such cases, enterprises try to transfer their risks to a third party to avoid risk. Factoring and credit insurance can be cited as examples of such transfer methods [14]. Although numerous regulatory mechanisms and norms have been developed for loans provided by commercial banks and other financial institutions, trade lending is almost unregulated [15,16,17].

Research methodology

In our analysis, using the vector autoregression model, we examined factors influencing the growth of our country's export volume. These factors include the growth in the volume of bank loans, the growth in long-term loan interest rates, the growth in money supply circulation, the growth in the economy's inflation rate, and the growth in the national currency exchange rate. The selected indicators are quarterly and cover the period from the first quarter of 2005 to the second quarter of 2024. Additionally, to clarify the impact of these indicators, the selected statistical data were natural log-transformed.

3. Results

Commercial banks, as one of the main intermediaries in financing exports, play a crucial role in the national economy. They stimulate the entry of goods and services into the international market by offering manufacturers and exporters various financial instruments, such as working capital, investment loans, and pre-export and post-export financing. Particularly for small and medium-sized enterprises engaged in exports, credit lines, unsecured financing mechanisms, and preferential loan types provided by commercial banks expand their opportunities to participate in foreign trade operations. This situation serves to increase export potential, expand production volumes, and boost the share of competitive products.

Furthermore, export-specialized financial services provided by commercial banks - such as export letters of credit, bank guarantees, insured loans, and trade financing lines - reduce financial risks in foreign markets. These services act as a means of financial protection for exporters against foreign insolvency, political instability, or currency risks. At the same time, banks, in cooperation with international financial institutions, provide financial support for the implementation of export transactions by arranging long-term export credits for foreign buyers. This creates opportunities for national exporters to enter new markets and ensures stable participation in international trade.

To assess the data's compliance with normal distribution, the Jarque-Bera test was applied. The analysis results revealed that all the selected external factors follow a normal distribution. This is because the calculated Jarque-Bera statistic for all indicators showed reliable results, with their probability values being less than 0.05. In the preliminary stage of the analysis, we conducted descriptive statistics of the selected indicators.

Table 1. Descriptive statistics of selected factors

	$LnLoan_t$	$InLTLR_t$	$LnM2_t$	$LnCPI_t$	$LnExR_t$	$LnExport_t$
Mean	0.031213	0.000157	0.024110	–0.00917	0.031930	0.019290
Median	0.030152	0.001636	0.021397	-0.001630	0.019016	0.056725

Maximum	0.082368	0.058857	0.099833	0.055645	0.154312	0.387413
Minimum	-0.007218	-0.056895	-0.039588	-0.056889	-0.048522	-0.506609
Std. Dev.	0.020875	0.024940	0.022672	0.024077	0.042320	0.202406
Skewness	0.406131	0.113028	0.464034	-0.097158	1.239384	-0.623032
Kurtosis	2.405897	2.591769	4.281591	2.609230	4.368523	2.678803
Jarque-Bera	3.249167	0.698627	8.032987	0.611058	25.72167	5.312492
Probability	0.196994	0.705172	0.018016	0.736734	0.000003	0.070211
Sum	2.403414	0.012081	1.856493	-0.007065	2.458642	1.485311
Sum Sq. Dev.	0.033117	0.047272	0.039066	0.044059	0.136113	3.113572
Observations	77	77	77	77	77	77

In the next stage, we will examine the correlation of factors affecting the export volume.

Table 2. Correlation matrix of indicators

	$LnLoan_t$	$InLTLR_t$	$LnM2_t$	$LnCPI_t$	$LnExR_t$	$LnExport_t$
$LnLoan_t$	1					
$InLTLR_t$	-0.22	1				
$LnM2_t$	0.80	-0.18	1			
$LnCPI_t$	0.23	-0.79	0.19	1		
$LnExR_t$	0.21	-0.19	0.26	0.38	1	
$LnExport_t$	0.53	-0.35	0.42	0.11	-0.23	1

As evident from the table, the correlation coefficient between our country's export volume and bank loan volume is 0.53, indicating a moderate positive relationship. This implies that as the total volume of loans allocated to the economy by banks increases, export activity also develops positively. Loans become a means of supporting exports for enterprises, serving purposes such as working capital, new technologies, logistics, and product certification. However, there is a negative correlation of −0.35 between the share of long-term loans and export volume, suggesting that export indicators decrease as the proportion of long-term loans increases. This paradoxical situation can be explained by the insufficient effective allocation of long-term loans or the extended payback period of long-term investments.

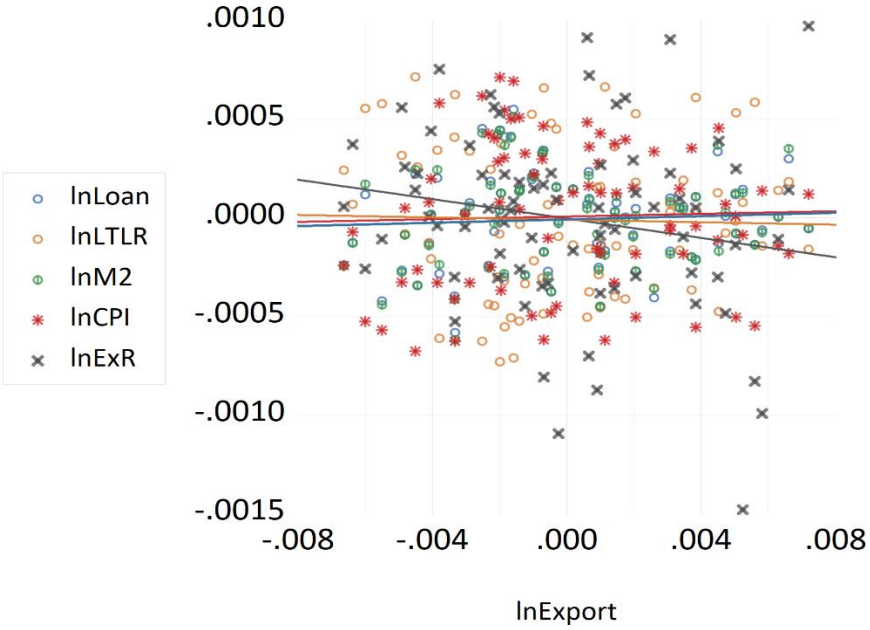

Diagram 1. Correlation matrix of changes in export volume with selected indicators.

In our analysis, we employ a vector autoregression model. This model evaluates the dynamic relationships among multiple variables that interact over time. When using the vector autoregression model, it is crucial to conduct an Augmented Dickey-Fuller Test on the indicators. Through this Augmented Dickey-Fuller Test, the indicators are examined for unit roots, and it is determined whether the selected indicators are stationary or non-stationary.

Table 3. Augmented Dickey-Fuller Test

	Ko'rsatkichlar	**t-Statistic**	**Probability**	**Xulosa**
1	$\boldsymbol{LnLoan_t}$	-5.806967	0.0000	I(0)
2	$\boldsymbol{InLTLR_t}$	-6.551909	0.0000	I(0)
3	$\boldsymbol{LnM2_t}$	-4.909435	0.0001	I(0)
4	$\boldsymbol{LnCPI_t}$	-6.609802	0.0000	I(0)
5	$\boldsymbol{LnExR_t}$	-10.53124	0.0001	I(0)
6	$\boldsymbol{LnExport_t}$	-10.20491	0.0001	I(0)

As evident from the above data, all selected indicators are in a stationary state, which serves as the basis for utilizing a vector autoregression model based on these indicators.

In the next stage of our analysis, we will develop a structural vector autoregression model of the selected indicators. When constructing this model, it is necessary to determine the optimal lag.

Table 4. VAR Lag Order Selection Criteria

VAR Lag Order Selection Criteria
Endogenous variables: LnLoan, LnLTLR, LnM2, LnCPI, LnExR, LnExport.
Exogenous variables: C
Sample: 2005Q1 2024Q2
Included observations: 72

Lag	LogL	LR	FPE	AIC	SC	HQ
0	3125.137	NA	9.48e-46	-86.64270	-86.45298	-86.56717
1	3318.479	349.0901	1.20e-47	-91.01332	-89.68526	-90.48462

2	3451.815	218.5223	8.22e-49	-93.71709	-91.25070*	-92.73521
3	3524.595	107.1478	3.12e-49	-94.73874	-91.13402	-93.30369*
4	3576.471	67.72762*	2.23e-49*	-95.17976*	-90.43670	-93.29153

As we can observe from the table data, the sequential modified LR test statistic, Final prediction error, and Akaike information criterion indicate that the optimal number of lags is 4. However, according to the Schwarz information criterion the optimal number of lags is shown to be 2 and the Hannan-Quinn information criterion the optimal number of lags is shown to be 3. Therefore, in our empirical analysis, we can consider the optimal number of lags to be 4.

Based on the analysis above, we express the structural vector autoregression model of factors influencing the interest rate of Uzsanoatqurilishbank loans in the following form:

$$\Delta LnExport_t = \alpha_1 + p_1 e_1 + \sum_{i=1}^{4} \beta_i \Delta LnExport_{t-i} + \sum_{i=1}^{4} \delta_i \Delta LnLoan_{t-i} + \sum_{i=1}^{4} \vartheta_i LnLTLR_{t-i} + \sum_{i=1}^{4} \gamma_i \Delta M2_{t-i} + \sum_{i=1}^{3} \omega_i LnCPI_{t-i} + \sum_{i=1}^{4} \eta_i \Delta LnExR_{t-i}$$

Table 5. The result of the vector autoregression model on the impact of bank loans on export volume growth.

	$LnLoan_t$	$InLTLR_t$	$LnExport_t$
$LnLoan_{t-1}$	-5.178490	-9.071066	-5.801402
	(5.09549)	(4.74653)	(74.7173)
	[-1.01629]	[-1.91110]	[-0.07764]
$LnLoan_{t-2}$	5.027089	5.202670	0.042056
	(9.31434)	(8.67644)	(136.580)
	[0.53971]	[0.59963]	[0.65471]
$LnLoan_{t-3}$	0.653522	10.79823	0.704237
	(8.90847)	(8.29837)	(230.629)
	[0.07336]	[1.30125]	[2.70997]
$LnLoan_{t-4}$	-1.921624	-9.058173	2.196448
	(4.66491)	(4.34543)	(68.4035)
	[-0.41193]	[-2.08453]	[0.18953]
$InLTLR_{t-1}$	2.672797	-3.089102	1.148617
	(2.64134)	(2.46045)	(38.7311)
	[1.01191]	[-1.25550]	[0.55475]
$InLTLR_{t-2}$	-1.123294	-5.214135	-0.142573
	(3.13906)	(2.92408)	(146.293)
	[-0.35784]	[-1.78317]	[-2.59583]
$InLTLR_{t-3}$	-1.843397	-2.634280	-1.973649
	(2.84621)	(2.65129)	(41.7352)
	[-0.64767]	[-0.99359]	[-0.04729]
$InLTLR_{t-4}$	-1.985967	0.400000	4.079401
	(2.33887)	(2.17869)	(34.2958)

[-0.84912]	[0.18360]	[1.59769]

As evident from the model results, analyzing the role of commercial banks in financing foreign trade proved to be a logically sound decision. This is because our modeling of the impact of selected indicators, such as changes in the volume of commercial bank loans and long-term loan interest rates, on the changes in our country's export volume yielded statistically significant results. Specifically, an increase in the volume of foreign trade loans from commercial banks is leading to an increase in our country's export volume, while an increase in long-term loan interest rates is causing a decrease in export volume. This confirms the correctness of the hypothesis we put forward.

Table 5. The result of the vector autoregression model of factors influencing the growth in export volume changes.

	$LnM2_t$	$LnCPI_t$	$LnExR_t$	$LnExport_t$
$LnM2_{t-1}$	6.001921	-8.383694	-13.23319	0.392693
	(5.09257)	(4.52567)	(15.7956)	(75.3672)
	[1.17856]	[-1.85248]	[-0.83778]	[0.11136]
$LnM2_{t-2}$	-5.682360	5.134276	9.617171	-2.055914
	(9.16713)	(8.14665)	(28.4336)	(135.668)
	[-0.61986]	[0.63023]	[0.33823]	[-0.65276]
$LnM2_{t-3}$	-1.229967	10.64024	28.73603	0.180146
	(8.79280)	(7.81399)	(27.2725)	(330.129)
	[-0.13988]	[1.36169]	[1.05366]	[2.72237]
$LnM2_{t-4}$	2.398241	-8.435009	-26.11268	-1.584630
	(4.64909)	(4.13156)	(14.4200)	(68.8040)
	[0.51585]	[-2.04160]	[-1.81086]	[-0.23031]
$LnCPI_{t-1}$	2.352923	1.040114	-4.344205	2.494732
	(2.76499)	(2.45719)	(8.57613)	(40.9203)
	[0.85097]	[0.42329]	[-0.50655]	[0.60966]
$LnCPI_{t-2}$	-1.761240	3.398545	0.133689	3.112547
	(3.26379)	(2.90047)	(10.1233)	(48.3023)
	[-0.53963]	[1.17172]	[0.01321]	[0.70650]
$LnCPI_{t-3}$	-2.378047	1.272807	-3.529826	3.972235
	(2.96025)	(2.63072)	(9.18176)	(43.8100)
	[-0.80333]	[0.48383]	[-0.38444]	[0.09067]
$LnCPI_{t-4}$	-2.415421	-0.709424	-6.300485	3.609985
	(2.42580)	(2.15576)	(7.52407)	(35.9005)
	[-0.99572]	[-0.32908]	[-0.83738]	[1.75763]
$LnExR_{t-1}$	-0.022512	-0.037764	-0.391927	-0.937894
	(0.04466)	(0.03969)	(0.13852)	(0.66093)
	[-0.50409]	[-0.95153]	[-2.82941]	[-1.41905]
$LnExR_{t-2}$	-0.053718	-0.011630	-0.406935	0.130134

	(0.04816)	(0.04280)	(0.14936)	(2.71268)
	[-1.11551]	[-0.27176]	[-2.72445]	[2.18260]
$LnExR_{t-3}$	-0.016119	0.062087	0.019870	-0.432164
	(0.04765)	(0.04235)	(0.14780)	(0.70520)
	[-0.33828]	[1.46618]	[0.13444]	[-0.61282]

4. Discussion

Based on the empirical models assessing the impact of changes in money supply, inflation rate, and national currency exchange rate on export volume growth, we can observe that changes in both the money supply in circulation and the national currency exchange rate have a statistically significant influence on changes in export volumes.

5. Conclusion

As can be seen from the model results, the analysis of the role of commercial banks in financing foreign trade was a logically correct decision. Because, as a result of modeling the influence of such selected indicators as the change in the volume of loans from commercial banks and the change in the interest rate on long-term loans on the change in the volume of exports of our country, we obtained statistically significant results. In particular, an increase in the volume of foreign trade loans of commercial banks increases the volume of domestic exports, while an increase in the interest rate on long-term loans reduces the volume of exports. This indicates the correctness of the hypothesis we put forward.

If we look at statistical data, then a one percent increase in commercial bank loans leads to a three-quarter delay in increasing the volume of our country's exports by 0.7 percent. Also, a one percent increase in the interest rate on long-term bank loans reduces the change in export volumes by -0.14 percent with a two-quarter lag. The reason why we did not take the change in short-term bank loans in the model is that since enterprises took short-term loans mainly for replenishing raw materials or similar short-term purposes, it is doubtful that enterprises will increase production and ultimately increase export volumes.

Based on the empirical models assessing the impact of changes in money supply, inflation rate, and national currency exchange rate on the growth of our country's export volume, we can see that changes in money supply and national currency exchange rate have a statistically significant influence on export volume changes. Specifically, while an increase in money supply has a positive impact on export volume, an increase in the national currency exchange rate also positively affects our country's export volume. However, among the selected indicators, the impact of rising inflation rates in the economy on export volume is not statistically significant.

It should be noted that when selecting our country's export volume, we excluded the amount of non-monetary gold exports. This is because the sale of non-monetary gold does not affect macroeconomic indicators or commercial bank loans. Rather, the export of non-monetary gold by our Central Bank is conducted to ensure the stability of the national currency exchange rate.

If we analyze the model results accurately, a one percent increase in money supply leads to a 0.18 percent increase in our country's export volume growth with a three-quarter lag. Similarly, a one percent devaluation of our national currency causes a 0.13 percent increase in export volume with a two-quarter lag.

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