



Efficiency Of Indian Banks – Private Versus Public Sector Banks: A Two-Stage Analysis

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Abstract:

This paper estimates and compares various efficiencies, namely, business, profit, and Z-Score efficiencies for private and publicly owned Indian banks. It uses the data envelopment analysis (DEA) following variable returns to scale, under input and output orientation, for measuring efficiency. Further, the Tobit regression model is used in the second stage to check the significant determinants from a list of bank-specific factors for various efficiencies. The study finds that the average efficiency scores of public sector banks (PSBs) are higher than private banks. The Z-score indicates that both PSBs and private banks are facing stability risks. Tobit regression model results confirm that return on assets and capital levels are significantly related to all types of efficiencies for private banks. On the other hand, the efficiency of PSBs is mainly affected by the level of non-performing assets, market share, size of the bank, return on assets, and capital level. It is inferred that the prompt corrective action (PCA) framework of RBI (2014) and the merger and consolidation of PSBs by the government (2019) favorably impacted the efficiencies of PSBs. Additionally, it identifies the stability risk of Indian banks and suggests banks should build up adequate capital for stressful situations.

Keywords: *Xport Diversification, Financial Development, ARDL, Ethiopia.*

Introduction:

Ali et al. (Citation1991) defined export diversification as the change in the composition of commodity exports. Export diversification is twofold, i.e. horizontal and vertical. The first deals with the number or volume of primary export commodities, but the latter is concerned with changes in the structure and commodities from primary to secondary and tertiary goods (Herzer & Nowak-Lehmann, Citation2006). The exports of most developing countries in

Africa are heavily dependent on very few primary commodities. The exports of primary commodities are extremely vulnerable to external shocks (Fonchamnyo & Akame, Citation2017). Sub-Saharan Africa's export earnings largely depend on coffee, gold, oilseed, vegetables, hide, and skin, representing 80% of total export (World Bank, 2006). For more export entrepreneurs, financial development reduces liquidity constraints and encourages diversification of exports

(Chaney, Citation2016; Hausmann & Rodrik, Citation2003). Prebisch's (Citation1962) theory also argues that the export of primary products reduces the terms of trade and further increases the instability of income. Furthermore, to improve falling terms of trade, a country needs to diversify its export composition (Dogruel & Tekce, Citation 2011); (Massell, Citation 1964); (WILSON, Citation 1984). They indicate that diversification of developing country exports should become a common economic policy objective (Brainard & Cooper, Citation 1968; Dogruel & Tekce, Citation 2011). Moreover, in the contemporary literature, opposite to the division of labour and specialization idea of Adam Smith, countries appear to diversify their production and exports as they grow (Hesse, Citation 2009; Krugman, Citation 1980).

Like other developing countries, the main objective of the Ethiopian government has been to achieve rapid and sustainable economic growth. Foreign trade is an area which has been emphasized in the various programs of the Ministry of Finance and Economic Development for the year 2002/03. External trade is the most important sector to generate foreign exchange needed to finance imports of essential goods and services for the economy and to promote the economic performance of the country (EEA, 2013). However, Ethiopian export heavily depends on

very few primary products; which constitutes above 90% of the total export earnings. As stated in the World Bank Journal (2016), the prices of these primary products fluctuate from time to time and led to lower and unstable export revenues earning. Unless the countries diversify their export earnings, it is hard to achieve sustainable economic growth and reduces external debts.

One factor among different hindrances of export diversification is lower financial development. There are many measures of financial development, but the most frequently used measure is a credit to the private sector. Compared to low-income sub-Saharan African, Ethiopia's financial sector development is low. The number of banks operating in Ethiopia remained at 18, of which 16 were private and the remaining 2 are publicly owned banks. These banks opened 4,625 branches, of which 68.2 percent were private bank branches. According to the central statistical agency estimation, the total population is 96,503,000. It indicates on average one branch serves 20,865.5 people. Among the total branches 34.4 percent resided in Addis Ababa in Addis Ababa there are only around four million residents. In Ethiopia 17 insurance companies are operating with 4.7-billion-birr total capital from 17 insurance companies; 16 were privately owned, with a 74.6 percent share of total insurance capital. There are 518

branches, of which 53.90 percent were located at Addis Ababa. In addition to banks and insurance companies were 35 microfinance institutions (MFIs) with 28.4 billion birr saving deposit (NBE, 2017/2018 quarterly report). This causes a lower level of credit to the private sector. For instance, most funds by banks (two-thirds) have gone to the public sector. In 2011–2012 the share of credit going to the private sector was as high as 36 percent of total credit, but in June 2018 it declines to 32 percent. Still, the scale of such directed credit schemes to the public sector has been to such an extent that Ethiopia's financial development now stands at just 11 percent of GDP, which is half of 20 largest African economies estimated 22 percent of GDP average. Therefore, Ethiopia's financial sector is in need of much improvement if a more private sector-driven economy is to take hold in the coming years. Beyond the comparatively limited credit made available to the private sector, the specific forms and features of lending offered have not matched the needs and demands of most private sectors (CEPHEUS, 2019). Hence this study intends to examine the relationship between credit to the private sector, a proxy for financial development and export diversification in Ethiopia. The remainder of the paper is presented as follows. Section 2 provides an overview of previous theoretical and empirical literature. Section 3 presents

methodologies and data. The remaining sections 4 and 5 present the result and discussion and conclusion and recommendations, respectively.

Literature Review:

Export diversification is important for economic growth in that diversification of export reduces export earning instability caused by fluctuations in world commodity prices. According to WILSON (Citation1984), if a country relies on a few exportable products, one export commodity, and its foreign exchange position is highly insecure. Contrary to this, Cline (Citation1982) argued, export-led growth may break down if a large majority of developing countries seek to pursue it at the same time. Because the resulting outpouring of manufactured exports might be more than western markets could absorb. Generally, inadequate finance is a major constraint to a firm's production, at least as perceived by the firms themselves. Theoretically, this perception is likely to be based on the liquidity constraint hypothesis, that is, the need to finance particularly physical capital but also other production inputs with significant fixed costs. Since such outlays entail lagged returns, sufficient liquidity through credit is required to keep the firm afloat until future returns are realized. Also, as diversification often involves investment projects with long gestation periods, compared to primary

production, greater liquidity would be required. Where such liquidity is lacking, firms are likely to resort to shorter-term, probably less productive, investment projects rather than to projects involving longer gestation periods, usually required by export diversification. Such liquidity constraint is similar to that relating to a debt constraint, where longer-term projects are less attractive to investors and the government in the presence of a debt constraint (Fosu & Abass, Citation2019). In addition, domestic credit is expected to reduce liquidity constraints through the increase in the number of entrepreneurs in the export sector, and in turn it facilitates export diversification (Chaney, Citation2016). Moreover, Hausmann & Rodrik (Citation2003) pointed out that overcoming the liquidity constraint is critical in terms of expanding exports, especially relatively diversified exports that are likely to require longer-term and riskier investment projects. Such circumvention would in turn require readily available sources of funding. Recent theoretical and empirical studies emphasized the importance of export diversification instead of export specialization (Herzer & Nowak-Lehmann, Citation2006). According to Parteka and Tamberi (Citation2011) export diversification can be emanated from the change in the structure of the economy, which requires a deep transformation of a country's economy

along different development paths. In addition, Kiendrebeogo (Citation2012) pointed out that having a developed financial sector creates a comparative advantage in the industrial sector, which in turn contributes to the diversification of export. Though diversified external trade generates ample foreign exchange and in turn promotes economic growth (EEA, 2013), export of Ethiopia heavily depends on very few primary products; which constitute above 90% of the total export earnings. Moreover, the price of those primary products varies frequently from time to time, which worsens the problem and causes lower and unstable revenue, and a huge negative trade balance (World Bank Journal (WBJ), 2016)). Unless the countries diversify their export earnings, it is hard to achieve sustainable economic growth and reduces external debts (Yokoyama et al., Citation2015). Among the factors causing low export diversifications in Ethiopia, underdeveloped financial sector is the major one. Financial sector development is measured in terms of credit to the private sector by all banks. Ethiopia's financial sector is underdeveloped and unfairly distributed (Kassie, Citation2014). According to the Ministry of Finance and Economic Development (MoFED (Ministry of Finance and Economic Development), Federal Democratic Republic of Ethiopia, Citation2006)

since 2003 to achieve accelerated and sustainable growth the government of Ethiopia has emphasized external trade as a major tool. However, it is not as much as expected. Despite these previous researchers gave low attention to the effect of credit to the private sector on export diversification. For instance, Oliveira et al. (Citation2020), Fosu and Abass (Citation2019), Dogruel and Tekce (Citation2011), Nieminen (Citation2020), Liu and Zhang (Citation2015), and Long et al. (Citation2017) conducted a study on determinants of export diversification. However, most of the studies focused on the exchange rate, economic growth, trade openness (trade liberalization), and other macro variables as determinants of export diversification. Thus, most of the studies overlooked the effect of credit to the private sector on export diversification in the Ethiopian economy. Particularly in Ethiopia, hardly any evidence, there is no study conducted on the subject area. Therefore, this study intended to fill these gaps and examine the effect of financial development, which is the factors policies, and institutions that lead to effective financial intermediation and markets, and deep and broad access to capital and financial services" (Financial Development Index, 2008) on export diversification of Ethiopia. From the literature reviewed there is no adequate empirical and theoretical literature on the relationship between

export diversification and credit to the private sector in Ethiopia. Some of the researchers did not consider the effect of financial development on the trade balance, particularly in Ethiopia, some other studies are out of date, and the remaining research conducted are in developed countries. Hence, we can't conclude the same result as in developed countries because the micro- and macro-economic performance of developed and developing countries is different. Thus, the reviewed literature shows there is no evidence providing the effect of financial development on export diversification in Ethiopia.

Data and Methodology:

This study employed a quantitative analytical research approach. Descriptive and inferential/empirical study designs were used. Time series data of 41 sample years from the period 1980 to 2020 drawn from secondary sources were used. The Auto Regressive Distributed Lag (ARDL) co-integration technique developed by Im et al. (Citation2003) and Pesaran et al. (Citation2001) was employed as an econometric analysis method to indicate the relationship between export diversification and financial development, and other control variables. ARDL is a dynamic unrestricted model in which the explained variable is expressed as a function of its lag and other explanatory

variables. According to Charemza and Deadman (Citation1997), the methodology of the ARDL model follows a general to a specific approach, which enables the researcher to solve econometrics problems. ARDL model has many advantages over the Johansen (Citation1988) co-integration approach in that the first avoids the problem of the order of integration, suitable for both large and small samples (Pesaran et al., Citation2001), and provides unbiased estimates even when some of the explanatory variables are endogenous (Harris & Tzavalis, Citation1999).

Model Specification:

Based on the theoretical and empirical literature reviewed in this study, five variables are identified as factors that affect export diversification (ED). When identifying these variables we adopt Lugeiyamu (Citation2016) and modify it based on our objective. These are financial development (FD) measured by credit to private sector as a percentage of GDP (CPS%GDP), an official exchange rate (OER), external debt (EDEBT), real gross domestic product (RGDP), and trade liberalization (TL).

Checking the Existence of Long-Run Relationship:

This is a stage where the long-run relationship existing between variables is assessed. The existence of such a relationship is tested by computing a bound test for co-

integration (bound F-statistic) to establish long-run relationship among variables. ARDL is extremely useful because it allows us to describe the existence of an equilibrium/relationship in terms of long-run and short-run dynamics without losing long-run information. The ARDL involves estimating the following equation:

The General ARDL (p, q) Model is Specified as:

β_i represents long-run co-integration/relationship and α_i represents short-run dynamics of the model. The existence of long-run co-integration will be tested based on the null hypothesis of $\beta_i = 0$ against the alternative hypothesis $\beta_i \neq 0$. To identify the presence of co-integration in the long run bound test has been conducted. The value of F- statistics is used as identifying the existence of long-run relationship between dependent and independent variables. ARDL bound test is based on Null hypothesis (H0): no long-run relationship and alternative hypothesis (H1): there exists long-run relationship. The decision is to accept H0 if $F < \text{critical value for } I(0)$ independent variables or reject if $F > \text{critical value for } I(1)$.

Most time series data exhibit a non-stationary trend and estimating a regression model with non-stationary data will result in spurious relationship and, in turn, causes misleading and biased parameter estimates. Though it only reveals short-run dynamics, to

resolve such type of problem differencing variables is important. In this regard error correction model (ECM_1) will be included based on the existence of long-run co-integration or not.

Methodology:

Definition and Summary Statistics of Variables:

HHI is 1 if the trade pattern is completely concentrated, and $1/n$ if all products have equal shares in the export of a commodity. However, its value is substantially affected by n . to avoid this problem we used the normalized Herfindahl-Hirschman index. Therefore, as can be seen from Table 1 and Figure 1, export is more diversified if HHIN is close to zero and vice versa. For the study sample, the

mean value of export diversification is 0.41, with the highest diversification period in 2015 amounting to the normalized Herfindahl-Hirschman value of 0.209 and the highest concentration of Ethiopia's export from 1980 to 2020 recorded in 1988 with a value of 0.694. Financial development is defined as all financial resources provided to the private sector by depository institutions through loans, purchases of non-equity securities, trade credits, and other accounts receivable. This measure of financial development is theoretically identified by King & Levine (Citation1993) and empirically investigated by Ahad (Citation2017). For the study sample, the mean value of financial development is 16.188 percent, with minimum and maximum of 6.11 and 34.537% respectively.

Figure 1. Trends of export diversification and financial development.

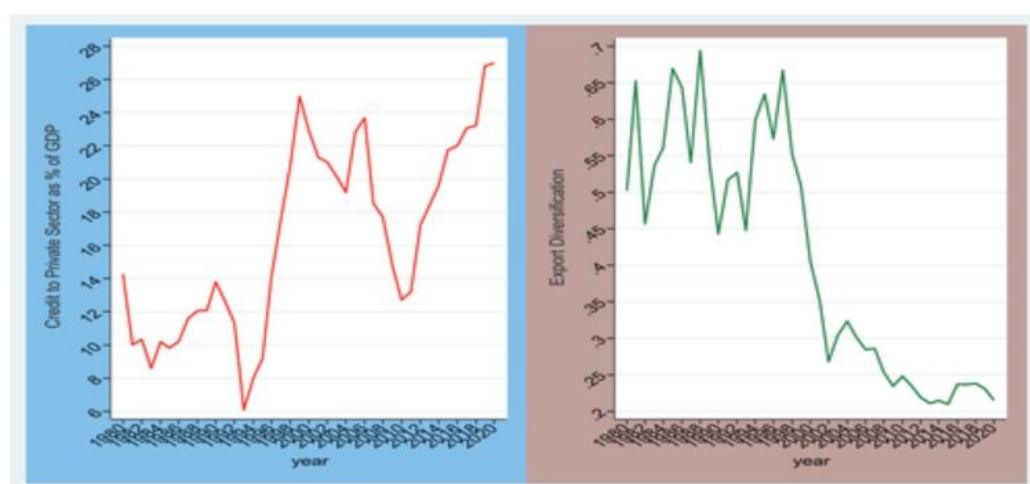


Table 1. Summary statistics of variables used in the study

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Variables	Observation	Mean	Std. Dev.	Min.	Max
Export diversification	40	.4062	.167	.209	.6937
Credit to private sector% GDP	40	16.1876	5.5599	6.1077	34.5369
Trade liberalization	40	0.65	0.483	0	1
Official exchange rate	40	9.2931	7.641	2.07	28.3257
External debt	40	59.6873	36.0638	10.5085	147.181
Real gross domestic product	40	5.9786	6.6245	-11.1444	13.8593

Source: WB & NBE data, 2022

In addition to financial development economic growth was used as an independent variable. The real GDP growth rate used in the empirical analysis averaged 5.9786% between 1980 and 2020 ranging from negative -11.144% to positive 13.57% with a standard deviation statistics of 6.6245. This growth variation across time in the country may be because of occurrences in domestic and external factors such as continuous deterioration in terms of trade, falling commodity prices, global economic downturn, and financial crisis in the international economies. The effect of economic growth on export diversification is ambiguous in that the expected signs under the absorption and monetary approaches are negative and positive respectively. Higher-income levels stimulate increased import demand as well as increased domestic production of tradable, leaving the ultimate impact on the trade balance somewhat indeterminate. However, it is argued that the former effect dominates

the latter. In this study trade liberalization (TL) is used as a dummy variable. In 1992/93 the current government of Ethiopia implemented (major policy reforms). These policy measures include the reduction of tariff and non-tariff barriers, harmonization and simplification of tariffs, like tariff dispersion and lines, and reduction and gradual elimination of all controls including on domestic price. Before 1992 it takes the value 0 and 1 for post 1992.

External debt (Debt): External debt or borrowing refers to taking monetary aid from a foreign country or institution. It is expected that external debt has a negative relationship with export diversification. From 1980 to 2020 external debt as a percentage of GNI ranges from 10.5085 to 131.181% averaging 59.6873% with a standard deviation of 36.0638. This is an indication that countries in the region are heavily dependent on external financial source to fill their financial gaps or government budget deficit.

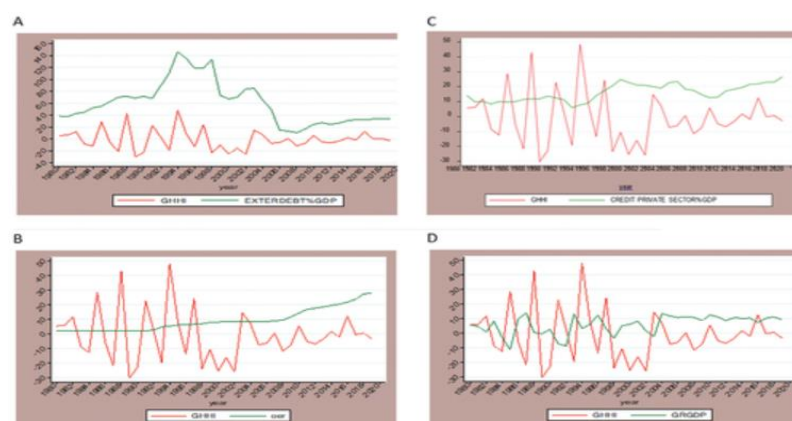
Finally official exchange rate (OER): is an exchange rate at which the currency of one country can be exchanged for the currency of another country. During the study period, Ethiopia's official exchange rate ranges from 2.07 to 28.323 with mean values and standard deviation of 9.293 birr/USD and 7.641 respectively. Depreciation in the domestic currency can cause the price of foreign goods to become relatively more expensive as compared to domestic goods. In effect, it may lead to the competitiveness of domestic exports and will cause a shift of resources from sectors that produce non-tradable to sectors producing tradable goods. This implies an increase in domestic export relative to imports, thereby improving export diversification.

The Relationship between Dependent and Independent Variables:

In Figure 2 graphical relationship between the dependent and

independent variables is presented. For the purpose of drawing the graphical relationship, the dependent variable, export diversification, is changed in to growth value of Herfindahl-Hirschman index (GHHI) before normalization. On panel "A" one can understand that stock of external debt as a percentage of gross national income was continuously rising during the military government in Ethiopia. After the fall of the military government the stock of external debt as a percentage of RGDP started to very slowly decline, remaining at its high level until 1998 and then after it showed a radical decline to reach at its lowest level since ever in 2006. This was mainly due to debt cancellation made to the country from various creditors in 1999 and it was the reflection of the impact of HIPC relief assistance made to Ethiopia in 2006 proposed by IMF and IDA. There is a positive relationship with concentration, but it has negative relationship with export diversification.

Figure 2. The relationship between dependent and independent variables.



Discussion:**Long- and Short-Run Estimation Results:**

The short-run (ECM₁) and long-run regression results are presented in Tables 5 and 6 respectively. The short-run model revealed that the coefficient of ECM_{t-1} (error correction term) is negative, and it is statistically significant at 1% level of precision with a value of 0.7168, which confirms that deviation from the long-run equilibrium after a short-run shock is corrected by about 71.68% at the end of each year. Therefore, we conclude that there is convergence towards long-run equilibrium. As indicated in section 2.2 exports diversification ranges from 0 to 1 and closer to 0 indicates a higher level of export diversification, but if it is closer to 1 it implies a higher degree of concentration. Because of the nature of the dependent variable negative coefficient between dependent and independent variables shows a positive effect and vice versa.

In both the long and short run credit to private sector, a proxy for financial development has a positive significant effect on export diversification. In the long run, 1% increase in financial development results in 0.245% increase in export diversification, and in the short run a 1% increase in financial development may cause 0.013% improvement in export diversification. This may be

because financial development in the form of credit to private sector increases, and in turn it increases investment and domestic production. As the level of output produced increases there may be an increase in export in both value and number of exported commodities. This result is similar to the study by Ahad (Citation2017), Kumarasamy and Singh (Citation2018), and Adeola and Evans (Citation2017). The other variable which is found to be statistically significant is trade liberalization. In the long run it has a positive significant effect, but in the short run has no significant effect on export diversification. The long-run coefficient is 2.31%, which is higher as compared to the effect of credit to private sector. This may be because domestic investors will have the incentive to produce diversified products and export to the rest of the world. This result is in line with the results found in the study of Cadot et al. (Citation2011), Xiang (Citation2007). The third variable is the external debt which significantly affects export diversification. In both the long and short run external debt has a positive significant effect on the export diversification of Ethiopia. In the long run, a 1% increase in external debt as a percentage of GNI leads to a 0.057% increase in Ethiopia's export diversification. While in the short run a 1% increase in external debt as a

percentage of GNI results in 0.003 percent increase in export diversification. This will be true if the borrowed money is invested in productive assets and on exportable products. Our empirical findings are consistent with those of Udeh et al. (Citation2016) and Ugbaka and Oseigbemi (Citation2020). Finally, real gross domestic product has significant effects on the long and short run. In the long run, it has a positive significant effect on export diversification. A 1 percent growth in RGDP may cause a 0.105 percent increase in export diversification, while in the short run it will have a 0.0096 percent effect on export diversification. In the short run as domestic income increases domestic consumers will feel wealthier and demands high-quality products. In Ethiopian context, the perception of a consumer is that in domestic production the quality of goods and services is low so the propensity to import increases and import increase. This in turn leads to the deterioration of the trade balance in the country. However, in the long run, as income increases marginal propensity to save will outweigh the marginal propensity to consume and in turn increase investment and production. As production increases export volume and number of exported commodities will increase and import declines. This result is in line with the findings of Hesse (Citation2009), and as expected and found in some previous

studies such as Lederman and Maloney (Citation2007). Besides using the Vector Error Correction Model Shadab and Tiwari (Citation2021) investigated the short-run and long-run relationship between export diversification and economic growth in the UAE and found a significant long-run relationship between export diversification and economic growth.

Finally, in the short run regression official exchange rate and trade liberalization have negative insignificant effect on export diversification at 5% level of precision. While in the long run only official exchange rate has an insignificant effect on export diversification. These may be because in the short run devaluation and trade policy change will cause inflationary impact in that as devaluation policy implements imported commodities in the domestic market will be expensive and also the cost of production will also increase, which in turn causes an increase in cost of production and will finally end lower level of production. Moreover, devaluation of domestic currency does not necessarily lead to an increase in export diversification. This result is in line with the findings of the study by Rose (Citation1990).

Results:

Stability Test:

To test the structural stability both cumulative sum of squares

(CUMSUMSQ) and cumulative sum (CUSUM), which are recommended by (Im et al., Citation2003; Pesaran et al., Citation2001), were used. If this cumulative sum square and cumulative sum go outside the critical bound, one concludes that there was a structural break at the point at which the sum square and cumulative sum began its movement towards the bound. Hence, for the stability test, the graph plots both the cumulative sum square of residual with 5% critical lines. And, if the cumulative sum square and cumulative sum remain inside between the two critical lines or bounds back after it is out of the boundary lines, the null hypothesis of correct specification of the model cannot be rejected. But, if the cumulative sum square goes outside the two critical bounds, there exists a series parameter instability problem. The straight line on cumulative sum square graph represents critical bounds at a 5% level of significance. As depicted in Figure 3, the plot of CUMSUMSQ lies within the boundary lines. Moreover, on Figure 4 cumulative sum plot lies within the upper and lower bounds. This confirms the equation is correctly specified and that the model is stable. Furthermore, the result shows that there is no structural instability in the model during the sample period. Henceforth, the study can precisely conclude that long- and short-run estimates are quite stable and as well there is no structural break showing the

results of the estimated model are efficient and reliable.

Conclusion and Recommendations:

Like most developing countries, Ethiopia has been running a persistent trade deficit except in 1974/75. Many empirical studies show that least developing countries have been marginalized from the world economy and international markets, because of the structure, composition, and performance of the trade, particularly the export sector. Ethiopia is one of the most affected countries because its export highly depends on agricultural output in the form of raw materials and semi-processed commodities. As a result, it is important to diversify the export of goods. To do so identifying determinant factors has paramount importance. This study is conducted to examine the effect of financial development (credit to private sector) on export diversification using time series data from the period 1980 to 2020. An auto-regressive distributed lag estimation (ARDL) technique, which avoids the problem of the order of integration associated irrespective of $I(0)$ or $I(1)$, was used. Independent variables used in the model are credit to private sector as a percentage of gross domestic products as a proxy for financial development, trade liberalization, official exchange rate, external debt, and real gross domestic product.

The short-run ARDL estimation result indicates that credit to the private sector, trade liberalization, external debt, and real gross domestic product have a positive significant effect on export diversification. The short-run adjustment rate is negative 0.7168 or 71.68 percent which represents the existence of deviation from long-run equilibrium is adjusted towards equilibrium at a rate of 71.68 percent. In the long-run, however, credit to private sector has a positive significant effect on trade balance, i.e. an increase in credit to private sector enables investors to get enough resources for production and it stimulates domestic production. In addition, the trade liberalization coefficient is statistically significant, which advocates free trade international policy. Though the coefficient is positive, people's preference is in Favor of foreign goods, which will result in an increase in imports instead of export. The estimation result has also external debt positively affecting export diversification. Despite this, the level of threshold should be determined and the government borrows based on that level. Finally, the real gross domestic product has positive significant effect on export diversification. The bound test of ARDL estimation shows the existence of long-run relationship.

To improve export diversification of Ethiopia's credit to the private sector, as a proxy for financial development, is found to be an

important variable. Thus, the government and the national bank of Ethiopia can adjust both saving and lending interest rate policies. The increasing interest rates on savings will increase the deposit in the financial institution, which will make financial institutions have enough deposits to lend in the form of a loan. To equilibrate the demand and supply of loanable funds the authority concerned would reduce the lending interest rates. Moreover, providing sufficient loan to export industries that diversify and facilitates the shift towards the export of semi-finished and manufactured goods would be indispensable. A country borrowed either to finance its deficit or for the sake of large-scale investment in manufacturing goods. As a result, the government of Ethiopia will improve export diversification by allocating the borrowed money into high return investment and investing in industries that can substitute the imported goods. Finally boosting economic growth will improve the export diversification of Ethiopia making the trade will export diversity.

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