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RESEARCH ARTICLE

ECONOMIC GROWTH AND FINANCIAL DEVELOPMENT: AN EMPIRICAL ANALYSIS OF MONGOLIAN ECONOMY.

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Abstract

Mongolia has been passing through the transitional stage from controlled economic system to liberalized political and economic system during last two decades. The country is still on the early stage of development of market economy but one of the fastest growing economies in the world and especially in Asian region. At a same time, Mongolian financial sector, especially banking sector, is one of the fastest growing industry among the others since its economic and financial reform started. Naturally, it arises the questions whether financial sector development leads to economic growth or otherwise economic growth leads to financial sector development.

This paper is the result of an attempt to analyze the causal relationship between financial sector development and economic growth in Mongolia. This empirical analysis is performed using Granger Causality test procedure under Vector Auto Regressive model with quarterly data of economic growth and financial development proxies which dimensioned into financial depth, access, efficiency and stability in 2001-2017. These empirical tests provide an evidence for presence of significant causal relationship from financial development to economic growth in Mongolia. This unidirectional causality can be explained by the result of Mongolian Government policies which have liberalized its financial sector since 1990s. The empirical analysis found that financial indicators causes economic growth in different time horizons. Among the financial deepening indicators, an increase in broad money drives to economic growth in short term while growth in private sector credit and capital market lead to economic growth in long term. Improvement in access to the finance followed by economic growth in short term, while financial sector efficiency causes economic growth in long term. In summary, Mongolian economic growth strongly follows the financial sector development. Therefore, macroeconomic policies to strengthen and stimulate financial sector development are highly recommended.

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Introduction:-

Mongolia is a country which made economic and political reform at same time in 1990s. This simultaneous transformations had brought numerous challenges for the country. Generally, in first decade of the transformations, basic fundamentals of market economy and multi-party political system were set by reform policies, in second decade, reform policies focused to strengthen prior achievements. In 1990s, structural reforms including currency reform, price and wage liberalization, privatization of small and medium enterprises and state owned companies and legal environment reforms introduced successfully. One of the successful reform policies was the financial liberalization policy which starts from creating two-tier banking system and encourages private commercial banks. Although, stock market emerged in 1991, it still remains illiquid until today and Mongolian financial sector is dominated by banking sector. In recent years, Mongolian economy has grown rapidly due to development in mining industry. In parallel, financial sector, especially banking industry, relatively strengthened through these years even though it faced several crisis in mid and late of 1990s and mid and late of 2000s. These crisis also gave chances policymakers to strengthen financial sector policy framework and financial institutions to empower their capabilities to overcome risks and external threats.

As financial sector plays significant role to allocate resources efficiently to the economy, its effect on the economic growth is enormous. On the other hand, better and bigger financial sector is required as much as an economy grows. In Mongolia, financial assets of the financial institutions and broad money (M2) has grown rapidly hand in hand with GDP. It arises the question of whether financial sector development leads to economic growth or otherwise economic growth drives financial development. This issue was well studied by many economists and scholars in terms of cross countries and individual country cases. Prior scholars' works, the relationship between economic growth and financial development was analyzed well, but the results were inclusive. The previous empirical results vary among the countries which have been tested. Some results show the financial development had caused economic development while others support the opposite case.

Therefore, this paper's aim to investigate the causal relationship between financial sector development and economic growth in a case of Mongolia. There are two possibilities of the relationship which are unidirectional or bidirectional. In 1990s, because Mongolian government put efforts to liberalize private and financial sector in order to stimulate further economic growth, there is a high probability of financial development causes economic growth. In contrast, some countries such as China and South Korea implemented financial repression policy which controls financial sector heavily and allocates resources to prioritized economic sectors until they achieve certain level of economic growth and then they started reforming their financial sector. In this case, there is a causal relationship from economic growth to financial development.

The rest of the paper proceeds as follows: In section 2, in order to explore theoretical and empirical relationship between financial development and economic growth a literature survey is executed. Followed by, in section 3, the empirical analysis is performed using Granger Causality test procedure under Vector Auto Regressive model with quarterly data of economic growth and financial development proxies which dimensioned into financial depth, access, efficiency and stability in 2001-2017. In this study, the researcher has analyzed the financial development by not only financial depth indicators which are widely used by other scholars but also indicators of efficiency, accessibility and stability compared to other works. The empirical tests provide an evidence that a presence of significant causal relationship between financial development indicators and economic growth depends on time horizons.

Literature Review

There are several driving forces in economic growth of a country. Early economic growth theory argues that exogenous technological progress provide a driving force for the long run economic growth rate whereas financial intermediaries were not included explicitly in economic models. In this regard, the contributions of pioneers such as Bagehot (1873), Schumpeter (1912), Hicks (1969), Goldsmith (1969), McKinnon (1973), Shaw (1973) and many others' work cannot be avoided. The relationship between economic growth and financial development has been attracting many scholars' interests but still remains one of the popular research area which has no single explanation. Schumpeter (1912) viewed that a well functioned financial system would induce technological innovation by identifying, selecting and funding those entrepreneurs that would be expected to successfully implement their innovative products and productive processes. Hicks (1969) argued that financial institutions facilitates economic growth through capital formation. In his perspective, financial institutions affect interest rates by reallocating

financial resources among different capital producing technologies. Therefore, financial institutions manage their liquidity risks and it is a crucial factor for market developments.

In contrast, Joan Robinson (1952) argues that financial sector follows where enterprise leads. There are many authors agree with this argument and they argue that economic development demands better financial services and financial sector adjusts for this demand. Robert Lucas (1988) says that role of financial sector is over stressed and according to this view many development economists including Noble Laureates Bauer, Colin Park, Hirshman, Lewis, Myrdal, Prebisch, Rosenstein-Rodan. Rostow, Singer and Tinbergen neglected financial sector role when they analyzed economic development.

Nowadays economists are seeking to answer what the causality is rather than if financial development is an important for economic growth. Levine (1998), King and Levine (1993a, 1993b), Rousseau and Wachtel (1998), Rajan and Zingales (1998), and Okedokun (1998) investigated the issue in more empirical aspect.

The unidirectional relationship from financial development to economic growth

Levine (1997) argues that financial systems can accomplish five functions to ameliorate information and transactions frictions and contribute to long-run growth. These five functions are: facilitating risk amelioration, acquiring information about investments and allocating resources, monitoring managers and exerting corporate control, mobilizing savings, and facilitating exchange. These functions facilitate investment and hence higher economic growth. McKinnon (1973), King and Levine (1993), Levine et al. (2000), and, Christopoulos and Tsionas (2004) argues that there is a causal direction from financial development to economic growth. They say that appropriate financial policies will lead to long run economic growth. Their fundamental objective is to determine if there is a significant causality from financial development to economic growth. For example, King and Levine (1993a) found, by studying 80 countries over the period 1960-1989, the level of financial development to be a good predictor of economic growth. They used real per capita GDP growth, the rate of physical capital accumulation, and the rate of improvement in economic efficiency as dependent variable and four financial development indicators which includes financial depth (M2/GDP), magnitude of banking sector (deposit money/ (deposit money + central bank domestic asset)), private sector credit, and other controlling variable (technology growth and human capital accumulation etc.) as explanatory variables. They found out that lack of financial development could possibly induce some form of “poverty trap” because of the possible existence of multiple steady state equilibriums.¹

Shan and Morris (2002) examined the relationship for 19 OECD countries using Toda and Yamamoto’s (1995) model using variables of real GDP, ratio of total credit to GDP, spread of borrowing and lending interest rates, productivity, ratio of gross investment to GDP, ratio of total trade to GDP, CPI, official interest rate, stock and market price index etc. They concluded that financial development leads to economic growth. Evans, Green, and Murinde (2002) examined the relationship for 82 countries using panel regression including variables as labor, physical capital, human capital, and monetary factors including money and credit. They show that financial development is important as human capital in the economic growth process.

The unidirectional relationship from economic growth to financial development

Robinson (1952), Gurley and Shaw (1967), Goldsmith (1969), Jung (1986) and others argue that if the economy grows, there will be increasing demand for financial services and it will lead to financial sector’s expansion and development. All these views are generally based on the indicator which is ratio of broad money to GDP which is standard measure of financial development and on the other hand it is inverse of the velocity of circulation of the broad money. Therefore, because of a downward trend in the velocity of circulation of money, positive relationship between the financial sector development and economic growth exists. Hence, then the positive relationship between financial development and real GDP can reflect an income elasticity of the demand for money with respect to income, which is greater than one. Consequently, according to this argument Ghali (1999) argues that the direction of causality will be from real GDP to financial development, and that through the demand for money.

These findings can lead us to financial repression policy. In other words, government focus on economic growth rather than financial development with a financial repression policies by intervening in financial resource allocation.

¹ Financial Development and Economic growth: The case of eight Asian countries, Dipendra Sinha and Joseph Macri

Financial repression policy can achieve rapid economic growth but after the economic development reaches certain level the government needs to liberalize the financial sector for further development.

The Bidirectional relationship between financial development and economic growth

There are also authors such as Demetriades and Hussein (1996), Blackburn and Huang (1998), Khan (2001), and Shan, Morris, and Sun (2001) who believe two way causality. They argue that financial development and economic growth support each other, if financial development helps economic growth, economic growth helps to develop financial systems. In early period, for example, Patrick (1966) claims that the causality goes from finance to growth and then switch from growth to finance. In other words, financial sector development encourages real capital formation per capita, consequently, when the economy is in the growth stage, an increasing demand for financial services induces an expansion not only in the financial sector but also in the real sector.

Shan, Morris, and Sun (2001) examined the relationship between financial development and economic growth for 9 OECD countries and China using VAR model. The result shows that 5 out of 10 countries have a bilateral Granger causality, 3 of the have reverse causality with economic growth leading to financial development and other 2 countries do not have a causal effect at all. Arestis, Demetriades and Luintel (2001) investigated stock market development, credit market development and economic growth using time series analysis for 5 developed countries. Their result shows that bank based financial system is more likely to promote long-run growth than capital market based countries.

Sinha and Macri (2001) investigated the relationship between financial development and economic growth for 8 Asian countries which consist of 7 developing countries and Japan. Their result says that bilateral causal relationship exists for 3 countries, unidirectional relationship from finance to growth for 2 countries, reverse causality from growth to finance for 3 countries including South Korea.

In terms of research method, some scholars like Berger, Hassan and Klapper, (2004), Dawson (2003), Deidda (2001), Khan and Senhadji (2000), King and Levine (1993), Lensink (2001), Odedokun (1996), Rajan and Zingales (1998), and Sala-i-Martin (1997) applied cross country regressions whereas others such as Calderon and Liu (2003), Edison, Levine, Ricci and Slok (2002), and Manning (2003) employed panel data regression. Therefore, some others have used a combination of both cross and panel data regression. There are also studies which used Granger causality tests to examine the relationship by Arestis, Demetriades and Luintel (2001), Bhattacharya and Sivasubramanian (2003), Chang (2002), Darrat, Abosedra and Aly (2005), Demetriades and Hussein (1996), Ghirmany (2004), Luintel and Khan (1999), Thangavelu and James (2004), and Shan and Morris (2002) etc.

Since financial development is not easily measurable, papers attempting to study the link between financial deepening and growth have chosen a number of proxy measures and subsequently, have come up with different results (King and Levine, 1992; Savvides, 1995; Khan and Senhadji, 2003; Hassan and Bashir, 2003; Chuah and Thai, 2004; Al-Awad and Harb, 2005, among others). However, the general consensus of these studies is that there is a positive correlation between the financial sector and growth and that the development of bank credit has an important impact on economic growth.

Financial repression policy and financial liberalization

Economists generally argue that financial repression policies prevents the efficient allocation of capital and in that way harms economic growth. Mckinnon and Shaw (1973) examined the impact of the government involvement in the financial sector development. They argued that financial repression policy has negative impact on the development of the financial sector and economic growth as well. Roubini and Sala-i-Martin (1992) viewed that because financial repression leads to inefficient allocation of capital, high costs of financial intermediation, and lower rates of return to savers, it is theoretically clear that financial repression inhibits growth.

Financial repression refers to a set of government regulations, laws, and other non-market restrictions prevent the financial intermediaries of an economy from functioning at their full capacity. Financial repression policies also can be government directives for commercial banks to allocate credit at subsidized rates to specific firms and industries to implement industrial policy. It is also more cost effective than going through the public sector's budgetary process. South Korea and Japan are the successful examples of government's directives which used financial repression policies to boost their export oriented economies during 20th century. South Korea is one of the cases of most successful financial reforms which had tight and effective control over interest rates. In 1960s, higher real

interest rates led to rapid growth of bank deposits which enabled government to finance its industrial policies that promotes export oriented economic growth. Cho (1989) viewed that this government intervention in the financial market shared the associated risks with the commercial banks and it enabled commercial banks to get involved long-term activities. In 1980s, interest rates and credit allocation were still under control of the government. However, the government intervention was reduced relatively at that time.

The Japanese financial repression and liberalization policies are also successful example and in the 1950s and 1960s the government actively and successfully intervened in the pricing and allocation of credit. World Bank (1993) also viewed that in a few economies of North East Asia, government interventions resulted in higher and more equal growth than it would not have occurred.

Demetriades and Arestis (1997) say that successful reform of the real sector came to be seen as prerequisite to financial reform. Thus financial repression would have to maintain during the first stage of economic liberalization. Caprio (1994) argue that managing the reform process rather than adopting a *laissezfaire* stance is important, and that sequencing along with the initial conditions in finance and macroeconomic stability are critical elements in implementing successfully financial reforms.

Kaminsky and Schmukler (2002) argue that financial liberalization can create short-term volatility despite its long-term gains. Therefore, fully liberalized financial sector does not mean prerequisite condition of further development and removing all the regulations and controls lead to crises rather than economic growth in a short run. Some developing countries which liberalized their financial markets experienced crises partially because of the external shocks that financial liberalization introduces or amplifies.

Financial Sector in Mongolia Economic Review

Mongolia is the one of the countries which started shifting from centrally planned economy to a market based economy in 1990. The country had been under the political and economic influence of former Soviet Union until 1990 even though the country declared its independence in 1911. After the collapse of communist regimes in 1989, Mongolia embarked irrevocably on the transition to a market economy.

At a same time, as the world financial markets had been rapidly evolving and integrating, the transition economies faced to challenge of reforming their financial and private sectors efficiently and properly. In early 1990s, Mongolian Parliament passed several important legislations for the finance economy such as Privatization Law, Banking law, and Bankruptcy Law. As a result, privatization program of state enterprises initiated and Central bank, several commercial banks and Mongolian stock exchange established. Generally, Mongolian economic and financial institutional framework established during that time.

In recent years, Mongolia is regarded as one of the fastest growing economy in the world due to a boom in mining sector. Because of its extensive deposits of copper, coal, molybdenum, tin, tungsten, gold and other minerals, the country attracted foreign direct investors in the mining industry. Despite rapid economic growth, the proportion of the population below the poverty line remains in high level and it was 27.4% in 2012 even it decreased by 19% compared to previous year². Therefore, a stability in legal environment, external factors such as global economic downturn and commodity prices decline in the world market influence the economy severely. Especially during the Global financial crisis, the GDP growth rate was -1.3% in 2009.

Due to world market price decline of main exporting commodities, a decrease in net capital inflow caused a sharp reduction in foreign exchange reserve. Grateful to strong policy response from the Mongolian authorities with the financial support by IMF, other international financial institutions and donor countries, two years later Mongolia experienced it's the highest economic growth rate of 17.5% in 2011. However, keeping the high economic growth rate sustainably became a major challenge for Mongolian authorities and because of uncertainty in Mongolian legal environment which resulted a sharp decline in foreign direct investment and Chinese decreasing demand in imported coal, the economic growth rate fell down to 11.7% in 2013.

² Joint estimation of World Bank and National Statistics Office of Mongolia in 2012.

Furthermore, high inflation rate tends to erode GDP gains, with an average rate of 12.3% in 2013. In early years, Mongolia experienced hyperinflation with the rate of 325% in 1992 right after the transition to market economy. As a result of macroeconomic stabilization policy, financial sector reform which includes privatization of commercial banks and restructuring, the inflation declined to less than 10% in 2000. However, Mongolian economic reliance on a few major industries keeps the country vulnerable on external shocks such as world commodity market prices fluctuations. These external shocks reflects to the higher inflation in Mongolia and during the global financial crisis, it peaked to 23.2%. In terms of economic activities, besides mining (21%), wholesale and retail (16%) and agriculture (15%) are the main industries in the composition of GDP of Mongolia by 2012. Besides impact of world market prices of main exporting products, weather condition is still one of the factors influences the economy especially on agriculture, which is one of the main industry but still not developed well.

Banking Sector

Prior to 1991, Mongolia had the mono banking system administered by the State bank of Mongolia which carried out functions to transfer government resources to public enterprises and commercial banking functions as well as. Mongolian banking system was changed from mono banking system to dual-tier banking system under the new Banking Law enacted by Mongolian parliament in 1991. After the legislation, five banks established from the former State bank and nine were created later. The banking law enabled the central bank to manage money and credit using indirect instruments but allocation of resources to the market remained in market mechanism.

Therefore, Mongolian Government implemented a strategy which intended to stabilize macro economy and reform financial sector. The main objectives of the reform program was to promote establishment of a competitive, autonomous, market-based, and sound financial system that could regain public confidence and efficiently mobilize and allocate resources for economic growth. The objective was to be achieved through a financial sector reform program designed to:

1. Strengthen financial intermediaries,
2. Strengthen the legal and regulatory framework for the sector, and
3. Establish a market-based financial intermediation process³.

One of the important element in this reform program was to establish a well-defined operating and regulatory frameworks for the banking sector which meets international standards and norms. On September 3rd 1996, Mongolian Parliament passed Law on Central banking and the powers and responsibilities of BoM were enhanced in a range of activities including the supervision of commercial banks.

The reason of this legislature was that banking system confronted several banks' bankruptcies and instability in the financial sector. Because of liquidity problem and lack of internal risk management and external control over the banks, banks did not maintain capital adequacy ratios and issued more loan than they should had issued with exceeding the amount of total deposits. In September 1994, the government forcibly merged two small banks with two large banks and provided highly subsidized loans to cover the cost of mergers. In summer 1996, two additional banks were closed, prompting bank run. The BoM injected large volumes of liquidity in response, but public confidence in the banking system continued to erode. In December 1996, the government closed large two insolvent banks. After this banking crisis, the BoM implemented restructuring and recapitalizing the banks. According to World Bank, the direct cost of the banking crisis in Mongolia in 1996 was 8.7% of GDP.

The reform program also included some actions to eradicate government influence on credit decisions and to improve banks own autonomy by increasing shareholders and managers responsibilities. As a result of the reform, all commercial banks implemented appropriate credit policies and procedures, improved risk management and information systems. In terms of human resources capabilities, necessary trainings were supported by donor countries. Besides banking sector, the reform program encouraged diversification and competitiveness of financial institutions. In this regard, legal framework for nonbanking financial institutions was developed.

In 2000-2005, the Government initiated a Medium-Term Strategy for Financial Sector Development which also addressed the liquidity and solvency issues of commercial banks. One of the main points of that strategy was to continue the improvement of a market oriented financial system. The restructuring of the commercial banks was to

³ Asian Development Bank, Evaluation Study: Financial Sector in Mongolia—Transition to a Market Economy Built on Successful Financial Reforms, Rapid Sector Assessment, 2008

be pursued more strongly to reduce the role of the government in allocating financial resources, through liquidation of non-viable banks, and privatization of the more viable banks. ITI Bank and Reconstruction Bank were liquidated and state owned TDB, the largest bank, was privatized in 2000.

Subsequently, Agriculture Bank and Savings banks were restructured and privatized. These actions also encouraged a financial development in rural areas and financial sector diversifications by promoting nonbank and capital market subsectors. In the result of the reform, corporate governance practices in banks improved, movable property regarded as loan collateral, the types of immovable properties could be used as collateral expanded and transaction costs associated with collateral registration reduced. Therefore, the reform strengthened bank supervision and regulations by establishing minimum capital requirements, asset classification, an exit policy to facilitate the liquidation of troubled banks, and the foundation for developing a Government bonds market and an interbank market.

Securities and Non-Banking Sector

The initial step of Mongolian plan to efficiently functioning market economy through the privatization of state owned assets was entered when the complex policy measures of restructuring the whole economy, introducing fair market competition, and the sustainable encouragement of a viable private sector development were taken by the Government. In order to achieve these objectives in the shortest period, and to provide the basis for a more efficient allocation of economic resources, regulating the flow of capital and to mobilize savings into the private sector, the establishment of securities market was at the core of the Mongolian privatization program.

The Mongolian Stock exchange (MSE) was founded in 1991 with the introduction of the mass voucher privatization program. It was used to initially distribute and collect vouchers, and to sell state assets through direct share offerings. At the onset of the privatization program, each citizen of Mongolia were given MNT

3000 worth of “Pink” vouchers, and MNT 7000 of “Blue” vouchers. Pink vouchers were used for the privatization of small business units, and blue vouchers were used to privatize large scale industrial enterprises. Secondary trading at MSE started in August 1995 and all of the 419 publicly listed companies were privatized through the mass voucher privatization program.

The role of securities markets is to facilitate the reallocation of property rights. However, much of the standard benefits of securities markets, such as compliance with the disclosure requirements the internationally accepted accounting principles and the improvement of corporate governance by monitoring managers and trading shares actively, have not yet materialized in Mongolia. While market capitalization is relatively high, the turnover ratio is extremely low in Mongolia, reflecting a lack of liquidity in the market, investor perceptions that the market is risky, widespread noncompliance with disclosure requirements, and Government indecision to further the privatization process by releasing state held shares to the public through the MSE.

Establishment of Financial Regulatory Committee (FRC) which replaced Mongolia Securities and Exchange Commission enabled to oversee nonbank and capital market. FRC introduced prudential norms, minimum capital and licensing requirement for NBFIs.

A reform strategy promoted capital markets to

1. Strengthen the regulatory body
2. Accelerate privatization of SOEs to increase the number of stocks listed on MSE; and
3. Introduce the Law on Trusts and Law on Investment Funds, as part of the effort to establish a legal framework for promotion of new investment instruments.

The MSE was to be separated into two institutions: the MSE would oversee trading functions, while the Central Depository System handled clearing, settlement, and depository functions.

Overall, Mongolian financial reform strategies were expected to facilitate resource mobilization and increase the efficiency of resource allocation, in this manner benefiting the whole population. In addition, the reform program was expected to facilitate access to credit by private entrepreneurs, which would impact positively on employment opportunities in the country’s growing private sector. Through these developments, the reform program was also expected to have a positive impact on poverty reduction. For example, first phase of financial reform led to an

average annual GDP growth rate of 3.9% in 1995–1999. Inflation was reduced from over 50% in 1996 to less than 10% in 1998, according to ADB.

Empirical Study

Model

To analyze the causal relationship between financial sector development and economic growth, I use the following VAR model.

$$\begin{cases} GDP = f(FD) \\ FD = g(GDP) \end{cases} \quad (1)$$

Where:

GDP: Growth rate of real GDP per capita

FD: Financial sector development variables including:

{Financial deepening; accessibility; efficiency; stability}

The bivariate VAR model to be tested:

$$yt = \alpha_0 + \alpha_1 yt-1 + \dots + \alpha_l yt-l + \beta_1 xt-1 + \dots + \beta_l xt-l + et \quad (2)$$

$$xt = \gamma_0 + \gamma_1 xt-1 + \dots + \gamma_l xt-l + \theta_1 yt-1 + \dots + \theta_l yt-l + ut \quad (3)$$

The model will be tested for possible pairs of (x, y) series in the group. The reported F-statistics in causality tests are the Wald statistics for the joint hypothesis for equation (2) and (3), respectively:

$$\beta_1 = \beta_2 = \dots = \beta_l = 0 \quad (4)$$

$$\theta_1 = \theta_2 = \dots = \theta_l = 0 \quad (5)$$

Data

In order to analyze the causal relationship between economic growth and financial sector development, the indicators or variables should be chosen wisely. Because of data availability and consistency, the researcher analyzed Mongolian quarterly data between 1995 and 2012⁴. King and Levine (1993) chosen the 4 variables including ratio of M2 to GDP, ratio of deposit money in the commercial banks to total banking system, ratio of claims on nonfinancial sector by banks to total domestic credit and ratio of claims on nonfinancial sector by banks to GDP as proxies of financial sector development. In this research paper, I will follow the general practices to choose the variables which commonly used in previous studies. Therefore, additional variables which reflect to financial accessibility, efficiency and stability as financial development indicators.

Economic Growth

The standard measure of economic growth is growth rate of GDP per capita and in this study We used real GDP per capita (PPP) at constant price in 2005 in U.S dollar terms. Because the quarterly data contains seasonality, Census X12 is used to make seasonal adjustment on the data

Financial Deepening Indicators:

Roubini and Sala-i-Martin (1992), King and Levine (1993) and many other subsequent authors used the ratio of broad money to GDP as financial deepening indicator. In order to measure banking sector magnitude, researcher has used ratio of domestic bank credit to private sector to nominal GDP as second indicator of financial sector development. Capital market development is also crucial for financial sector development, thus, ratio of market capitalization to the GDP is used as one proxy as well.

Financial Accessibility Indicators:

One of the financial development measure is its accessibility. In this regard, the researcher included bank accounts number per 1000 adults and bank branches per 100,000 adult. Due to data limitation, there is no available data to measure the access to finance for enterprises.

Financial Efficiency Indicators:

Efficiency of banking sector refers to its profitability and efficient operation. Therefore interest rate spread can be a good proxy to measure competition among the commercial banks. As banking sector grows, interest rate spread tends to shrink and it also reflects to banks' healthiness. Although, interest rate can be affected by macroeconomic policies and economic circumstances, generally it shows the efficient allocation of resources. Therefore, financial

⁴ Some data of financial accessibility, efficiency and stability are available since 2000s.

sector efficiency is the qualitative measure of financial development and therefore the quality of financial sector contributes economic growth in the long run. Economic growth requires not only bigger financial market but also better one. In this study, financial sector efficiency, particularly banking sector efficiency, is measured by interest rate spread, banking sector's ROA, ROE, noninterest income, and overhead cost.

Financial Stability Indicators:

Pierre and Terhi (2010) found that banking sector stability affects real economic output using panel VAR model for OECD countries. Financial stability reduces the uncertainty and it has positive impact on output. Therefore, I included financial sector, particularly banking sector, stability as one measure of financial development. Liquidity measures and probability of bank defaults also included in this category

Stationary Test

A series is said to be (weakly or covariance) stationary if the mean and covariance of the series does not change over the time. If the time series is not stationary or to series is I(d) which means integrated with respect to d, it should be used in the regression as differenced with respect to d until it becomes stationary. A difference stationary series is said to be integrated and is denoted as I(d) where d is the order of integration. Stationary time series should be checked by unit root test and Augmented Dickey- Fuller (ADF) test is widely used. At first, the test used in variables on their own level and result shown in Table 4.

As a result of ADF unit root test, all the variables are stationary in the level except variable Y. Accordingly, the unit root of variable Y is tested again in its first order. Because when time series is stationary its further orders are also stationary, additional unit tests for stationary series are not required. Moreover, the results of ADF test with intercept and both of trend and intercept for all variables are same as previous tests result.

Table 1:-ADF Unit root test (level, no trend and no intercept)

	t-stat	Probability	Unit Root
ACC	-5.7446	0.0000	Stationary
ASSET	-11.0519	0.0000	Stationary
BRANCH	-5.7446	0.0000	Stationary
CAR	-5.5978	0.0000	Stationary
DEPOSIT	-9.9073	0.0000	Stationary
Y	-1.9074	0.0543	Non stationary
LIQ	-7.2801	0.0000	Stationary
LIQGDP	-9.0000	0.0000	Stationary
LOAN	-6.4390	0.0000	Stationary
M2	-11.1558	0.0000	Stationary
MKTCAP	-7.6104	0.0000	Stationary
NONINT	-7.2801	0.0000	Stationary
NPL	-6.3813	0.0000	Stationary
OVERHD	-7.0000	0.0000	Stationary
ROA	-7.0000	0.0000	Stationary
ROE	-7.0000	0.0000	Stationary
SPREAD	-7.3559	0.0000	Stationary
Z	-7.0000	0.0000	Stationary

Source: Author's calculations

Table 2:-ADF Unit root test (1st order)

	t-stat	Probability	Unit Root
DY	-13.3935	0.0000	Stationary

Source: Author's calculations

Causality test

VAR models have several advantages compared with other models. One of them is all of variables in VAR model are regarded as endogenous, and OLS method can be applied to each equation separately. When we estimate unrestricted VAR model, it is required to use same number of lags for all of the variables in all equations. Using

too many lag length will reduce the degrees of freedom while using too few lagged terms can lead to specification errors. In order to determine the appropriate lag lengths, the multivariate generalization of Akaike's information criterion is used⁵. The lowest values of these criteria gives the appropriate length of the lag. In doing so, researcher used VAR lag order selection criteria and focused on AIC and LR criterion. After determination of the lag order, we estimate bivariate VAR models for possible pair variables of economic growth and financial development indicators. The causality analysis is carried out by using the equations (2) and (3). Table 5-8 shows the results of causality tests between economic growth and financial development indicators. Financial development indicators can be divided into 4 groups: financial depth, access to finance, efficiency, and stability⁶.

Table 5 shows that financial depth indicators cause economic growth in unidirectional way. ASSET, DEPOSIT and M2 cause economic growth in a short term (within 1 year, according to the causality tests with the lags between 1 and 4 quarters.) at 5% significance level whereas variables of MKTCAP and PRIVATE cause economic growth in longer term (2 years and 3 years respectively) at 5% significance level.

Table 3:-Causal relationship between financial depth and economic growth

No.	Null Hypothesis	Observations	Order of the lag	F-Statistic	Probability	Causality
1.	DY does not Granger Cause ASSET	68	1	0.01757	0.8950	Banking sector Asset → Growth
	ASSET does not Granger Cause DY	68	1	8.48309	0.0049	
2.	DY does not Granger Cause DEPOSIT	68	1	0.18016	0.6726	Deposit → Growth
	DEPOSIT does not Granger Cause DY	68	1	15.3444	0.0002	
3.	M2 does not Granger Cause DY	68	1	9.70198	0.0027	M2 → Growth
	DY does not Granger Cause M2	68	1	0.19465	0.6605	
4.	DY does not Granger Cause MKTCAP	50	8	0.8504	0.5665	Market Capitalization → Growth
	MKTCAP does not Granger Cause DY	50	8	2.75183	0.0191	
5.	DY does not Granger Cause PRIVATE	61	12	1.51206	0.1650	Private sector credit → Growth
	PRIVATE does not Granger Cause DY	61	12	2.15656	0.0374	

Source: Author's calculations

Table 6 reports that variables of financial accessibility causes economic growth in short term. Because of banking sector dominated financial market in Mongolia and limited data availability, variables of this group refers to proxies of an access to banking services. The result concludes that there is unidirectional relationship from financial accessibility to economic growth.

Table 4:-Causal relationship between financial accessibility and economic growth

No.	Null Hypothesis	Observation	Order of the lag	F-Statistic	Probability	Causality
1.	DY does not Granger Cause ACC	34	1	0.17313	0.6802	Bank Accounts → Growth
	ACC does not Granger Cause DY	34	1	4.58527	0.0402	

⁵ Introductory Econometrics for Finance 2nd edition, Chris Brooks, 2008

⁶ World bank's Framework of measuring financial development

2.	DY does not Granger Cause BRANCH	34	1	0.26443	0.6107	Bank Branches → Growth
	BRANCH does not Granger Cause DY	34	1	6.01393	0.0200	

Source: Author's calculations

Granger causality tests in Table 7 report that there are unidirectional relationship from financial efficiency variables to economic growth in lag order of 8-15. It reports that financial sector efficiency causes economic growth in 2-4 years.

Table 5:-Causal relationship between financial sector efficiency and economic growth

No.	Null Hypothesis	Observation	Order of the lag	F-Statistic	Probability	Causality
1.	DY does not Granger Cause SPREAD	51	8	1.20876	0.3234	Interest rate Spread → Growth
	SPREAD does not Granger Cause DY	51	8	2.32546	0.0414	
2.	ROA does not Granger Cause DY	38	13	2.39281	0.0778	ROA → Growth*
	DY does not Granger Cause ROA	38	13	0.28658	0.9821	
3.	ROE does not Granger Cause DY	38	13	3.13448	0.0329	ROE → Growth
	DY does not Granger Cause ROE	38	13	0.15963	0.9987	
4.	DY does not Granger Cause NONINT	47	15	4.37246	0.0154	Noninterest income ← Growth
	NONINT does not Granger Cause DY	47	15	0.41692	0.9354	
5.	OVERHD does not Granger Cause DY	35	16	3.43506	0.2487	No causality
	DY does not Granger Cause OVERHD	35	16	0.44762	0.8606	

*At 10% significance level

Source: Author's calculations

In researcher's point of view, developed financial sector means better financial services and stable environment. In this regard, CAR and banking sector liquidity measures lead to economic growth in unidirectional way while bidirectional relationship exists between NPL and economic growth. This bidirectional relationship is obvious because when economy shrinks, there is high possibility to increase nonperforming loan, when NPL increases, an economic activity also can slow down.

Table 6:-Causal relationship between financial stability and economic growth

No.	Null Hypothesis	Observation	Order of the lag	F-Statistic	Probability	Causality
1.	DY does not Granger Cause CAR	26	1	0.41515	0.5257	CAR → Growth
	CAR does not Granger Cause DY	26	1	7.96272	0.0097	
2.	DY does not Granger Cause NPL	62	2	3.14107	0.0508	NPL ↔ Growth
	NPL does not Granger Cause DY	62	2	9.13453	0.0004	

3.	LIQGDP does not Granger Cause DY	75	8	6.87872	0.0000	LIQGDP → Growth
	DY does not Granger Cause LIQGDP	75	8	0.47708	0.8674	
4.	LIQ1 does not Granger Cause DY	43	12	3.52669	0.0080	LIQ1 → Growth
	DY does not Granger Cause LIQ1	43	12	0.50694	0.8837	
5.	DY does not Granger Cause Z	38	13	0.13763	0.9994	No Causality
	Z does not Granger Cause DY	38	13	1.30135	0.3348	

Source: Author's calculations

Conclusions:-

This paper studied the causal relationship between range of indicators of financial development and economic growth using Granger Causality test in case of Mongolia for the period of 2001-2017. The main interest was analyze if there are causalities between various types of financial development indicators and economic growth and if exist, what the directions will be.

In general, the empirical findings show that financial development indicators drive to economic growth in case of Mongolia, and relationship is unidirectional. Following main causal relationships between financial development indicators and economic growth found:

1. Financial deepening indicators – ratios of banking sector asset to GDP, banking sector deposit (as a source of credit) to GDP, broad money or M2 to GDP – strongly and promptly causes economic growth in short term. In contrast, domestic credit provided by banking sector relative to GDP and market capitalization relative to GDP drive to economic growth in medium term of 2-3 years.
2. The causal relationship exists from financial accessibility indicators – bank accounts per 1000 adults and bank branches per 100,000 adults – to economic growth in short period. However, because of data limitation, financial accessibility indicators did not include the accessibility for enterprises. Therefore, these indicators might not represent the access to finance fully.
3. Banking sector efficiency indicators – interest rate spread and profitability measures – causes economic growth in medium term of 2-4 years.
4. There is a causal relationship from banking sector stability indicators – capital adequacy ratio, nonperforming loan to total loan, banking sector liquid asset to GDP, banking sector liquid asset to its total asset – to economic growth.

Because of the presence of relationship from financial development to economic growth, the study suggests that Mongolian policymakers need to continue to pursue further financial sector development. Since the financial liberalization policies have significant effect on strengthening Mongolian financial sector, the government should continue implementation of policies which dedicated to stabilize macro economy and create suitable macro environment through sound fiscal, monetary, exchange rate and interest rate policies. Therefore, preserving the stability of banking sector is vital for not only sustainable financial sector development but also for economic growth. In doing so, strengthening macro and micro supervision framework for financial institution is a further action to continue. In terms of access to finance, increasing the possibilities to access financial resources for enterprises, especially small and medium ones, will make benefits for the economy and society in large scale.

In order to improve the efficiency of financial sectors resource allocation function, the further development of capital market is truly important. Legal and supervisory framework and internationally acknowledged practices to support modern securities market is needed and it will encourage the efficiency of capital market operation. The development of capital market will diversify the Mongolian financial sector and reduce the dependence on only banking sector. Furthermore, because current banking sector is highly concentrated on few banks, the policies to encourage competition among the banks should be implemented.

Finally, in current situation of Mongolia, the empirical tests suggest that policies aimed to strengthen and develop the financial sector will lead to economic growth.

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