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**THE ASEAN ECONOMIC
INTEGRATION PRINCIPLES:
OPEN, CONVERGENCE,
INCLUSIVE, AND GREEN**

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The ASEAN Economic Integration Principles: Open, Convergence, Inclusive, and Green

Kiki Verico^{1,★}

Executive Summary

ASEAN is in the process of structural economic and digital transformation. ASEAN needs to adopt related principles to support it. This paper found that structural economic transformation requires the open economy as the necessary principle and economic convergence as the sufficient condition. The open regionalism principle is needed because ASEAN needs Foreign Direct Investment (FDI) from member and non-member states. Furthermore, open regionalism must decrease the economic gap within member states. Therefore, ASEAN needs a sufficient condition of economic convergence within member states. This paper took the implementation of Bali Concord III on FDI inflows as a proxy for open and the GDP per capita gap to the highest member state's GDP per capita within member states as a proxy for economic convergence. This paper confirmed that economic convergence comes after the open principle. As for the digital economic transformation, this paper showed ASEAN needs the inclusive principle. Lastly, it described ASEAN's commitment to the green economy. This paper adopted the quantitative method in assessing open and convergence and the qualitative approach in analysing inclusive and green principles.

JEL Classification: F02; F15; F41; O36; Q01

Keywords

international economy — open economy — economic integration — digital economy — sustainable economy — ASEAN

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1. Background

Indonesia holds the Presidency of G20 in 2022 and the ASEAN Chairmanship in 2023. Each cooperation applies similarities in the decision-making process: the soft approach with consultation and consensus. They are inter-governmental type cooperation. Nevertheless, since ASEAN has a secretariat with a general secretary of ASEAN at the ministerial level, the implementation in ASEAN is more intense than that in Troika. The other difference is G20 refers more to existing multilateral organizations while ASEAN is the organization itself. Therefore, the decisions in ASEAN are non-transferable and must be decided on the site or postponed.

In terms of historical background, G20 was established as a response to regional and global financial crises, while ASEAN aims for the long-run objective of structural economic transformation. G20 utilizes monetary, fiscal, and rule-based trade, while ASEAN also aims for structural economic transformation from forward participation to backward participation region. As ASEAN aims for structural economic transformation, the essential things, there is a need to assess the long-run foundations of ASEAN economic cooperation of both open and convergence.

In 2023, Indonesia will hold ASEAN Chairmanship right after Indonesia holds the Presidency of the G20 in 2022. Indonesia has provided fundamental legacies during her chairmanships since ASEAN's first Treaty of Amity and Cooperation (TAC) as ASEAN's Fundamental Non-Interference Principle. This treaty is the main output of the Bali Concord One. In the Bali Concord Two in 2003, Indonesia was behind the born of the three pillars of ASEAN cooperation in the ASEAN Security Community (ASC),

ASEAN Socio-Cultural Community (ASCC), and ASEAN Economic Community (AEC). Last but not least was the Bali Concord Three in 2011 for the AEC's pathways towards the ASEAN common market, a comprehensive real sector integration of ASEAN.

The AEC becomes the main road to shifting ASEAN economic integration from intra-trade to intra-investment. It provided ASEAN with the ASEAN Plus Frameworks or ASEAN Umbrella in the forms of ASEAN Plus One FTA, ASEAN Plus Three, Regional Comprehensive Economic Cooperation (RCEP), and East Asian Summit. In 2023, amidst the increasing global economic pressures of the global pandemic and war in Ukraine, Indonesia, again, takes a driver's seat for ASEAN Chairmanship. This chance is challenging as it combines high expectations reminding the Bali Concord legacies and the rising global economic challenges.

Towards the ASEAN Chairmanship in Indonesia, there is a need to assess ASEAN economic integration development. ASEAN has been facing economic structural and digital transformation and green economic transition. As for structural economic transformation, there is a need to assess two ASEAN economic conditions. The necessary condition is the ASEAN open economy, and the sufficient condition is the ASEAN economic convergence. As for digital economic transformation, ASEAN's inclusiveness needs to be assessed as to its necessary foundation. The first two conditions of open and convergence need a quantitative analysis with the econometric model.

Since Indonesia is the Chairmanship of ASEAN immediately after her role in the Presidency of G20, the subsequent and streamlining issues that connect both occasions are worth continuing. Therefore, ASEAN's commitment to

the green economy aligns with Indonesia's Presidency G20 mission in 2022 which also carries it. This paper adopts qualitative research in the last two conditions of inclusive for digital transformation and green for sustainable development. Indonesia's chairmanship output holds high expectations not only by ASEAN member states but also the world.

This paper discusses structural economic transformation with open and convergence principles, digital transformation with inclusive principles, and sustainable development with green economy principles.

2. Research Objective

Based on the background, this paper has five research objectives:

1. Understanding the effect of the open economy on ASEAN member state's FDI inflows to ASEAN
2. Understanding the effect of the open economy on non-ASEAN member state's FDI inflows to ASEAN
3. Assessing the ASEAN member state's economic convergent during the observation period
4. Evaluating the effect of the inclusive economy on the ASEAN's digital economic integration
5. Understanding the ASEAN's commitment to green economy orientation

This paper takes the period of analysis from 2000 to 2019. The year 2000 is selected because it was before the Bali Concord II of 2003 but after the Asian Financial Crises of 1998. The latter significantly affects structural reforms and the timeline of the ASEAN economic integration process. This paper takes the year 2011 because this year was the time of Bali Concord III's implementation towards the economic integration shifting from intra-trade to intra-investment over the adoption of the ASEAN economic community with the ASEAN Plus Frameworks utilization. As for the green economy vision, this paper briefly discusses ASEAN in the context of a productive, environmentally friendly concept. The latter became more important as the world entered a green economy-led growth after the trade and investment-led growth era.

3. Research Question

Given the research objectives, this paper attempts to answer the five following questions:

1. Does the open economy affect ASEAN's FDI inflows from member states?
2. Does the open economy increase ASEAN's FDI inflows from non-member states?
3. Does the ASEAN member state's economic convergent increase?
4. Does the inclusive economy support ASEAN's digital economic integration?
5. Does ASEAN commit to the green economic orientation?

This paper selects six ASEAN member states Indonesia, Malaysia, Thailand, Philippines, Singapore, and Vietnam. The reason is that they hold significant FDI inflows in Southeast Asia. As for the non-member state, this paper chooses China, Japan, South Korea, and Australia because

these countries are dominant economic partners for ASEAN under the ASEAN Plus Framework of ASEAN Plus FTA. Research questions number one, four and five apply to both member and non-member states, while question number three only applies to the ASEAN member states. This paper answers questions number one, two, and three with a quantitatively approach and question number four and five with a qualitative approach

4. Literature Review

Different from the original theory of economic integration from the EU that opted for closed regionalism (Balassa, 1961), ASEAN adopted the open regionalism principle (Verico, 2017). ASEAN allows its member states to have various economic cooperation such as the direct bilateral trade agreements between members and non-members of ASEAN, sub-regional economic cooperation that involves limited member states, regional cooperation involving ASEAN members, and regional-plus which incorporates non-members under the "ASEAN Umbrella" as ASEAN plays as the central power (Urata, 2007).

Another factor to the EU that has high-income member states in terms of GNP per capita and large size in terms of proportion of the population and value-added is that ASEAN has a high-income country member state of Singapore. Still small in terms of size (GDP and population), while ASEAN has Indonesia a large GDP size and population, the only G20 member state, she is not a high-income country yet. Therefore, ASEAN does not have the center power member yet shown like a "doughnut shape" without a single member state playing as the center of gravity (Acharya, 2003). The indicator of the annual GDP per capita (US\$) gap between that of the member states to the anchored member state's highest GDP per capita (US\$) is the convergent economic indicator of ASEAN (Verico, 2017). Furthermore, ASEAN adopts open and convergent economic conditions in enhancing its economic cooperation with other member states. Economic convergence is a long-term issue in ASEAN.

In Singapore's ASEAN Summit of 1992, AFTA was accepted by all ASEAN member states (Bowles & MacLean, 1996). The AFTA adopted the Common Effective Preferential Tariff (CEPT) among member states which Indonesia designed. In addition to the acceptance of the CEPT, ASEAN had upscaled the Secretary-General level of ASEAN from Director-General Level to Ministerial Status and promoted the ASEAN Regional Forum (ARF), which represents the ASEAN+8 cooperation. To complete the AFTA, the ASEAN member states also open their investment regulations that show ASEAN's consistent and long-run commitment to attracting FDI. ASEAN adopted the 'open-regionalism' principle to attract investment creation (FDI inflows) from non-ASEAN member states. This open regionalism principle must be completed with economic convergence, as open without economic convergence is incomplete. To limit the economic divergence, the enlargement of economic cooperation in ASEAN must involve all the ASEAN's member states.

An open economy is a way for ASEAN to set up a building block for its economic transformation from intra-trade

to intra-FDI inflows. Bilateral economic cooperation can be the building block for multilateralism (Baldwin, 2006). The open economy discloses an excellent chance for ASEAN to absorb positive spillover effects from various cooperation. These enlargements are more potent if they achieve economic convergence under the ASEAN umbrella or ASEAN Plus Frameworks, where all ten ASEAN member states come together. Therefore, open economy and economic convergence are conditions for ASEAN to have more vital and progressive regional economic integration. The open economy and economic convergence are the foundations for ASEAN's stable and sustainable economic integration. An open economy is necessary, and economic convergence is sufficient (Verico, 2021).

Since the computer was operated, the world's industrial revolution entered its third revolution of information and communication technology in the 1970s. This revolution became more dominant after the computer, and digital devices turned to be communication devices. Information becomes more liquid, received in real-time, and even more with the internet of things become an artificial intelligence. This digital revolution affects all economic activities, including regional economic cooperation in Southeast Asia. Another condition that has been important for ASEAN in particular in the last ten years since 2010 is digital economic transformation. The progressive development and growth of digital economic development in Southeast Asia have stimulated ASEAN to establish a business-friendly ecosystem for digital transformation in the region. This nurturing digital economy needs an inclusive principle to complete two previous ASEAN economic principles of open and convergence. The inclusive economy platform is vital for digital transformation in ASEAN (Chen & Kimura, 2019).

5. Method: Model, Variable, Data and Hypothesis

This paper utilizes a quantitative approach of econometric modeling test to assess ASEAN structural transformation. ASEAN requires two conditions to have stable regional economic integration: open economy and economic convergence. This paper adopts economic models from previous studies by Verico (2017) and Oktavia & Verico (2020) to assess the open economy. This paper tests the model for both FDI inflows from member and non-member states of ASEAN. As for economic convergence, this paper follows the logical framework of GDP per capita convergency by Verico (2017). This economic convergence test, this paper only tests member states as it applies only to ASEAN member states

The chosen countries, as mentioned above, are Indonesia, Malaysia, Philippines, Singapore, Thailand, and Vietnam for member states and China, Japan, South Korea, and Australia for non-member states. As for the digital economy in Southeast Asia, this paper assesses the ASEAN's inclusiveness foundation. This paper adopts a qualitative approach to analyzing this foundation. Last but not least, this paper utilizes a formula equation brief assessment to review Southeast Asia's green economy transition.

Following previous models, this paper uses FDI inflows

as a dependent variable for the open economy. As for economic convergence, this paper adopts the proportion of GDP per capita of the member state to the highest GDP per capita member state. Singapore is the ASEAN's highest GDP per capita member state; therefore, it has become the anchored country. The independent variables for both models are the same. They are three fundamental economic variables: open unemployment, inflation, and economic growth. One fundamental variable of the financial sector of the real effective exchange rate (REER).

As for the long-run economic integration variable, this paper adopts GDP representing the economic size and GDP per Capita representing the economic level. For the external balance, this paper adopts the value of export goods and services, import goods and services, and openness. The latter is the share of export and import value to the GDP.

This paper applies panel data analysis with annual data of 20 years from 2000 to 2019 and the space dimension of six member states for openness and economic convergence and four non-member states for openness. The models are below.

$$FDI_{nt} = \alpha_0 + \alpha_1.TD_{nt} + \alpha_2.CV_{nt} + \varepsilon_{nt} \quad (1)$$

$$Conv_{nt} = \alpha_0 + \alpha_1.TD_{nt} + \alpha_2.CV_{nt} + \varepsilon_{nt} \quad (2)$$

The list of data, source, and hypothesis are presented in Table 1 in the Appendix.

This paper applies panel data analysis with statistical regression. Panel data regression provides Best Linear Unbiased Estimation (BLUE), combining cross-section and time-series data. This paper has twenty years of periods ($t = 2000$ to 2019) and n with six member states of ASEAN and four non-member states of ASEAN. This paper has a total observation of $n \times t$. The data is a balanced panel as the time series applies to all countries. This paper estimates the Fixed Effect and Random Effect model and applies the Hausman Test to check the statistical stability of Fixed Effect or Random Effect. If Result: H_0 : Select FE ($p > 0.05$) H_1 : Select RE ($p < 0.05$). As for digital transformation and green economic transition, this paper adopts qualitative analysis.

6. Result and Analysis

This paper provides the descriptive statistic of dependent variables of FDI inflows as the proxy for open regionalism and the GDP per capita gap for economic convergence. This descriptive statistic is provided to support the quantitative method of open and convergence. It shows that during the observation period from 2000 to 2019, Singapore is the two most dominant ASEAN member states of FDI inflow's home countries in Southeast Asia (see Figure 1 in the Appendix).

As from non-member states, in terms of FDI inflows home country, Japan and China were more dominant than South Korea and Australia during the observation period (see Figure 2 in the Appendix). Australia's FDI inflows in ASEAN seem stagnancy to a decrease during the observation period.

This paper formulates economic convergence as the proportion of a member state's GDP per capita per the ASEAN

member state's highest GDP per capita. Singapore holds the highest GDP per capita in ASEAN, followed by Malaysia, Thailand, Indonesia, the Philippines, and Vietnam. The figure also shows that most member states have a stable proportion during the observation period (2000–2019) except for Vietnam (see Figure 3 in the Appendix).

This figure indicates that Vietnam's income per capita growth has been higher than Singapore's and relatively over other member states. As Vietnam has the lowest GDP per capita in this selected ASEAN member state but has the fastest economic growth, then economic convergence in ASEAN works on the right path.

As seen on Table 2 in the Appendix, this paper finds that FDI inflows representing an open economy and economic convergence are correlated, then the models connect both FDI inflows and economic convergence proxy. This paper estimates open economy in two models for member states and non-member states, while for economic convergence in one model of member states only. Both open and economic convergence represents the structural economic transformation of ASEAN.

As for the open economy of the member state, with its Hausman test, this paper found that Random Effect provides a more stable result than Fixed Effect. The details can be read as follows (see Table 3 in the Appendix). Variable of interest positively relates to the FDI inflows to ASEAN but is insignificant. This result indicates that the Bali Concord II that produced the AEC blueprint has been on track but remains low in its power.

ASEAN member states must enhance their intra-investment capacity related to their economic size and level. The latter can be seen from the results in GDP and GDP per capita that have the level of significance of one percent with the positive sign as expected. These results prove that long-run economic variables explain ASEAN's structural economic transformation. The open economy is both the long run and an irreplaceable issue for ASEAN. This paper found that open as a necessary condition requires economic convergence as a sufficient condition since the latter significantly affects the open economy.

Two of the three fundamental economic indicators, the economic growth, and inflation rate, follows the expected sign but are insignificant. It takes time until both variables significantly affect the open economy in ASEAN. The other fundamental real economic indicator, open unemployment, is significant with the negative sign as expected. This result shows that employment creation significantly affects open economic effectiveness in ASEAN. These results proved that three fundamental economic variables affect ASEAN's structural economic transformation. The stronger the real sector fundamental, the more influential the open economy is necessary for ASEAN structural transformation from intra-trade to intra-investment.

The external balance of export and import are consistent with the expected sign and significant. These results prove that the more robust the external balance, the more effective ASEAN structural economic transformation. Nevertheless, the open economy indicator is insignificant, which indicate that export and import remain disjoint in affecting the structural economic transformation in ASEAN. The fundamental financial indicator of REER shows a different sign than

expected but is insignificant; therefore, it can be explained that ASEAN's structural economic transformation is still in the real sector, not the financial sector yet. Details are in the Table 3 in the Appendix.

As for the open economy from non-member states, this paper found that ASEAN Plus FTA cooperation is effective as they follow the expected signs for Japan and Korea (see Table 4). Yet, ASEAN Japan FTA is significant while ASEAN Korea FTA is insignificant. The latter needs more years to come to be more effective. As for China and Australia, the results oppose the expected sign but are significant for China and insignificant for Australia. For these two non-member states, ASEAN needs more than ASEAN FTA Frameworks. For instance, mega regionalism such as the RCEP (Verico, 2021).

Similar to the results in the open regional economy within the member states, external balance is significant (at a level of significance of five percent) with a similar expected sign. This identical result confirmed that export and import are vital factors for ASEAN's structural economic transformation. Unlike to open principle within member states, the open between member and non-member states of ASEAN has a different sign. Open within member states proves that ASEAN structural economic transformation is ASEAN vision while for non-ASEAN members is not. This result demonstrates that the more open the economy of non-member states, the higher FDI inflows to non-ASEAN members.

As for fundamental real sector variables, similar to the open FDI inflows within member states, the open FDI between non-member and member states of ASEAN is significant for open unemployment but insignificant for economic growth and inflation. The difference is the sign in the inflation rate opposes its expected sign. This result confirmed that non-ASEAN member states are more enthusiastic about investing FDI outside Southeast Asia. The financial sector fundamental indicator of REER follows the expected sign but insignificant. This result indicates that for non-member states, financial sector expectation matters more than the real fundamental sector but remains weak. It means that ASEAN requires more than ASEAN FTA Plus frameworks to attract FDI inflows and support structural economic transformation in ASEAN.

As for the long-run variables of GDP size and GDP per capita, this paper found that economic size gives a significant and positive sign for FDI inflows while GDP per capita is the opposite. It shows that the bigger the economic size, the more motivation for non-member states to invest FDI inflows in Southeast Asia. It was not affected by the economic level. Like the open economy within member states, the open economy between member and non-member states fits with Random Effect Model. Details are presented at Table 4 in the Appendix.

Last but not least, this paper assesses the economic convergence during the observation period from 2000 to 2019, after Bali Concord I and II but before the global pandemic hit Indonesia. The economic convergence adopts the GDP per capita gap between the selected member state and the ASEAN member state's highest GDP per capita, Singapore. The higher the proportion of GDP per capita of a member state to Singapore's GDP per capita, the more

convergent the ASEAN economy.

This paper found that even after ASEAN has had an AEC blueprint after Bali Concord II and III, ASEAN economic convergence remains its homework since its variable of interest of Bali Concord III is significant at one percent but in negative sign (see Table 5 in the Appendix). This finding proves that economic convergence is ASEAN's long-run issue. Meanwhile, FDI inflows as a proxy to an open economy, the necessary condition of ASEAN structural economic transformation comes before its sufficient condition of economic convergence. The insignificant statistical results of the three fundamental economic indicators of open unemployment, inflation, and economic growth showed that fundamental variables did not directly work to economic convergence but directly to open economy (FDI inflows).

This paper confirmed that GDP per capita is the pillar for economic convergence measurement. It showed that GDP per capita growth is significant at one percent, consistent with the expected sign. As for the external balance, only import is significant and consistent with the expected sign. This finding indicated that shifting from forward to backward participation is happening as export follows the expected sign but is still insignificant. Like the open economy within member states and the open economy between member and non-member states, economic convergence modeling also fits with Random Effect Model. The details are in Table 5 in the Appendix.

ASEAN is home for at least seven unicorns of GoJek, Grab, Lazada, Razer, Sea Ltd (Garena/Shopee), Traveloka, and Tokopedia. Grab, Uber, and GoJek's ride-hailing platforms generated more than USD\$5.1 billion in GMV (Gross Merchandise Volume) and connected more than 200 cities in Southeast Asia (OECD, 2017). The ride-hailing activities also serve food messaging and delivery features (GrabFood, UberEATS, and Go-Food), courier services (Go-Send and Grab Express), payments (Go-Pay, GrabPay, and OVO), and health services.

Before the global pandemic, Google, Temasek, and Bain & Company 2018 showed that ASEAN's digital economy estimation is quite prominent, with a range of US\$240 billion for 2025. This estimation will be dominated by e-commerce, online media, transportation services, entertainment, and travel. Indonesia, Malaysia, the Philippines, Singapore, Thailand, and Vietnam had around 350 million internet users in Southeast Asia alone. This figure increased from 260 million users in 2015. Approximately 80 percent of the ASEAN community are connected to the internet (Das, 2017).

This paper uses one important indicator to evaluate digital development by country, entitled Digital Evolution Index, provided by Tufts University and Master Card. This index consists of static current condition (state) and dynamic movement condition (momentum). It shows in Diagram 1 (in the Appendix) that three ASEAN Plus member states, Singapore, Malaysia, and South Korea, are three world champions in the digital evolution as they have shown advanced achievement both in the current state and dynamic momentum. The index classifies their digital evolution condition as 'stand out' or great. The next level is low in the current state but high in momentum, entitled a 'break out' or the sunrise. At this level, another three member states of

the ASEAN Plus are here: China, Indonesia, and Thailand.

On the opposite of sunset or the index classified as 'stall out,' there are two member states of ASEAN Plus Frameworks of Japan and Australia. For the low current state and slow momentum, which this index ranks as 'watch out' or poor, ASEAN has one member state, the Philippines. Only Vietnam was not available. These diagram shapes showed that similar to its GDP per capita, ASEAN has various classifications of digital evolution index. This current achievement has confirmed that convergence is a long-run issue. It explains why the ASEAN Plus Framework remains vital to support the necessary condition of the open economy of ASEAN.

Digital economic development needs acceleration in the Philippines and Vietnam; therefore, economic convergence can quickly be achieved. ASEAN requires inclusive principles that benefit economic convergence in general and secure a bottom-up approach specifically. Both are working toward the vision of empowering and enhancing the economic roles and networking of the MSMEs (Micro Small Medium Enterprises) at the local and regional levels. An inclusive principle is a vital tool for ASEAN to shift ASEAN's economic integration amidst the digital era.

The dominance of e-commerce has become potential in the region due to reasonably significant market acceleration through a mobile-first platform or mobile phone connected to the internet. E-commerce platforms such as Lazada, Tokopedia, and Shopee (Sea Group Ltd) also provide benefits for Micro and Small Medium Enterprises (MSMEs) as it helps them serve consumers both at home and abroad. The use of social media and the internet can encourage economic growth in Southeast Asia. The digital economy is the game-changer for empowering and enhancing the MSME growth, welfare, and wellbeing in Southeast Asia.

Besides structural and digital economic transformation, the world is entering the environment-led growth era. Manufacturing products such as electric vehicles have been increasing both from the demand and supply side, including in Southeast Asia. This paper follows an equation below to show that population and human productivity as the most vital factors supporting a productive but environmentally friendly economy.

$$y_{nt}(k_{nt}) = (\partial_{nt} + n_{nt} + g_{nt}) \cdot k_{nt} \quad (3)$$

$$MPK_{nt} = \partial_{nt} + n_{nt} + g_{nt} \quad (4)$$

$$MPK_{nt} - \partial_{nt} = g_{nt} + n_{nt} \quad (5)$$

Economic growth from capital factor ($y_{nt}(k_{nt})$), environment justice (∂_{nt}), population size (n_{nt}), human productivity ($g_{nt} = \frac{\partial E}{E_{nt}}$). MPK is Marginal Productivity of Capital. This equation shows that depreciation, including in the environment, such as decarbonization for mitigating climate change, depends on human quality, the combination of number of populations, and productivity—the latter in the sense of the advancement of environmentally technology-friendly.

This paper argues ASEAN's awareness and commitment to sustainable development depend on its human capital and technology orientation. The increasing population must be balanced with the rising quality of human capital. The higher the human capital quality, the lower probability of a subsistence economy that helps countries in Southeast

Asia to take care of their environment and apply gradual energy transition mechanisms replacing their unrenovable energy sources with green and renewable energy ones. Human capital quality remains the game-changer for ASEAN structural and digital transformation and the green economy orientation.

Amidst its fast economic growth, ASEAN showed a solid commitment to sustainable development over a so-called ASEAN Working Group on Climate Change and Climate and Energy Project. Each of the ten ASEAN member states showed commitment to, for instance, the usage of renewable energy targets of 23 percent of the primary energy mix by 2025, as mentioned in *The ASEAN Post* (2019)¹. This commitment requires an adjustment due to the global pandemic and the War in Ukraine, which force the world to return to non-renewable energy for a while. Detailed percentage targets of renewable energy and year by member states are on Table 6 in the Appendix.

ASEAN is aware of these commitment consequences in the energy transition mechanism with carbon trading, carbon tax, stranded asset management, and else towards renewable energy orientation. The green economy spirit has become the basic principle for ASEAN in developing green infrastructure and optimizing the digital economy in Southeast Asia.

Finally, the combination of four principal elements of open, convergence, inclusive, and green is the ultimate means for ASEAN to achieve the long-run objectives of structural and digital transformation and sustainable development. The first two principles, open and convergence, are the conditions for ASEAN's structural transformation. The inclusive principle is the platform for ASEAN's digital economic progress, and the green led-growth principle is the mean for ASEAN's sustainable development

7. Conclusion

In the context of G20 and ASEAN missions, the similarities are that both discuss digital economic transformation with inclusive principle and sustainable development transition with green principle. The primary difference is that the G20 focuses on the quick response (fiscal and monetary policies) to global economic crises at any cause, while ASEAN focuses on long-run structural economic transformation with open and convergence principles. G20 discusses rule-based trade while ASEAN aims for integrated trade. In the ASEAN economic integration matters, this paper found that:

1. An open economy with FDI inflows as its proxy is necessary for ASEAN. This paper proved that real fundamental variables of economic growth, inflation, and open unemployment directly affected FDI inflows but did not affect ASEAN's economic convergence. This paper confirmed that ASEAN needs to remain focused on the open economy to enhance its structural economic transformation from intra-trade to intra-investment. This transformation is the key to ASEAN economic integration pathways from the economic community to the common market as the comprehensive real sector integration.
2. The time dummy variable as the variable of interest of Bali Concord III of the AEC blueprint of 2011 has followed the expected sign but is insignificant. The AEC supports structural economic transformation in ASEAN but is still weak. This time dummy significantly affected economic convergence but in a negative sign. It proved that economic convergence remains a long-run issue for ASEAN.
3. One of the three fundamental variables of open unemployment has a consistent sign to the expected sign and is significant. At the same time, the other two of growth and inflation are insignificant in the FDI inflows within and between member and non-member states. This finding indicated that structural economic transformation from intra-trade to intra-investment in ASEAN still focuses on employment creation. These three fundamental variables did not work for economic convergence. It proved that fundamental variables significantly affected necessary conditions before affecting the sufficient condition of economic convergence.
4. The external balance variables of export and import work for FDI inflows within and between the member and non-member states but did not work in the openness (export plus import per GDP). This finding indicated that export and import separately affected FDI inflows. As for economic convergence, import is significant with a consistent sign, while export is insignificant. This finding indicated that backward participation happens in ASEAN.
5. The fundamental financial sector indicator of the Real Effective Exchange Rate (REER) is insignificant to all models. This finding proved that ASEAN economic integration, open economy, and economic convergence are still at real sector integration, not at financial sector integration. However, learning from the Asian Financial Crises (AFC) in 1998, the crises can come from the financial sector instability. ASEAN offers its financial sector stability two things: progressive competitiveness and real productive sector and the ASEAN Plus Three Finance Cooperation with Chiang Mai Initiative Multilateralization (CMIM) as its backbone.
6. Long-run GDP size and GDP per capita variables are significant, with positive signs of FDI inflows within member states. This finding that long-run variables work well for ASEAN structural economic transformation. As for FDI inflows from non-member states, the long-run variable that is significant with the positive sign is only GDP size. It showed that size matters more than level. As for economic convergence, GDP size and GDP per capita are significant, but only the GDP per capita is consistent with the expected sign. This finding confirmed that the GDP per capita gap is the backbone of ASEAN's economic convergence.
7. Out of four of the ASEAN FTA Plus Frameworks, only AJFTA that work well followed the expected sign and significant. The rest of ASEAN Plus FTA is a positive sign for AKFTA but remains insignificant. This paper indicated that AKFTA holds potential power in supporting structural transformation for ASEAN economic integration. Its orientation in developing electric vehicle production networks in ASEAN will connect all three

¹<https://theaseanpost.com/article/protecting-environment-together>

- structural, digital, and green transformations
8. As for the AANZ FTA, this paper found a significant result but a negative sign. Australia and ASEAN need to work even closer to have positive outcomes within the ASEAN Plus Framework. This paper indicated that both parties require beyond just the ASEAN Plus FTA. It could be the Regional Plus agreement covering not only trade liberalization but also investment and production network liberalization, such as the RCEP. This paper showed a similar result for the ACFTA but insignificant. ASEAN and China need to enhance their economic co-operation and convergence.
 9. This paper showed that digital economic transformation is a long-run issue similar to economic convergence. It requires a specific principle of ASEAN named inclusive economy. Over the last ten years, digital economy and economic convergence have walked together in ASEAN. At this moment, this paper showed that the digital economy progresses still unequal within member states. ASEAN needs to ensure that the digital economy will work progressively and reduce the digital development gap within member states. The latter will increase the ASEAN economic convergence.
 10. As for the long-run issues of sustainable development, this paper showed that the economic transition towards a green economy needs human capital improvement. The more advanced the green-based innovation, the more efficient energy usage, and the more sustainable the development. Again, it requires human capital quality and green economy awareness and orientation. This paper also showed ASEAN member states' commitment to renewable energy.

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APPENDIX

Tables

Table 1. Variable, Data, Source and Hypothesis

Variable	Data	Source	Hypothesis
FDI_{nt}	FDI Inflows from n country to ASEAN at t time	https://www.aseanstats.org/category/yearbook/	Dependent variable representing the ASEAN Open Economy. Independent variable for economic convergence
$Conv_{nt} = \frac{GDP_{capita_{nt}}}{GDP_{capita_{at}}}$	Proportion of GDP per Capita of n country at t time per GDP per Capita of anchored country (Singapore) at t time per GDP	https://databank.worldbank.org/reports.aspx?source=world-development-indicators	Dependent variable representing economic convergence. Independent variable for ASEAN Open Economy.
$GDPgr_{nt}$	Part of three real fundamental independent variables; Control Variable (CV_{nt})	https://databank.worldbank.org/reports.aspx?source=world-development-indicators	Positive for both the ASEAN's open economy and economic convergence
π_{nt}	Part of three fundamental independent variables; Control Variable (CV_{nt})	https://databank.worldbank.org/reports.aspx?source=world-development-indicators	Positive for both the ASEAN's open economy and economic convergence
OU_{nt}	Part of three fundamental independent variables; Control Variable (CV_{nt})	https://databank.worldbank.org/reports.aspx?source=world-development-indicators	Negative for both the ASEAN's open economy and economic convergence
$REER_{nt}$	Fundamental independent variable of financial sector; Control Variable (CV_{nt})	https://fred.stlouisfed.org/series/RBUSBIS	Positive for both the ASEAN's open economy and economic convergence
X_{nt}	External balance as independent variable; Control Variable (CV_{nt})	https://databank.worldbank.org/reports.aspx?source=world-development-indicators	Positive for both the ASEAN's open economy and economic convergence
M_{nt}	External balance as independent variable; Control Variable (CV_{nt})	https://databank.worldbank.org/reports.aspx?source=world-development-indicators	Negative for both the ASEAN's open economy and economic convergence
Op_{nt}	Share of external balance to GDP; Control Variable (CV_{nt})	Own calculation	Positive for both the ASEAN's open economy and economic convergence
GDP_{nt}	Economic size; Control Variable (CV_{nt})	https://databank.worldbank.org/reports.aspx?source=world-development-indicators	Positive for both the ASEAN's open economy and economic convergence
$GDPCap_{nt}$	Economic level; Control Variable (CV_{nt})	https://databank.worldbank.org/reports.aspx?source=world-development-indicators	Positive for both the ASEAN's open economy and economic convergence
$bctt_{nt}$	Time dummy of the implementation of the ASEAN Economic Community (2011); Time Dummy/TD (TD_{nt})	Variable of Interest	Positive for both the ASEAN's open economy and economic convergence
$ACFTA_{nt}$	Time dummy of the implementation of the ASEAN China FTA (2010); Time Dummy/TD (TD_{nt})	Variable of Interest	Positive for both the ASEAN's open economy and economic convergence
$AJFTA_{nt}$	Time dummy of the implementation of the ASEAN Japan FTA (2008); Time Dummy/TD (TD_{nt})	Variable of Interest	Positive for both the ASEAN's open economy and economic convergence
$AKFTA_{nt}$	Time dummy of the implementation of the ASEAN South Korea FTA (2018); Time Dummy/TD (TD_{nt})	Variable of Interest	Positive for both the ASEAN's open economy and economic convergence
$AANZFTA_{nt}$	Time dummy of the implementation of the ASEAN Australia New Zealand FTA (2015); Time Dummy/TD (TD_{nt})	Variable of Interest	Positive for both the ASEAN's open economy and economic convergence

Source: Various, 2022

Table 2. Correlation between Open Economy (FDI Inflows) and Economic Convergence

```
. correlate (ln_fdiasean ln_convergence)
(obs=120)
```

	ln_fdi-n	ln_con~e
ln_fdiasean	1.0000	
ln_converg~e	0.8832	1.0000

Source: Own Estimation, 2022

Table 3. ASEAN Member State’s Open Economy (FDI Inflows) Effectiveness

Random-effects GLS regression	Number of obs	=	120
Group variable: countrys	Number of groups	=	6
R-sq:	Obs per group:		
within = 0.0448	min =		20
between = 0.9961	avg =		20.0
overall = 0.8656	max =		20
corr(u_i, X) = 0 (assumed)	Wald chi2(10)	=	.
	Prob > chi2	=	.

ln_fdiasean	Coef.	Std. Err.	z	P> z	[95% Conf. Interval]
bcttt	.0615133	.1616005	0.38	0.703	-.2552178 .3782445
convergence	.0106904	.0050288	2.13	0.034	.0008241 .0205468
ln_reer	-.306617	.7608924	-0.40	0.687	-1.797939 1.184705
ln_export	3.806182	.5327282	7.14	0.000	2.762054 4.85031
ln_import	-4.355971	.6192339	-7.03	0.000	-5.569647 -3.142295
ln_open	.0461339	.1330962	0.35	0.729	-.2147299 .3069976
ln_gdpcapita	.9773826	.3062334	3.19	0.001	.3769802 1.577785
gdp	1.12e-12	4.28e-13	2.61	0.009	2.79e-13 1.95e-12
opunemploy	-.0752734	.042873	-1.77	0.077	-.158715 .0081681
inflation	.0319287	.0198094	1.61	0.107	-.006897 .0707544
gdpr	.0128656	.0230125	0.56	0.576	-.0322381 .0579694
_cons	12.73653	4.644031	2.74	0.006	3.634401 21.83867
sigma_u	0				
sigma_e	.44887873				
rho	0	(fraction of variance due to u_i)			

	Coefficients			
	(b) fe	(B) re	(b-B) Difference	sqrt(diag(V_b-V_B)) S.E.
bcttt	.3825231	.0615133	.3210098	.0256564
convergence	-.0830844	.0106904	-.0937748	.078089
ln_reer	1.668636	-.306617	1.975254	.315448
ln_export	-.800556	3.806182	-4.606738	.6417596
ln_import	.4785277	-4.355971	4.834499	.6040641
ln_open	.2791843	.0461339	.2330505	.0156
ln_gdpcapita	.4458677	.9773826	-.5315149	.6515258
gdp	-3.96e-13	1.12e-12	-1.51e-12	5.89e-13
opunemploy	.0005768	-.0752734	.0758502	.0827021
inflation	.0097184	.0319287	-.0222102	.
gdpr	.0130257	.0128656	.00016	.

b = consistent under Ho and Ha; obtained from xtreg
B = inconsistent under Ha, efficient under Ho; obtained from xtreg

Test: Ho: difference in coefficients not systematic

$$\text{chi2}(10) = (b-B)' [(V_b-V_B)^{-1}] (b-B)$$

$$= 54.38$$

Prob>chi2 = 0.0000
(V_b-V_B is not positive definite)

Source: Own Estimation, 2022

Table 4. Non-ASEAN Member State's Open Economy (FDI Inflows) Effectiveness

```

Random-effects GLS regression           Number of obs   =       80
Group variable: countrys                Number of groups =        4

R-sq:                                   Obs per group:
  within = 0.2777                          min =       20
  between = 0.9914                          avg =      20.0
  overall = 0.7808                          max =       20

corr(u_i, X) = 0 (assumed)                Wald chi2(12)   =        .
                                           Prob > chi2     =        .
    
```

ln_fdi	Coef.	Std. Err.	z	P> z	[95% Conf. Interval]	
gdp	1.84e-13	5.66e-14	3.24	0.001	7.27e-14	2.95e-13
gdpcapita	-7.38e-06	.0000101	-0.73	0.467	-.0000272	.0000125
ln_reer	.2517367	.4329229	0.58	0.561	-.5967766	1.10025
ln_unemploy	-1.063122	.3397251	-3.13	0.002	-1.728971	-.3972725
inflation	-.0494671	.0461522	-1.07	0.284	-.1399238	.0409897
gdpgr	-.0523245	.0321093	-1.63	0.103	-.1152576	.0106087
ln_export	1.802299	.9024858	2.00	0.046	.0334598	3.571139
ln_import	-1.959142	.990122	-1.98	0.048	-3.899746	-.0185389
ln_open	-.093879	.149368	-0.63	0.530	-.3866348	.1988769
acfta	-.5842605	.4176869	-1.40	0.162	-1.402912	.2343908
ajfta	.6254737	.2848651	2.20	0.028	.0671483	1.183799
akfta	.2691712	.3743728	0.72	0.472	-.4645861	1.002928
aansfta	-.9654842	.2786576	-3.46	0.001	-1.511643	-.4193254
_cons	12.82844	4.616832	2.78	0.005	3.789612	21.88726
sigma_u	0					
sigma_e	.33265063					
rho	0	(fraction of variance due to u_i)				

	Coefficients			
	(b) fe	(B) re	(b-B) Difference	sqrt(diag(V_b-V_B)) S.E.
gdp	1.31e-13	1.84e-13	-5.29e-14	.
gdpcapita	.000048	-7.38e-06	.000054	.0000146
ln_reer	.1894876	.2517367	-.0622491	.
ln_unemploy	-.0073672	-1.063122	1.055754	.
inflation	.0700371	-.0494671	.1195042	.
gdpgr	.0292771	-.0523245	.0816016	.
ln_export	.1209451	1.802299	-1.681354	.
ln_import	-.8451775	-1.959142	1.113965	.
ln_open	-.1688804	-.093879	-.0750015	.
acfta	.3014265	-.5842605	.885697	.
ajfta	.1378722	.6254737	-.4876015	.
akfta	-.0309507	.2691712	-.3001219	.
aansfta	-.896225	-.9654842	.0692592	.

b = consistent under Ho and Ha; obtained from xtreg
 B = inconsistent under Ha, efficient under Ho; obtained from xtreg

Test: Ho: difference in coefficients not systematic

chi2(11) = (b-B)'[(V_b-V_B)^(-1)](b-B)
 = 102.19
 Prob>chi2 = 0.0000
 (V_b-V_B is not positive definite)

Source: Own Estimation, 2022

Table 5. ASEAN Economic Convergence Progress

```

Random-effects GLS regression           Number of obs   =   120
Group variable: countries              Number of groups =    6

R-sq:
  within = 0.2162
  between = 0.9988
  overall = 0.9874

Obs per group:
  min = 20
  avg = 20.0
  max = 20

Wald chi2(10) = .
Prob > chi2 = .

corr(u_i, X) = 0 (assumed)
    
```

ln_converge	Coef.	Std. Err.	z	P> z	[95% Conf. Interval]	
bcttt	-.2177107	.03229857	-6.60	0.000	-.2823614	-.15306
ln_fdiasean	.0653122	.0195546	3.34	0.001	.0269859	.1036385
ln_reer	-.0755594	.1518741	-0.50	0.619	-.3732271	.2221083
ln_export	.0841612	.1253344	0.67	0.502	-.1614897	.3298121
ln_import	-.3511462	.1520792	-2.31	0.021	-.649216	-.0530764
ln_open	-.0268146	.0271966	-0.99	0.324	-.080119	.0264898
ln_gdpcapita	1.038062	.0505309	20.54	0.000	.9390235	1.137101
gdp	-2.04e-13	8.76e-14	-2.33	0.020	-3.76e-13	-3.28e-14
opunemploy	.0013683	.0087609	0.16	0.876	-.0158026	.0185393
inflation	-.0040984	.0041316	-0.99	0.321	-.0121961	.0039994
gdppr	-.0073337	.0047673	-1.54	0.124	-.0166774	.00201
_cons	.0259133	.9838768	0.03	0.979	-1.90245	1.954276
sigma_u	0					
sigma_e	.05243849					
rho	0	(fraction of variance due to u_i)				

	Coefficients			
	(b)	(B)	(b-B)	sqrt(diag(V_b-V_B))
	fe	re	Difference	S.E.
bcttt	-.0085963	-.2177107	.2091144	.
ln_fdiasean	-.0196736	.0653122	-.0849858	.
ln_reer	.2486758	-.0755594	.3242352	.
ln_export	-.1236536	.0841612	-.2078148	.
ln_import	.2160735	-.3511462	.5672197	.
ln_open	-.0223354	-.0268146	.0044792	.
ln_gdpcapita	.0819562	1.038062	-.9561061	.0661388
gdp	-4.11e-13	-2.04e-13	-2.06e-13	.
opunemploy	-.0241082	.0013683	-.0254766	.0057895
inflation	-.0092438	-.0040984	-.0051454	.
gdppr	-.0014994	-.0073337	.0058342	.

b = consistent under Ho and Ha; obtained from xtreg
 B = inconsistent under Ha, efficient under Ho; obtained from xtreg

Test: Ho: difference in coefficients not systematic

chi2(10) = (b-B)'[(V_b-V_B)^(-1)](b-B)
 = 336.96
 Prob>chi2 = 0.0000
 (V_b-V_B is not positive definite)

Source: Own Estimation, 2022

Table 6. Commitment in Percentage and Year Target by ASEAN Member States

ASEAN Member States	Renewable Target	Year
Indonesia	23%	2025
Malaysia	31%	2025
Thailand	30%	2036
Philippines	2-3 Gigawatts	2030
Brunei Darussalam	10%	2035
Singapore	2 Gigawatts	2030
Cambodia	1,815 Megawatts	2030
Laos	30%	2025
Myanmar	62%	2030
Vietnam	50%	2045

Source: Various, 2022

Figures

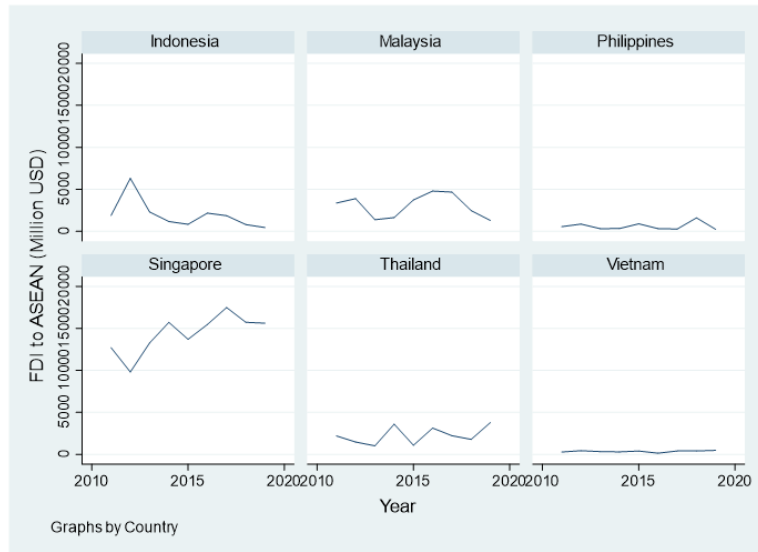


Figure 1. FDI Inflows Home Country for ASEAN: Selected Member States from 2011 to 2019
 Source: Own Illustration, ASEAN Statistic Data, 2022

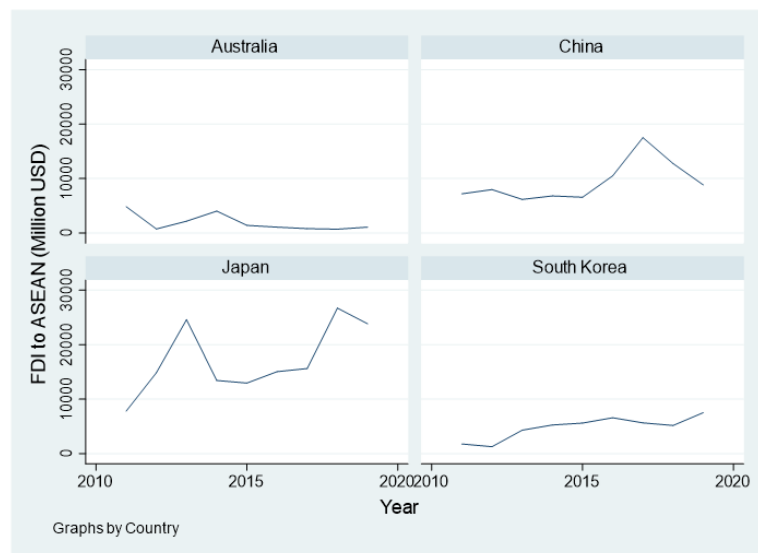


Figure 2. FDI Inflows Home Country for ASEAN: Non-Member States from 2011 to 2019
 Source: Own Illustration, ASEAN Statistic Data, 2022

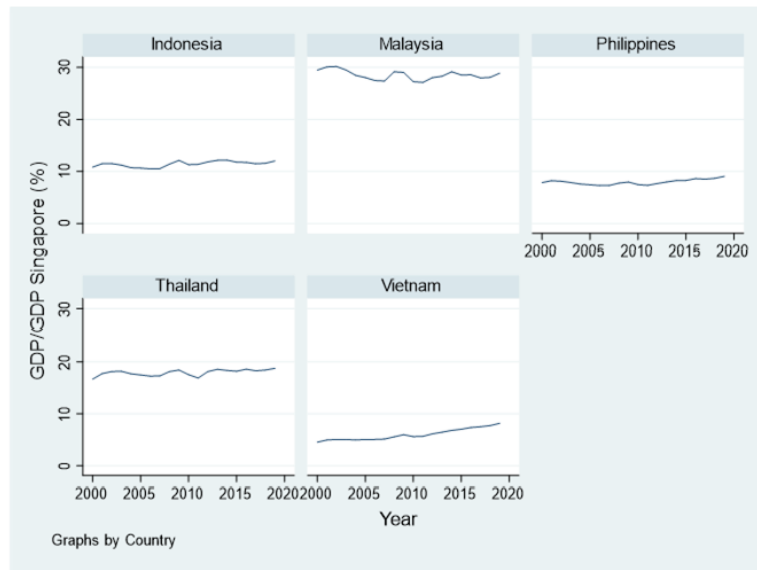


Figure 3. Economic Convergence in ASEAN: Selected Member States from 2000 to 2019
 Source: Own Illustration, WDI Data, 2022



Diagram 1. State and Momentum in Economy's Digital Trajectory
 Source: Digital Intelligence Index - a study of global digital competitiveness (tufts.edu)
<https://digitalintelligence.fletcher.tufts.edu/trajectory>

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