Determinants of Economic Growth in Founder Countries of the PA and the ASAN

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Determinants of Economic Growth in Founder Countries of the Pacific Alliance and the Association of Southeast Asia Nations: Approach from a Systematic Literature Review*

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Abstract

The objective of this article is to carry out an approach from a systematic review of the literature and about the determinants of economic growth from a Kaldorian virtuous cycle approach

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2

focused on the founder countries of the Pacific Alliance and the Association of Southeast Asia Nations through databases such as Web of Science and Scopus. Two knowledge gaps have been identified. The first corresponds to the lack of studies that comparatively analyze the Kaldorian determinants of virtuous economic growth; the second is the shortage of publications related to the identification of convergence/divergence between countries and trade blocs, which no other paper has yet studied. As a complementary section, the exploratory cluster analysis revealed that the clusters of countries formed from 1990 to 2018 had been maintained.

Determinantes de crecimiento económico en los países fundadores de la Alianza del Pacífico y la Asociación de Países del Sudeste Asiático: aproximación desde una revisión sistemática de literatura

Resumen

El objetivo de este artículo es realizar una aproximación desde una revisión sistemática de la literatura sobre los determinantes del crecimiento económico desde un enfoque de ciclo virtuoso kaldoriano enfocado en los países fundadores de la Alianza del Pacífico y la Asociación de Naciones del Sudeste Asiático a través de bases de datos como Web of Science y Scopus. Se han identificado dos vacíos de conocimiento. El primero corresponde a la falta de estudios que analicen comparativamente los determinantes kaldorianos del crecimiento económico virtuoso; el segundo está relacionado con la escasez de publicaciones relacionadas con la identificación de la convergencia/divergencia entre países y bloques comerciales, que ningún otro trabajo ha estudiado todavía. Como apartado complementario, se realiza un análisis exploratorio de conglomerados el cual reveló que aquellos formados desde 1990 hasta 2018 se han mantenido.

Introduction

World economic history has been characterized by dynamics, volatility, and the interconnection of economies as time goes by. For this reason, different countries around the world have adopted strategies, and economic openness focuses on the growth and development of nations. Generally, these strategies arise, on the one hand, thanks to the analysis of the local environment, allowing the recognition of comparative advantages, competitive advantages, and the vulnerability of markets, aspects specific to each economy. On the other hand, these strategies are usually the response to variations in international markets that affect a particular economy depending on its level of openness. Consequently, economic growth and trade openness strategies differ from one country to another, generating enormous disparities between economic growth rates.

The interest in carrying out this work arises from the question of identifying the success in the process of economic opening advanced by Colombia in recent years, which has made a transition from bilateral free trade agreements to the formation of a solid regional economic bloc called The Pacific Alliance (PA). PA aims to consolidate itself in markets other than the traditional ones (Europe and the United States), such as the East Asian population, represented by The Association of Southeast Asian Nations (ASEAN). ASEAN is considered one of the strongest and oldest economic blocs in the recent history of international trade, which, due to its history, has become a valuable model of comparison for the economic integration projects that have emerged in recent years[1].

Specifically, PA is a regional integration initiative created on April 28, 2011, by four countries: Chile, Colombia, Mexico, and Peru, to enhance economic integration as an engine of economic growth and development main objectives and increase the commercial relation with the Asia-Pacific region. On the other hand, ASEAN is a regional organization of East Asian countries created on August 8, 1967, with the central objective of accelerating economic growth and promoting regional peace and stability; it currently has ten member countries: Indonesia,

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[1] To understand the relations between these two economic blocs, García (2010) identifies those countries of East Asia, such as Malaysia, Singapore, and Indonesia, had an economic structure similar to that of the Latin American countries of the PA in the early 1960s. Their economic integration in the ASEAN boosted their economic growth. Additionally, based on this economic structure, is it possible to compare the import substitution industrialization applied in Latin America and the export-oriented industrialization in East Asia, as Chica (2007) mentioned.

4

Malaysia, the Philippines, Singapore, Thailand, Brunei, Vietnam, Laos, Myanmar, and Cambodia.

On the other hand, different studies have analyzed economic growth from different perspectives, such as capital accumulation and technical change (Solow, 1956) and the incidence of human Capital (Romer, 1990), among many others. However, industrial strengthening on economic growth gained great relevance with the contributions of Nicholas Kaldor, who conducted an in-depth examination of the dynamics behind the principle of cumulative circular causation.

From his perspective, the positive effects of the expansion of the industrial sector on economic growth and its contagion effect on the rest of the sectors —by raising productivity in all economic activities—are based on the assumption of increasing returns and the presence of economies of scale in the industrial sector, the decreasing returns present in the agricultural sector. Thus, these increasing returns manifest the multiplier effect of the industrial sector, which in essence means that this sector is considered an engine of growth. In this way, increased productivity and industrial strengthening lead to greater economic openness through increased exports, encouraging new economic growth scenarios enhanced by insertion into international markets through participation in economic blocs. Thus, understanding the Kaldorian theory to stimulate productive development in the aforementioned economies makes valuable sense for analyzing the economic structure and policy.

Kaldorian theory of economic growth supposes the conception of endogenous technical progress (Kaldor, 1966), which extends the argument of Young (1928) and proposes that the increasing returns to scale due to the division and specialization of industries (Moreno, 2008; Lucas, 1988), are generated by the interaction of different economic sectors in economic growth. Nicholas Kaldor (1966) raises his endogenous economic growth model through the importance of industrial-manufacturing growth. From there, Kaldor (1966, 1967, 1968, 1970) establishes his three fundamental laws of economic growth:

1. The growth rate of industrial-manufacturing production is the main engine of economic growth. If there is an increase in industrial-manufacturing output, there will be an increase in the GDP.
2. The growth rate of labor productivity in the industrial-manufacturing sector is positively and significantly correlated with the production growth rate in the same industry. This means that if there is an increase in the production of

the industrial manufacturing sector, there will be an increase in labor productivity in the industrial-manufacturing sector. This is known as the Verdoorn Law.

3. The growth rate of the entire economic productivity sector is positively and significantly correlated with the industrial-manufacturing production growth rate and negatively and significantly associated with the employment growth rate in the non-industrial-manufacturing sector. As such, if there is an increase in the production of the industrial manufacturing sector, there will be an increase in the growth rate of productivity in the entire economy. Suppose there is an increase in the employment growth rate in the non-industrial-manufacturing sector. In that case, there will be a decrease in the productivity growth rate of the entire economy.

The three Kaldor laws support the importance of industrialization in each economy, which allows for an increase in returns to scale and endogenous growth of the entire economy. Specifically, it refers to three mechanisms: the internal economy, externalities, and accumulative causality. This last aspect includes a virtuous circle of accumulation of capabilities: coordination economies (because of scale economy interaction) and market size (demand). Specifically, it is considered to be the accumulative causality proposed by Kaldor (1961) that comprehends the following virtuous circle: investment (I) to increase productivity (b), which influences exportation levels (x). It stimulates productivity growth (b). This affects exportation levels (x) and stimulates economic growth (g), yielding new investment levels (I-b-X-g).

Based on the postulates before mentioned, it can be affirmed that the Kaldorian theory of economic growth is a potent tool to analyze the determinants of economic growth in different countries empirically, through economic sector interaction and the importance of each sector through time. There is increasing literature on the empirical approach of Kaldor Laws applied through different economies.

In this sense, it was done as an approximation to scientific development in an empiric way of the Kaldor Theory approach to know the background literature and the investigative actuality surrounding this investigation. To reach the objective of analyzing the determinants of economic growth, through the Kaldorian theory, of the founder countries of the Association of Southeast Asian Nations: Indonesia, Malaysia, Philippines, Singapore, and Thailand; and the Pacific Alliance trade bloc: Chile, Colombia, Mexico, and Peru, making particular emphasis in how industrial strengthening, favors the entrance of economies into international markets

by the advantages of globalization through the bonding of trade blocs, it was done research in Web of Science (WoS) and Scopus platforms.

The present article has been structured into five sections: i) a methodological description of the systematic literature review, ii) the main results from the bibliometric analysis, iii) the discussion of different conclusions and methods contained in the studied papers, iv) an exploratory cluster analysis, and finally, v) conclusions.

Methodology

To achieve the objective of analyzing the determinants of economic growth, via Kaldorian theory, in the founder countries of the Pacific Alliance trade bloc, between 1980 and 2019, how industrial reinforcement favors the entrance of economies into international markets through the advantages of globalization and the bonding of trade blocs was emphasized. For this purpose, we use WoS and Scopus platforms. Said databases were selected due to their positioning, including great scientific research on various scientific topics and in many fields of knowledge (Bar-Ilan, 2008) (Gavel & Iselid, 2008). WoS [*Clarivate*], includes approximately 18,000 indexed journals, and Scopus *[Elsevier]* includes approximately 40,000 indexed journals (Duque & Cervantes, 2019).

The research equation employed in both databases was ["Economic Growth" + "Kaldor" + "Manufacturing"], other equations used were as follows: ["Economic Growth" + "Kaldor" + "Industrial*"], ["Economic Growth" + "Kaldor"], ["Economic Growth" + "Kaldor" + "Structural Change"], however, these equations did not capture the objective of the article and the selected equation. Further, said equation included various documents not relevant to the literature review. This search was done with main topics, titles, abstracts, and keywords. With this research methodology, 45 papers were obtained: 21 from WoS and 24 from Scopus (Table 1). However, it should be noted that 11 of said papers were published in both databases, so there were just 34 papers to be reviewed.

The results obtained above were exported from both databases, into BIB text format, with primary data including author, year, DOI, source, and references. This process implies incorporating different sources and indexed and non-indexed journals, with database and language independence. It could offer a considerably broad view of the field of study and its most relevant academic production. Once the sources had been exported to BIB text format, the *Bibliometrix* tool developed

by Aria and Cuccurullo (2017) was employed for bibliometric analysis. Specifically, this process analyzes scientific production, most relevant journals, co-citation networks, author provenance, and the vital abstract elements to determine the paper's relevance within this research purpose.

Table 1. Search and criteria

Research equation	Database	Results	Number of papers
"Economic Growth" + "Kaldor" + "Manufacturing"	Only Scopus	13	
Time: Every year	Only WoS	10	34
	Both	11	

Source: own work.

Results

This section presents the related bibliometric elements of this study into scientific production, related to the determinants of economic growth, as seen through Kaldorian theory. Herein, the quantity of production, country classification, most essential authors, following scientific production and citation, and the relevant sources in this field of research are shown. Also, a discussion surrounding the documents is proposed to improve the analysis, which groups them into categories with common characteristics.

Table 2 presents the scientific papers published in the databases mentioned above, which discuss the determinants of economic growth with Kaldorian theory. Until 2007 only 12 articles had been published, the least productive period on the topic. After 2007, research publications on this topic increased, but not dramatically. The most productive year was 2018, with seven published papers (three in Scopus and four in WoS), approximately 15% of all scientific production on the topic.

By analyzing this annual scientific production by country, we find that the United Kingdom is the leading scientific producer, with 12 papers in WoS and six papers in *Scopus*. Table 2 presents a list of the ten countries with the most significant scientific production worldwide related to the determinants of economic growth with Kaldorian theory, organized by the database. It should be noted that

the following countries have been identified in both databases: the United Kingdom, United States, Brazil, Mexico, Austria, China, Saudi Arabia, and Denmark.

Within the ten countries with the most significant scientific production worldwide, related to the purpose of this article, the importance of British results, which represents 38% of all scientific production on the topic, is evident. Specifically, the five countries with the largest production in this field, without differentiating by the database, are the United Kingdom, with 18 publications; the United States, with 16 publications; Brazil, with 15 publications; Mexico, with 11 publications; and Austria, with eight publications.

Table 2. Scientific production by country

Databases			
Web of Science (WoS)		Scopus	
Country	Number of Papers	Country	Number of Papers
Brazil	12	USA	8
UK	12	Italy	6
USA	8	UK	6
Italy	7	Austria	5
Mexico	6	Mexico	5
Austria	3	Brazil	3
Saudi Arabia	2	China	3
Turkey	2	Denmark	2
China	1	Netherland	2
France	1	Saudi Arabia	2

Source: own work.

Regarding authors, Table 3 presents a list of the most relevant authors, classified by the number of publications in each database and with their *h*-index, used to characterize the scientific production of each researcher.

No single author leads scientific production in the Scopus database. Each of them has published one paper, according to the research equation. On the other hand, John S. L. McCombie is the most relevant author in the WoS database, with the highest number of publications (two papers).

Table 3. Most relevant authors

Databases					
Scopus			WoS		
Author	Number of Papers	h index	Author	Number of Papers	h index
Almoree MA	1	0	McCombie JSL	2	2
Almosabbeh IA	1	0	Almoree MA	1	0
Araujo E	1	0	Almosabbeh IA	1	0
Aroche Reyes F	1	0	Araujo E	1	0
Barbieri L	1	-	Aroche Reyes F	1	0
Berger S	1	-	Bbaale E	1	0
Bernat Jr GA	1	-	Cabral de Lorenco AL	1	0
Boggio L	1	-	Cantore N	1	1
Cantore N	1	1	Cardoso FA	1	0
Clara M	1	-	Ciriaci D	1	1

Source: own work.

Publications in the Scopus database are focused on social studies (34.5%), business, management, and accounting (17.5%), economics, econometrics, and finances (12.1%), and arts and humanities (10.7%). In WoS, they are focused on categories such as education research (38%) and social studies (21.5%) (Duque and Cervantes, 2019). This result shows that WoS employs a more homogenous classification than Scopus and offers a more specific field of research about the determinants of economic growth with Kaldorian theory.

Table 4 shows the ten most relevant journals for the determinants of economic growth with Kaldorian theory, in Scopus and WoS, with their respective *h*-index. It is essential to acknowledge the most influential journals in terms of the determinants of economic growth with Kaldorian theory because this helps to identify journals in which to publish to link similar work on this topic.

Table 4. The most relevant journals

Journal	Papers	h index	Database
Structural Change and Economic Dynamics	3	3	WoS
Applied Economics	2	-	Scopus
Cambridge Journal of Economics	2	1	WoS
Investigación Económica	2	1	WoS
Journal of Economic Studies	2	1	WoS
Journal of Post Keynesian Economics	1	2	WoS
Develment and Change	1	-	Scopus
Economies	1	-	Scopus
International Regional Science Review	1	1	WoS
European Planning Studies	1	1	WoS

Source: own work.

Discussion

The documents are classified into seven categories regarding the article's main topic. Said categories included: relationship to the research purpose, three Kaldor laws, only the first law, only the Kaldor-Verdoorn law, only the third law, two Kaldor laws, and theoretical or propositional papers. This categorization allowed for a more in-depth analysis of the documents and fostered discussion of their approaches.

Documents directly related to the research purpose

According to the database, there were only five with direct implications for our research purpose: those that empirically approach ASEAN or PA Countries.

Jiménez (2017) used a time series method, through cointegration and causality direction analysis, to test whether the manufacturing sector continues as an engine of growth. This analysis described the premature deindustrialization process in developing countries after the Washington Consensus. He established

that the Kaldor Laws are still valid in the Peruvian economy, but the loss of importance of the manufacturing sector is evident after its weakening by neoliberal politics. Peru is meant to apply modern development politics and strive to expand its internal market.

Sánchez (2011) used a time series method, through cointegration and causality direction analysis and a data panel analysis, to empirically assess the validity of the Kaldorian approach to economic growth and thus explain the causes of the described phase of economic stagnation in Mexico. For that purpose, the stagnation process in Mexico was characterized by dividing the country into different regions to demonstrate the dependence of Mexican economic growth on central regions. The three Kaldor laws were proven, highlighting that the first established manufacturing remains the engine for growth but that there is a dynamic inadequacy in the manufacturing sector. The second showed that growth in demand for industrial products was the main driving force behind an economy's long-term growth, and the third established that manufacturing growth is crucial for economic growth and employment. Finally, the author demonstrated that technological dynamization must be prioritized to avoid Mexican economic stagnation.

Sánchez-Juárez et al. (2019) used the Generalized Moments Method and rolling econometric regression techniques to explain low Mexican economic growth using the first Kaldor law. The dynamic evolution of capital formation confirms its downward trend, which makes it possible to assure that the dynamic inadequacy of manufacturing is an essential factor in explaining the Mexican economy's low long-term growth. To achieve positive structural change, an active policy of productive development, particularly industrial development, with an emphasis on manufacturing, must be implemented.

Rasiah (1996) used Panel Data Analysis to understand industrialization in Malaysia. This naturally resource-rich country has dynamized its manufacturing capacity as a leading economic growth engine, especially since 1971. They established that their success in economic growth had been integrated with manufacturing sector growth, marking the difference between two types of periods in Malaysian economic politics: an initial protective period and a later less protective, more expansive period. Foreign investment has played a crucial role in both periods. Also, they propose that industrial policy should reinforce linkages between the growing manufacturing sector and the domestic economy.

Finally, Aroche-Reyes (2019) uses an input-output model to examine Mexican economic growth from a multisectoral perspective, emphasizing the

Kaldor-Verdoorn Law estimation. It concludes that manufacturing is the sector with the greatest capacity to generate growth, sustained within itself. According to Aroche-Reyes (2019), Mexico is what Kaldor called an 'immature economy.'

Documents that test the three Kaldor laws

Bernat Jr. (1996), Pons-Novell and Viladecans-Marsal (1999), and Güçlü (2013) used spatial econometric methods to analyze the determinants of economic growth, including geographic dependence. Bernat Jr. (1996) tested the three laws for US regions and supported the first and second Kaldor laws uniformly across the country. Pons-Novell and Viladecans-Marsal (1999) tested the three laws for European regions between 1984 and 1992. In contrast to Bernat Jr. (1996), they established that the second and third laws hold for European regional economies. Later, Güçlü (2013) tested the three laws for Turkey's regions between 1990 and 2000, established that the three laws hold, and emphasized the presence of spatial dependence in the first law, which indicates that growth in neighboring regions has an effect on growth in this country.

Necmi (1999), Atesoglu (1993), and Mamgain (1999) used time series econometric methods to test Kaldor laws, over time, in a specific context. Necmi (1999) tested the three laws, using instrumental variables, for 45 developing countries, between 1960 and 1994, and concluded that the three laws hold in each developing country, except the Sub-Saharan African region. Atesoglu (1993) tested the three laws describing the North American economy between 1965 and 1988 and determined that the three laws hold and are compatible with the description and dynamic of the US economy.

Later, Mamgain (1999) tested the laws for two sets of countries: Singapore and South Korea, and Malaysia, Indonesia, Thailand, and Mauritius, between 1960 and 1988, and saw similarities with Bernat's (1996) conclusions because they determined that the first law holds uniformly in each country, but the holding of the subsequent two laws is detailed and depends on the capacity of the manufacturing sector in each country. They also proposed a re-examination of the third law.

Yu, Qi, and Yu (2018) used the panel data econometric method to test the relationship between economic growth and manufacturing growth, based on Kaldor's laws, describing China's industrialization process between 1978 and 2016. They determined that the three Kaldor laws hold in the Chinese country

uniformly, so public policy should be to continue investing in manufacturing development.

Apart from those documents that test all three of Kaldor's laws, multiple publications focus their analysis on just one or two laws. It is more common that the documents target Kaldor-Verdoorn's law, or the second law, as it is also called. Therefore, the approach of the present study categorizes the analysis by the law or laws tested in said documents.

Documents that test only the first law

Cantore et al. (2017) and Guo et al. (2013) focus on Kaldor's first law to support the effectiveness of manufacturing as an engine of growth, and both of them use a different econometric approach to explain this. Cantore et al. (2017) test the effectiveness of manufacturing to foster growth in 80 countries, applying the generalized method of moments. They support the manufacturing sector's role as an engine of growth and decompose the industry to see those components that foster more remarkable development clearly. Guo et al. (2013) focus on the Chinese territory, aiming to prove that manufacturing applies to China as an engine of growth. Due to China's manufacturing structure, spatial econometric techniques were required to decompose the sector.

Documents that test only the Kaldor-Verdoorn law

Millemaci and Ofria (2016), Almosabbeth and Almoree (2018), Boggio and Barbieri (2017), Nassif et al. (2018), Deleidi et al. (2019), Castillo et al. (2019), Romero and McCombie (2016), Magacho and McCombie (2017) and Ciriaci and Palma (2008) focus on the second law (the Kaldor-Verdoorn's law). In this order, said documents may be categorized as Millemaci and Ofria (2016), Almosabbeth and Almoree (2018), and Ciriaci and Palma. (2008) used a time series methodology to reveal the determinants of productivity growth in the manufacturing sector. On the other hand, Boggio and Barbieri (2017), Nassif et al. (2018), Deleidi et al. (2019), Castillo et al. (2019), Romero et al. (2016), and Magacho et al. (2017) used a panel data approach to observe how the different manufacturing sectors reacted to increasing returns to scale and labor productivity.

Documents that test only the third law

Ssozi and Bbaale (2019) tested Kaldor's third law to determine whether employment growth outside the manufacturing sector could foster productivity. They used a generalized two-step method of moments to approach data from 29 Sub-Saharan African countries to observe the structural change, finding that industries such as services that involve technological changes boosted productivity growth. Also, Tregenna (2009) described two kinds of deindustrialization: that with low employment and another with low value-added. These represent how manufacturing can be the engine of growth in both circumstances.

Documents that test two Kaldor laws

Marcon et al. (2016), Dalum et al. (1999), and McCausland and Theodossiou (2012) centered their analysis on explaining two of Kaldor's laws through the employment of panel data analysis. Thus, Marcon et al. (2016) tested the role of the manufacturing sector in the developmental process, guided by the first two Kaldor laws. They found that the output growth in manufacturing is key to increasing economic growth and productivity overall. Dalum et al. (1999) used Kaldor's theory and Thirlwall's to gauge the importance of specialization for economic growth, testing the data across 11 different manufacturing sectors. On the other hand, McCausland and Theodossiou (2012) focused their analysis on those factors that fostered economic growth, showing that manufacturing output is still an engine for economic and productive growth.

Theoretical or propositional papers

These papers do not directly test the Kaldor laws but propose a new model that attempts consistency with Kaldor laws and stylized facts or tries the determinants of economic growth from another perspective. Kongsamut et al. (2001) asked whether there was a growth model consistent with both the Kaldor facts and the massive sectoral labor reallocation experienced in the US during the past century. They concluded that there was evidence of sectoral employment reallocation, from agriculture to services, in all growing countries they studied. Cabral de

Lourenço and Alves-Cardoso (2018) compared the performance of Brazil, Russia, India, and China between 1980 and 2013. They concluded that the countries that grew faster had more developed manufacturing value-added. Theoretically, Rocha (2018) argued the Kaldor posture of manufacturing as an economic growth engine because of its properties, which combine Keynesian-Kaldorian, structuralist and neo-Schumpeterian frameworks.

Summary charts

The present investigation used bibliometric analysis to summarize the most relevant information into two tables. Table 5 presents the most often-used variables among authors, and Table 6 shows the most econometric or statistical methods used in the studies. These tables are given below.

Table 5. Variable trends among papers

Variables	Number of uses
Manufacturing GDP (and its growth rate)	7
Other forms of GDP (Services, Agriculture, Non-Industrial, etc.) and its growth rate	18
Manufacture outputs (and its growth rate)	8
Productivity (and its growth rate)	11
Technology variables	5
Employment and labor variables	14
Proxy variables	1
Dummy variables	2
Control variables	1

Source: own work.

Table 6. Methodological trends among papers

Methodology	Frequency in papers
Time series	8
Panel data	12
Spatial models	4
GMM	5
AR	1
Theorical models	2
Other techinques	11

Source: own work.

A preliminary cluster analysis

This preliminary exercise approaches the determinants of economic growth in the blocks above based on a multivariate method that complements the understanding of this phenomenon commonly carried out with time series and panel data analysis. Based on the information available, at the World Bank, about the founding countries of the blocs, a cluster analysis was carried out based on four key variables of Kaldorian theory: GDP, exports, investment, and industrial growth. We assume that the variables are independent for this preliminary approximation, recognizing the possible dependence between the mentioned variables, which can be studied in subsequent analyses.

This exploratory analysis aims to form groups or conglomerates of individuals, or in this case, countries, which are as homogeneous as possible. In other words, when comparing the elements that make up a group, they should be as similar as possible and as heterogeneous as possible when comparing groups. Specifically, cluster analysis aims to form groups, segments, or variables (although this is uncommon) that are as similar as possible within each group and as different as possible when compared between groups.

The first step in cluster analysis is to define the proximity measure. Proximity expresses the degree of similarity or difference that exists between pairs of individuals (countries). Cluster analysis uses measurements of similarity or dissimilarity

between individuals. Their difference lies in interpretation; the smaller a measure of dissimilarity, the larger the value of a similarity measure and the more similar two objects are. For this purpose, the following topics are considered:

1. The type of data available.
2. The type of proximity, similarity, or dissimilarity.
3. The distance measurement to be used.

In the present study, quantitative data is measured on a metric scale, and the dissimilarity used is the Euclidean distance.

$$d_{ij} = \left[\sum_{k=1}^{r} (x_{ik} - x_{jk})^2 \right]^{\frac{1}{2}} \tag{1}$$

Where, d_{ij} is the distance of the object profiles (countries) i and j, x_{ik} represent variable k, measured in the object (country) i, x_{jk} represents the variable k, measured in the object (country) j, and r is the number of variables used to evaluate their similarity.

Specifically, the hierarchical method is used herein. This method seeks to group from most similar to least similar. It can be agglomerative, ascending, divisional, descending, dissociative, or divisive. Agglomerative hierarchy is employed in the present study. This method assumes that each of the grouped elements constitutes a group. There are as many groups as there are individuals (countries). They merge to unite all treads into a single group based on tread similarity.

As a preliminary analysis, the Ward criterion was used here. Ward criterion, also called the minimum variance method, looks for the two groups, or clusters, whose union leads to the smallest increase in variance. This method means that, in each step, one must attempt all possible combinations of two groups, calculate the value of the index of the sum of squares, and select the one with the lowest value.

The process begins with m clusters, each of which comprises a single individual, so each individual coincides with the cluster's center. Therefore, in this first step, we have $E_k = 0$ for each cluster, and with it, $E = 0$. The objective of the Ward method is to find, in each stage, those two clusters whose union provides the lowest increase in the total sum of errors, E. Where, x_{ik} is the value of the j-th variable over the i-th individual of the k-th cluster, assuming that said cluster has n_k individuals (countries), m^k is the centroid of cluster k with components m_j^k, E_k is the sum of

Daniel Osorio Barreto et al.

the squares of the errors for all clusters, where $E = \sum_{k=1}^{h} E_k$. If it is assumed that there are m clusters:

$$E_k = \sum_{i=1}^{nk} \sum_{j=1}^{n} (x_{ij}^k - m_j^k)^2 = \sum_{i=1}^{nk} \sum_{j=1}^{n} (x_{ij})^2 - n_k \sum (m_j^k)^2 \tag{2}$$

Finally, one may determine how many groups may constitute solutions from a dendrogram. Leaving all the objects (countries) in a single group makes no sense, nor does having as many groups as objects. The cluster analysis then would not make sense. Table 7 and Figure 1 present, by decade, the results of cluster analysis based on the countries mentioned above:

Table 7. Cluster analysis by decade

Decade	Cluster 1	Cluster 2	Cluster 3
1960-1969	Peru, Chile, Colombia, Philippines, Indonesia and Thailand	Mexico	Singapore and Malaysia
1970-1979	Peru, Chile, Colombia, Indonesia, Malaysia, Philippines, Singapore and Thailand	Mexico	
1980-1989	Colombia, Chile, Peru, Philippines, Malaysia and Thailand	Mexico and Indonesia	Singapore
1990-1999	Colombia, Chile, Peru and Philippines	Mexico and Indonesia	Malaysia, Thailand and Singapore
2000-2009	Colombia, Chile, Peru, Malaysia, Thailand and Philippines	Mexico and Indonesia	Singapore
2010-2018	Colombia, Chile, Peru, Malaysia, Thailand and Philippines	Mexico and Indonesia	Singapore

Source: own work.

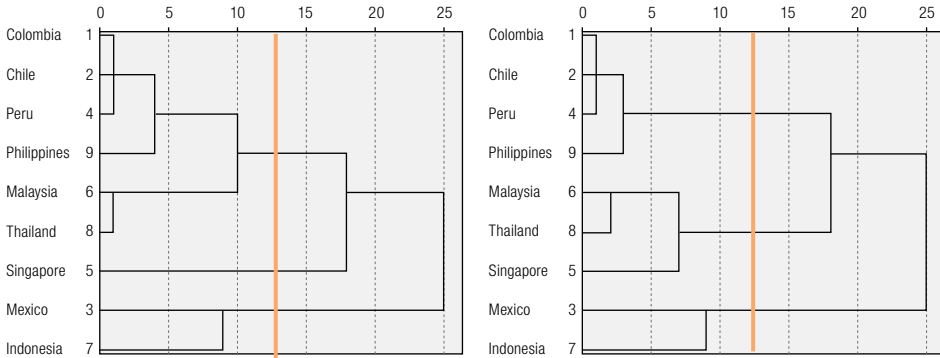Equidad Desarro. N.º 39 • enero-junio de 2022 • ISSN 1692-7311 • E-ISSN: 2389-8844

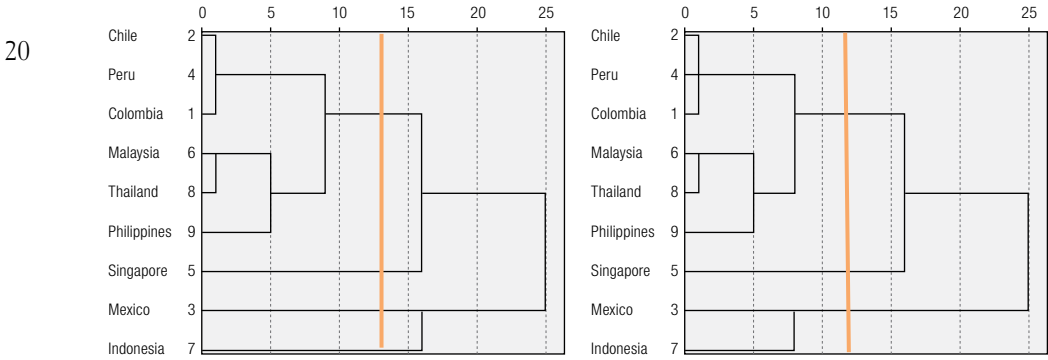Figure 1. Cluster analysis 1960-1969 and 1979-1979
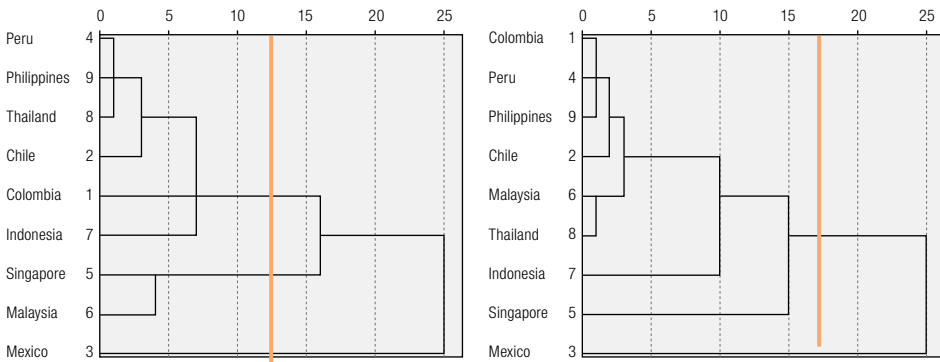
Source: own work.

Figure 2. Cluster analysis 1980-1989 and 1990-1999

Source: own work.

Figure 3. Cluster analysis 2000-2009 and 2010-2018

Source: own work.

Following the above, it is crucial to identify that the cluster between three Latin American countries is conserved over time (Colombia, Chile, and Peru), accompanied by the Philippines. Additionally, two countries are kept in different conglomerates by their GDP levels: Mexico and Singapore. Finally, Indonesia has resembled the conditions of Mexico since the 1980s, and oscillations between clusters are observed over time in the cases of Malaysia and Thailand.

It is interesting to see that previous results suggest that in the second cluster, there are common characteristics in the growth process and variables of interest between Mexico and Indonesia. During the 1980s, oil production in both countries grew significantly. Both countries increased investment in oil resources to strengthen tradable sector growth (agriculture and industry) (Usui, 1997), closely linked to improvement and a subsequent increase in industrial productivity. This phenomenon employs the logic of Moreno (2008), Lucas (1988), and hence Kaldor (1975). It is not surprising, then, that during the decades between 1980-2010, both countries shared a process of industrial specialization, in the sense of McCausland and Theodossiou (2012), and under Keynesian-Kaldorian, structuralist, neo-Schumpeterian frameworks, from a theoretical perspective (Rocha, (2018).

On the other hand, the results from Cluster 1 may be explained by the similarities between Colombia, Chile, Peru, Malaysia, Thailand, and the Philippines from the 1970s to 2018. Singapore began a process of technological change that has allowed it

to attract significant Foreign Direct Investment (FDI) (Lim and McAleer, 2002). This situation subsequently allowed the Southeast Asian country to boost its productivity and stand out from the countries with the slightest technological change relative during the 2000-2018 period. These include Colombia, Chile, Peru, Malaysia, Thailand, and the Philippines. The above is supported by the hypothesis of Ssozi and Bbaale (2019), which asserts that sectors such as services, which involve technological changes, provide the necessary means for structural change and productivity growth.

Conclusions

There is a growing trend regarding the number of scientific productions related to the determinants of economic growth from the Kaldorian approach. Still, it is not a synonym for widespread production, with the same purpose of this research projection. Only five papers study the determinants of economic growth from the Kaldorian approach of countries from ASEAN or the PA trade bloc. It may thus be concluded that there is a clear knowledge gap about this research objective.

The present study aimed to identify publications that analyze the determinants of economic growth, with Kaldorian theory, of founder countries of the mentioned economic blocs between 1980 and 2018, emphasizing how industrial enforcement favors the insertion of economies into international economies markets. There are two knowledge gaps that this study aimed to fill: (i) the identification of the determinants of economic growth in this literature review and (ii) the identification of evidence of convergence/divergence between countries and trade blocs, which no other paper has yet studied. Given the pertinence of economic integration and the current importance of trade blocs in recent years, as with the PA and ASEAN, it is essential to know the determinants of economic growth, and to perform a convergence/divergence analysis among countries and trade blocs, to allow for a broad vision for policymakers in developing countries.

Additionally, the systematic literature review reveals that the scientific community uses panel data analysis more frequently than other econometric or statistical methods. Also, in the Kaldorian theoretical context, this review evidences that different variables are employed to approach the manufacturing sector, such as the manufacturing GDP, productivity in the manufacturing industry, and the manufacturing employment rate. The main conclusion in most reviewed papers is that manufacturing is the main engine of economic growth.

Finally, the exploratory cluster analysis revealed that the clusters of countries formed from 1990 to 2018 had been maintained. In light of the variables analyzed, their economic behaviors have remained unchanged. Furthermore, although initiated with a classification by economic bloc, the cluster analysis identified differences and similarities between blocs, showing independent Mexico-Indonesia and Singapore conglomerates.

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