



THE RELATIONSHIP BETWEEN REFINANCING RATE AND GDP

Jo'rayev Og'abek Oybek o'gli

The student of TSUE

ogabekjorayev081@gmail.com

Annotation: *The refinancing rate is an instrument used by central banks to control the money supply and influence the overall economy. The refinancing rate, also known as the discount rate, is the interest rate at which commercial banks can borrow money from the central bank. By making it simpler for companies and individuals to borrow money, a decline in the refinancing rate promotes economic growth. The relationship between the refinancing rate and gross domestic product (GDP) is necessary, and understanding it is crucial for policymakers and investors alike. In this article we will see how they are related and in last a few decades they have influenced on each other in different countries.*

Keywords: *Refinancing rate, GDP, STATA, The US, China, statistical table, significance level, regression analysis, t-value, F-value.*

Researchers suggest that reducing the refinancing rate can lead to an increase in economic growth by stimulating consumer spending and investment in businesses. This is because a reduction in borrowing costs encourages individuals and companies to borrow more money and to embark upon new projects. Businesses can then invest in research and development, expand their operational capacity, and hire more people, boosting the GDP. Moreover, a decrease in the refinancing rate also results in an increase in the money supply. With banks having easier access to cheaper loans, they are likely to lend more money to customers, essentially increasing the aggregate demand. This results in consumers buying more goods and services, leading to higher levels of economic growth. Conversely, an increase in interest rates makes saving more appealing because the benefit is now greater. So, saving in the economy is likely to increase, which will decrease consumption¹, also an increase in interest rates drives up borrowing costs, which drives up investment costs. This deters companies from making investments, which lowers economic investment and GDP because investment and consumption are the key factors to calculate gross domestic product. Therefore, GDP changes accordingly these two elements of economy. It is worth noting that the impact of the refinancing rate differs when examining the sectors and industries that make up the economy. Certain sectors, such as the bond market or the stock market, are more sensitive to fluctuations in interest rates than others. In order to successfully balance the many economic elements and take into consideration their needs, policymakers must carefully evaluate the needs of the various industries when determining interest rates. Now let's analyze in what way interest rates have affected to the economy in recent years in developing and developed countries.

Table 1

The refinancing rate and GDP in recent decades in the US²

Years	Refinancing rate	GDP
2001	3,89	10581,929
2002	1,67	10929,108
2003	1,13	11456,450
2004	1,35	12217,196
2005	3,21	13039,197
2006	4,96	13815,583
2007	5,02	14474,227
2008	1,93	14769,862
2009	0,16	14478,067
2010	0,18	15048,970
2011	0,10	15599,732
2012	0,14	16253,970
2013	0,11	16843,196
2014	0,09	17550,688
2015	0,13	18206,024
2016	0,40	18695,106
2017	1,00	19477,337
2018	1,83	20533,058
2019	2,16	21380,976
2020	0,38	21060,474
2021	0,08	23315,081
2022	1,68	25462,722

It can be observed from the table that in the scratch of the century the refinancing rate of the United States stood at 3.89% while its GDP was about 10582,000 billion dollars. In the next three years the refinancing rate decreased significantly to 1.35% while the GDP witnessed a gradual increase to 12217,196 billion US dollars. After some changes, in 2007 the rate reached its peak in researched 22 years having approximately 5% and in the following years refinancing rate had a mostly decreasing trend reaching its minimal point to even 0.08% in 2021. Coming to GDP, it had an upward trend during the remaining period, exceptionally declined only in 2009, reaching maximally to 25462,722 billion USD in 2022. Overall, we can consider that even though the refinancing rate had significant changes, GDP rose gradually over time.



Graph 2

The regression analysis between refinancing rate and GDP of the US

Source	SS	df	MS	Number of obs	=	22
Model	5.01007992	1	5.01007992	F(1, 20)	=	2.52
Residual	39.699302	20	1.9849651	Prob > F	=	0.1278
Total	44.7093819	21	2.12901819	R-squared	=	0.1121
				Adj R-squared	=	0.0677
				Root MSE	=	1.4089

lnRefinanc~e	Coef.	Std. Err.	t	P> t	[95% Conf. Interval]
lnGDP	-1.991047	1.253244	-1.59	0.128	-4.605268 .6231741
_cons	18.84914	12.14579	1.55	0.136	-6.486541 44.18481

Now we are making a deeper research using Stata. First up, we have used a Dickey-fuller test³ to make our data more stationary. Then we took a natural logarithmic exponent of both variables to describe changes in percentages. So we can know from the graph that only 11,21% of GDP is characterized by Refinancing rate, seeing R-squared. The sample regression function is $\ln\text{GDP} = 18,84914 - 1,991047 \ln\text{Refinancingrate}$ which means one percent increase in refinancing rate can reduce the GDP up to 2% but with little potential owing to the little R-squared. But F-test is not satisfactory because it is 12.78% which should be less than 5% while it can be said that t test is 12.8% referring to be statistically insignificant because of being more than acceptable 10% rate.

Table 3

The refinancing rate and GDP in CHINA in recent two decades⁴

Years	Refinancing rate %	GDP
2001	3,24	1339395718865,3000
2002	2,75	1470550015081,5500
2003	2,70	1660287965662,6800
2004	2,86	1955347004963,2700
2005	3,33	2285965892360,5400
2006	3,33	2752131773355,1600
2007	3,33	3550342737010,8400
2008	3,94	4594307032660,7900
2009	2,79	5101703073086,0400
2010	2,83	6087163874512,2100
2011	3,25	7551500124203,3600
2012	3,25	8532229986993,6500
2013	3,25	9570406235659,6400
2014	3,25	10475682920594,5000

2015	3,19	11061553079876,4000
2016	2,90	11233276536737,2000
2017	2,90	12310409370892,8000
2018	2,90	13894817549374,2000
2019	2,90	14279937500606,5000
2020	2,90	14687673892882,0000
2021	2,90	17734062645371,4000
2022	2,90	18100104000000,4000

What about in developing countries, let's see in example of China! From the graph it is obvious that initially in 2001 the refinancing rate was 3,24%, when the GDP came to about 1,34 trillion estimated in US dollars. In the following two years, discount rate slightly fell to 2,70% in, but then reached its maximum to 3,94% in 2008, meanwhile, GDP saw an upward trend standing at approximately 4,6 trillion USD at this time. Then, the rate remained constant in both 2011-2014 and 2016-2022 years having 3,25% and 2,90%, respectively. Coming to GDP, it rose considerably to its maximal amount about 18,1 trillion dollars in 2022. To conclude, despite the changes in interest rate during the observed period, the GDP only increased to its peak without an exception.

Graph 4

The regression analysis between refinancing rate and GDP of China

Source	SS	df	MS	Number of obs	=	22
Model	.004242976	1	.004242976	F(1, 20)	=	0.73
Residual	.11595393	20	.005797696	Prob > F	=	0.4024
Total	.120196905	21	.005723662	R-squared	=	0.0353
				Adj R-squared	=	-0.0129
				Root MSE	=	.07614

lnRefinanc~e	Coef.	Std. Err.	t	P> t	[95% Conf. Interval]	
lnGDP	-.0164494	.0192283	-0.86	0.402	-.0565589	.0236602
_cons	1.595027	.5662966	2.82	0.011	.4137529	2.776301

If we make research on Stata with the data of China as we did for the US³(3rd page), it can be seen that the sample regression function is $\ln\text{GDP}=1,595027-0,0164494\ln\text{Refinancingrate}+E$, from function we can say that one percent change in refinancing rate doesn't nearly swift the GDP, only 0.016% decrease can be in it. It means it may be not reliable to make a conclusion about the GDP seeing the changes in refinancing rate, also the fact - R-squared is 3% meaning only this part of GDP is characterized by Refinancing rate could be proof for preceding mentioned statement. Also both F-test and t-test is far more than reliable rate having 40%. It can be because of other factors that are more key indicators which impact on GDP.



Conclusion

In conclusion, macroeconomic policy-making places a great deal of emphasis on the link between the refinancing rate and GDP. The refinancing rate can directly influence economic growth by affecting borrowing costs, making it essential for policymakers to understand and manage it effectively. So as to balance the different economic factions and support stable and sustainable economic growth, government must also take into account the needs of the various industries when setting interest rates. By the way in terms of countries like the US and China, it can be considered that relationship between refinancing rate and GDP is little bit negative according to the regression analysis, GDP of both countries had an increasing trend in spite of changes in discount rate, though. Seeing the probability's no accordance with the reliable measure we can say that GDP is likely to be more sensitive to other factors rather than refinancing rate.

LITERATURE:

<https://www.mytutor.co.uk>

<https://fred.stlouisfed.org>

<https://www.sciencedirect.com>