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THE ROLE OF DOMESTIC DEMAND IN INDONESIAN ECONOMIC GROWTH

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Abstract

The increasingly frequent financial crises have developed the thought to rethink the export-led growth strategy (ELG) to shift to domestic-demand-led growth (DDLG). We employed growth accounting approach to determine DDLG and the autoregressive distributed lag (ARDL) bound test to cointegration to determine the effect of domestic demand on economic growth in the closed and opened economic system. The study revealed that the Indonesian economy was characterized by DDLG in the period 2000 - 2018, and in the open economic system, domestic demand and export have a positive and significant effect on economic growth both in the short- and long-run.

Keywords: Domestic Demand led Growth; Global Financial Crises; External Financial Shock; ARDL bound test to cointegration; Indonesian Economic.

JEL:E13; O11; O44

1. Introduction

Globalization which has the backbone in the technological advancements of information and communication, has sped up economic inter-linkages among countries that have changed the pattern of production from a centralized system to become regionally fragmented and have encouraged widespread economic integration in the form of regional trade agreements (RTA) to facilitate mobilization of capital, goods and services (Baldwin, 2006; Brynjolfsson & McAfee, 2014; Baldwin & Lopez-Gonzalez, 2015; Schwab, 2016; Morkovina et al., 2016). The phenomenon of globalization has contributed to the prosperity of the global economy through trade liberalization and capital transfer, especially in East Asia (Asian Development Bank [ADB], 2017). However, the financial crisis has revealed the risk of financial integration. Global economic integration has made developing countries' growth relies more than ever on access to international markets (Palley, 2011). On the other hand, economic inter-linkages that have resulted in financial crises in one country (especially in developed countries) will have a negative contagion impact in various countries in developing and developed economies (Logut, 2015; Marin, 2019). Financial crises take place more often and with increasingly shorter intervals from

one to another. Between 1901 - 1990 (in 90 years), there were 11 financial crisis events, but in the last 30 years (1991 - 2018), the world¹³ had experienced 17 financial crises, 10 of which occurred in the 21st century (2001-2018). The next financial crisis is probably around the corner—we do not know from where, according to Detrix (2017).

The COVID-19 pandemic (during 2020) has, with alarming speed, delivered a global economic shock of enormous magnitude, leading to steep recessions in many countries and tipping many millions⁶ back to poverty. Emerging markets and developing economies (EMDEs) have weak health systems; those that rely heavily on global trade, tourism, or remittances from abroad; and those that depend on commodity exports will be particularly hard-hit (World Bank, 2020). The financial crisis source is no longer solely from the financial sector itself but also from external factors in the form of zoonotic disasters¹⁴ that spread the deadly virus. Following the development of the flu since the Spanish Flu of 1918 followed by Asian Flu (1957) and Hong Kong Flu (1968) and since 1997 Bird Flu (H5N1 and H7N7), SARS (2003), Mexican Flu (H1N1) in 2009 and Corona (Covid -19) in 2020, it showed that biological disasters spread by viruses in the form of various types of flu revealed a high frequency of the emergence of new types of viruses with shorter periods. On this basis, Osterhaus (2005: 151) warns that "pandemic flu is on our doorstep".

The external shock caused by the financial crisis has deteriorated not only developing economies but also developed ones (Popkova *et al.*, 2016), especially ASEAN⁵⁰ which has enjoyed high economic growth in the last three decades because of intra-regional trade and its economic growth dependence mainly on international trade, especially export (ADB, 2017). After the 2008/2009 global financial crisis, many countries returned to pay attention to domestic demand as their economic base to shift economic policy to reduce the country's overdependence on external demand and foreign capital (Felipe & Lim, 2005; Yeah, 2017; Saçlam&Egeli, 2018).

Long before, Hsu (1972) had suggested the critical role of domestic demand⁵¹ on export performance. Domestic demand and trade (exports) were not seen as 'either-or' menu choices but rather to optimize the country's potential growth and strengthen national competitiveness. This argument is in line with the conclusion of the study of Felipe & Lim (2005), which states that the more successful development phase associated with significant investment increases and capital accumulation and significant export growth that brought about trade surpluses or reductions in trade deficits. As shown by the PRC (People Republic of China) and India mid-2000, the two countries experienced the best periods when domestic demand and exports exhibit significant continuous growth or improvements.

This study aims to investigate: (i) whether, in general, Indonesia follows the export-led growth (ELG) or domestic-demand-led growth strategy (DDLG), (ii) the effect of the domestic demand component (C/household consumption, G/government expenditure, I/domestic investment) on Indonesia's economic growth in a closed economic system and the causal relationship between variables, (iii) the

influence of domestic demand and trade in an open economic system on Indonesia's economic growth and the causal relationship between variables.

2. Literature Review

Domestic demand is a closed economic component of Keynes' three sectors comprising private consumption, government consumption and investment of private sector, famous in the macroeconomic textbook with the symbols C, G and I (Mankiew, 2016, for example). Hsu (1972) expressed the vital role of domestic demand on export performance, including: (i) increasing domestic demand for new investments, thanks to externalities and increasing output rates with new technologies, (ii) domestic demand tested the new product's design, quality, and technical qualifications before sending them for international trade competition, (iii) it is cheaper to test the first reaction of consumers and problems about the new products in the domestic industry, and (iv) domestic demand is the primary indicator of efficiency in the economy with the increasing amount of industry output.

On that basis, Saglam&Egeli (2018) argues that the "infant industry", which is entitled to protection, basically relies on domestic demand as a market to serve the learning process towards industries that have economies of scale and efficiency. After the industry is strong enough, the door open to free trade to compete with products from outside or penetrate the world market. China successfully implemented this strategy until 2001, when it entered the WTO (Tsen, 2010).

The development of thoughts on the assessment of the importance of domestic demand recently is a response to the global financial crisis motivated by Palley (2002), who identifies the negative impact of export-led growth strategy (ELG), namely: (i) hampering growth and development of the domestic market, (ii) forcing fellow developing countries to compete to the bottom among themselves, (iii) it puts workers in developing countries in conflict with workers in developed economies, (iv) international trade blamed for financial instability by creating an overinvestment boom, (v) the overemphasis on international markets could aggravate the deterioration in terms of trade of developing economies in the long run, and (vi) it reinforces the dependency of developing countries on the developed economies.

In short, export-oriented economies are very dependent on foreign demand. However, if there is a recession in the international market, developing countries will experience slowing economic growth. That is why ELG received criticism that it suffers from a fallacy of composition; that is, it assumes that all countries can grow by depending on demand growth in other countries (Palley, 2002; Felipe & Lim, 2005; Tsen, 2010).

Palley promotes domestic-demand-led growth (DDLG) as a new paradigm of development (Palley, 2002 and 2011). On the other hand, Felipe & Lim (2005) empirically concluded that it was not the export-led growth strategy contributing to crises in Asia 1997. However, instead, it promoted debt-financed domestic demand growth at the expense of net export, i.e. increasing trade deficit.

Renewed focus on domestic demand-led growth strategies among the export-oriented Asian economies is a reaction to the prolonged weakness in the advanced economies (US, Japan and European Union) in the aftermath of the 2008/2009 global financial crises (Yeah, 2017). Similar views also developed among countries in the transition of Europe (Saglam&Egeli, 2018), Latin America (Alvarado, Ochoa-Jimenez, & Garcia-Tinisaray, 2018) and Africa (Keho, 2018). Likewise, all studies concluded that a shift in strategy from export-led growth (ELG) to DDLG is not an 'either-or' menu choice. Even Palley (2002) as a prominent figure in promoting DDLG, thinking that developing countries must still participate in exports in order to obtain foreign exchange to finance imports that are considered more efficient than debt abroad (Tsen, 2010 and Felipe & Lim, 2005 also share the similar view). For this reason, Lian (2004) introduces the term "dual track" strategy: relying on external demand (first track) and simultaneously developing domestic demand and supporting domestic enterprise (second track).

Felipe & Lim (2005) were the first to introduce the DDLG criteria, followed by other researchers such as Wong (2008), Tsen (2010), Yeah (2017) and Saglam&Egeli (2018), i.e. (i) if GDP (Gross Domestic Product) grows as domestic demand is growing and net exports are deteriorating, or (ii) domestic demand and net exports are growing; however, domestic demand is growing faster. The relationship between domestic demand and economic growth is not monotonic (Keho, 2018 and the literature cited therein): There possibility variations of that relationship is (i) domestic demand caused economic growth, (ii) economic growth caused domestic demand, and (iii) there is a bi-directional causal relationship. Considering that domestic demand consists of three components, there is a possibility that the overall domestic demand relationship and the relationship between the variables forming domestic demand and economic growth show different causality, as found by Wong (2008) in five ASEAN countries (The Association of Southeast Asian Nations). There is Granger causality between either private consumption or government consumption and GDP per capita; however, the relationship between investment and economic growth is less conclusive. In China, a bi-directional causality applies between domestic demand and economic growth (Tsen, 2010). There is one direction causality from domestic demand to economic growth in Cote d'Ivoire, both private consumption and government consumption to GDP (Keho, 2018). In Bangladesh (Islam & Hossain, 2015), household consumption and export influence economic growth in the short- and the long-run. Economic growth impacts domestic demand in the short-run, but in the long-run economic growth has an impact only on household consumption. Whereas in Brazil (Bakari, Fakraoni&Tiba, 2019), domestic investments have bi-directional causality with economic growth.

All studies mentioned above emphasize that it is a better macroeconomic policy to have the balance between ELG and DDLG strategies for sustainable economic growth because DDLG strategies can help to offset the weak export demand prevailing during and post-financial crisis periods. The complementarity of the two strategies is a reverse mirror of other benefits and disadvantages strategy.

Compared to ELG strategies, DDLG offers the following advantages (Yeah, 2017): (i) reduce vulnerability to a global demand shock. Given the increasing volatility and unpredictability of international markets and doubts about advanced economies' ability to absorb all exports from developing countries, a DDLG strategy will lead to more stable and sustainable growth, (ii) prospects for a better quality of growth. The pursuit of export growth to the extreme of mercantilism where trade is viewed as a zero-sum game may entail sacrificing labour and human rights and environmental standards, leading to a worse outcome than a DDLG approach that takes into consideration such concerns, (iii) development of a more balanced economy and full utilization of resources. The production of goods and services that caters to foreign demand tends to be highly concentrated, leading to unbalanced growth and more pronounced income inequality. A DDLG strategy, on the other hand, can lead to more optimal utilization of resources.

Studies related to the relationship between domestic demand and economic growth in the sense of the relationship between the four components of aggregate expenditure and economic growth have so far not existed for Indonesia's case. Attention was paid more to government expenditure on economic growth, both at the national level (e.g. Anwar, Sriyan, & Shidiqie, 2020) and at the regional level by Faisol et al. (2018) for East Java Province. These studies only looked at government expenditure either partially or simultaneously with other variables besides the aggregate expenditure component on economic growth without cointegration testing. Rafiy et al. (2018) employed an error correction model (cointegration analysis) to determine the effect of consumption spending and investment on Indonesia's economic growth and revealed that there were the long- and short-run effect of consumption spending on economic growth, while the effect of investment on economic growth is not significant.

3. Data and Method

To investigate the existence of domestic-demand-led growth (DDLG), Felipe & Lim (2005) uses a demand-side growth accounting approach. This method compares domestic demand growth (in aggregate and per component) and export growth, each weighted by their contribution to Gross Domestic Product (GDP). There is DDLG if domestic demand is growing and net exports are deteriorating (becoming a smaller positive number or more significant negative number) as GDP growth is positive. Related to this method, Felipe & Lim (2005: 5) emphasizes that "the demand side growth accounting and the stances exercises are not, strictly speaking, an economic model in itself (or based on a model), so no causal inferences should be drawn". The influence and causality relationship between domestic demand and export on GDP requires a different method.

In order to determine the effect of one variable on another, cointegration and error correction models are superior to the traditional regression method for the following reasons (Hashim & Still, 2014): (i) regression techniques make assumptions about long-run theoretical relationships between the variables and

assu³³e which variables are leader and follower. However, cointegration techniques test the long-run theoretical relationship between the variables and test the Granger-causality between variables, (ii) most finance variables are non-stationary (according to Anwer& Sampath, 1997: 4, "most of the macroeconomic series are non-stationary"). This means that performing ordinary regression on variables will render the results misleading, as statistical tests such as t-ratio and F-statistics are not statistically valid when applied to non-stationary variables. Performing regression on the differenced form of these variables will solve one problem, but the regression of variables in their differenced form will effectively remove the long-term trend. Thus, the differenced regression variables only capture short term, cyclical or seasonal effects. The regression in differenced forms is not testing the long term, or theoretical relationship, (iii) traditional regression presumed the causality, whereas, in cointegration, the data proved it empirically.

One of the cointegration analysis models is the⁴⁰ autoregressive distributed lag (ARDL) bound test to cointegration. Referring to Pesaran, Shin, & Smith (2001) ARDL bounds testing approach provides efficient and reliable results once a single equation cointegration relation exists between the variables. The Granger procedure also tests the direction of causality within the vector error correction model (VECM). If a set of variables is cointegrated, they must have an error correction (error correction term, ECT). The advantage of VECM is the reintroduction of the⁷ formation lost by differencing time series. This step is fundamental to investigate the short-run dynamics and the long-run equilibrium. ARDL bound test to cointegration is increasingly popular and widely used recently due to its various properties (Furuoka, 2018; Koyuncu& Unver, 2018; Dritsaki&Stamatios, 2019). The advantages of using the ARDL bound test to cointegration model include: (i) this model is considered superior for small samples, (ii) the series does not need to be integrated at the same level and at the same time it is enough not to be integrated in order two or more, and (iii) this method allows to use different lag-lengths of series to estimate simultaneously short-run and long-run coefficients (Pesaran& S³¹n, 1999; Pesaran et al., 2001). Through a simple transf⁷ormation, the ARDL model can derive a dynamic error correction model (ECM) that integrates the short-run dynamic and the long-run equilibrium.

Referring to Asteriou& Hall (2007: 204), long-term equations with lag p formulated as equation (1). With lag p , the period required for changes in the independent variable (X_t) to affect the dependent variable (Y_t) is $p + 1$ period.

$$\begin{aligned}
 Y_t &= \alpha + \beta_0 X_t + \beta_1 X_{t-1} + \beta_2 X_{t-2} + \dots + \beta_p X_{t-p} + \pi_t \\
 &= \alpha + \sum_{j=0}^p \beta_j X_{t-j} + \pi_t
 \end{aligned}
 \tag{1}$$

The ARDL¹² test to cointegration approach involves two steps (Pesaran, Shin & Smith, 2001). The first step is to investigate the existence of a long-term relationship between all variables in the estimated equation. The long-run relationship between

GDP and domestic demand components in a closed economic system (three sectors) is formulated as follows:

$$(2) \quad GDP_t = \beta + \phi_1 HHC_t + \phi_2 GOV_t + \phi_3 INV_t + \varepsilon_t$$

Where GDP_t is the real GDP (constant 2010 in billion Rupiahs), HHC is the real household consumption (in billion Rupiahs, 2010 = 100), GOV is government expenditure (in billion Rupiahs, 2010 = 100), and INV is private investment, i.e. domestic capital formation (in billion Rupiah, 2010 = 100). All data is transformed into logarithmic form and covers the period 2000 - 2018.

The ARDL bound test to cointegration model, which is an unrestricted ECM (error correction model) for equation (2), is formulated in equation (3).

$$(3) \quad \Delta GDP_t = \beta_{01} + \gamma_{11} HHC_{t-1} + \gamma_{21} GOV_{t-1} + \gamma_{31} INV_{t-1} + \sum_{i=1}^p \phi_{1i} \Delta HHC_{t-i} + \sum_{i=1}^q \phi_{2i} \Delta GOV_{t-i} + \sum_{i=1}^r \phi_{3i} \Delta INV_{t-i} + \sum_{i=1}^s \phi_{4i} \Delta GDP_{t-i} + \varepsilon_{1t}$$

⁴³
p, q, r and s are the optimal lags of the ARDL models. The bound testing procedure is based on the joint F-statistic that tests the null hypothesis of no cointegration:

Ho: $\gamma_{11} = \gamma_{21} = \gamma_{31} = 0$, against the alternative Ha: $\gamma_{11} \neq \gamma_{21} \neq \gamma_{31} \neq 0$

Referring to Pesaran et al. (2001), there is cointegration if the F-statistic is greater than the upper critical bound (UCB). Decisions about long-term relationships is inconclusive if the F-statistic value lies between a lower critical value (lower critical bound = LCB) and a higher critical value (UCB), while a value smaller than LCB indicates the absence of a long-term relationship. ⁴⁶ See, e.g. Acaravci & Ozturk, 2012; Shahbaz & Rahman, 2012). Suppose there is evidence of a long-run relationship ⁴⁷ (cointegration) between the variables. In that case, the following steps are to estimate the long run and the short-run models as represented in equation (4) and (5).

$$(4) \quad GDP_t = \beta_1 + \sum_{h=1}^{p1} \gamma_{1h} GDP_{t-h} + \sum_{i=0}^{q1} \gamma_{1i} HHC_{t-i} + \sum_{j=0}^{r1} \gamma_{1j} GOV_{t-j} + \sum_{k=0}^{s1} \gamma_{1k} INV_{t-k} + \varepsilon_{1t}$$

$$\Delta GDP_t = \beta_2 + \sum_{h=1}^{p2} \gamma_{2h} \Delta GDP_{t-h} + \sum_{i=0}^{q2} \gamma_{2i} \Delta HHC_{t-i} + \sum_{j=0}^{r2} \gamma_{2j} \Delta GOV_{t-j} + \sum_{k=0}^{s2} \gamma_{2k} \Delta INV_{t-k} + \psi ECM_{t-1} + \varepsilon_{2t} \quad (5)$$

where ψ is the coefficient of error correction term (ECT), that shows how quickly variable adjust to equilibrium after a shock. Whereas to explore the causality relationship among variables is by employing the following models:

$$\begin{bmatrix} \Delta GDP_t \\ \Delta HHC_t \\ \Delta GOV_t \\ \Delta INV_t \end{bmatrix} = \begin{bmatrix} \beta_1 \\ \beta_2 \\ \beta_3 \\ \beta_4 \end{bmatrix} + \sum_{i=1}^q \begin{bmatrix} \gamma_{11} & \gamma_{12} & \gamma_{13} & \gamma_{14} \\ \gamma_{21} & \gamma_{22} & \gamma_{23} & \gamma_{24} \\ \gamma_{31} & \gamma_{32} & \gamma_{33} & \gamma_{34} \\ \gamma_{41} & \gamma_{42} & \gamma_{43} & \gamma_{44} \end{bmatrix} \begin{bmatrix} \Delta GDP_{t-q} \\ \Delta HHC_{t-q} \\ \Delta GOV_{t-q} \\ \Delta INV_{t-q} \end{bmatrix} + \begin{bmatrix} \psi_1 \\ \psi_2 \\ \psi_3 \\ \psi_4 \end{bmatrix} ECM_{t-1} + \begin{bmatrix} \varepsilon_{1t} \\ \varepsilon_{2t} \\ \varepsilon_{3t} \\ \varepsilon_{4t} \end{bmatrix} \quad (6)$$

The model formulation to investigate the effect of domestic demand on economic growth in an open economic system, is as equation (7):

$$GDP_t = \alpha + \delta_1 HHC_t + \delta_2 EXP_t + \delta_3 IMP_t + \varepsilon_t \quad (7)$$

where domestic demand (DD) is represented by household consumption (HHC), the dominant domestic demand component which contributes to GDP, while economic openness is represented by the trade component, namely exports (EXP), is the value of Indonesia's non-oil and gas exports in a million Rupiahs and imports (IMP), which is the value of non-oil and gas imports in a million Rupiah. All variables in the 2010 constant value (2010 = 100) and are transformed into logarithms.

Testing steps employing the ARDL bound test to cointegration, formulation of short-term equations, and checking causality relationships between variables GDP, DD, EXP, and IMP follow the method employed in equations (3) to (6).

4. Results and Discussion

According to Felipe & Lim (2005), whether an economy follows the export-led growth strategy (ELG) or domestic-demand-led growth (DDLG) can be seen through growth accounting and comparing the growth of aggregate expenditure components weighted by their share in GDP. Table 1 presents the average growth of GDP and components of expenditure, then the share of expenditure components in GDP and the growth of expenditure components weighted by their share in Indonesian GDP (2000 to 2018). Throughout the observed period, Indonesian economic growth has

always been in line with domestic demand growth. There is no period in which the economy has grown positively when domestic demand and export have grown, but export growth has been higher than that of domestic demand. In two periods, there was a relatively high economic growth when exports grew negatively. Thus, Indonesia's economic growth "strictly speaking" follows the DDLG hypothesis.

Table 1. Economic Growth and Expenditure Components of Indonesia, 2000 - 2018

Average Growth Rate (%)								
Year	GDP	DD	HHC	GOV	INV	EXP	IMP	N_EXP
2000-2003	16.90	18.34	16.66	17.45	21.78	-1.17	-0.06	-3.14
2004-2007	18.39	16.76	18.71	16.34	19.25	18.96	18.04	21.15
2008-2011	17.17	15.25	16.80	12.81	19.63	22.26	16.39	33.01
2012-2015	11.67	10.03	12.63	12.53	13.89	-4.27	-4.98	-3.30
2016-2018	8.78	7.46	8.09	8.41	5.86	9.00	7.50	10.74
Share of Expenditure Components in GDP (%)								
Year	DD	HHC	GOV	INV	EXP	IMP	N_EXP	
2000-2003	95.45	67.34	7.58	20.54	0.74	0.42	0.32	
2004-2007	96.37	64.77	8.41	23.19	0.61	0.36	0.26	
2008-2011	97.42	57.70	9.03	30.69	0.52	0.44	0.08	
2012-2015	97.83	55.84	9.49	32.50	0.37	0.35	0.02	
2016-2018	97.72	56.18	9.20	32.34	0.24	0.25	0.03	
Growth Rate of Expenditure Components Weighted by Their Share in GDP								
Year	DD	HHC	GOV	INV	EXP	IMP	N_EXP	
2000-2003	17.50	11.22	1.32	4.47	-0.01	0.00	-0.01	
2004-2007	16.15	12.12	1.37	4.46	0.12	0.06	0.05	
2008-2011	14.86	6.69	1.16	6.02	0.12	0.07	0.03	
2012-2015	9.81	7.06	1.19	4.52	-0.02	-0.02	0.00	
2016-2018	7.29	4.55	0.77	1.89	0.03	0.02	0.00	

Source: Author's calculation.

Note: EXP is Indonesian export value of non-oil and gas, IMP is import value of non-oil and gas and N-EXP is net export (EXP minus IMP).

Considering that domestic demand is an aggregate demand in a closed economic system (three-sector economy), the next step is to investigate the effect of each component of domestic demand on economic growth and their causal relationship. For this purpose, we utilized the ARDL bound test. Applying the ARDL

bound test to cointegration approach, the first step is to run a unit root test. This approach is flexible over the stationary level of variables. Therefore, the unit root test intends to ensure no variables integrated in order two, I (2) or more. According to Gujarati & Porter (2009: 760), "as yet there is no uniformly powerful test of the unit root hypothesis", therefore this study used three analysis tools, namely ADF (augmented Dicky-Fuller), ERS (Elliot-Rootenbergs-Stock) and PP (Phillips-Perron), respectively, with and without trends. ADF is the most popular unit root test tool (Gujarati & Porter, 2009). The ERS unit root test statistic has higher power for a small sample size, and the PP unit root test statistic is more robust in an error term process (Wong, 2008). The test results in table 2 show that all variables are stationary in I (0) or I (1) so that the use of the ARDL bound test as an analysis tool is the right choice.

Table 2. Unit Root Test Result

Variables	ADF		ERS		PP	
	C	C,T	C	C,T	C	C,T
GDP	-3.1850**	-0.3916	-0.1038	-1.0556	-3.0491**	0.3916
HHC	-3.8574**	-0.4458	-0.4447	-0.9679	-5.6369***	0.3194
GOV	-3.7213**	0.5913	-0.7744	-0.6797	-3.7251**	3.5683
INV	-2.4493	-1.9268	-1.6671*	-3.0291*	-1.4466	-0.2983
Δ GDP	-2.3085	-3.7040*	-2.4039**	-3.8830***	-2.2143	-3.7140**
Δ HHC	-2.7641*	-3.5455*	-2.8701***	-3.9073***	-2.7641*	-6.1582***
Δ GOV	0.2705	-4.1696**	0.1456	-4.4574***	-2.5444	-4.1815**
Δ INV	-1.8472	-1.8793	-1.9016*	-2.4979	-1.8297	-2.907

Source: Author's calculation.

Note: *, ** and *** significant level $p < 0.1$, $p < 0.05$, and $p < 0.01$, respectively C = constant and T = trend.

Cointegration test results with the ARDL bound test as in equation (4) show that cointegration is found in all four equations (table 3).

Table 3. The Results of ARDL Cointegration Test of The Component of Domestic Demand and Economic Growth

Estimated models	Optimal lag length	F-bound test	Decision
GDP/GDP, HHC, GOV, INV	(1,1,0,0)	14.7553	Cointegration
HHC/HHC, GDP, GOV, INV	(1,0,0,1)	54.5305	Cointegration
GOV/GOV, GDP, HHC, INV	(1,1,0,1)	8.6078	Cointegration
INV/INV, GDP, HHC, GOV	(1,1,1,0)	6.3422	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 calculation.

Table 3 shows that the F-bound test's value lies above the upper critical bound I (1) and significant at 95% for the investment equation and 99% for the others. Table 4 presents the results of ARDL regression and error correction regression (ECM) as in equation (4) and (5). In the long-run, household consumption and investment have a positive and significant effect on economic growth, but only household consumption shows an effect in the short-run. Besides, the system will return to its long-run equilibrium if there is a shock in the short-run, with a speed of adjustment of 71.34% per year.

Table 4. Results of Coefficient Estimation of Long and Short Run Economic Growth Equations.

ARDL Regression			ECM Regression		
Dependent variable: GDP, ARDL (1,1,0,0)			Dependent variable: Δ GDP		
Independent Variable	Coefficient	t-statistic	Independent Variable	Coefficient	t-statistic
GDP _{t-1}	0.2866	2.5599**	Δ HHC	0.7529	13.3934***
HHC	0.7529	9.4978***	Δ ECT	-0.7134	-8.5893***
HHC _{t-1}	-0.2698	-2.1642*			

GOV	-0.0349	-0.3704			
INV	0.2525	4.4638***			
R ² = 0.9998			R ² = 0.9641		
F-stat = 17395***			F-stat = 201***		
Residual diagnostic:					
Heteroskedasticity	F-stat = 0.2642, p-value = 0.9241 (Breusch-Pagan-Godfrey)				
Serial correlation	F-stat = 0.3056, p-value = 0.5914				
Normality	Jaque-Bera = 0.4686, p-value = 0.7911				
Autocorrelation	no autocorrelation and no partial correlation				
Stability test:	CUSUM and CUSUMSQ				

Source: Author's calculation.

Note: ***, **, and * are significant at $p < 0.01$, $p < 0.05$, and $p < 0.1$, respectively.

CUSUM is the cumulative sum of recursive and CUSUMSQ is the cumulative sum of squares of recursive residuals.

38 The existence of cointegration in a model shows the causality between at least one independent variable and the dependent variable. To determine the causality between variables and their direction, the ARDL-Granger causality analysis was employed; Table 5 exhibited the results. The analysis shows that all four variables have long-run causality relationships. Of the four observed variables, there is a bi-directional causal relationship (dynamic relationship), in the short-run, between economic growth and household consumption, between economic growth and investment (capital formation) and between household consumption and investment. Meanwhile, the causal relationship between government expenditure and investment is one-direction, namely from domestic capital formation to government expenditure.

Table 5. ARDL-Granger Causality Analysis of Economic Growth and Component of Domestic Demand

Dependent Variable	ARDL optimal lag	Short-run causality (F-stat of Wald-test)				Long-run (t-stat)
		Δ GDP	Δ HHC	Δ LGOV	Δ INV	
Δ GDP	(1,1,0,0)	-	0.7529***	-0.0349	0.2525***	-0.7134***
Δ HHC	(1,0,0,1)	1.1544***	-	-0.0834	-0.2035*	-0.7827***
Δ GOV	(1,1,0,1)	0.2677	-0.2516	-	0.4001**	-0.8412***
Δ INV	(1,1,1,0)	1.6256*	-0.15816	0.6972	-	-0.4828***

Source: Author's calculation.

Note: ***, **, and * are significant at $p < 0.01$, $p < 0.05$, and $p < 0.1$, respectively

In an open economic system as formulated in equation (7), by following the steps as in the previous analysis, covering the root unit test and cointegration test, the results show that three equations: economic growth, domestic demand, and import, indicate the existence of cointegration while the export equation is inconclusive (F-stat value of F-bound test lies between LCB and UCB). Table 6 presented the results of the estimation of economic growth in the open economic system (both in the long run and short run), where domestic demand and exports have a positive and significant effect on economic growth both in the short- and long-run. The effect of domestic demand is far higher than that of exports. The open economic system will also make adjustments towards its long-run equilibrium with a speed of 74.36% in the event of a shock that causes short-run disequilibrium.

Table 6. Results of Coefficient Estimation of Long and Short Run Economic Growth Equation in Open Economic System.

ARDL Regression			ECM Regression		
Dependent variable: GDP, ARDL (1,1,1,1)			Dependent variable: Δ GDP		
Independent Variable	Coefficient	t-statistic	Independent Variable	Coefficient	t-statistic
GDP _{t-1}	0.2568	1.7002	Δ HHC	0.8798	15.9960***
HHC	0.8798	9.1780***	Δ EXP	0.1139	3.7572***
HHC _{t-1}	-0.1771	-1.1277	Δ IMP	0.0235	1.2905
EXP	0.1139	2.8846**	Δ ECT	-0.7432	-6.9389***
EXP _{t-1}	-0.1115	-1.9366*			
IMP	0.0235	0.8175			
IMP _{t-1}	0.0999	2.8978**			
$R^2 = 0.9998$			$R^2 = 0.9674$		
F-stat = 11411***			F-stat = 96.5347***		
Residual diagnostic:					
Heteroskedasticity	F-stat = 0.3448, p-value = 0.9146 (Breusch-Pagan-Godfrey)				
Serial correlation	F-stat = 0.1190, p-value = 0.8894				
Normality	Jaque-Bera = 0.6053, p-value = 0.7389				
Autocorrelation	no autocorrelation and no partial correlation				
Stability:	CUSUM and CUSUMSQ				

Source: Author's calculation.

Note: ***, **, and * are significant at $p < 0.01$, $p < 0.05$, and $p < 0.1$, respectively.

CUSUM is the cumulative sum of recursive and CUSUMSQ is the cumulative sum of squares of recursive residuals.

There is a bi-directional causal relationship between economic growth and domestic demand, economic growth and exports, and between exports and domestic demand in the short-run. However, the last relationship is negative in both directions. While the variables that have a causal relationship with imports are only export, this relationship is one-direction, from exports to imports (Table 7).

Table 7. ARDL-Granger Causality Analysis of Economic Growth in an Open Economic System

Dependent Variable	ARDL optimal lag	Short-run causality (F-stat of Wald-test)				Long-run (t-stat)
		Δ GDP	Δ HHC	Δ EXP	Δ IMP	ECT
Δ GDP	(1,1,1,1)	-	0.8798***	0.1139**	0.0235	-0.7432***
Δ HHC	(1,1,1,1)	1.0160***	-	-0.1148**	-0.0247	-0.7603***
Δ EXP	(1,0,0,1)	3.4795**	-3.3089**	-	0.2443	-0.3379***
Δ IMP	(1,0,0,0)	0.5206	-0.4938	1.0717	-	-0.8232***

Source: Author's calculation.

Note: ***, **, and * are significant at $p < 0.01$, $p < 0.05$, and $p < 0.1$, respectively

The findings in this study show that the Indonesian economy by nature follows a dual-track (according to Lian, 2004), where domestic demand and exports have a positive effect on economic growth. Domestic and overseas demand contribute to economic growth (in line with Hye et al., 2013); however, the effect of domestic demand on economic growth is greater than that of exports, where a 1% increase in domestic demand will increase 0.88% of GDP, while an increase in exports of the same proportion would only increase GDP by 0.11%.

The dynamic relationship between economic growth and domestic demand and economic growth and exports shows exports and domestic demand are both vital for economic growth in Indonesia. Likewise, economic growth in Indonesia affects its exports and domestic demand. A successful and sustainable economic growth requires growth in exports and domestic demand, as enjoyed by China during the economic reform period (Tsen, 2010).

The domestic demand component that has a significant positive effect on economic growth is household consumption. Thus, the relevant policy for Indonesia is to maintain household consumption both through policies that directly increase household consumption (minimum wages and tax reductions for low and middle-

income workers) and through policies that will increase domestic capital formation (for example, encourage investment in the infrastructure) which will encourage economic growth.

Household consumption has a dynamic relationship with exports (bi-directional causality) but is negative in both directions. Therefore export promotion policies must be carried out carefully so that exports do not sacrifice domestic demand, which influences and contributes significantly to economic growth, due to the high proportion of agricultural products in Indonesia's non-oil and gas exports, both in the form of consumer goods and raw materials for the food industry (Tampubolon, 2019a and 2019b). The aggressive export promotion will result in (i) domestic prices will rise, (ii) manufacturing industry production costs will rise due to rising raw material prices so that product prices will rise, and (iii) the effect of (i) directly and the effect of (ii) will indirectly reduce household consumption. In the real world, this situation happens in palm oil exports (Indonesia's prime⁴¹ export commodity in the non-oil sector for recent decades). So that the export price of crude palm oil (CPO) is escorted by the Government; if the price exceeds a certain level, exports will be taxed so that domestic supply remains available as raw material for cooking oil, which is a staple food in Indonesia (Susila, 2004; Pramudya, Hospes, & Termeer, 2017; Tampubolon, 2020).

On the other hand, in terms of the policy, competition between domestic and overseas demand for commodities from the same sector is relatively non-problematic since the Government only needs to focus on the growth of one particular sector. This is relatively lighter than Malaysia, with a different structure between domestic and export demand, which causes a differential impact on industrial capacity when faced with ELG-DDLG shifts (Yeah, 2017). The most actual example is the increase of palm oil production faced restriction by the European Union. CPO, which was previously intended for the export market, was transformed into a bio-fuel component for domestic consumption (Mariska, 2020). This experience underlines that countries with large populations will more easily make the shift from ELG strategy to DDLG when facing a crisis that originates from external shock, a situation which for small countries would be a disadvantage of DDLG, according to Yeah (2017).

5. Conclusion

Referring to the definition of DDLG proposed by Felipe & Lim (2005), the Indonesian economy "strictly speaking" is DDLG because economic growth is in line with domestic demand growth and net export growth. However, net export growth is very low (around zero). In an open economic system, the Indonesian economy shows a dual-track strategy where domestic demand and export together have a positive effect on economic growth, although the influence and contribution of domestic demand are much more significant than exports. Therefore, it is a better macro-economic policy for Indonesia to balance export-led and domestic-demand-led growth strategies for sustainable economic growth.

Further explores the effect of the domestic demand component on economic growth; in the short-run, household consumption has a positive and significant effect. In the long-run, household consumption and domestic capital formation have a positive and significant effect on economic growth. In the short-run, there is a bi-directional causality relationship between economic growth and household consumption and between economic growth and investment.

In the analysis of open economic systems, the trade component has a positive and significant impact on only exports. In the short run, there is a bi-directional causality relationship between economic growth and household consumption and between economic growth and exports. Imports only have a one-direction causality relationship with exports, from exports to imports. Also, there is a negative bi-directional causality relationship between household consumption and exports, which indicates competition in agricultural commodities (the main component of non-oil and gas exports) between exports and domestic consumption, both as consumption/ final goods and as intermediate goods, which are the raw material for the food industry.

Thus, relevant policies to encourage economic growth stimulate household consumption through tax relief for low and middle-income groups and domestic capital formation through infrastructure development. Regarding international trade, aggressive export promotion is not an option because it turns out that exports and household consumption have a negative bi-directional causality relationship. Likewise, Indonesia does not face a policy choice of encouraging economic sectors between two or more different sectors because the domestic demand sector is the same as the export demand sector. Encouraging growth in this sector will serve both aggregate demand needs and foreign demand. Furthermore, external shock can be overcome by shifting the ELG strategy to DDLG.

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