




# “The impact of bank credits on non-oil GDP: evidence from Azerbaijan”

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## THE IMPACT OF BANK CREDITS ON NON-OIL GDP: EVIDENCE FROM AZERBAIJAN

### Abstract

This study explores the relationship between bank credits, exchange rate and non-oil GDP in Azerbaijan, utilizing FMOLS, CCR and DOLS co-integration methods to the data spanning from January 2005 to January 2019. The results from the different co-integration methods are consistent with each other and approve the presence of a long-run relationship among the variables. Estimation results reveal that there is a positive and statistically significant impact of bank credits and exchange rate on the non-oil GDP in the long run for the Azerbaijani case which are in line with the expectations and with the theoretical findings discussed in theoretical framework section. This finding also indicates that a 1% increase in credit and real exchange rate increases non-oil GDP by 0.51% and 0.56%, respectively. The results of this paper are useful for the policymakers and promote the economic literature for further researches in the case of oil-rich countries.

### Keywords

economic growth, financial development, exchange rate,  
co-integration, Azerbaijan

### JEL Classification

E44, G21, O16

## INTRODUCTION

In recent years, a slowdown in economic growth in developing countries and increased volatility in global financial markets make it necessary to concentrate on issues of lending to the real economy.

Practice shows that large volume and growth rates of credit investments do not always generate an adequate response, sometimes stimulation of demand (for instance, subprime mortgage crisis in 2007–2008 in the United States) and temporarily limiting the negative impact of structural problems on the economy create the illusion of economic growth. At the same time, an increase in financial losses and difficulties in meeting regulatory standards show the existence of problems in the banking sector with risk management; and the motive for profit maximization prevails over the motive to prevent risks. Moreover, when we add inefficient use of resources to these facts, we can predict systematic risks for the whole economy created by poor credit management.

In Azerbaijan, the overall volume of non-performing loans amounted to AZN 0.16 billion (1 USD = 0.82 AZN), which is 2.2% of credit portfolio in 2008. However, those numbers increased to AZN 0.98 billion (1 USD = 0.78 AZN) and 5.3% in 2014 and to AZN 1.6 billion (1 USD = 1.7 AZN) or up to 12.2% in 2018, respectively (CBAR, 2019a). Only in 2017 and 2018, licenses of two banks and 42 credit organizations were terminated in Azerbaijan (FIMSA, 2019).

The credit risks in the economy of Azerbaijan are also increasing due to the multiplier effect of a low level of diversification. The decline in oil prices in the years 2014–2015 led to a sharp decline in economic growth, which is accompanied by a credit crisis (Mukhtarov et al., 2018).

Over the past 25 years, the highest amount of loans in Azerbaijan was observed in 2015 – AZN 21.7 billion (39.9% of GDP). It was a year that the economy of Azerbaijan twice experienced the devaluation of the national currency – the exchange rate of AZN fell by almost two times against the USD (Mukhtarov et al., 2019). In the next two years, the decline in credit investments in the economy amounted to 24–28% per year. The negative trend changed only in 2018 and the volume of loans amounted to AZN 13 billion (40.1% less than the level of 2015). During the last three years, the share of loans in GDP decreased from 39.9% to 16.4% (SSCA, 2019).

Of particular interest are the results of Azerbaijan in the report of the World Economic Forum on the Global Competitiveness Index for 2018. Azerbaijan's rank is 69th among 140 countries, and its weakest positions are observed precisely in the indicators of financial sector (96th) and macroeconomic stability (126th). The 99th place in terms of volume of domestic credit to the private sector, the 92nd place in terms of soundness of banks, the 119th rank in terms of market capitalization, and the 118th rank in terms of non-performing loans show that the country has persistent problems in the field of financing economic growth. Relatively high – the 40th rank in lending to small and medium enterprises shows that loans are more available financing source for enterprises at the moment in Azerbaijan (World Economic Forum, 2018).

These facts actualize research of bank credits as a tool to diversify the economy. Reducing liquidity problems and stimulating demand loans can support the non-oil sector of the economy (Humbatova & Hajiyeve, 2016). From these points of view, it is concluded and hypothesized that bank credit may boost GDP.

After reviewing the related studies devoted to the investigation of the impacts of financial development as proxied by the bank credits on economic growth, one can say that the financial development has a significant role in economic growth for oil-rich economies. Azerbaijan is an oil-rich country, has realized some macroeconomic and financial reforms, particularly in banking sector and faced some challenges, and 46% of its budget is being financed through transfers from State Oil Fund of the Republic of Azerbaijan. Hence, to avoid resource-based macroeconomic challenges and reach sustainable development, Azerbaijani policymakers need to develop non-oil sectors for avoiding resource based macroeconomic problems. As discussed related literature concludes, providing financial resource to non-oil sectors is one of the ways for a resource-rich economy to accelerate reforms on economic diversification to reach sustainable development.

Considering the importance of the issue, this empirical study has investigated the impacts of bank credits on economic growth in the case of Azerbaijan, which is abundant by its oil and gas resources, and, one of the fastest growing economies in the last decade. The main driving forces of this remarkable economic growth are its crude oil and gas extractions that pump foreign currency to the economy and attract foreign investors. The average annual economic growth of the economy in the last 15 years is about 5%. In 2017, the share of fuel exports in the total merchandise exports was 90.1%, which indicates the strong dependency of the economy on oil and gas revenues (WB data, 2018).

Considering the points mentioned above, the aim of this study is to explore the effect of bank credits on the non-oil GDP in Azerbaijan, as an oil-rich economy.

According to the authors, the contributions of the current research to the literature are as follows:

- a) It is the first study using quarterly data which cover the period after devaluation for assessing the long-run effect of bank credits on non-oil GDP in Azerbaijan.

- b) It is the first study where different co-integration methods, namely, FMOLS, CCR and DOLS are used to examine the relationship between bank credits and non-oil GDP for Azerbaijani case.
- c) It is the first study in the financial development-economic growth nexus, which examines the role of the exchange rate in the non-oil economic sector considering the effect of devaluation in Azerbaijan. In addition, this study is also useful for researchers and policy makers to understand the role of bank credits in economic growth for macroeconomic stability and sustainable development in Azerbaijan and other oil-rich economies.

The remainder of the paper is structured as follows. The previous detailed studies are first reviewed, followed by the information about data and econometric methodology. Then the obtained results and the related discussion are provided. The last section describes conclusion and policy implications.

## 1. LITERATURE REVIEW

The relationship between credits and economic growth in the case of different countries has been investigated by a large number of studies in economic literature.

In the context of credits and economic growth, Akpansung and Babalola (2011) evaluated the bank credit influence on economic growth in the case of Nigeria, employing Two-Stage Least Squares (TLS) to the data spanning from 1970 to 2008. The results show a positive impact of private sector credit on economic growth. Iqbal et al. (2012) studied the impact of private saving and private credits on economic growth in Pakistan utilizing ARDL technique to the data ranging from 1993 to 2007. They found a positive and statistically significant effect of credits on economic growth. The link between bank credits and economic growth was also investigated by G. Gozgor and K. Gozgor (2013) for twenty Latin American countries. They used panel co-integration technique for empirical analysis. The results approved the presence of a long-run relationship between variables. In addition, the employed panel causality test concluded unidirectional causality running from domestic credits to economic growth.

Ben et al. (2014) studied the relationship between domestic credits and economic growth in Tunisia employing Autoregressive Distributed Lag model (ADRL) method. They revealed a positive and significant effect of bank credit on economic growth. Their results concluded that a 1% increase in the private credit resulted in a 3.36% increase in real GDP per capita.

Using the bank credit as a measure of financial development, Bongini et al. (2017) explored the impact of bank credits on the economic growth for Central, Eastern and South-Eastern European countries. The study employed the GMM method for the time series data of 1995–2014. The estimation results showed that bank credit increases economic growth.

Aljebrin (2018) studied the impact of private sector's bank credits on the economic growth in Saudi Arabia by applying the FMOLS method for the period of 1990–2016. The study concluded a positive and significant long-term impact of domestic bank credit on the economic growth. Choong (2012) also obtained positive and statistically significant impact of credit on economic growth for 95 developed and developing economies.

Parallel to above mentioned studies, a positive link between credits and economic growth are obtained by Banu (2013) for Romania, by Önder and Özyıldırım (2013) for Turkey, by Timsina (2014) for Nepal, by Osman (2014) for Saudi Arabia, by Yakubu and Affoi (2014) for Nigeria, by Samargandi et al. (2014) for Saudi Arabia, by Korkmaz (2015) for 10 European countries, by Pistoiresi and Venturelli (2015) for Germany, Italy, and Spain, by Mahish (2016) for Saudi Arabia, by Ananzeh (2016) for Jordan, by Puatwoe and Piabuo (2017) for Cameroon, by Paul (2017) for Nigeria.

On the other hand, Al-Zubi et al. (2006) studied the relationship between financial development as proxied by the private credit and economic growth for eleven Arab countries. For this purpose, they used pooled OLS technique, random

effect model and fixed effect model. The study concluded a negative and statistically significant effect of private credits on the economic growth. Mahran (2012) also analyzed the link between financial development and real GDP employing the ARDL model for Saudi Arabia. The study concluded a negative and statistically significant private credit impact on real GDP, either in the long- or short-run period.

Iheanacho (2016) evaluated the link between financial sector development and economic growth for Nigeria applying the ARDL method for the period of 1981–2011. The results revealed that the credits as proxy of financial development have long-term insignificant and negative impact on economic growth, while short-term significantly negative impact.

In addition, numerous studies conducted by Cevik and Rahmati (2013), Samargandi et al. (2014), by Anyanwu (2014), Quixina and Almeida (2014), Adeniyi et al. (2015), and Nwani and Orie (2016) found a weak or negative link between credits and economic growth.

In the case of Azerbaijan, prior research conducted by Hasanov and Huseynov (2013) examined the bank credits effect on non-oil economic growth using ARDL Bounds Testing approach, Johansen's approach, and Engle-Granger methodology. Authors found a positive impact of bank credits on non-oil economic growth. Koivu and Sutela (2005) evaluated the link between financial sector development and economic growth for 25 transition economies (including Azerbaijan) using fixed effect model and found financial development as proxied by credit increasing economic growth. Mukhtarov et al. (2018) evaluated the relationship among energy consumption, economic growth and financial development in Azerbaijan. Different co-integration methods, namely, Autoregressive Distributed Lags Bounds co-integration test, Gregory-Hansen co-integration test and Johansen co-integration test are applied to see long-run relationship among the variables. The results approve the presence of long-term relationship between financial development as proxied by bank credit, energy consumption and economic growth. Mukhtarov et al. (2016a,

2016b), Muxtarov and Mikayilov (2016) also found that bank credits are an important transmission channel of monetary policy to affect aggregate output in Azerbaijan.

In the outcomes of the above-mentioned studies, there are a few studies related to the impact of bank credits on economic growth in Azerbaijan. Overall, Azerbaijan is a unique case to examine the effect of bank credits on the private sector, a proxy for financial development on the economic growth of non-oil sectors. Therefore, the main purpose of this article is to fill in this gap by employing different co-integration tests to observe the long-term relationship between bank credits and economic growth. The results of this article will suggest to researchers and policy makers to comprehend the role of bank credits in economic growth for macroeconomic stability and sustainable development goals in Azerbaijan and other developing oil-rich countries.

## 2. ECONOMETRIC METHODOLOGY AND DATA

For empirical analysis, the study uses monthly data over the period of January 2005 to January 2019 for the following variables: credits (CRD), real exchange rate (REXC) and non-oil GDP (NGDP). All data set have been retrieved from the Central Bank of the Republic of Azerbaijan (CBAR, 2019). Non-oil GDP is the dependent variable. The non-oil GDP is measured by non-oil sector output deflated by the consumer price index (CPI). Credits is the main independent variable, and measured by bank credits to the private sector in a million constant manats. Prior literature, like Demetriades and Hussein (1996), King and Levine (1993), Levine (2002), Oluitan (2009), Ang (2008), Jalil et al. (2010), Beck (2011), Banu (2013), Hasanov and Huseynov (2013), found that private bank credits boost the economic growth. The real exchange rate (REXC) is also used as a control variable, which may have an effect on the economic growth. The REXC is measured in national currency per US dollar. This variable was used in many previous studies, such as Egert



(2009), Habib and Kalamova (2007), Sturm et al. (2009), Hasanov and Huseynov (2009), Hasanov and Samadova (2010), Hasanov (2010, 2011), Hasanov and Huseynov (2013), Mukhtarov (2018), Mukhtarov et al. (2019), who found that REXC has a significant effect on main macroeconomic factors. All variables have been transformed into the natural logarithmic form.

The relationship between credits, exchange rate and non-oil GDP is explored utilizing the different co-integration methods in this study. In the empirical part, stationarity and unit root of variables will be tested, then the long-run co-integration relationship, and then the long-run relationship between credits, exchange rate and non-oil GDP will be estimated. The Augmented Dickey-Fuller (ADF) test by Dickey and Fuller (1981) is applied for unit root exercise, while for analyzing the co-integration relationship, the Engle-Granger test by Engle and Granger (1987), and the Phillips-Ouliaris test by Phillips and Ouliaris (1990) are utilized. Next, three co-integration methods are used to analyze the long-run relationship. First, Fully Modified Ordinary Least Squares Method (FMOLS) is used as a main tool, then Canonical Cointegrating Regression (CCR) and Dynamic Ordinary Least Squares (DOLS) methods are utilized for the robustness check.

The above-mentioned methods are extensively used in vast studies, they are not discussed in this study. The detailed information about these methods has been mentioned in Dickey and Fuller (1981), Engle and Granger (1987), Phillips and Ouliaris (1990), Phillips and Hansen (1990), Saikkonen (1992), Park (1992) and Stock, Watson (1993), and others.

### 3. EMPIRICAL RESULTS AND DISCUSSION

First, unit root problems of the used variables are checked by employing ADF unit root test. Results of the ADF test are provided in Table 1. Table 1 shows that all the variables are non-stationary at their levels but they become stationary at first difference. Therefore, they can be analyzed for the co-integration relationship.

**Table 1.** ADF unit root test results

Variables	Panel A: Level	Panel B: 1st difference	Results
	Actual value	Actual value	
NGDP	−0.099707	−3.813951***	I(1)
CRD	−1.593282	−12.33008***	I(1)
REXC	−0.218238	−9.24939***	I(1)

Note: \*, \*\* and \*\*\* accordingly show null hypothesis rejection at 10%, 5% and 1% significance levels.

For co-integration relationship, the Engle-Granger and the Phillips-Ouliaris co-integration tests are employed and results are given in Table 2. Both co-integration tests show the co-integration relationship among the variables.

**Table 2.** Co-integration test results

	Engle-Granger	Phillips-Ouliaris
Tau-stat	−7.7271 (0.00)	−7.6433 (0.00)
z-stat	−88.126 (0.00)	−85.117 (0.00)

Note: p-values are provided in parentheses.

Therefore, after approving the presence of co-integration among the variables, the long-run relationship can be estimated. For this purpose, FMOLS, CCR and DOLS methods are used to analyze the long-run relationship among the variables. The estimation results are provided in Table 3.

**Table 3.** Results from different methods

Methods	CRD	REXC	Constant
	Coefficient (Std. err.)	Coefficient (Std. err.)	Coefficient (Std. err.)
FMOLS	0.51*** (0.14)	0.56** (0.27)	3.85*** (1.08)
CCR	0.51*** (0.13)	0.56** (0.27)	3.83*** (1.04)
DOLS	0.50*** (0.15)	0.67** (0.28)	3.78*** (1.21)

Note: The dependent variable is NGDP; Std. err. means standard error; \*, \*\* and \*\*\* show significance levels at 10% 5% and 1%.

In terms of significance and magnitude, the long-run coefficients of the three methods are statistically significant and close to each other. As was mentioned in the methodology section, priority is given to the FMOLS method, the results of which are presented in the first row of Table 3. The study finds a positive and statistically significant effect of bank credits on non-oil GDP at the 1% level. The results indicate that a 1% increase in credits results in 0.51% increase in non-oil GDP. Regarding the financial development-economic

growth nexus, the results are similar to those of many previous studies like Akpansung and Babalola (2011), Hasanov and Huseynov (2013), Osman (2014), Samargandi et al. (2014), Yakubu and Affoi (2014), Mahish (2016), Paul (2017), and Aljebrin (2018), who also found a positive effect of bank credits on economic growth in oil-rich countries. It is also found that the effect of real exchange rate on non-oil GDP is positive and

statistically significant at the 5% level. This indicates that a 1% increase in real exchange rate (depreciation of national currency) increases non-oil GDP by 0.56%. This result is appropriate with the economic theory. According to the theory, an increase in exchange rate (depreciation of the national currency) leads to an increase in net exports. In addition, rise in the net export resulted in increase in GDP.

## CONCLUSION

The study examines the impact of credits and exchange rate on non-oil GDP. First, unit root problems of variables are tested. The results concluded that they are stationary at first differenced form, hence variables can be tested for the long-run co-integration relationship. Engle-Granger and Phillips-Ouliaris tests confirm co-integration relationship among bank credits, exchange rate and non-oil GDP in Azerbaijan. The FMOLS, CCR and DOLS techniques are used to evaluate the long-run relationship among these variables. Estimation results of FMOLS show that credits and real exchange rate increase non-oil GDP in the long run, namely, a 1% increase in credit and real exchange rate increases non-oil GDP by 0.51% and 0.56%, respectively. The related policy implication and key findings of this study are that policymakers should focus on bank credits to boost economic growth in order to diversify economy for reaching sustainable development in Azerbaijan and also promote the economic literature devoted to economic growth and financial development in oil-rich countries.

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