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ESTIMATING THE IMPACT OF THE FINANCIAL SECTOR ON REAL SECTOR: THE CASE OF MONGOLIA

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Abstract

This paper aims to compare some indicators of the financial sector of Mongolia with international level, using the World Bank's financial sector development methodology. According to the survey, Mongolia is at a lower and lower middle income level with indicators like banking sector depth, efficiency and stability as well as above average level by financial performance accessibility indicators. The development of financial institutions and financial markets other than banks was significantly at below average level when it's compared to the other countries with similar income levels. The impact of financial depth on the real sector, which is one of the indicators for evaluating the development of the financial sector, was evaluated by the OLS model. This finding concludes that indicators such as loans to the private sector, GDP ratio, the turnover ratio of the stock market suppress real GDP growth and don't affect Mongolia non-linearly. Furthermore, it indicates that the effect of financial depth of lower-income countries on economic growth is relatively small or weak.

Keywords: financial depth, efficiency, stability, economic growth

1. INTRODUCTION

Levin, a U.S. economist, considered the role that financial systems can play in economic growth within five key aspects in his 2004 study (Levine, 2004). First, the financial sector generates savings or significant savings which can be used as an investment in the economy. For an enterprise or entity, using the savings from different sources as investment is pretty much costly process. To solve this time-consuming problem or activity, the financial market performs as a regulator on the behalf of the enterprise or the entity. Secondly, the financial sector prepares all necessary information related to investing opportunities and presents it to the interested parties like organizations and people. In other words, the financial market entities charges relatively cheaper fees for their activities like doing research on the available investors by categories such as field of business, management style, market position et cetera which are highly costly if it's paid separately for such services. Third, the financial market provides the investors necessary oversight of the investment and corporate governance on behalf of them. Good corporate governance and proper use of capital improve corporate profitability and stimulate investors' motivation for production and innovation. Fourth, the financial market is responsible for the economy's diversification which reduces risks by allocating them among various financial sectors and instruments.

Fifth, the financial market creates an easier way to exchange goods and services. Moreover, the financial system is responsible for not only regulating the payment process of goods and services but also lessening the costs from transactions and information. Throughout the five aspects, the development of the financial sector contributes to economic growth. Therefore, estimating and defining the development of the financial sector of Mongolia and its contribution to economic growth is essential.

2. FINANCIAL DEPTH AND ECONOMIC GROWTH

Financial depth measured by domestic credit to private sector, M3 money and stock market capitalization plays an important role in shaping economic growth. According to the finding by Hoi, Ho, & Vu on ASEAN countries, it's important to make a policy to support the financial development. On the other hand, there is the unavoidable need to consider the depth of the financial sector to accelerate the country's economic development, reduce poverty, and increase employment as well (Hoi, Ho, & Vu, 2019).

2.1. Domestic credit to private sector as share of GDP

In the study of examining the long-run impact of bank loans on economic growth in Ethiopia using the multi-variable Johansen cointegration method, it's proven that there is a positive and direct correlation between those variables (Murty, Sailaja, & Demissie, 2012). Bank loans to the private sector affect the economic growth through efficient allocation of available financial resources. Thus, decision-makers will have to take into account that the banking and financial sectors are crucial to increase capital which is one of the ingredients of production and to expand domestic investment.

The research, by Alves which defined the impact of public debt on the economic growth of 14 European countries from 1974 till 2012 using non-linear method tells us that the optimal debt ratio is around 75%, and if it exceeds it, debt service costs can have a negative effect on GDP growth (Alves & Afonso, 2015). Similarly, Bank loans to the private sector will increase the enterprise's output and have a positive influence on the overall economy to a certain extent. Exceeding the optimal ratio may augment interest costs and adversely affect total output.

2.2. Financial system deposits as share of GDP

The study by He, Lu & Mano concludes that China's high national savings, which considered as one of the highest in the world, increase their domestic investment and accelerate its economic growth. In such case, the authorities of the country are making some effort to reduce the high savings by promoting domestic consumption in order to achieve sustainable social growth, reduce economic bubble and eliminate inequality (He, Lu, & Mano, 2018).

However, most countries are pursuing a policy which is from exactly opposite point of view to China's intentions to reduce investment and to keep its economic growth at a controlled level. Due to the lack of investment in most developing countries, on the one hand they encourage investments not only more savings. But on the other hand they comply with lower consumption to support domestic accumulation. Hundie found in his study that there is a long-term positive direct relationship between savings and gross domestic investment, and also the long-term effect of savings on total investment is stronger than the short-term effect (Hundie, 2016). For that reason, it's necessary to maintain the ratio of deposits to GDP as higher as possible.

2.3. Economic growth

Economic growth means that the volume of production in a given year is growing steadily over the previous year. However, economic growth and development are about not only quantitative changes but also qualitative changes such as poverty alleviation in the country's economy and society, new job creation and rising GDP per capita (Ivic, 2015). The growth of those quantitative and qualitative indicators determines the standard of living of the citizens of the country, so the authorities of the country must consider the consequences of their policy on this issue.

3. THE 4X2 FRAMEWORK FOR FINANCIAL SYSTEM BENCHMARKING

Indicators of defining the financial sector's development reflects the quality of services provided by the financial sector. For example, the financial depth generally reflects the size of services provided by the financial sector, and the availability of services reflects the degree to which individuals and entities can and use financial institutions and markets. The World Bank researchers have developed the 4x2 Framework for Financial System Benchmarking shown in Table 1 which including the usage of 4 indicators.

Table 1. The 4x2 Matrix of Financial System Characteristics

	FINANCIAL INSTITUTIONS	FINANCIAL MARKETS

DEPTH	**Private sector credit to GDP** Financial institutions' assets to GDP M2 to GDP Deposits to GDP Gross value-added of the financial sector to GDP	**Stock market capitalization plus outstanding domestic private debt securities to GDP** Private debt securities to GDP Public debt securities to GDP International debt securities to GDP Stock market capitalization to GDP Stocks traded to GDP
ACCESS	**Accounts per thousand adults** (commercial banks) Branches per 100,000 adults (commercial banks) % of people with a bank account % of firms with line of credit (all firms) % of firms with line of credit (small firms)	**Percent of market capitalization outside of top 10 largest companies** Percent of value traded outside of top 10 traded companies Government bond yields (3 month and 10 years) Ratio of domestic to total debt securities Ratio of private to total debt securities (domestic) Ratio of new corporate bond issues to GDP
EFFICIENCY	**Net interest margin** Lending-deposits spread Non-interest income to total income Overhead costs (% of total assets) Profitability (return on assets, return on equity) Boone indicator (or Herfindahl or H-statistics)	**Turnover ratio** (turnover/capitalization) for stock market Price synchronicity (co-movement)[1] Private information trading Price impact Liquidity/transaction costs Quoted bid ask spread for government bonds Turnover of bonds (private, public) on securities exchange Settlement efficiency
STABILITY	**Z-score** (or distance to default)[2] Capital adequacy ratios Asset quality ratios Liquidity ratios Other (net foreign exchange position to capital etc)	**Volatility** (standard deviation / average) of stock price index, sovereign bond index[3] Skewness of the index (stock price, sovereign bond)[4] Vulnerability to earnings manipulation Price/earnings ratio Duration Ratio of short-term to total bonds (domestic, int'l) Correlation with major bond returns (German, US)

Source: World bank (2012), Benchmarking Financial Systems around the World

In the first part of our research, we selected some indicators based on their commonly use in empirical research and data availability from main 4 indicators such as financial depth, availability of service, efficiency, stability in the 4x2 framework. The classification of countries by income level is based on the World Bank's Atlas methodology which defines the countries' economies as low-income, lower-middle-income, upper-middle-income and high-income. This study compiled a database of 183 countries with 2000-2018 annual intervals from "The Global Financial Database". However, some indicators especially in the financial sector did not have much data.

3.1 Financial depth

[1] Return on stocks fluctuates, depending on market and corporate level data. Whether the stock returns will fluctuate together depends on the relationship between the two levels. While other factors are constant, there is a tendency for volatility in stock returns to be collective, as there is a wealth of corporate-level information in a marketplace where investor-led regulation and financial reporting are transparent.

[2] Z score indicates a bankruptcy of a financial institution and was first developed by Edward Altman in 1968.

[3] The indicator will be determined by the standard deviation/average ratio. Also it is called the coefficient of variation.

[4] It expresses the asymmetry of a distribution, and shows how much is the probability of the asymmetry around the mean of a distribution.

The financial institutions' depths are calculated in two versions, as shown in Figure 1. The ratio of bank loans in the private sector to GDP is quite different for countries. For example, while the ratio is 13.7 percent for low income, 71.2 percent for middle income, 81.5 percent for upper middle income, 144.5 percent for high income countries, Mongolia has a below average performance which is 37.8 percent. Even though there is an increasing trend with the financial system deposits to GDP, Mongolia is among lower middle income countries.

Figure 1. Domestic credit to private sector (% of GDP)

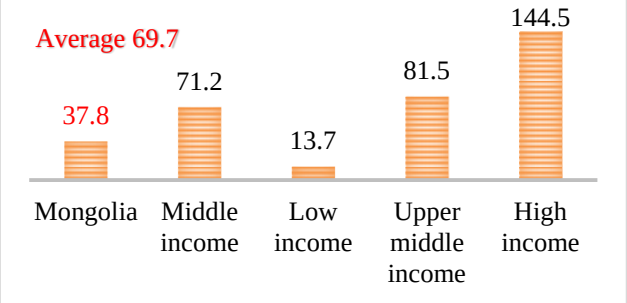
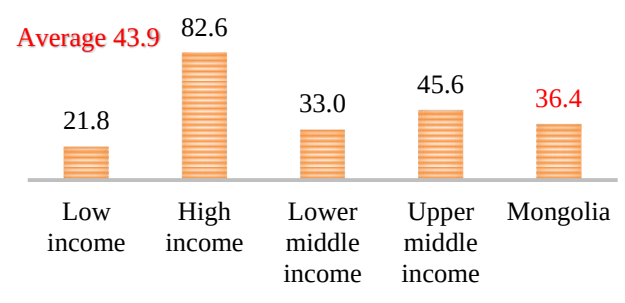


Figure 2. Financial system deposits to GDP (%)



Source: Worldbank, Global Financial Database & Estimates of Researchers

The ratio of non-banking financial institutions to GDP varies widely across countries, and it can be concluded that as income increases, non-banking financial institutions become larger. Mongolia has shown a decrease of 1.7% below the lower middle income countries.

On the other hand, Mongolia is quite below the average for low-income countries in terms of stock market capitalization to GDP. From this we can conclude that with increasing income, the financial market's share in the economy grows.

Figure 3. Nonbank financial institutions' assets to GDP (%)

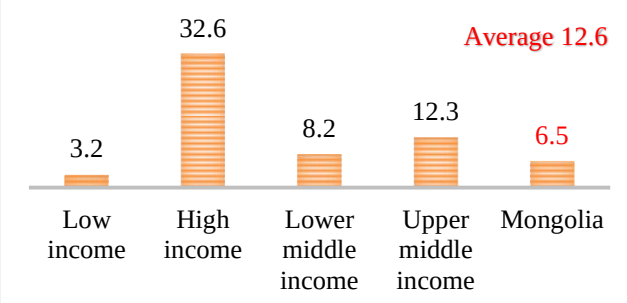
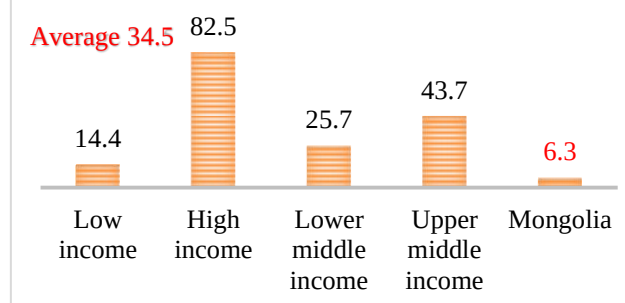


Figure 4. Stock market capitalization to GDP



(%)

Source: Global Financial Database, Financial Regulatory Commission of Mongolia & Estimates of Researchers

3.2. Access to financial services

An efficient and well-functioning financial system deliver financial services smoothly and evenly without discrimination of size of business entity or citizen. Therefore access to both financial institutions and financial markets are examined as follows:

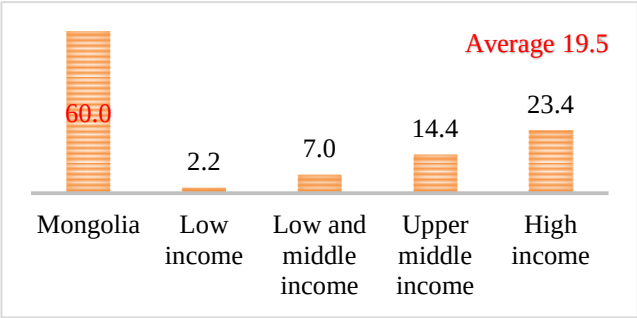


Figure 5. Bank branches per 100,000 adults

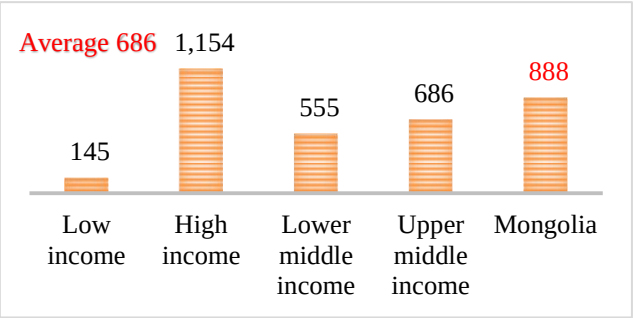


Figure 6. Bank accounts per 1,000 adults

Source: Worldbank, Global Financial Database & Estimates of Researchers

The number of commercial bank's account holders per every 1000 adults in low income countries is 145 and 686 in upper-middle income countries, 154 in high income countries but 888 in Mongolia which is relatively higher though. However, Mongolia has more than 60 commercial banks per every 100.000 people if it's compared to high income countries. Although these indicators do not fully illustrate the access degree to financial services fully, in comparison with other countries, it's still considerably higher than average. As can be seen from Figure 7, there is a positive correlation between real GDP per capita and the number of commercial banks per 100,000 people.

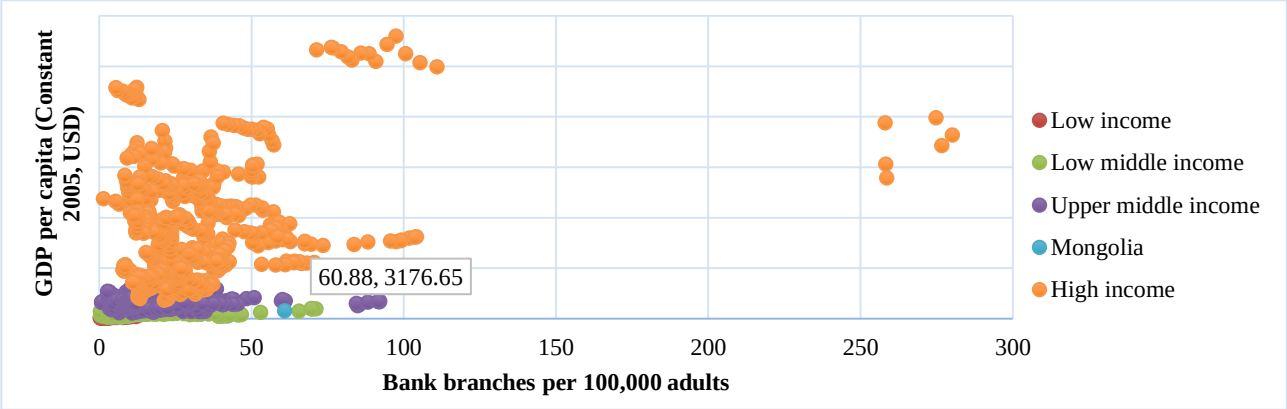


Figure 7. Correlations between financial access and income (2000-2017 Average)

Source: Worldbank, Global Financial Database & Estimates of Researchers

3.3. Financial efficiency

We cannot say that a highly profitable financial institution is operating efficiently. This is because it's possible that an inefficiently operating organization can operate efficiently in case of temporary economic changes, or the organization may suffer losses due to the adverse effect of the external environment even though it's a good financial institution. Here are efficiency performance of financial institutions and markets.

Figure 8. Bank net interest margin (%)

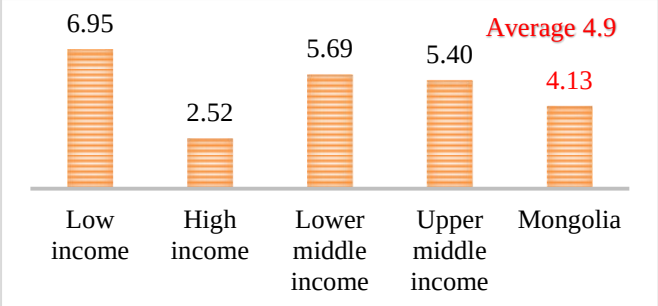
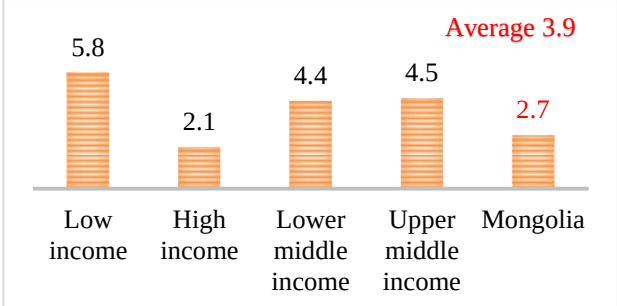


Figure 9. Bank overhead costs to total assets

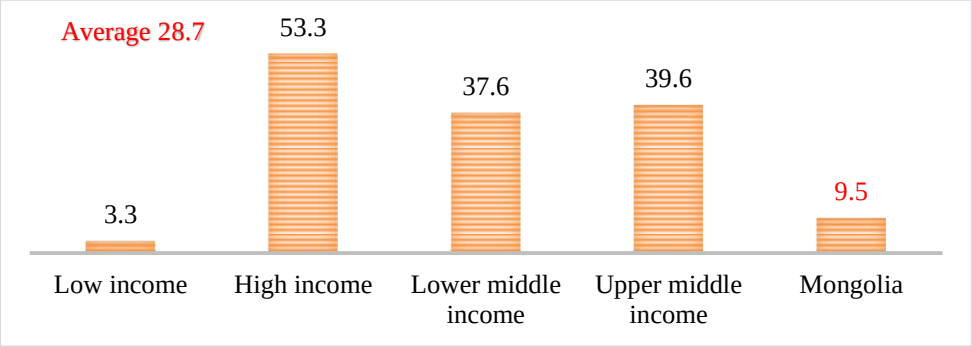


(%)

Source: Worldbank, Global Financial Database & Estimates of Researchers

Financial efficiency is represented by the bank's net interest margin and bank overhead costs to total assets. Net interest margin is declining as countries' income levels grow. In low-income countries, higher operating profit can occur due to relatively low bank competition and difficulty for entering new markets. The net interest margin on the banking sector of Mongolia is at a moderate level after high-income countries. The same pattern holds for operating costs, as can be seen from Figure 9, where the efficiency of the banking sector in low-income countries is relatively poor.

Figure 10. Stock market turnover ratio (%)



Source: Worldbank, Global Financial Database & Estimates of Researchers

It shows that the stock market turnover ratio is 3.3% in low-income countries and 53.3% in high-income countries, but in Mongolia, the stock market activity and profitability are weak.

3.4. Financial stability

Financial stability is important for macroeconomic stability and researchers are exploring it extensively. The most commonly used indicator for measuring the sustainability of financial institutions is the Altman Z-score. For the same purpose, ratios such as equity ratios, non-performing loans and liquidity ratios are used to analyze the sustainability of financial institutions.

Figure 11. Bank Z-score

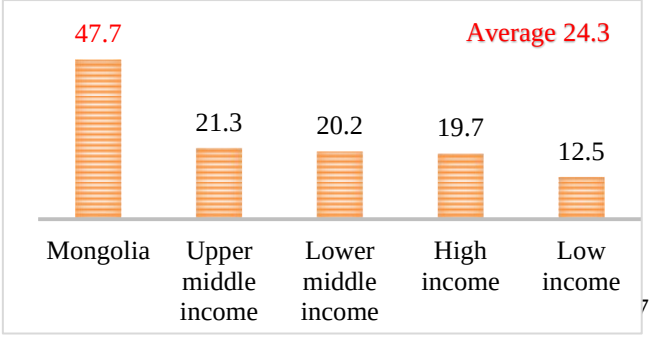


Figure 12. Stock price volatility

Source: Worldbank, Global Financial Database & Estimates of Researchers

As can be seen from Figure 11, the income level of the countries is not related to the stability of the banking sector. In the banking sector, Mongolia's Z score is the highest, at 21.4 percent. The Z-score is based on a balance sheet and has disadvantages that contain limited information, but it can be used to compare financial institutions' likelihood of bankruptcy when there is limited financial market data. Therefore, the financial market stability is calculated using the stock price index fluctuations as shown in Figure 12. As a result, the indicator does not depend on income level, and fluctuations in the stock price index in our country seem to be very high or highly uncertain.

4. THE IMPACT OF THE FINANCIAL SECTOR ON REAL SECTOR

4.1. Literature review

(Goldsmith, 1969; McKinnon, 1973; King ба Levine, 1993) emphasize that the financial sector plays an important role in economic growth but (Robinson.J, 1952), (Lucas.R, 1988) have suggested that the contribution of financial systems to the growth is negligible.

Robert and Ross Levine examined the impact of financial depth on economic growth, and in all cases, the financial depth had a positive impact on the economic growth according to their empiric study (Robert G. King & Ross Levine, 1993).

Adolfo Barajas et al grouped countries by their commonality. As a result they found that the impact of financial depth on economic growth was relatively low for low-income countries (Adolfo Barajas, Ralph Chami, Seyed Reza Yousefi, 2012).

Researchers from the International Settlements Bank (IBC) have investigated the non-linear effects of the financial depth on economic growth in a sample of developed economies. Research shows that if a rise in bank credits to GDP is up to 40 percent, the economic growth will be supported and also a rise in stock market turnover ratios to 95 percent has a catalyst for accelerating economic growth. But exceeding the above levels shows the opposite effect (Lenardo Gambacorta, Jing Yang, Kostas Tsatsaronis , 2014).

S.Myagmarsuren assessed the impact of financial depth on the real sector, using panel data from 98 countries, which showed that increasing financial depth to a certain level promotes economic growth and further expansion causes economic bubble, which results in a loss of financial stability and slowing economic growth. (Myagmarsuren.S, 2015)

4.2. Research data and resources

As mentioned in the first part of the study, financial depth is one of the indicators of the development of the financial sector. This chapter (part) estimated the impact of financial depth on economic growth in the case of Mongolia, using data from 1991-2018, and a list, description, and sources used for the study are shown in Table 2.

Given the empirical research in this area and the availability of data, the depths of the banking sector were chosen as the ratio of bank credits to GDP and the depth of the financial market was chosen as the ratio of stock market turnover. Other explanatory variables include the human capital index, government spending, inflation, and open economic environment which are based on a model developed by the International Bank for Settlements (BIS) researchers.

Table 2. Definition of the study variables

Variables	Definitions	Resources
GDPG	GDP per capita growth (annual %)	World bank
DC	**Domestic credit to private sector (% of GDP)**	World bank
GE	Government expenditure to GDP	countryeconomy.com
DM	The turnover ratio of the stock market	World bank, tradingeconomics.com, www.theglobaleconomy.com
TB	Trade balance (% GDP)	countryeconomy.com
HC	Human capital index per capita	Penn World Table 9.1
INF	Inflation calculated by the consumer price index	World bank

4.3. Factor Agility Analysis

Most time series data is unstable. Therefore, the data used in the study was tested using ADF and PP tests.

Table 3.The results of unit root tests

	H_0: Unit root process					
	Fisher-ADF			Fisher-PP		
	Intercept	Trend&Intercept	None	Intercept	Trend&Intercept	None
GDPG	0.0404**	0.0261**	0.0318**	0.0284**	0.2259	0.0336**
DC	0.9343	0.1815	0.9289	0.9468	0.1867	0.9474
GE	0.0110**	0.0027***	0.3475	0.0097***	0.0024***	0.3292
DM	0.1944	0.0917*	0.0266**	0.1944	0.1250	0.1480
TB	0.0271**	0.0091***	0.7530	0.0295**	0.0096***	0.9209
HC	1.0000	0.9994	0.9766	1.0000	0.8811	1.0000
INF	0.0000***	0.0002***	0.0254**	0.1806	0.1014	0.0430**

Source: Estimates of Researchers

Note: Zero hypotheses are shown with the smallest probability of rejection, and (*), (**), (***) indicate significance at 10%, 5%, and 1% significance level, respectively.

For example, Table 3 shows that GDPG recognizes a constant variable and is stable at a simple level with 95 percent significance. With these tests, the variables GDPG, GE, TB, and

INF were stable, but the variables DC, DM, and HC were unstable at their normal level and were used in the study by logarithm.

4.4. The empirical findings

To investigate the impact of financial depth on economic growth, we have used the following equation of econometric estimation least squares (OLS), and have compiled the equation below here.

Table 4. Estimation results

Variable	Coefficient	T-Statistic
C	-2.075***	-3.078
GDPG(-1)	0.369*	2.093
LOG(DC(-1))	-0.005**	-2.831
LOG(DM)	-0.005***	-3.495
TB	0.278***	4.329
GE	-0.540**	-2.268
GE(-1)	-0.878***	-3.355
INF	0.003**	2.718
INF(-1)	0.002***	3.241
LOG(HC(-1))	3.301**	2.281
R-squared	0.743	
F-statistic	3.46**	
S.E. of regression	0.029	
Durbin-Watson stat	1.637	

Source: Estimates of Researchers

Note: (*), (**), (***) indicates that the rejection of zero assumptions that is not influenced by the model at the significance level of 10%, 5%, and 1%.

It is statistically significant that the results show that indicators such as the ratio of the domestic debts to the private sector to GDP, and the stock market turnover ratio could have a negative impact on real GDP growth per capita. This is partly due to the fact that Mongolia is too dependent on its banking sector which accounts for about 95% of the whole financial system in the country. On the other hand, it is in line with the empirical results of the research showing that

excessive financial depth in less developed financial markets results in a loss of financial stability and a negative effect on real economic growth.

Also we assume that Mongolian financial depth doesn't affect its own economic growth nonlinearly. The reason can be that for low-income countries, the effect of financial depth on economic growth is relatively small or weak.

For other variables, human capital (HC) and foreign trade openness (TB) have a positive effect on economic growth (GDPG), while government spending/ expenditure indicator (GE) has a negative effect on growth.

5. CONCLUSIONS

In the first part (chapter) of this study, we compared some indicators of the financial sector of Mongolia with international level, using the World Bank's financial sector development methodology. For example, in the banking sector, such as the depth, efficiency and stability are at an average level among low and lower middle income countries and at above average level for its financial services accessibility indicators. However, the development of financial institutions and financial markets other than banks were at significantly lower level when compared to the average income-earning countries (Shown in table 5).

Table 5. The level of development of the financial sector of Mongolia as compared to the average of low and lower middle income countries:

	Indicators for measuring the development of the financial sector	**Comparison**
Depth	А. Financial institutions	Approximately the same
	• Bank	Approximately the same
	• Non –banking organizations	Below
	Б. Financial markets	Below
Access	А. Bank	Higher
	Б. Financial markets	Not calculated
Efficiency	А. Bank	Approximately the same
	Б. Financial markets	Below
Stability	А. Bank	Higher
	Б. Financial markets	Below

Source: Estimates of Researchers

Then we estimated the impact of financial depth on the real economy, one of the measurements for evaluating the development of the financial sector. To do so, we assessed the non-linear effects on economic growth using OLS model and considered the depth of banking sector and stock market.

The study results shows that the key variables were consistent with theoretical assumptions and also that each of the indicators of the banking and financial market depth negatively affected real economic growth (non-linear effects were negligible). In other words, we assume that for low-income countries, the effect of financial depth on economic growth is relatively small or weak. From a financial institution's view, in Mongolia, due to the banking sector alone accounting for about 95% of the financial system, excessive financial depth takes place. Then the risk is accumulated by excess leverage in the economy, which has a negative effect on the real economy.

However, from a financial market's view, the following factors such as the activation of the stock market, weak profitability, or very high uncertainty or fluctuations in the stock price index could have a negative effect on the real economy when the financial depth takes place.

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