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The Nexus of Export, FDI, Financial Development and Economic Growth in North Sumatra, Indonesia

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Abstracts

This study investigated the relationship between exports, foreign direct investment (FDI), financial development and economic growth in North Sumatra, Indonesia. Using autoregressive distributed lag (ARDL) bound test to cointegration, this study confirms the pattern of relationships between economic growth, exports, FDI and financial sector development as follows: (i) FDI does not contribute to the economy of North Sumatra because it does not affect economic growth, exports, and financial development and vice versa, (ii) the causality relationship between economic growth and exports is one way in the pattern of a growth-led export hypothesis (GLEH), and (iii) the causality relationship between financial development and economic growth follows the finance-led growth /supply-leading hypothesis. These findings suggest that the local governments should pay more attention to financial development's crucial role by facilitating the financial sector to expand the banking network and support rural credit banks.

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1. Introduction

Economic growth is influenced both individually and simultaneously by exports, foreign direct investment (FDI), and the advancement of the financial sector. However, each of these factors is also problematic, or at least not unassailable, concerning economic development such that each produces several hypotheses requiring different policy choices. Trade and economic growth empirically usually show a positive correlation, but the direction of causation is not monotonic (Cadoret et al., 2014; Huchet-Bourdon, M, Le Mouël & Vijil, 2018). For example, four suggestions relate to the export-economic growth relationship, each of which has multiple political consequences: (i) export-led growth hypothesis (ELGH) where export activities lead to economic growth. The positive impact of outward-oriented trade policy on technological change, labour productivity, capital efficiency and production, (ii) growth-driven exports hypothesis (also famous as the growth-led export hypothesis/GLEH) where economic growth drives trade flow. It can also create a comparative advantage in certain areas that lead to specialization and facilitate exports, (iii) the relationship of feedback (bi-directional causality) between export and economic growth, and (iv) a simple contemporary relationship between export and economic growth (Cadoret et al., 2014); Busse & Königer, 2012). A similar pattern also applies to the relationship between FDI and economic growth. Theoretically, FDI will increase productivity and promote economic development, but various empirical studies have shown various relationship patterns between FDI and economic growth in various countries (Tiwari & Mutascu, 2011).

Theoretical and empirical research in recent years suggests that financial development plays an essential role in economic development. However, according to Duarte et al. (2017), the role of FDI will only have emerged if the financial sector development has reached a certain threshold level categorized as country-specific-factors.

Indonesia pays special attention to exports and FDI as a source of economic growth (Rahmaddi & Ichihashi, 2013; Mahadika et al., 2017; Ahmad et al., 2018; Seskab, 2019). Likewise, there is still no study on the role of financial development and its relation to exports and FDI in economic growth both at the national and provincial level.

Critique of the scientific study of export-economic growth relationship (which also applies to FDI and financial development variable) focus on the methodology. Empirical studies undertook between 1967 and 1998, generally using cross-section analysis and ordinary least square (OLS). Cross-section investigation has several deficiencies, namely (i) by assuming the same production function in various types of economy, they do not consider the level of technology, which tends to be different in each country (Belloumi, [2014] calls it country-specific issues), and (ii) the results are often causing debate due to the limited sample size.

This study aims to fill the research gap on financial development, exports, FDI and economic growth relationship at the provincial level in Indonesia. With due regard to criticism of previous studies, this study conducted a region-specific approach using time series data by making the North Sumatra economy as a background, because in terms of international trade patterns North Sumatra has differences with Indonesia in general at least in terms of: (i) not relying on oil exports and gas, (ii) export sector is basically renewable natural resources (agro-based products), (iii) has a high trade openness, and (iv) the trade balance is always a surplus. The correlation between economic growth, exports, FDI and financial progress, will be studied in-depth, including, (i) Economic growth determinant, (ii) the determinant of export, and (iii) the analysis does not stop only at looking at functional relationships between variables, but further, it will investigate whether the functional relationship that exists is causal and the direction of the causality. The dynamic models (ARDL and ECM/ error correction model) will be employed, which is more robust than OLS.

2. Literature Review

Economic theory has established the widely known ways in which trade can impact development. The better effect of export growth on total factor productivity (TFP) is encouraging at a higher capital production level. As part of the trade, exports will foster the efficient distribution of capital and allow a country to achieve economies of scale, encourage technology diffusion, foster technical processes, and promote domestic and foreign market competitiveness. It will lead to the optimization of production processes and the creation of new goods. Besides, it increases have led to the loosening of foreign currency restrictions. Facilitate imports and therefore, higher growth in capital goods. Exports thus positively contribute to economic development and function as the "engine of growth" and supported by the hypothesis of export-led growth (Busse & Königer, 2012).

In contrast to the export-led growth hypothesis (ELGH), the growth-led export hypothesis (GLEH) explains that causality runs from output growth to export growth. In a growing economy, several industries face significant progress in learning and technological innovation, related to the accumulation of human capital, manufacturing experience and technology transfer or accumulation of real capital arising from FDI. This process has nothing to do with the outward-oriented policy. The output will continue to grow in the absence of this policy. As long as domestic demand growth lags behind output growth in these affluent industries, producers will sell their goods in the foreign market. Therefore, economic growth will drive export growth.

FDI contributes to positive external productive output. FDI consists of a bundle of finance, infrastructure administration, and market access. FDI appears to have a comparatively edge in the manufacturing sector, building economic size and linkage and increasing efficiency (Huchet-Bourdon, M, Le Mouël, C Vijil, 2011). Furthermore, (Belloumi, 2014) said that FDI inward could increase host countries' export capacity, which led developing countries to increase their foreign exchange

earnings, create new jobs, increase technology transfer, and encourage overall economic growth in host countries. The three main channels through FDI that can affect technological change, increase capital stock and generate economic growth, among others are, (i) direct transmission through 'Greenfield Investment', (ii) indirect transmission through 'Ownership Participation' and (iii) second-round transmission through 'Technology Spillover'.

FDI, by itself, does not provide sustainable development and economic prosperity for the host country. Whether or not FDI affects economic growth depending on local condition (absorptive capacity), especially human capital and financial markets (Duarte et al., 2017; Menyah et al., 2014; Sirag et al., 2018). In line with the endogenous growth hypothesis, technology plays an essential role throughout the economic growth phase. This model combines human resource and skill and knowledge. Various studies show that the effectiveness of FDI depends on education, training, and skilled labour.

Theoretical and observational evidence has shown that financial development plays an integral part in economic growth in years gone by finance facilitates economic growth through efficient inter-time resource allocation, capital accumulation, and technological innovation. According to Menyah et al. (2014), and the literature referred to in it, "developing countries with underdeveloped financial systems are trapped in a vicious circle, where poor financial development leads to poor economic performance and in turn, poor economic performance causes poor financial development. Conversely, countries with better-developed financial system tend to grow faster and therefore finance not only pro-growth but also pro-poor shows that financial development helps the poor to keep up with economic development as they grow". Like FDI, foreign trade financial development aims to foster economic growth. A well-developed financial sector develops economic potential by growing technical change, allowing reaping foreign trade benefits (Shahbaz et al., 2015; Duarte et al., 2017).

There are dubious relationships that exist between financial development and economic growth. There are four propositions related to financial-growth nexus (Menyah et al., 2014; Shahbaz et al., 2015; Samargandi et al., 2015; Sirag et al., 2018): (i) finance-led growth, i.e. supply-leading hypothesis, regards financial development is a necessary and pre-condition for economic growth; consequently, finance leads economic growth and causality run from financial development to economic growth, (ii) growth-led finance, i.e. demand-following hypothesis, argues that finance is led by rather than leads economic growth and finance plays a minor role in economic growth. In this reasoning line, finance is merely a by-product or an outcome of growth on the economy's real side. Therefore, when an economy grows, more financial institutions, financial products, and services emerge in the market in response to higher demand for financial services, (iii) the feedback hypothesis assuming that financial development affects economic growth, and economic growth contributes to financial development. Economic growth and financial development complement each other, making financial deepening and real economic growth mutually causal. It would be a bi-directional causality running between economic growth and financial development, and (iv)

neutral hypothesis assuming financial development and economic growth do not affect each other.

For Indonesia at the national level, various studies come to different between FDI-export-economic growth. Fazaalloh (2019) noticed "there is no causal relationship between FDI and economic growth in the short and long run. However, there is a uni-directional causal relationship running from economic growth to FDI in the short and long run". Meanwhile, according to Febiyansah (2017), FDI and export can promote economic growth in the short-run and increase competitiveness for Indonesian commodity export. Mahadika et al. (2017) found a long-run relationship between economic growth, FDI and Indonesia's export volume. Finally, Salebu (2014) stated that the positive and significant effects of FDI on economic growth only exist in four sectors: crops and plantation, mining, the food industry, transportation, and communication. Financial progress calculated in the private credit ratio of deposit money banks has a uniform cause and economic growth in Indonesia (Astuti, 2018). Financial development at the regional level shows a positive and significant influence in Java (Baroroh, 2012) and (Supartoyo et al., 2018) found the same result for Sulawesi.

3. Research Methods

This study used logarithmic values to evaluate the impact of exports, FDI, and financial sectors on economic growth. Variables used include economic growth measured in Gross Regional Domestic Product per capita (symbolized by GDP), export value (EXP), implement FDI and national private sector financing as the surrogate for growth of the financial sector (FD). GDP, EXP and FD are in Rupiah constant price (2010 = 100), while FDI in US$ constant price (2010 = 100). GRDP (Gross Regional Domestic Product) data, export value and FDI were available in "North Sumatra in Figures" published annually by the Central Statistics Agency of North Sumatra. Meanwhile, the private sector's domestic credit data were from the Central Bank of Indonesia (Bank Indonesia). Time series data covering 2000-2018.

Pesaran *et al*., about two decades ago, introduced the autoregressive distributed lag model (ARDL). It is a dynamic econometric model based on OLS (ordinary least square). This model is considered superior for small samples and does not require that all variables be stationary at the same level, as long as they are still at level and order 1, I (0) and I (1). Besides, ARDL also allows procedures on variables with different optimal lags. The ARDL model can produce dynamic error correction models (ECM) through a simple transformation, integrating the short-term dynamic model with its long-term equilibrium. The ARDL bound tests are increasingly popular and widely applied, see for example (Acaravci & Öztürk, 2012; Shahbaz & Rahman, 2012; Belloumi, 2014; Shahbaz et al., 2015; Furuoka, 2018; Dritsaki & Stamatiou, 2019).

Long-term equations with lag p formulated as equation (1). With lag p, the period required for changes in the independent variable (Xt) to affect the dependent variable (Yt) is $p + 1$

$$Y_t = \alpha + \beta_0 X_t + \beta_1 X_{t-1} + \beta_2 X_{t-2} + \ldots + \beta_p X_{t-p} + \pi_t = \alpha + \sum_{j=0}^{p} \beta 1 \, X_{t-i} + \pi t \quad (1)$$

In general, the ARDL cointegration experiment method consists of two phases. The first approach is to explore a long-term relationship in the approximate equation for all variables. The ARDL model formulation to include standard log-linear functions for the long-term GDP, EXP-, FDI- and FD relationships are:

$$LGDP_t = \beta_{01} + \sum_{i=0}^{k} \alpha_{1i} \; LEXP_{t-i} + \sum_{i=0}^{k} \alpha_{2i} \; LFDI_{t-i} + \sum_{i=0}^{k} \alpha_{3i} \; LFD_{t-i} + \pi_t \quad (2)$$

$$LEXP_t = \beta_{02} + \sum_{i=0}^{k} \alpha_{1i} \; LGDP_{t-i} + \sum_{i=0}^{k} \alpha_{2i} \; LFDI_{t-i} + \sum_{i=0}^{k} \alpha_{3i} \; LFD_{t-i} + \pi_t \quad (3)$$

$$LFDI_t = \beta_{03} + \sum_{i=0}^{k} \alpha_{1i} \; LGDP_{t-i} + \sum_{i=0}^{k} \alpha_{2i} \; LEXP_{t-i} + \sum_{i=0}^{k} \alpha_{3i} \; LFD_{t-i} + \pi_t \quad (4)$$

$$LFD_t = \beta_{03} + \sum_{i=0}^{k} \alpha_{1i} \; LGDP_{t-i} + \sum_{i=0}^{k} \alpha_{2i} \; LEXP_{t-i} + \sum_{i=0}^{k} \alpha_{3i} \; LFDI_{t-i} + \pi_t \quad (5)$$

The ARDL model is transformed into an ECM model to get the short-run equation. For this reason, the ECM formulation for economic growth is as follows:

$$\Delta LGDP_t = \alpha_0 + \sum_{i=0}^{n} \alpha_{1i} \, \Delta LGDP_{t-1} + \sum_{i=0}^{q1} \alpha_{2i} \, \Delta LEXP_{t-1} + \sum_{i=0}^{q2} \alpha_{3i} \; \Delta LFDI_{t-1} + \sum_{l=0}^{q3} \alpha_{4i} \, \Delta LFD_{t-l} + \lambda_1 ECM_{t-1} + e_{1t} \quad (6)$$

whereas the ECM for the export, FDI and Financial Development equation are as follows:

$$\Delta LEXP_t = \alpha_0 + \sum_{i=0}^{q1} \alpha_{1i} \, \Delta LEXP_{t-1} + \sum_{i=0}^{n} \alpha_{2i} \, \Delta LGDP_{t-1} + \sum_{i=0}^{q2} \alpha_{3i} \, \Delta LFDI_{t-1} + \sum_{l=0}^{q3} \alpha_{4i} \, \Delta LFD_{t-l} + \lambda_2 \; ECM_{t-1} + e_{1t} \quad (7)$$

$$\Delta LFDI_t = \alpha_0 + \sum_{i=0}^{q2} \alpha_{1i} \, \Delta LFDI_{t-1} + \sum_{i=0}^{n} \alpha_{2i} \, \Delta LGDP_{t-1} + \sum_{i=0}^{q1} \alpha_{3i} \, \Delta LEXP_{t-1} + \sum_{l=0}^{q3} \alpha_{4i} \, \Delta LFD_{t-l} + \lambda_3 ECM_{t-1} + e_{1t} \quad (8)$$

$$\Delta LFD_t = \alpha_0 + \sum_{l=0}^{q3} \alpha_{1i} \, \Delta LFD_{t-l} + \sum_{i=0}^{n} \alpha_{2i} \, \Delta LGDP_{t-1} + \sum_{i=0}^{q1} \alpha_{3i} \, \Delta LEXP_{t-1} + \sum_{i=0}^{q2} \alpha_{4i} \, \Delta LFDI_{t-1} + \lambda_4 ECM_{t-1} + e_{1t} \quad (9)$$

Where λ_1, λ_2, λ_3 and λ_4 is an error correction term (ECT) which shows an adjustment of the short-run model that is not in equilibrium towards its long-run

equilibrium according to equation (2), (3), (4) and (5) with an absolute value of λi is the speed of adjustment.

The adjustment of short-run equations such as eq. (4) and (5) to their long-run equilibrium as in eq. (2) and (3) requires cointegration between the dependent variables with at least one independent variable. Therefore, before operating ECM regression, it is necessary to conduct cointegration testing through the ARDL bound test. For this purpose, the formulation of ECM unrestricted equation for economic growth is as follows:

$$\Delta LGDP_t = \alpha_1 + \alpha_2 LGDP_{t-1} + \alpha_3 LEXP_{t-1} + \alpha_4 LFDI_{t-1} + \alpha_4 L\ FD_{t-1} + \sum_{i=0}^{n} \alpha_{GDP}\ \Delta LGDP_{t-i} + \sum_{j=0}^{p} \alpha_{EXP}\ \Delta LEXP_{t-k} + \sum_{k=0}^{q} \alpha_{FDI}\ \Delta LFDI_{t-l} + \sum_{l=0}^{r} \alpha_{FD} \Delta LFD_{t-n} + \mu_t \quad (10)$$

Furthermore, the unrestricted ECM for exports, FDI and financial development is:

$$\Delta LEXP_t = \emptyset_1 + \emptyset_2 LGDP_{t-1} + \emptyset_3 LEXP_{t-1} + \emptyset_4 LFDI_{t-1} + \emptyset_4\ LFD_{t-1} + \sum_{i=0}^{n} \emptyset_{EXP}\ \Delta LEXP_{t-i} + \sum_{i=0}^{n} \alpha_{GDP}\ \Delta LGDP_{t-k} + \sum_{k=0}^{q} \emptyset_{FDI}\ \Delta LFDI_{t-l} + \sum_{l=0}^{r} \emptyset_{FD} \Delta LFD_{t-n} + \mu_t \quad (11)$$

$$\Delta LFDI_t = \emptyset_1 + \emptyset_2 LGDP_{t-1} + \emptyset_3 LEXP_{t-1} + \emptyset_4 LFDI_{t-1} + \emptyset_4\ LFD_{t-1} + \sum_{i=0}^{n} \emptyset_{FDI}\ \Delta LFDI_{t-i} + \sum_{i=0}^{n} \alpha_{GDP}\ \Delta LGDP_{t-k} + \sum_{k=0}^{q} \emptyset_{EXP}\ \Delta LEXP_{t-l} + \sum_{l=0}^{r} \emptyset_{FD} \Delta LFD_{t-n} + \mu_t \quad (12)$$

$$\Delta LFD_t = \emptyset_1 + \emptyset_2 LGDP_{t-1} + \emptyset_3 LEXP_{t-1} + \emptyset_4 LFDI_{t-1} + \emptyset_4\ LFD_{t-1} + \sum_{i=0}^{n} \emptyset_{FD}\ \Delta LFD_{t-i} + \sum_{i=0}^{n} \alpha_{GDP}\ \Delta LGDP_{t-k} + \sum_{k=0}^{q} \emptyset_{EXP}\ \Delta LEXP_{t-l} + \sum_{l=0}^{r} \emptyset_{FD} \Delta LFDI_{t-n} + \mu_t \quad (13)$$

The next stage is to measure the F-statistics after the non-cointegration null hypothesis, respectively:

$H_0 : \alpha_{GDP} = \alpha_{EXP} = \alpha_{FDI} = \alpha_{FD} = 0$, and
$H_0 : \emptyset_{EXP} = \emptyset_{GDP} = \emptyset_{FDI} = \emptyset_{FD} = 0$,

contradict the alternate cointegration hypothesis, i.e.

H_a: $\alpha_{GDP} \neq \alpha_{EXP} \neq \alpha_{FDI} \neq \alpha_{FD} \neq 0$, and
$H_a : \emptyset_{GDP} \neq \emptyset_{EXP} \neq \emptyset_{FDI} \neq \emptyset_{FD} \neq 0$,

Cointegration is declared when the F-statistic has a higher value than the upper critical bound (UCB). The decision on long-term relationships is inconclusive when the F-statistic calculation value lies between a lower critical value (lower critical bound = LCB) and a higher critical value (UCB). There is an absence of a long-term partnership if the F-statistic value lower than LCB (Shahbaz & Rahman, 2012). The cointegration observed suggests at least one causal interaction. Granger illustrates that the cointegration of factors offers knowledge on long-run and short-run causal relations. In doing so, the vector error correction model (VECM) is used, as the multivariate counterpart of ECM (error correction mechanism) as the model is dealing with more than one variable in a vector

autoregression (VAR) system (Gujarati, 2012). The error correction represents as follows:

$$(1-L)\begin{bmatrix} LGDP_t \\ LEXP_t \\ LFDI_t \\ LFD_t \end{bmatrix} = \begin{bmatrix} \emptyset_1 \\ \emptyset_2 \\ \emptyset_3 \\ \emptyset_4 \end{bmatrix} + \sum_{t=1}^{p}(1-L)\begin{bmatrix} \alpha_{11t}\alpha_{12t}\alpha_{13t}\alpha_{14t} \\ \beta_{11t}\beta_{12t}\beta_{13t}\beta_{14t} \\ \delta_{11t}\delta_{12t}\delta_{13t}\delta_{14t} \\ \rho_{11t}\rho_{12t}\rho_{13t}\rho_{14t} \end{bmatrix} + \begin{bmatrix} \theta \\ \chi \\ \xi \\ \zeta \end{bmatrix} + ECM_{t-1} + \begin{bmatrix} \eta_{1t} \\ \eta_{2t} \\ \eta_{3t} \\ \eta_{4t} \end{bmatrix} \quad (14)$$

Where $(1-L)$ is an operator of differences; ECM_{t-1} is the lagged term of a transient long-term relationship, while η_{1t}, η_{2t}, η_{3t}, η_{4t} are serially independent random error with zero mean and limited covariance matrix. The existence of a significant relationship in the first difference of the variable provides evidence in the direction of short-run causality. Simultaneously, the long-run causation is indicated by t-significant relating to the error correction term (ECM_{t-1}).

4. Results

There are two phases in analyzing the nexus of FDI, Export, Financial development, and economic growth using the ARDL bound test to cointegration. The first step is to run a unit root test. Since the ARDL bound test is flexible about integrating the order of variable, the unit root test's intension ensures no variables integrated with order two, I (2). Using ADF, DF-GLS and PP, each with and without trend, the test results show the four variables are stationary at I (0) and I (1) as in table 1.

Table 1. Unit Root Test Result

Variable	ADF		DF-GLS		PP	
	C	C,T	C	C,T	C	C,T
LRGDP	-2.0193	-3.2326	-2.4685**	-2.8004	-1.9415	-7.5698***
LEXP	-2.2953	-3.1143	-2.1973*	-3.1692*	-2.2332	-3.1143
LFDI	-1.6522	-4.8134***	-1.7570*	-4.9542***	-1.4061	-5.2981***
LFD	-0.1766	-1.8936	-0.3554	-3.0658*	-0.2812	-5.0906***
Δ LRGDP	-4.0761***	-4.4173**	-3.2510***	-4.4996***	-4.0451***	-4.3701**
Δ LEXP	-6.0558***	-6.1494***	-5.6539***	-6.5265***	-6.7705***	-15.1035***
Δ LFD	-2.9822*	-3.3604*	-3.4259***	-4.1924***	-5.2516***	-5.5903***

Note: *** p < 0.01, ** p < 0.05, * The p < 0.1; C = constant and T = trend.
Source: Author's Computation

Because the variables tested are not stationary in order two I (2) or more, the ARDL bound method is the right option for checking cointegration between variables. The Akaike Information Criteria (AIC) was used to identify the most suitable model for optimal lag.

The results of the test on eq. (2), Table 2 portrays economic growth in particular as a result of exports, FDI and financial sector production. Among export, FDI and financial development (FD), FD alone has a considerable impact on economic development and a favourable impact.

Table 2. Estimation of Coefficient of The Long-run Economic Growth Equation

The dependent variable is GDP per capita, ARDL method (1,0,0,0)		
Variable	Coefficient	t-statistic
$LRGDP_{t-1}$	0.7654	4.4485***
LEXP	-0.0724	-0.6216
LFDI	-0.0083	-0.2731
LFD	0.2281	2.6816**
Constant	0.0253	
R2 = 0.9920		
F-statistic = 403.6033***		

Note: *** p < 0.01, ** p < 0.05, * p < 0.1;
Source: Author's Computation

The cointegration test results show no cointegration in the economic growth equation since F-statistic values lie between LCB and UCB (table 3). Therefore, the analysis of error correction regression to get the short-run equation as eq. (6) is not necessary.

Table 3. The Result of ARDL Cointegration Test

Bound testing for cointegration		
Estimated equation	$LRGDP_t = f(LEXP_t, LFDI_t, LFD_t)$	
Optimal lag structure	(1,0,0,0)	
F-statistic	2.7643	
Significant level	Lower bound, I(0)	Upper bound, I(1)
10%	3.008	4.15
5%	3.71	5.018
1%	5.333	7.063
$R^2 = 0.9842$		

Source: Author's Calculation

Residual diagnostics test results of the heteroscedasticity, serial correlation, normality and autocorrelation/ partial correlation presented in table 4.

Table 4. Residual Diagnostic Test Results

Description	LGDP (Equation 2)
Heteroscedasticity:	
F-stat	0.8604
Prob. F (4,13)	0.5129
Serial Correlation:	
F-stat	0.7866
Prob. F (2,11)	0.4794
Normality	
Jaque-Berra:	7.4656
Prob.	0.0239
Autocorrelation:	No autocorrelation/ No partial autocorrelation

Source: Author's calculation

The stability test ensures that the economic growth equation model obtained is stable. The cumulative sum of recursive residuals (CUSUM) tests to deliver the stability performance of the model. The test results show that the estimated coefficients in table 2 are stable because the CUSUM own value and square lines are in the critical range at the 95% confidence level ($p < 0.05$).

Following the similar analysis steps, in table 5, the results of ARDL cointegration tests for export, FDI and financial development equation are presented. All three equations indicated cointegration. Therefore an error correction regression analysis was conducted to obtain the short-term equation and the speed of adjustment to its long-term equilibrium (table 6).

Table 5. The Outcomes of the ARDL Cointegration Experiment of Variable Export, FDI and Financial Development Equations

Estimated models	Optimal lag length	F-bound test	Decision
LEXP/ LEXP, LGDP, LFDI, LFD	(1,2,2,2)	56.4890	cointegration
LFDI/ LFDI, LGDP, LEXP, LFD	(1,2,2,1)	9.5959	cointegration
LFD/ LFD, LGDP, LEXP, LFD	(1,2,2,2)	4.2896	cointegration
	Significant (finite sample, n = 30)		
		lower bound, I(0)	upper bound, I(1)
	10 %	3.008	4.150
	5 %	3.710	5.018
	1 %	5.333	7.063

Source: Author's Computation

Here is worth noting that in table 6, economic growth has a negative effect on export. However, further analysis is carried out separately, with two variables where export as the dependent variable and economic growth as an independent variable on ARDL (1,0) with a favourable impact in economic growth to the export with an elasticity of 0.3631. The pair-wise Granger Causality tests show that export-economic growth causal relationships are one-way, namely, from economic growth to exports. Thus, for North Sumatra, the growth led export hypothesis (GLEH) is valid and FDI and financial development, actually become a pressure variable in the model.

Table 6. ARDL Error Correction Regression

Export as Dependent Variable, ARDL (1,2,2,2)			**FDI as Dependent Variable, ARDL (1,2,2,1)**		
Variable	Coeffcient	t-statistic	Variable	Coeffcient	t-statistic
Δ LGDP	-0.6933	-7.6706***	Δ LGDP	1.0625	0.6108
Δ LGDPt-1	-0.7772	-7.8357***	Δ $LGDP_{t-1}$	4.6872	2.6815**
Δ LFDI	-0.0114	-1.5970	Δ LEXP	0.2316	0.1849
Δ LFDIt-1	0.0999	11.2127***	Δ $LEXP_{t-1}$	-2.2848	-1.8167
Δ LFD	0.6498	11.7549***	Δ LFD	-0.8867	-0.6139
Δ LFDt-1	0.5367	10.4372***	ECT	-1.6204	-7.4049***
ECT	-0.4162	-18.4102***			
R^2 = 0.9870			R^2 = 0.8570		
F-statistic = 97.7145***			F-statistic = 9.9906***		
Stability	CUSUM and CUSUM square		Stability	CUSUM and CUSUM square	
Residual diagnostic:			Residual diagnostic:		
Heterosce-dasticity:	F-stat = 0.6158 Prob. = 0.7626		Heteroscedasticity:	F-stat = 0.9023 Prob. = 0.5676	
Serial correlation:	F-stat = 1.8397 Prob. = 0.2713		Serial correlation:	F-stat = 0.6455 Prob. = 0.5632	
Normality:	Jaque-Berra = 0.2307 Prob. = 0.8111		Normality:	Jaque-Berra = 0.0896 Prob. = 0.9562	
Autocor-relation:	No autocorrelation No partial correlation		Autocorrelation:	No autocorrelation No partial correlation	
Financial Development as Dependent Variable, ARDL (1,2,2,2)					
Variable	Coeffcient	t-statistic	Residual diagnostic:		
Δ LGDP	0.6203	2.7655**	Heteroscedasticity:	F-stat = 0.8542 Prob. = 0.6072	
Δ $LGDP_{t-1}$	0.7249	3.4819***			
Δ LEXP	0.8362	6.0931***	Serial correlation:	F-stat = 1.8326 Prob. = 0.2723	
Δ $LEXP_{t-1}$	-0.3022	-2.6848**			
Δ LFDI	0.0163	0.9271	Normality:	Jaque-Berra = 0.8867 Prob. = 0.6419	
Δ $LFDI_{t-1}$	-0.1104	-5.0652***			
ECT	-0.3281	-5.0732***	Autocorrelation:	No autocorrelation No partial correlation	
R^2 = 0.9040					
F-statistic = 12.1074					
Stability	CUSUM and CUSUM square				

Source: Author's Computation

Note: *** p < 0.01 , ** p < 0.05, * p < 0.1 respectively

Table 7 presents the outcome of the ARDL Granger causality test which shows the causality relationship among economic growth, export, FDI and financial development in the short run can be summarized as follows: (i) FDI is an isolated variable, where FDI has no substantial impact on economic growth, exports and financial development and vice versa (in the FDI equation, none of the three independent variables has a significant effect on FDI), (ii) One-way causality from financial development to GDP (finance-led growth/ supply-leading hypothesis), (iii) there is a one direction causality from GDP to Export (growth-led export hypothesis, GLEH), and (iv) Export and financial development has a bi-directional causality relationship.

Table 7. Analysis of ARDL – Granger Causality

Dependent Variable	Short-run Causality (t-statistic of Wald test)					Long-run causality
	ARDL	Δ LGDP$_t$	Δ LEXP$_t$	Δ LFDI$_t$	Δ LFD$_t$	ECT
Δ LGDP$_t$	(1, 0, 0, 0)		-0.6216	-0.2731	2.6816**	0.2340***
Δ LEXP$_t$	(1, 2, 2, 2)	-4.6687***		-0.6751	7.7673***	-0.4162***
Δ LFDI$_t$	(1, 2, 2, 1)	0.3919	0.1248		0.3771	-1.6204***
Δ LFD$_t$	(1, 2, 2, 2)	1.8014	3.8504***	0.3623		-0.3281***

Source: Author's Computation
Note: *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$ respectively.

A novel understanding of the role of FDI in economic growth has become evident from this report. The empirical study's findings do not encourage the Central Government and Local Government in North Sumatra, which value the Foreign Investment (FDI) role in providing various infrastructure and facilities to speed up economic development. FDI has no significant effects on development or export promotion for North Sumatra. In contrast, domestic lending to growth and exports from the private sector has a significant positive effect on financial sector development through investment lending and mainly working capital loans.

Also, causative is the observed association between the production of the financial sector and economic growth and exports. This finding highlights that the efforts made to invite foreign investment (FDI) are not comparable with the economic growth benefits they generate. On the other hand, the financial sector as a catalyst driving economic growth needs more serious attention. Although export promotion policies in the form of trade liberalization by taking part in various collaborations in the form of regional trade agreements/ free trade agreements have helped boost exports and economic growth while reducing poverty, the financial sector's importance are still substantially higher.

The correlation between exports and economic growth that follows GLEH (economic growth that encourages export) shows a sectoral imbalance in North Sumatra's economy. Furuoka (2018) found a similar pattern for Indonesia. Exports are mainly palm oil and rubber, and its roots in fast-growing sectors where the production is not fully absorbed domestically. In addition to geographical factors, these commodities' competitiveness also includes a long history of experience in palm oil plantations in North Sumatra (Tampubolon &

Nababan, 2018; Tampubolon, 2018). The relationship between exports and economic growth will produce high export values even without outward-oriented policies, i.e. export promotion.

The unrelated causality of FDI and financial sector growth, on the other hand, shows that FDI that is developing in North Sumatra is primarily in the primary and energy mining sectors such as Sarulla geothermal power plant or Batangtoru gold mining. The aluminium smelting industry (Inalum), which recently turned into a state-owned enterprise after decades as FDI, basically imported raw materials from other region and the productions to serve export. These FDI projects have no upstream or downstream linkages with local companies that positively impact the regional economy. That FDI does not affect economic growth or exports indicates a misallocation of resources other than some distortion in existing trade, as has been reminded by Belloumi (2014). Thus, there is a deviation Salebu (2014) finding that on the national level "FDI has a positive and significant effect on economic growth in four sectors, namely agriculture (mainly food crops and plantations), mining, food industry and transportation and communication".

5. Conclusion and Suggestion

The results of this analysis can be summarized as follows: (i) FDI and economic growth do not influence one another, (ii) FDI does not affect export and production of the financial sector and vice versa; (iii) the export/economic growth connection follows the growth-driven export hypothesis (GLEH). Thus, the financial sector's growth plays a crucial role in North Sumatra's economy, and the FDI contributes very little.

Large scale investment projects such as aluminium smelting (PT. Inalum), which for decades were FDI and the construction of a geothermal power plant (Sarulla) and a gold mine in Batangtoru, did not have a significant impact on the regional economy because it had no linkages to upstream and downstream economic activities of North Sumatra so that both outputs and financial transactions do not enter the local economic circulation. Therefore, the regional government needs to review the various efforts to attract foreign investors to invest in North Sumatra. The investment needed is an investment that can increase local economic activities such as the manufacturing industry that makes local products as raw materials and manufacturing industries that initiate the development of small businesses supplying parts and components locally, something that is common in machinery, electronics and transportation (the transport/ vehicle industry).

As the results of this study indicate a crucial role of the financial sector on economic growth and exports, facilitating the financial sector to expand the banking network and support rural banks (BPR = Bank Perkreditan Rakyat) capable of reaching rural services is a priority policy that should be considered by the North Sumatra provincial government to achieve sustainable and quality economic growth.

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