IMPACT OF FINANCIAL DEVELOPMENT, FINANCIAL LIBERALIZATION AND ECONOMIC GROWTH ON FINANCIAL INSTABILITY: EVIDENCE FROM PANEL DATA

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ABSTRACT

Financial instability refers to the situation when financial system faces some disturbances and volatility. There are some important factors that can have a significant influence on the stability or instability of the financial sector. The main objective of this study is to examine the impact of financial sector development, financial liberalization, and GDP growth rate on financial instability. Using data from 53 countries from 2000 to 2016 and employing a battery of estimation techniques consisting of fixed effect, random effect, dynamic panel, and system GMM, the study finds that financial development and financial liberalization accentuate financial instability. The study also finds that economic growth dampens it. Furthermore, the relationship is robust to a variety of controls like monetary independence index, exchange rate stability, law and order, and government expenditure. The policy implication is straightforward that financial development and financial liberalization demand a caution.

INTRODUCTION

After the 1930's great depression when Keynes's concept of government intervention emerged, and the crisis was successfully overcome. It was claimed by the advocates of capitalism that the issue of financial crisis had been solved and now the world is free from crisis. This notion made them overconfident in the capitalist economic system. For instance, Spanish economists used to say about the Spanish economy before the financial crisis, it has solid fundamentals. Despite the large debt burden and the imbalances, it is crisis-resilient (Jimeno and Santos, 2014). But these claims proved vague and wrong, when the world was again stuck in the financial crisis of 2008, which proved again that the global financial system is fundamentally weak and fragile. In addition, it has also been confirmed that the current economic theories and models are unable to predict the crisis. Moreover, we are living in uncertain and risky world where the current financial system may face a new crisis at any time (Nelson and Katzenstein, 2014; Batuo et al., 2018). When a crisis hits the financial sector, it also disturbs the performance of other economic sectors by adversely affecting the capital flows, international trade, domestic credit and slowing down the growth and performance of the economy since all sectors are connected and interdependent. Hence, it has become much more important to make financial system crisis resilient. But this will be difficult and nearly impossible without understanding reasons of financial crisis (Minsky, 1982; Stiglitz, 2000).

According to the principle of dialectics no event can occur accidently or by chance because there is a reason behind every event, in addition quantitative changes leads or cause to qualitative changes (Engels and Marksizma-Leninizma, 1940; Harvey, 2004). Similarly, the crisis in financial sector do not occur accidently or by chance. There must be a reason behind it. Now the question is what causes financial sector crisis? The answer to this question is not easy and simple it is difficult and complex because of the complexity of financial system.

Nevertheless, it has multiple causes, but the main cause is the fragility or instability of financial sector. Thus, to stop or reduce the likelihood of a crisis, we need to save financial system from fragility or instability, which demands understanding about instability. Financial instability refers to the situation when financial system faces some disturbances and volatility. Or in other words, when imbalances occur in the financial system, this situation is known as instability in the financial sector. This can be seen in many ways or forms. For instance, stock market volatility, increase in the volatility of assets price, increase in non-performing loans, or bad debt ratio which causes banking failure and collapse in the market liquidity (Batuo et al., 2018). As already discussed, the financial sector is not simple; it has different dimensions (Podviezko, 2015).

Generally, any issue occurs due to two reasons: first is subjective (endogenously or internal contradictions and changing) and second is objective (exogenously or due to

external factors). The issue of financial instability is no exception. Minsky (1982) pointed out the internal reason for financial instability. He explains that the internal dynamic of global financial architecture consists of the inherent characteristics of destabilization. Therefore, stability itself cause to create financial instability. Because in tranquility or stability, when the financial system is stable, interest rate rises slower than the stock prices. This incentivizes the investors to invest more, taking more risks through external borrowing. Moreover, the investor starts paying the asset price more than its intrinsic value. This practice over expands the loan market. And cause to convert loans into non-performing loans. Consequently, this creates an asset price boom and bust and increases the instability in the financial sector (Minsky, 1982; Bordo and Meissner, 2015; Almarzoqi et al., 2015; Batuo et al., 2018).

Along with the above internal reasons, exogenous factors also play an important role in the stability and instability of the financial sector. These factors may be of multiple natures. To investigate these factors, for which the study is also being conducted, much literature has been produced on different dimensions. Such as Klomp and Haan (2009) examine the relationship between financial instability and independence of the central bank. Soedarmono et al. (2011) explore how inflation, economic growth, loan reserves and loan growth effect on financial sector stability after the Asian financial crisis. Guerineau and Leon (2019) conducted their study for the sake of exploring correlation between information sharing and financial instability interaction with credit boom.

Besides, Horvath and Vasko (2016) explore how central bank transparency impact the financial sector stability. Bouheni and Hasnaoui (2017) examine how GDP, loss of loan provision ratio, and credit ratio impact financial instability. In addition, Jayakumar et al. (2018) explore correlation between GDP growth rate, banking competition and financial instability. These studies do not discuss financial liberalization and financial development, which are very important dimensions of current financial system. These both factors have also played a significant part in financial instability. However, our study takes both factors into account. We begin our discussion with the first factor, which is financial liberalization.

Role of Financial Liberalization in Instability

Liberalization of financial system relies on internal and external noninterference of financial authorities into the capital market to control credit's excess demand. These deregulations may be of entry restriction, credit ceiling, or lending requirements (Mckinnon, 1973; Shaw, 1973; Weller and Helburn, 2010). During the period between 1960 and 1970, the financial system was not free, and there was continuous government intervention in financial matters such as high reserve requirement imposition, interest rate setting in addition restrictions on credit allocation (Arestis and Demetriades, 1997).

Later, Goldsmith (1969), Shaw (1973) and Mckinnon (1973) said this period was financial repression period and made this period responsible for slow economic growth due to low savings, investment, and credit rationing. To come out of this period, they suggest financial liberalization as the solution.

Where they suggested that the financial market should be kept free from the intervention of government and let the market forces decide about the price in addition to credit allocation (Arestis and Demetriades, 1997)

They kept the foundation of financial liberalization theory on the assumptions of perfect information, perfect competition, and institution free system (Arestis and Demetriades, 1997). After the liberalization of financial markets, these assumptions were found unrealistic. Because these assumptions were fundamentally and theoretically weak (Weller and Helburn, 2010). Along with the concerned assumption, financial liberalization thesis also ignore the role of stock markets; even the stock markets have played a significant role into financial tranquility (Singh, 1997).

However, following these assumptions, the liberalization policies were practically implemented in the period of 1970 and 1980. In this result, restrictions from external capital flows were removed. Interest rate ceiling were reduced, reserve requirements were made lower, and involvement of government in the financial sector was also reduced. Furthermore, for the increase in the supply of credit and better allocation of capital development of stock market along with privatization of bank and insurance companies were encouraged. Initially the reform was implemented by Uruguay, Colombia, and Venezuela. Then Chile, Argentina, Malaysia, Brazil and Mexico implemented these policies. Moreover, in the early period of 1980 Indonesia, Israel, Philippines and Turkey did these reforms. These financial reforms rather giving good results, it started creating problems. It faced the flood of capital flow. Consequently, sharp increase in interest rates were recorded.

Furthermore, the ratio of bad debt along with failure of banks increased. This increase in the volatility of asset prices which leads the financial system on the edge of recession. This whole situation created instability in the financial sector which also adversely affected the other sectors of the economy (Arestis and Demetriades, 1997). Thus, financial openness policies, along with feeble institutional framework and misunderstanding about the financial markets gave birth to the new era of instabilities and crisis. However, the Southeast Asian crisis of 1997 can be taken as example of these financial imbalances because of which the fastest growing economies (which were called with the name of Asian tigers Malaysia, Thailand, South Korea, and Philippines) were also affected. These Southeast Asian economies implemented the financial liberalization policies in the early period of 1990 and faced a huge lose in term of crisis. After these bad experiences of liberalization of the financial sector, a revised thesis of financial liberalization was given where the minor intervention of government in these economies was justified. In this regard, the institutional framework and the stabilization policies were given importance. In addition, these interventions were considered important for the stability of the economy.

Role of Economic Growth and Financial Development in the Instability

Along with financial liberalization, financial development also played an important part in the destabilization of financial

sector. Initially, the development of the financial sector was considered good for GDP growth (King and Levine, 1993) and financial stability. But after the liberalization of financial sector, it faced huge capital inflows and outflows, which caused over-expansion of the financial sector leading to enhanced financial instability.

The rapid expansion of the financial sector is the excessive loans or funds provided by financial institutions. These loans expansion converted into non-performing loans and created asset price boom and bust. This caused an increase in instability in the financial sector (Bordo and Meissner, 2015; Almarzoqi et al., 2015). Moreover, these over expansions also cause an increase in speculative finance, which leads to stock exchange volatility and creates instability in the financial sector. Unlike the development and openness of the financial system, economic growth has been found negatively correlated with financial instability (Stiglitz, 2000). This indicates that if the economic performance increases it will reduce the instability of the financial sector; the reason is that when the growth of the economy increases, it brings banks or financial intermediaries into the market, which are less competitive, and reduce the risks which are taken by banks during the issuance of loans along with this it also cause in the overcome or solve the issue of insolvency and finally increase the total equity which is the ratio of GDP this all process increase in the stability of the financial sector and reduces instability (Soedarmono et al., 2011).

The main objective of our study is to examine the impact of all these three factors: financial development, financial liberalization, and GDP growth on financial instability. This study uses annual data from 53 countries from 2000 to 2016. The system GMM is the focal estimation technique; however, the study also used random effect and fixed effect models for the sake of robustness and reliability. The results are not econometric-technique specific. We find that financial liberalization and financial development aggravate financial instability, whereas economic growth dampens financial instability.

This study consists of 6 sections. The first section is the introduction, where the background and the overview of the topic have been discussed; furthermore, the objective of the study and the research gap have also been discussed in this section. The second section is about the review of literature that has been produced in this area. In this section further sections have also been made where we discussed all factors separately. Section three is about data and methodology; in this section, we discussed the theoretical framework, model, construction, and definition of variables, along with their summary statistics, data, and the methodology which we have used in the study. In section four, the results and the findings of the study have been discussed. And the fifth section consists of policy recommendation, and section 6 discuss the conclusion and direction of future research.

REVIEW OF LITERATURE

After a detailed discussion on the different segments of literature produced on financial instability it may be concluded that exploring the causes of instability is a difficult issue because the instability is not only occurred due to the exogenous factor (Klomp and Haan, 2009; Guerineau and Leon 2019; Horvath and Vasko, 2016), but it is also endogenous because the stability of the financial sector creates instability itself (Minsky, 1982). However, after an extensive review of literature, it was observed that there are some important factors that can have influence on the stability or instability of the financial sector. These are financial liberalization and financial development.

Financial liberalization, which is considered a very much important factor and has become a key topic for economists has less been discussed in relation to financial instability. However, some studies examine the association between financial instability and financial liberalization (Riaz et al., 2018; Mathonnat and Minea, 2018; Hamdaoui, 2017; Hamdaoui et al., 2016; Lee et al., 2016; Aka 2006; Aghion et al., 2004; Weller, 1999). These studies discuss the relationship amid instability in addition liberalization by means of a different measure of financial liberalization and financial instability. Most of the studies found a positive relationship between financial liberalization and financial instability (Riaz et al., 2018, Mathonnat and Minea, 2018; Mendonca and Nascimento, 2020). These studies support the argument given against the liberalization of financial liberalization in literature (Demirguc-Kunt and Detragiache, 1999; Grabel, 1995). On the contrary, very few studies consider financial liberalization good for the economy and promotes stability of the financial sector. These studies document a negative relationship between financial liberalization and financial stability (Mendonca and Nascimento, 2020; Lee et al., 2016). This indicates that financial openness promotes stability in the financial system and reduces instability which is good for the economy. Along with positive and negative, U-shaped results were also found in the literature (Hamdaoui et al., 2016). According to the post-Keynesian school of thought credit growth is the fundamental cause of financial instability, as highlighted by Vo et al. (2019). A study by Moyo and Le Roux (2020) finds that financial liberalization, along with financial development, accentuates the financial crisis.

Studies that discuss the relationship between financial liberalization and financial instability show different nature of the relationship depending on the methodology, model, and data used in the analysis (Hamdaoui, 2017). Moreover, these studies discuss the one-factor financial liberalization which effect financial instability, but the other variables, financial development and economic growth were not discussed. For this purpose, some studies also tried to consider which have discussed the association amid financial development in addition to financial instability. In this regard, very few numbers of research have been found which discuss association between financial development in addition financial instability. Among these studies, few studies found a positive association between financial development in addition financial instability (Koong et al., 2017; Mathonnat and Minea, 2018). This indicates that the increase in financial development causes more instability in the financial sector.

It is not very common; however, Fernandes et al. (2018) found negative associations between financial instability and financial development. This indicates that financial development is good for the financial sector because it

promotes stability of the financial sector and reduces instability. These studies discuss another factor, financial development, which has an important part in stability or instability, but the role of economic growth was not analyzed. To diagnose part of economic growth into stability, related studies have been taken into account. In this context, it has tried to cover the literature which has been produced to discuss the relationship. The same situation was observed in the studies conducted on economic growth in relationship with financial instability. Few studies examined the relationship between financial instability and economic growth (Danlami et al., 2018. Jayakumar et al., 2018, Bouheni and Hasnaoui, 2017, Creel et al., 2015; Klomp and Haan, 2009). These studies found a mixed relationship between economic growth and financial instability. Few studies suggest a negative relationship between economic growth and financial instability (Guerineau and Leon, 2019; Danlami et al., 2018; Batuo et al., 2018). This indicates that the increase in the economy's growth promotes stability of the financial sector and a decline in instability.

On the contrary, few studies found that growth is harmful to the financial sector. These studies suggest that economic growth and financial instability are positively correlated (Riaz et al., 2018). This indicates that the increase in the growth of the economy fragile the financial sector and increases instability. Along with positive and negative relationship, mixed relationship has also been found in the literature. These studies suggest that financial instability and economic growth may have both positive and negative kind of relationships. It depends on the time (Alsamara et al., 2019; Noman et al., 2018).

Conclusively, Different studies have been conducted to examine the relationship between financial development, financial liberalization, economic growth, and financial instability in different regions in different time periods. Either these studies capture the relationship separately of each variable or use two of the variables to examine the relationship. Batuo et al., 2018 examine the effect of development, liberalization of the financial sector in addition economic growth on the instability of financial sector simultaneously for the 41 African countries. But to the best of our knowledge, no study has been conducted to examine the impact of financial development, financial liberalization, and economic growth on the financial instability simultaneously in the selected region, income group, and time. This is the first study that fills the gap in the literature.

METHODOLOGY
Data
The annual data for 53 countries has been obtained; the data spans from 2000-2016. The sample has been selected on data availability basis. Data has been obtained from different sources. The unit of analysis is a group of countries.

Data of domestic credit to private sector as percentage to GDP, GDP growth, inflation, term of trade and Government expenditure has been collected from the World Bank's data. Exchange rate stability and monetary policy independence data are obtained from Aizenman et al. (2010). Law and order index has been obtained from the International Country Risk Guide (ICRG). And the data of financial liberalization index has

been obtained from Chinn and Ito (2006). The detail of variables and sources are given in Appendix A while the list of countries is given in Appendix B.

Financial Instability
In economic literature, financial instability has been measured by using different measures, such as bank-based measures (Demirguc-Kunt and Detragiache1999; Baek et al., 2004) and aggregate financial sector-based measures (Loayza and Ranciere, 2005; Jeanneney and Kpodar, 2006, 2011).

First measure, which is bank based measure of financial instability, includes z-score by taking the return on assets and equity to measure financial instability (Roy 1952; Baek et al., 2004) and the Banking crisis as the measure of financial instability (Demirguc-Kunt and Detragiache, 1998). These studies used bank-level data to measure instability, but by using this as measure some problems may arise. Banks represent one segment of the financial system, and if instability in the banking sector is taken as the measure of financial instability, this results in ignorance of instability in other parts of the financial sector. Moreover, if a banking crisis is used as the proxy of financial instability, it gets difficult to identify the accurate timing of crisis. Furthermore, during the tranquility period banking crisis is ignored because the crisis is noted when it becomes severe (Caprio and Klingebiel, 1996; Batuo et al., 2018).

These problems can be overcome if financial instability is measured using financial sector-based measure, which is measured through financial development indicator (Batuo et al., 2018). Through financial development indicators, Loayza and Ranciere (2005) and Jeanneney and Kpodar (2006, 2011) measure financial instability. However, we used method of Jeanneney and Kpodar (2006, 2011), which was also used by Danlami et al. (2018). They used absolute values of residuals of financial development variables as a measure of financial instability. We used the following equation to obtain an absolute value of the residual.

$$DCPS_t = \delta_0 + \delta_1 DCPS_{t-1} + \delta_2 T + \varepsilon_t \qquad (1)$$

Where the DCPS is the domestic credit to private sector as percentage to GDP and the $DCPS_{t-1}$ is lagged 1 period of DCPS. Therefore, actual value of residual of the regressor has got through time trend and lag value of DCPS regression.

Empirical Specification
In this section, the model has been discussed, which has been used to investigate the relationship between economic growth financial development, financial liberalization, and financial instability. However, to estimate the relationship dynamic panel model has been used.

Regarding the estimation technique, among the available GMM types, this study follows the Roodman (2009a,b) approach, which is an extension of Arellano and Bover (1995) that has been established in the contemporary GMM-centric literature to limit the proliferation of instruments and produce more robust estimated coefficients (Boateng et al., 2018). The following equations in level (2) and first difference (3) summaries the standard system GMM estimation procedure.

The empirical specification of the model has been written below.

$$\text{finst}_{it} = \alpha + \beta_0 \text{finst}_{i,t-1} + \beta_1 \text{flib}_{i,t} + \beta_2 \text{fdev}_{i,t} + \beta_3 \text{Gr}_{i,t} + \sum_k \gamma_k X_{i,tk} + \mu_i + v_t + \varepsilon_{i,t} \dots \dots (2)$$

Where i represent country and t represents time. Moreover, financial instability ($finst_{it}$) is a dependent variable. The measurement of this variable has been discussed above. $finst_{it-1}$ is lag of financial instability. $dcps$ is the financial development variable. Financial sector development is our explanatory variable. To measure financial development, we follow the method of Levine et al. (2000), where they used domestic credit to the private sector as a percentage of GDP as the measure of financial development. This measure has been widely used in literature (Yeh, 2017, Ibrahim and Alagidede, 2017; Ang and Fredriksson, 2018).

$flib$ shows financial liberalization. To measure financial liberalization, we have used capital account openness (KAOPEN) index as a proxy, which was developed by (Chinn and Ito 2006). This index has been widely used in literature (Mendonca and Nascimento 2020, Riaz et al., 2018, Motelle and Biekpe 2015). This index is based on the data set which has been derived from the annual report which is published by IMF on the exchange arrangements and exchange restrictions (AREAER). This is the first index which measures financial openness in a broad way. While constructing the index four kinds of restrictions (restriction on current account, existence of multiple exchange rates, restriction on capital account, and existence of export proceeds' requirements) have been considered. These restrictions explain the intensity of capital flow across borders (Misati and Nyamongo 2012). This index ranges between -2.0, which indicates the highest control, and +2.5 which indicate complete liberalization. In other words, higher value of index indicates the higher liberalization.

$fdev$ is financial development captured by credit to private sector, whereas Gr is economic growth. To examine the relationship log of GDP per capita has been used which has been measured on the market prices which are based on constant local currency. This variable has been widely used in literature which examines the relationship between financial instability and economic growth (Demirguc-Kunt and Detragiache, 1999; Soedarmono et al., 2011).

$X_{i,tk}$ is the control variable vector consists on the variables which was initially suggested by Demirguc-Kunt and Detragiache (1999). Along with these variables, we also used some other control variables which effect financial instability (Klomp and Haan 2009 and Riaz et al., 2018). These variables consisting of inflation, shock to term of trade, law and order, government expenditure, exchange rate stability index, and monetary policy independence index. In addition, μ_i refers the country effect v_t refers time effect and $\varepsilon_{i,t}$ explains the error term.

$$\Delta finst_{it} = \alpha + \beta_0 \Delta finst_{i,t-1} + \beta_1 \Delta flib_{i,t} + \beta_2 \Delta fdev_{i,t} + \beta_3 Gr_{i,t} + \sum_k \gamma_k \Delta X_{i,tk} + \mu_i + v_t + \varepsilon_{i,t} \quad (3)$$

In equation 1 we have used the dynamic error component model. This model is used widely in the econometric analysis of time series and cross-section data (Anderson and Hsiao, 1981). While estimating this model through ordinary least square (OLS), many problems are faced. When the estimations are made not only in the random effect but in the fixed effect as well the lagged dependent variable starts correlating with the error term.

Moreover, this issue may also arise when autocorrelation is not found in the disturbances. This problem was solved by Arellano and Bond (1991) by developing the generalized method of moment (GMM) estimator. In this method, the first difference of the equation is taken to estimate the model.

However, in equation (2) instrumental variable procedure is required to have correction due to the endogeneity and the correlation between the lag of the dependent variable and the error term (Klomp and Haan, 2009). This problem can be overcome by using system GMM, which was developed by Blundell and Bond (1998).

RESULTS AND DISCUSSION

Our main method to estimate the results is system GMM but for the greater reliability of our results we began our estimations by fixed effect model and passing through an estimate of the random effect (GLS) finished our estimations on system GMM. Table 1 shows the results of the fixed effect, Random effect, and dynamic panel data model.

First model of Table 1 shows results using fixed effect, which indicate that the one year lag of financial instability is significant at 5% and increases financial instability. Results are in conformity with the results attained by Klomp and Haan (2009) and Batuo et al. (2018). Similarly, case two indicates financial liberalization, which is significant at level of 10% and positively affect financial instability. Findings suggest that the 1% increase in financial liberalization causes 0.247% increase in financial instability. Our outcomes are consistent with Batuo et al. (2018), Motelle and Biekpe (2015) and Riaz et al. (2018). The rationale for this chain is that when the financial markets are deregulated, and restriction are reduced or eliminated, it causes increase the short-term gains or profit. But this situation leads toward expectation and causes increase in speculative capital investment. In the liberalized environment, banks lend more, this phenomenon enhances the credit risk. Consequently, financial liberalization under weak institutional, high credit risk, and rising speculative investment environment increase instability in the financial sector (Weller and Helburn, 2010; Grabel, 1993, 1995). This has also been substantiated by the statistically significant and positive relationship between financial development (DCPS) and financial instability and is in line with Batuo et al. (2018) and Demirguc-Kunt and Detragiache (1999). Moreover, excessive loans provided by financial institutions turns out to be bad loans leading to asset price booms and consequently upsurge into instability (Bordo and Meissner, 2015; Almarzoqi et al., 2015). Economic growth is negatively correlated and supports the empirical evidence found by Soedarmono et al. (2011) and Mendonca and Nascimento (2020).

Table 1. Dependent variable financial instability.

Variables	(1) FE	(2) RE	(3) DPD
L.finst	0.499***	0.499***	0.566***
	(0.0191)	(0.0127)	(0.0196)
Finlib	0.247	0.247	2.274***
	(0.303)	(0.152)	(0.694)
Dcps	0.507***	0.507***	0.443***
	(0.0187)	(0.0124)	(0.0174)
Lngdppc	-0.500	-0.500**	-1.583*
	(0.348)	(0.198)	(0.889)
Constant	4.534*	4.534***	12.41*
	(2.699)	(1.587)	(7.476)
Observations	771	771	771
R-squared	0.948		
Hausman test		67.58	
Prob.		(0.000)	
Breusch-Pagan LM		0.00	
Prob.		(1.00)	
Number of i	53	53	53

Note: financial instability (finst) has been taken as dependent variable and L.finst. Dcps, finlib and lngdppc are explanatory variables. The table presents fixed effect, random effect and dynamic panel data model. Results in all cases are consistent and statistically significant. Robust standard errors in parentheses. In addition (***) explains the significance level at 1%. (**) indicates significance level at 5%. And (*) explains level of significance at 10%.

We present the result system GMM in Table 2 and 3. We began our GMM estimation by examining the consistency of GMM estimators. For this purpose, we use two tests first is the Sargan test, which examines the instruments over all validity (Klomp and Haan, 2009), and the second is the test of autocorrelation. This test examines the serial correlation of the error term. These tests have widely been used in the literature (Klomp and Haan, 2009; Roodman, 2009b). According to the results of both tests Sargan test of over-identifying restrictions and the Test for autocorrelation, the estimates of the GMM estimator are consistent. Results of both tests have been reported in Table 2.

While estimating the results we start from our base line model; 1st model of Table 2 shows the results of the baseline model where financial instability (finst) is the dependent variable and financial development (dcps), financial liberalization (finlib), and GDP growth rate (gdppc) are used as the independent variables. Results show that the lag of financial instability significant increase the level of financial instability. Similarly, 1% increase in the level of financial liberalization also significant 1.974% increase in the instability of financial sector. Moreover, 1% increase in the level of financial development significant 0.556 increase in the instability of financial sector. On the contrary, the 1% increase in GDP growth rate significant 3.938% reduce in the instability of financial sectors. These results are consistent with the results in Table 2.

In the second model of Table 2, inflation was added, where the result did not change. And positive relationship between inflation and financial instability has been found. This indicates that the 1% increase in inflation significant 0.916% increase in financial instability. Our results confirm the

findings by Misati and Nyamongo (2012). This happens because the high-interest rate may attract international capital, and the capital inflow (especially private capital inflow) increases in the economy; this causes an increase in the liquidity, which generate inflation in the economy. When inflation rises, it effects negatively to the balance sheet of the bank. Because the increase in the capital inflow causes over borrowing and this over borrowing causes increase in credit risk. When credit risk rises, it creates instability in the financial sector (Mishkin, 2011). In the Third model of Table 2, we add the monetary independence index (mi). The results were unchanged after adding the variable. However, mi is significant at 1% level, and positive relationship between financial instability and mi. This happen because the Higher monetary autonomy cause to increase in inflation which causes an increase in financial instability (Aizenman et al., 2010).

In the fourth model exchange rate stability (es) was also added to examine the results. Results are consistent after the addition of es. Result shows that the es is significant at the level of 10% and has positive relationship between es and financial instability. The reason is that higher level of exchange rate stability reduces the inflation which causes increase in the financial instability (Aizenman et al., 2010). Because when inflation reduces or deflation increase this causes decline in the profit margin of banks; when the banks' profit decline, this causes increase in non-performing loans on the balance sheet of banks increases, which consequently increases the instability in the financial sector (Klomp and Haan, 2009).

In the sixth model, government expenditure (ge) was added. Results show that the government expenditure are significant at 10% and found a negative relationship financial instability

and government expenditure, Which means that if the government will increase its expenditure by 1%, consequently

financial instability will significantly reduce 0.310%. Our results are similar to the results of Batuo et al. (2018).

Table 2. Results (Dependent variable financial instability).

VARIABLES	(1) SGMM	(2) SGMM	(3) SGMM	(4) SGMM	(5) SGMM	(6) SGMM
L.finst	0.492***	0.510***	0.505***	0.505***	0.504***	0.508***
	(0.0160)	(0.0174)	(0.0179)	(0.0179)	(0.0178)	(0.0181)
Finlib	1.974***	3.533***	3.719***	3.669***	3.486***	3.527***
	(0.572)	(0.593)	(0.604)	(0.605)	(0.608)	(0.613)
dcps	0.556***	0.489***	0.490***	0.491***	0.491***	0.487***
	(0.0137)	(0.0158)	(0.0161)	(0.0161)	(0.0161)	(0.0162)
lngdppc	-3.938***	-3.044***	-2.741***	-2.760***	-1.905**	-1.609*
	(0.676)	(0.715)	(0.741)	(0.741)	(0.832)	(0.843)
lninf		0.916***	0.870***	0.918***	0.853***	0.783***
		(0.259)	(0.263)	(0.266)	(0.268)	(0.273)
mi			5.200***	5.694***	5.220***	4.622**
			(1.768)	(1.824)	(1.838)	(1.866)
es				1.872	1.987	2.040
				(1.730)	(1.730)	(1.732)
law					-1.475**	-0.695
					(0.668)	(0.797)
ge						-0.310
						(0.196)
Constant	31.34***	23.76***	19.33***	18.14***	17.09***	16.38***
	(5.608)	(5.962)	(6.228)	(6.324)	(6.330)	(6.326)
Number of i	53	53	53	53	53	53
Arellano-Bond test (AR1)	-2.0513					
Prob	(0.0402)					
Arellano-Bond test (AR2)	-.54531					
Prob	(0.5855)					
Sargan test	547.0381					
Prob	(0.000)					
Observations	771	695	688	688	688	687

Note: financial instability (finst) has been taken as dependent variable and finst1. Dcps, finlib and lngdppc are explanatory variables. In 1st case base line model is estimated. In 2nd model inflation has been added for measurement. In 3rd model mi has been added. 4th manifest the results of es. And 5th and 6th models explain the estimation results of law and ge respectively. To estimate the result system GMM has been used. Results in all cases are consistent and statistically significant. Standard errors in parentheses. In addition (***) explains the significance level at 1%. (**) indicates significance level at 5%. And (*) explains level of significance at 10%.

However, model 1 of Table 3 shows the results of baseline model where financial instability is used as the dependent variable, and financial development, financial liberalization, and GDP growth rate are used as the independent variable. Results of model 1 remain consistent with previous findings. In the second model of Table 3, shock of term of trade (stot) has been added. This did not change the previous results. Sock of term of trade was found significant at level of 10%. Moreover, stot and financial instability are negatively correlated. Which means increase in the shock of term of trade significantly reduce in the instability of financial sector. This happens because of the positive shock of

economy. Because when the economy faces the positive shocks of term of trade it reduces the instability of financial sector (Klomp and Haan, 2009). In third model of the Table 3 interaction term of financial liberalization and financial development has been used. The positive sign attached with the coefficient shows complementarity. When the financial sector is liberalized and developed, they accentuate financial instability. This practice did not change the results of the baseline model so far as economic growth is concerned. Thus, the results obtained are robust and are not changed by the inclusion of another relevant variable in the model.

Table 3. Dependent variable financial instability.

Variables	(1) SGMM	(2) SGMM	(3) SGMM
L.finst	0.492***	0.510***	0.542***
	(0.0160)	(0.0181)	(0.0191)
Finlib	1.974***	3.590***	0.464
	(0.572)	(0.614)	(0.934)
Dcps	0.556***	0.484***	0.423***
	(0.0137)	(0.0163)	(0.0213)
Lngdppc	-3.938***	-1.508*	-1.530*
	(0.676)	(0.841)	(0.824)
lninf1		0.761***	0.740***
		(0.272)	(0.268)
Mi		4.928***	4.850***
		(1.870)	(1.840)
Es		1.950	0.673
		(1.730)	(1.729)
Law		-0.630	-0.106
		(0.797)	(0.792)
Ge		-0.321	-0.369*
		(0.195)	(0.193)
Stot		-4.73e-14*	-4.96e-14*
		(2.78e-14)	(2.74e-14)
Finlibdcps			0.0331***
			(0.00747)
Constant	31.34***	15.39**	16.73***
	(5.608)	(6.315)	(6.188)
Observations	771	686	686
Number of i	53	53	53

Note: financial instability (finst) has been taken as dependent variable and finst1. Dcps, finlib and lngdppc are explanatory variables. In 1st case base line model is estimated. In 2nd model shock in term of trade has been added for measurement. In 3rd model financial liberalization and financial development has simultaneously have been added in model. Results in all cases are consistent and statistically significant. Standard errors in parentheses. In addition (***) explains the significance level at 1%. (**) indicates significance level at 5%. And (*) explains level of significance at 10%.

CONCLUSION, POLICY IMPLICATION AND LIMITATIONS

The study investigates the impact financial development, financial liberalization and economic growth on financial instability. Using the annual data from 2000 to 2016 for 53 countries, the study finds that financial liberalization and financial development increase financial instability, whereas economic growth dampens it. To measure financial instability, we used the absolute value of residuals of financial development. The study uses dynamic panel model along with system GMM as the main method, but for the greater reliability of the results, the study begins estimation with fixed effect and passes from random effect, reaches system GMM. The study used Hausman test for fixed effect and random effect model; in addition, Breusch and Pagan LM test for random effect to take the decision of selection between fixed effect and random effect. Findings of both models suggest that the fixed effect will be appropriate to use. For over identifying restrictions and test for autocorrelation to examine GMM estimates the study employed Sargan test. In all models, financial instability is taken as the dependent variable and lag of financial instability, financial development, and financial liberalization in addition to economic growth as independent variables. Our results show that the lag of financial instability increases financial instability as concluded by Klomp and Haan (2009) and Batuo et al. (2018). The increase in financial development also cause a significant increase in the instability of financial sector and the results are in line with Demirguc-Kunt and Detragiache, 1999. Financial liberalization also manifests positive relationship with financial instability as the results found by Riaz et al. (2018), Mathonnat and Minea (2018) and Mendonca and Nascimento (2020). The increase in economic growth significantly reduces the financial instability. The negative association is in line with Guerineau and Leon (2019) and Danlami et al. (2018). The results survive across specification and estimation techniques. The policy implication warrants that financial development and financial liberalization can cause financial instability.

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Appendix A. Variable definition including data source.

Variable	Definition	Source
Financial Instability (Finst)	DCPSt = δ0 + δ1DCPSt-1 + δ2T+ εt Where the DCPS is the domestic credit to private sector and the DCPSt-1 is lagged 1 period of DCPS. Therefore, actual value of residual of the regressor has been obtained by regressing the DCPS on its lagged value with time trend. The fluctuation of the values over the years indicates financial instability,	World Bank's World Development Indicator (WDI)
Financial Development (DCPS)	Domestic credit to private sector as percentage to GDP	World Bank's World Development Indicator
Financial Liberalization (Finlib)	Financial openness index Chinn and Ito (2006)	Chinn and Ito (2006)
GDP growth rate (Gdppc)	Log of GDP per capita	World Bank's World Development Indicator
Inflation (Inf)	Log of consumer price index	World Bank's World Development Indicator
Shock to term of trade (Stot)	Standard deviation of term of trade	World Bank's World Development Indicator
Law and order (Law)	Law and order index	International Country Risk Guide (ICRG)
Government Expenditure (GE)	Annual government expenditure percentage to GDP	World Bank's World Development Indicator
Exchange rate stability (ES)	Exchange rate stability index	Aizenman et al. (2010)
Monetary Policy Independence (MI)	Monetary policy independence index	Aizenman et al. (2010)

Appendix B. list of countries.

Albania, Armenia, Australia, Austria, Azerbaijan, Bangladesh, Belarus, Belgium, Bulgaria, China, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hong Kong, Hungary, Iceland, India, Indonesia, Ireland, Italy, Japan, Korea Republic, Latvia, Lithuania, Malaysia, Moldova, Netherlands, New Zealand, Norway, Pakistan, Philippines, Poland, Portugal, Romania, Russian Federation, Singapore, Slovak Republic, Slovenia, Spain, Sri Lanka, Sweden, Switzerland, Thailand, Turkey, Ukraine, United Kingdom, Vietnam.