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## Article

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European Journal of Government and Economics (EJGE)

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*Suggested Citation:* Nathaniel, Solomon Prince (2021) : Natural resource abundance and broad-based financial development nexus in ASEAN countries: Accounting for globalization and human capital, European Journal of Government and Economics (EJGE), ISSN 2254-7088, Universidade da Coruña, A Coruña, Vol. 10, Iss. 1, pp. 30-45,  
<https://doi.org/10.17979/ejge.2021.10.1.7202>

This Version is available at:

<https://hdl.handle.net/10419/298630>

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# Natural resource abundance and broad-based financial development nexus in ASEAN countries: accounting for globalization and human capital

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**Abstract.** Sustainable resource consumption is important for the development of the financial system. Besides, an advanced financial system eases the transfer of revenues from production activities and export to productive investments. The influence of natural resource (NR) abundance on financial development (FD) is still an ongoing debate with conflicting results. However, this study applies a novel proxy for FD, which measures the efficiency, accessibility, and depth of the financial market and institutions. Therefore, the current study is a maiden attempt to explore the nexus between FD and NR abundance amidst globalization, human capital, and economic growth in ASEAN economies. Reliable panel econometric techniques, including second-generation unit root tests, Westerlund (2007) cointegration tests, and the Augmented Mean Group (AMG) estimator are employed on the data for the period 1990-2017. The preliminary tests affirm the existence of cross-sectional dependence, unit root, and cointegrating relationship among the variables. The findings from the study reveal that NR abundance reduces FD, while globalization, human capital and economic growth add to FD. A feedback causality exists between NR abundance and FD. Thus, this study argues that more investment to the manufacturing sector will ease the attainment of efficiency in financial sector accessibility and benefits from NR abundance.

**Keywords.** natural resource abundance; globalization; financial development; human capital; ASEAN; AMG.

**JEL Codes.** E44; N57; P48; Q32; Q33.

**DOI.** <https://doi.org/10.17979/ejge.2021.10.1.7202>

## 1. Introduction

Financial development (FD) is one of the strategies used by the World Bank to ensure poverty reduction and sustainable growth in developing countries. Loans and credits are the essential instruments adopted by the World Bank to actualize these objectives (Gokmenoglu and Rustamov, 2019). The World Bank directs these credits/loans to improve the private and financial sector, human and rural development, and public sector governance (World Bank, 2017). There is evidence in the literature that most resource-rich/dependent countries are barely financially developed (Frenkel 2012). More so, studies have revealed an inverse relationship between FD and natural resource (NR) abundance of resource-rich economies, but there is still no consensus, hence necessitating further probe to the nexus (Nathaniel et al. 2020c; Gylfason 2001; Auty 2003).

In recent times, resource-rich regions (like Africa, Asia, and Latin America) have witnessed minimal economic growth in relation to other regions with seemingly fewer NR (Khan et al. 2020). The link between lagging economic performance and NR abundance compared to economies with relatively few resources is termed “resource curse hypothesis” popularized by (Auty, 1993). The resource curse phenomenon has dominated recent policy and development discourse. Also, it remained an influential area of research for practitioners and economists, mostly from developing countries, after the 1980s. The intention was to challenge/refute the conventional idea of considering NR as a blessing (Xu et al. 2016; Apergis and Payne 2014 among others).

The Association of Southeast Asian Nations (ASEAN) founded in 1967, headquartered in Jakarta, Malaysia, is a regional grouping of ten (10) countries (the Philippines, Laos DPR, Cambodia, Brunei, Malaysia, Singapore, Myanmar, Thailand, Vietnam, and Indonesia) for security, economic, and political cooperation. The region had an average growth rate of 5.5% in 2018 (IMF, 2019). The 21<sup>st</sup> century was tagged ‘the Asian Century’ as economic growth was shouldered by Asia countries, and particularly countries in the ASEAN bloc (Nathaniel 2021; Nathaniel & Khan 2020). ASEAN is a resource-rich region. The regions NR include bauxite, iron, petroleum, landmass, copper, energy (natural gas, oil, and coal), fertile land, nickel, tin, freshwater, and timber, among others. ASEAN accounts for about 82% and 56% of the world’s total production of natural rubber and tin, respectively. With a growth rate of 5.2% and a collective GDP of 2.6 trillion USD, ASEAN has assumed the status of an important economic bloc (Nasir et al., 2019).

The primary objective of this study is to examine the effect of NR abundance, globalization, and human capital on FD in ASEAN. This study is super useful for ASEAN countries considering the fact that it is a resource-rich region and has witnessed significant growth over the years. Again, the region is opened to trade, which makes it globalized, but little or nothing is known as regards the influence of NR abundance, globalization, and human capital on FD in ASEAN. This was the motivation for this study. Thus, an adequate knowledge of the relationship between NR abundance and FD is required for better policy coordination and economic expansion. Hence, any impact of NR abundance on FD is likely to ease the pace of economic growth in ASEAN. In addition, exploring the relationship between FD and NR abundance will provide new insights for decision-makers in ASEAN to utilize NR more as a blessing other than a curse. A sound financial system is vital for the efficient utilization and sustainable use of NR and the stimulation of economic growth (Nathaniel et al., 2020e). FD is required to attain higher economic growth (Redmond and Nasir 2020; Sun et al. 2020; Nathaniel et al. 2020b; Nawaz et al. 2019). A developed financial sector facilitates the transfer of funds, stimulate savings, create investment opportunities, encourage corporate control, drives innovation, and promotes risk management (Murshed et al. 2020b; Gokmenoglu and Rustamov, 2019).

ASEAN is considered an economically dynamic region with laudable policies directed towards economic openness, heralding trade liberalization and globalization. Considerable globalization and natural resource consumption, together with persistent economic growth, necessitated the issue of FD. Globalization is an international phenomenon that economically and socially impacts

human lives, in terms of poverty reduction, and the financial well-being of the economy (Ahmed et al. 2020a). Evidence pertaining to the influence of globalization on the climate, economic growth, and inequality has been discussed in the literature, but the exact effect of globalization on FD has not been figured out (Murshed et al., 2020a). Globalization is becoming more and more important in ASEAN, which becomes a powerful promoter of its financial sector. Generally speaking, globalization can decrease the taxes and tariffs, and bring openness to trade and FD, which can boost economic growth (Ulucak & Khan, 2020). FD can decline the supporting costs of increasing financing networks, which could trigger enterprises to make more investment in buying new equipment (Umar et al., 2020).

This study adds to the literature in the following ways: (i) this is a maiden attempt to examine the impact of NR abundance on FD in ASEAN (ii) unlike previous studies, this study is the first to adopt the recently developed broad-based financial development index of the IMF to examine the FD-NR abundance nexus. This index is superior to those used by earlier studies in that, it considers the complex multidimensional nature of FD. It summarizes how developed financial institutions and financial markets are; in terms of access, depth, and efficiency. In addition, this study considered a more comprehensive human capital indicator which provides adjusted estimated returns to education for each country and covers labour market information. With these, the policy relevance of this study is assured. (iii) panel data have lots of issues (like serial correlation, heteroskedasticity, cross-sectional dependence (CD), heterogeneity, etc.) which could lead to inefficient and biased outcomes if ignored. The core of these issues is CD and heterogeneity (Dogan et al. 2020). This study, unlike previous studies, adequately deal with these issues to obtain robust estimates via advanced econometrics techniques. The Augmented Mean Group (AMG) estimator, Driscoll-Kraay (DK), and the Prais-Winsten regression (otherwise known as panel-corrected standard errors (PCSE) approach), have been applied to deal with these issues.

The study is arranged as follows: Section 2 presents the literature review which encompasses the theoretical framework and empirical review. Section 3 addresses the methodology. Results are presented and discussed in Section 4. Finally, Section 5 concludes.

## **2. Literature Review**

### *2.1. Theoretical Framework*

Theoretically, the channels through which NR abundance adversely affects FD has been highlighted by Beck (2002) who argued that NR sectors draw investment and skills away from financial sectors, concomitantly declining demand saving rates. In a similar gesture, Rajan and Zingales (2003) postulate the interest group theory of FD, which argued that existing powerful firms are always against FD by using their market power as an instrument to circumvent competition. In the presence of human capital, globalization, and economic growth, this study explores the nexus between FD and NR in ASEAN. FD is determined by NR, human capital, and

globalization which, in turn, affects economic growth (Yu et al. 2020; Nawaz et al., 2019). A sound financial system distributes NR wealth for lucrative investment projects that can promote growth (Shahbaz et al., 2018). NR could serve as an engine of growth and development, rather than the only driver of growth (Badeeb et al., 2017). Human capital enhances financial growth through the efficient utilization of NR (Tiba and Frikha, 2019). Human capital adds to the effective use of NR as well as the growth and stability of the financial system (Zaidi et al., 2019). An educated investor, as opposed to uneducated and unskilled people, can efficiently utilize financial resources (Hatemi-J and Shamsuddin, 2016).

## *2.2. Empirical Review*

According to the Classical resource abundance studies, NR is a blessing for the host countries. However, theories like the “Dutch disease” and “Resource curse,” have provided evidence that these resources (NR) could impede the economic growth of the countries concerned. Available studies affirmed that the blessings associated with NR abundance could transform to a curse amidst rent-seeking dependency, weak institutional management, low literacy rate, Dutch disease, and poor human capital development, among others (Nathaniel et al. 2020a; Ahmed et al. 2020a; Shahbaz et al., 2018a; Dwumfour and Ntow-Gyamfi, 2018). Besides, this “curse” is evidence in resource abundance economies. Khan et al. (2020) explored the impact of NR, technological innovations, and human capital on FD in China from 1987–2017. Their findings confirmed the negative impact of NR on FD in China. Also, trade openness, technological innovations, and human capital exact a positive impact on FD. The authors argued for the development of human capital and technological innovations to ensure the sustainable use of NR to enhance FD. Dwumfour and Ntow-Gyamfi (2018) discovered that NR has an unclear impact on FD in thirty-eight African countries. They attributed this to a weak institutional framework in the region. Institutions, especially political institution, could minimize the NR curse in developing economies by promoting sustainable resource use in resource-rich countries (Bhattacharyya and Hodler 2014; Mehlum et al., 2006; Humphreys et al. 2007). Guan et al. (2020) applied the FMOLS technique to investigate the NR-FD nexus in China while controlling for globalization, economic growth, and human capital. Analogous to the study of Khan et al. (2020), they discovered that NR is inimical to financial sector development, while globalization, economic growth, and human capital promote FD in China. Further findings revealed a one-way causality, in the long run, from NR, economic growth, and human capital to FD. This further corroborates the findings of Asif et al. (2020) for China.

Nevertheless, the majority of the recent studies affirmed that NR deteriorates FD in developing countries (Asif et al., 2020). There is also a growing literature on how NR promotes FD in high-income countries (Shahbaz et al., 2018a,b). Gokmenoglu and Rustamov (2019) examined the effect of NR on FD for selected countries, including Turkmenistan, from 1992 to 2017. Their findings confirmed that NR abundance plays a fascinating role in promoting FD in Azerbaijan, Kazakhstan, Turkmenistan, and Russia. Zaidi et al. (2019) investigated the effects of NR, globalization, and human capital on FD in 31 OECD countries from 1990 to 2016. They discovered

that economic growth, NR, globalization, capital formation, and human capital exact a positive impact on FD. Studies like (Bravo-Ortega and De Gregorio 2005; Behbudi et al. 2010; Marchand and Weber 2015; Sibel et al. 2015; Rickman et al. 2017; Khan et al. 2020) have shown the positive impact of human capital in promoting FD. Recent studies have also linked globalization and human capital to environmental degradation (Ahmed et al. 2021a,b; Ahmed et al. 2019; Ahmed et al. 2020a,b,c; Ahmed and Wang 2019)

Now, the reviewed studies point to inconsistent results as regards the nexus between NR and FD. Again, the majority of the studies are for a single country case, and there is/are no single study(s) on the ASEAN economies which should be an attractive case study considering the region's resource abundance, unprecedented growth, openness to trade, and budding financial sector. Therefore, there is a dire need to examine the NR-FD nexus for the ASEAN economies, including factors like human capital, globalization, and economic growth.

### 3. Methodology

#### 3.1. Model Construct and Data Source

From the above analogy, a framework has been developed to investigate the impact of NR abundance on FD in ASEAN by introducing human capital, economic growth, and globalization. The functional form of the model is given as:

$$FD_t = f(NR_t, HC_t, GB_t, GR_t) \quad (1)$$

where  $FD_t$ ,  $NR_t$ ,  $HC_t$ ,  $GB_t$ , and  $GR_t$  represent financial development, natural resource, human capital, globalization, and economic growth, respectively. We linearized and transformed Eq. (1) by taking the natural logarithm of the variables in line with the recent studies of Khan et al. (2020) and Sun et al. (2020) since log-linear models give reliable empirical results in elasticities (Meo et al., 2020a,b).

$$\ln fd_{i,t} = \xi_0 + \xi_1 \ln(nr)_{it} + \xi_2 \ln(hc)_{it} + \xi_3 \ln(gb)_{it} + \xi_4 \ln(gr)_{it} + \mu_{it} \quad (2)$$

where  $i = 1, 2, 3, \dots, N$  for individual countries.  $t = 1, 2, 3, \dots, T$  for time. Detailed information on the variables are presented in Table 1. The data for the study spans 1990-2017 for eight (8) ASEAN countries, a decision constraint by data availability.

**Table 1.** Description of Variables.

S/N	Variables	Measurement	Source	Supporting studies
1.	Natural resource	natural resource rent (% of GDP)	WDI (2019)	Sun et al. (2020)
2.	GDP per capita	in constant 2010 USD	WDI (2019)	Nathaniel et al. (2020a)
3.	Globalization	Overall KOF index	KOF (2017)	Guan et al. (2020)
4.	Financial development	Broad-based index of financial depth access and efficiency	IMF (2016)	Kassouri & Altıntaş (2020)
5.	Human capital	human capital index	Penn World Table	Khan et al. (2020)

**Sources:** Author's compilation.

### 3.2. Econometric Procedure

#### 3.2.1. Cross-sectional Dependence and Unit Root Tests

It is always necessary to examine whether individual units in the panel are independent or not, as this will help to overturn biased estimates (Omojolaibi and Nathaniel 2020; Adedoyin et al. 2020; Adeleye et al. 2020). International treaties, trade agreements, and spillover effect are the possible causes of CD (Chudik et al., 2016); and the ASEAN countries have signed more than three hundred and fifty agreements after its inception, and are also signatories to various international agreements. Therefore, it is possible that the cross-sections are not independent. This study applies the Pesaran (2004) tests to investigate the dependence/independence of the cross-sections. The tests equation is given as:

$$CD = \sqrt{\frac{2T}{N(N-1)}} \left( \sum_{i=0}^{N-1} \sum_{j=i+1}^{N-1} \rho_{ij} \right) \quad N(0,1),$$

where  $N$  and  $T$  are the cross-sections and time horizon, respectively.  $\rho_{ij}$  stands for cross-sections correlation of error between  $i$  and  $j$ . This test is suitable for this study due to the nature of our panel, given that  $T$  (time dimension)  $>$   $N$  (cross-section). In a situation where CD exist, second-generation tests are preferred. As such, the CADF (Cross-sectionally augmented ADF) and CIPS (Cross-sectionally augmented IPS) of Pesaran (2007) are applied in this study. The CADF test equation is given as:

$$\Delta y_{it} = \Delta \varphi_{it} + \beta_i x_{it-1} + \rho_i T + \sum_{j=1}^n \theta_{ij} \Delta x_{i,t-j} + \varepsilon_{it},$$

where  $\varphi_{it}$ ,  $x_{it}$ ,  $\Delta$ ,  $T$  and  $\varepsilon_{it}$  represent the intercept, study variables, difference operator, time span, and disturbance term respectively.  $\rho_i$  is the proxy of the unobservable common factor, which Pesaran (2007) introduced to eliminate CD emanating from common shocks that might affect all the units. Previous studies have applied these tests (CIPS and CADF) amidst CD in the dataset (Murshed 2020; Saint Akadiri et al. 2020).

#### 3.2.2. Cointegration and Parameter Estimation

Tests for long-run relationship are important for non-stationary variables, especially when variables are integrated at the same order, let's say  $I(1)$ . The study preferred the Westerlund (2007) cointegration test because it has a greater explanatory power, and also robust even in the presence of CD and nuisance from endogeneity. The test constructs four statistics; the group mean statistics,  $G_\tau = \frac{1}{N} \sum_{i=1}^N \frac{\hat{\alpha}_i}{SE(\hat{\alpha}_i)}$  and  $G_\alpha = \frac{1}{N} \sum_{i=1}^N \frac{T \hat{\alpha}_i}{\hat{\alpha}_i(1)}$ , and the panel mean tests,  $P_\tau = \frac{\hat{\alpha}_i}{SE(\hat{\alpha}_i)}$  and  $P_\alpha = T \hat{\alpha}$ . The former examines cointegration of the whole panel, while the latter explores the existence of cointegration in at least one of the units.

Since cointegration does not suggest long-run impact (Li et al. 2020), the AMG estimator,

popularized by Bond & Eberhardt (2013), is applied for parameter estimation, while the DK and PCSE were adopted to confirm the consistency of the AMG results. The AMG estimator involves a two-step procedure:

**AMG - Stage 1:**  $\Delta y_{it} = \alpha_i + b_i \Delta x_{it} + c_i f_t + \sum_{t=2}^T d_t \Delta D_t + e_{it}$

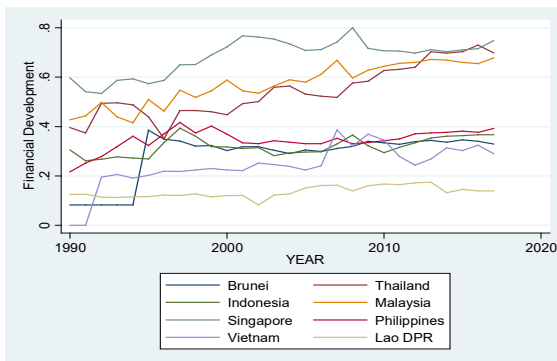
**AMG - Stage 2:**  $\hat{b}_{AMG} = N^{-1} \sum_{i=1}^N \hat{b}_i$

$x_{it}$  and  $y_{it}$  are the observables.  $f_t$  represents the unobserved common factor. The country-specific estimates of coefficients, the AMG estimator, and the time dummies are respectively  $b_t$ ,  $\hat{b}_{AMG}$ , and  $d_t$ . This test was preferred because it suits the nature of our panel ( $T > N$ ), it adequately addresses the two core panel data issues (CD and heterogeneity) and shows country-wise results which could inform the alignment of policies to suit countries peculiarities. The AMG is also appropriate for nonstationary data typical of our panel.

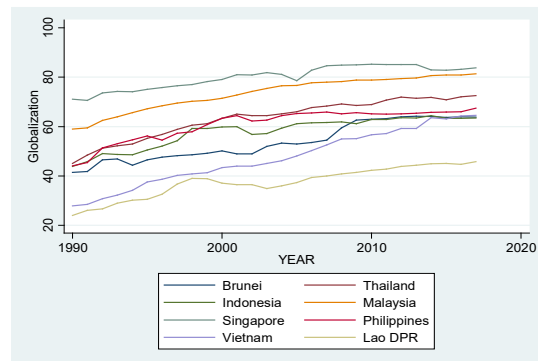
**4. Results and Discussion**

This section presents the trend of the variables, descriptive statistic and correlation, CD test, unit root, cointegration, and the parameter estimation tests (AMG, PCSE, and DK). From Figure 1, Malaysia, Thailand and Singapore are the most financially developed countries in ASEAN, while Laos DPR is the least developed. As shown in Figure 2, all the countries are getting increasingly globalized. However, Singapore is the most globalized, while Lao DPR is the least globalized. In Figure 3, NR rent is higher in Brunei compared to the other ASEAN countries.

**Trend of the Variables**



**Figure 1.** FD in ASEAN.



**Figure 2.** Globalization in ASEAN.



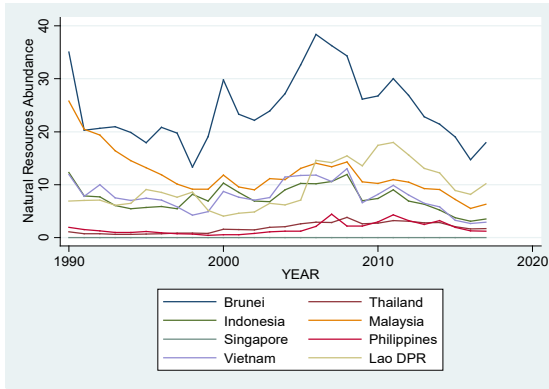


Figure 3. NR Abundance in ASEAN.

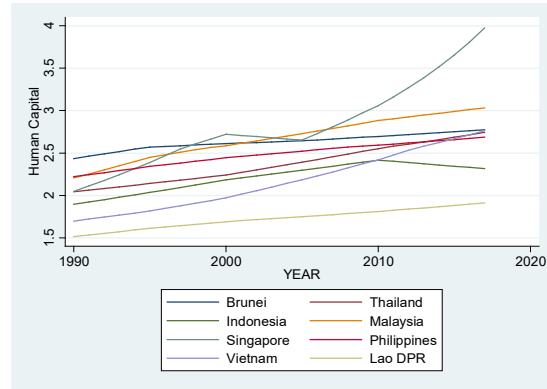


Figure 4. Human Capital in ASEAN.

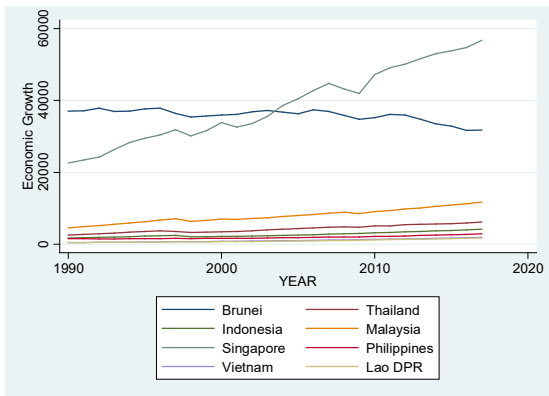


Figure 5. Economic Growth in ASEAN.

Singapore has witnessed more economic expansion (in terms of GDP growth) and human capital development in relation to the remaining countries in ASEAN as shown in Figure 4 and Figure 5 respectively.

Table 2. Descriptive Statistic and Correlation.

	FD	NR	GB	GR	HC
Mean	0.390	8.064	59.25	1163	2.384
Max.	0.799	38.37	85.34	5674	3.947
Mini.	0.001	0.000	24.00	433.2	1.512
Std. D	0.190	8.081	14.73	1.547	0.416
<b>Correlation</b>					
FD	1				
NR	-0.367	1			
GB	0.329	-0.284	1		
GR	0.409	0.263	0.422	1	
HC	0.170	-0.007	0.384	0.634	1

Source: Author's computation.

Table 2 reports the properties and correlation of the variables. Economic growth has the highest average while FD has the least. These findings reveal that economic growth has been increasing faster than FD in ASEAN countries. FD and NR have a minimum value of 0.001 and 0.000, respectively. All the variables are positively associated with FD, except NR. Economic growth and human capital show a positive correlation with globalization, while globalization is negatively associated with NR.

**Table 3.** Cross-sectional Dependence Result.

<i>Variables</i>	<i>Breusch-Pagan LM</i>	<i>Pesaran scaled LM</i>	<i>Pesaran CD</i>
lnEF	621.3251 <sup>a</sup>	21.56473 <sup>a</sup>	15.57385 <sup>a</sup>
LnGR	345.3425 <sup>a</sup>	45.67483 <sup>a</sup>	45.67464 <sup>a</sup>
LnGR	153.4738 <sup>a</sup>	43.57382 <sup>a</sup>	23.68937 <sup>a</sup>
LnHC	214.4636 <sup>a</sup>	98.56785 <sup>a</sup>	44.64445 <sup>a</sup>
LnNR	327.3524 <sup>a</sup>	67.78294 <sup>a</sup>	34.76589 <sup>a</sup>

**Source:** Author's computation. **Note:** 'a' represents significance at 1% level.

Table 3 confirms the existence of CD across the three tests. Table 4 revealed that the variables are non-stationary at  $I(0)$ , but  $I(1)$ . Therefore, with  $I(1)$  variables, cointegration is a possibility. The Westerlund (2007) test affirms cointegration as  $G_a$ ,  $P_t$ , and  $P_a$  are significant. Table 5 reports the AMG, DK, and PCSE results. The focus is on the AMG results. The DK and PCSE are applied to check the robustness of the AMG results. From the findings, NR abundance reduces FD. This is consistent with the findings of Sun et al. (2020) and Guan et al. (2020) for seven emerging economies and China, respectively.

**Table 4.** Unit Root and Cointegration Results.

<i>Variables</i>	<i>Level</i>		<i>First Difference</i>	
	<i>CIPS</i>	<i>CADF</i>	<i>CIPS</i>	<i>CADF</i>
FD (log)	-2.621	10.62	-5.387 <sup>a</sup>	21.21 <sup>a</sup>
NR (log)	-2.779	11.32	-5.440 <sup>a</sup>	25.12 <sup>a</sup>
HC (log)	-1.528	11.82	-1.911 <sup>b</sup>	23.56 <sup>a</sup>
GB (log)	-1.782	10.67	-4.314 <sup>a</sup>	28.12 <sup>a</sup>
GR (log)	-0.733	11.92	-2.624 <sup>a</sup>	20.43 <sup>a</sup>
<b>Westerlund (2007)</b>	<b>Gt</b>	<b>Ga</b>	<b>Pt</b>	<b>Pa</b>
	-3.016 <sup>a</sup>	-	-7.474 <sup>a</sup>	-9.783 <sup>b</sup>
		8.782		

**Note:** <sup>a</sup> and <sup>b</sup> represent statistical significance at 1% and 10% levels, respectively.

**Source:** Author's computation.

This suggests a trade-off between both variables. This finding could be attributed to the fact that ASEAN countries are still emerging, with weak institutional quality, and difficulty in efficiently managing the available NR. As such, the resource curse phenomenon, as it relates to FD, still exist. Another plausible reason is the increase in NR exports which decline the number of investments channelled to the manufacturing sector in ASEAN. More so, crowding-out investment from the manufacturing and industrial sector, as well as, inadequate infrastructure could be the other potential reasons for a decrease in FD in ASEAN. Further findings showed that human capital and globalization promote FD, though the influence of the former is not significant. Human capital is vital for FD. It helps in efficient utilization of NR, promotes financial inclusion and financial literacy, which contribute to FD. Besides, education is necessary for FD. An uneducated human capital is unaware of the mechanism of the financial sector, hence it may contribute little or nothing to its development. More human capital triggers productivity and skill-building economies, which is associated with more opportunities in the financial sector. However, the findings confirmed that

human capital is not yet at a desirable level to efficiently contribute to FD in the ASEAN bloc.

**Table 5.** AMG, DK, and PCSE Results.

<i>Variables</i>	<i>AMG</i>	<i>DRISCOLL/KRAAY</i>	<i>PCSE</i>
NR (log)	-0.010 (-3.91) <sup>a</sup>	-0.001 (-9.11) <sup>a</sup>	-0.019 (-4.20) <sup>a</sup>
HC (log)	1.246 (0.21)	0.080 (1.31)	0.209 (1.56)
GB (log)	0.123 (3.45) <sup>a</sup>	0.538 (10.5) <sup>a</sup>	1.877 (14.8) <sup>a</sup>
GR (log)	0.327 (2.96) <sup>a</sup>	0.009 (6.88) <sup>a</sup>	0.011 (0.49)
_cons.	-2.219 (-3.35) <sup>a</sup>	-1.786 (-7.60) <sup>a</sup>	-8.389 (-20.8) <sup>a</sup>

**Source:** Author's computation. **Note:** 'a' represents significance at 1% level. The z/t-values are in parenthesis.

Therefore, human capital development should be top on the agenda of policymakers in ASEAN, especially when enacting policies that relate to financial sector development. On the other hand, globalization opens up an economy. It allows for the importation of advanced technologies which could boost manufacturing, promote gainful trade, enhance productivity, and ensure FD. This is in line with the findings of Zaidi et al. (2019) and Guan et al. (2020). Just like globalization, economic growth adds to FD in ASEAN, consistent with the findings of (Nawaz et al. 2019; Sun et al. 2020). This suggests that economic expansion in ASEAN have created jobs and resulted in increased wage (purchasing power), leading to higher investment and consumption which promotes financial services, and hence increase FD.

**Table 6.** Country-Specific AMG Results.

<i>Countries</i>	<i>lnNR</i>	<i>lnHC</i>	<i>lnGB</i>	<i>lnGR</i>
Brunei	-43.1 (-1.96) <sup>b</sup>	34.1 (4.43) <sup>a</sup>	-1.31 (-0.96)	1.19 (0.49)
Thailand	-0.11 (-1.31)	0.62 (5.88) <sup>a</sup>	0.40 (3.09) <sup>a</sup>	-0.80 (-1.56)
Indonesia	0.05 (0.90)	-3.09 (-3.91) <sup>a</sup>	0.69 (1.68) <sup>c</sup>	0.07 (0.27)
Malaysia	-0.00 (-0.13)	-0.34 (-1.13)	0.75 (8.23) <sup>a</sup>	0.02 (2.07) <sup>b</sup>
Singapore	-0.13 (-3.04) <sup>a</sup>	-0.34 (-1.13)	0.10 (7.23) <sup>a</sup>	1.21 (3.89) <sup>a</sup>
Philippines	-0.11 (-3.30) <sup>a</sup>	-9.84 (-1.46)	1.11 (1.79) <sup>c</sup>	0.04 (3.34) <sup>a</sup>
Vietnam	0.00 (2.08) <sup>b</sup>	2.85 (0.61)	-0.27 (-4.21) <sup>a</sup>	1.87 (3.34) <sup>a</sup>
Lao DPR	0.10 (1.65) <sup>c</sup>	-22.1 (-2.81) <sup>a</sup>	0.32 (0.68)	1.84 (1.93) <sup>b</sup>

**Source:** Author's computation. **Note:** 'a', 'b', and 'c' represent significance at 1%, 5%, and 10% levels respectively. The z/t-values are in parenthesis.

The DK and PCSE results affirmed the outcome of the AMG estimator. Therefore, similar explanation applies. In Table 6, NR improves FD only in Vietnam, Laos DPR, and Indonesia. The influence of human capital is mixed, but it promotes FD in Brunei, Thailand, and Vietnam. Globalization harms FD in Brunei and Vietnam, while economic growth is not compatible with FD in Thailand.

**Table 7.** Dumitrescu & Hurlin (DH) (2012) Results.

<b>Null Hypothesis</b>	<b>W-stat.</b>	<b>Zbar-stat.</b>	<b>Probability</b>	<b>Decision</b>
<i>lnNR</i> → <i>lnFD</i>	10.01	9.987	0.000	Bidirectional
<i>lnFD</i> → <i>lnNR</i>	9.376	7.908	0.000	causality
<i>lnHC</i> → <i>lnFD</i>	7.650	5.783	0.003	Unidirectional
<i>lnFD</i> → <i>lnHC</i>	2.988	1.345	0.299	causality
<i>lnGB</i> → <i>lnFD</i>	8.910	7.557	0.000	Bidirectional
<i>lnFD</i> → <i>lnGB</i>	5.382	4.185	0.001	causality
<i>lnGR</i> → <i>lnFD</i>	5.780	2.962	0.003	Bidirectional
<i>lnFD</i> → <i>lnGR</i>	4.799	2.278	0.023	causality
<i>lnNR</i> → <i>lnGR</i>	6.789	4.129	0.000	Unidirectional
<i>lnGR</i> → <i>lnNR</i>	2.560	1.519	0.212	causality
<i>lnGB</i> → <i>lnGR</i>	1.078	0.347	0.565	No
<i>lnGR</i> → <i>lnGB</i>	1.346	0.667	0.765	causality

**Source:** Author's computation. **Note:** '→' shows the direction of causality.

The results in Table 7 suggests a feedback causality between NR and FD, globalization and FD, and between economic growth and FD. This further confirms the link between FD and NR, and why NR and economic growth policies should consider/be connected with policies that relate to financial sector development, vice versa.

## 5. Conclusion and policy implications

This study examined the nexus between FD and NR for eight (8) ASEAN countries from 1990- 2017. The preliminary estimation procedures involve the investigation of possible CD among the cross-sections. The three CD tests exposed the presence of CD which necessitated the adoption of robust second-generation unit root and cointegration tests to ameliorate the possible adverse effects associated with CD. Besides, the existence of a long-run relationship among the variables informed the choice of the AMG estimator. The causal direction between variables is investigated by using the DH panel causality method. The AMG results showed that human capital, globalization, and economic growth promote FD. On the flipside, NR abundance reduces FD, which confirms the resource curse hypothesis for ASEAN economies. The country-wise results are mixed. However, economic growth harms FD only in Thailand. These findings necessitate relevant policy directions.

In line with these findings, this study argues that more investment in the industrial and manufacturing sectors will help ASEAN economies attain efficiency in financial sector accessibility, efficiency, depth, and enhance the benefits from their NR abundance. The most serious issue is to manage NR to support FD; NR can be transformed into value-added exports to enhance export revenues and promote FD. Therefore, revisiting NR abundance utilization for a more productive output is recommended. Since human capital and economic growth trigger FD, policies regarding sustainable growth should be maintained and the formation of human capital should be focused. More so, there is a dire need to develop human capital in ASEAN economies. An investment in human capital will enhance the available labour market with skills to direct the benefits from trade to the financial sector. It will also promote financial inclusion, and help in the efficient utilization of NR for FD. The estimates of the causality test indicate a feedback causality

between economic growth and FD, globalization and FD, and between NR and FD. These further confirm the link between NR, globalization, and FD in the ASEAN bloc. Thus, policies to reduce customs duties, taxes, and trade restrictions, and boosting foreign investment would be the right option in the ASEAN region as globalization increases FD. However, trade and foreign investment in environmentally friendly technology should be encouraged to reap the economic and environmental benefits of globalization. In conclusion, future investigation of the interaction between NR and FD in different countries/regions may lead to more generalizable results, as financial policies and NR abundance vary from country to country/region to region. Future studies may need to incorporate the moderating role of technical innovations and governance with NR to re-examine FD using other advanced measures.

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