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Research Paper

Can R&D Transfer and Market Openness Improve the National Export Rate? A Global Entrepreneur Perspective

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Abstract

R&D Transfer gives birth to an understanding of the importance of the role of the latest applied research in developing entrepreneurs to compete in the global market. The global market that continues to be dynamic allows the emergence of various access restrictions that make it difficult for entrepreneurs, so the existence of market openness is needed as an entry point for entrepreneurs into the global market. This study aims to solve the gap of a significant decrease in world export levels in 2020 by 2.1%. This problem is considered crucial because this is the worst decline in the last decade. The aim of this study is to develop a model involving Government Support, Physical Infrastructure, R&D Transfer, and Market Openness, to creating National Export Rate in its application for Global Entrepreneurs with GEM perspectives. The data in this study was taken through secondary data from the Global Entrepreneurship Monitor (GEM) and the World Bank from various countries on five continents in the 2019-2021 data period. The data is processed using Structural Equation Modeling (SEM) analysis instruments. This study empirically requires that the existence of R&D Transfer can encourage market openness to increase the export rate with a direct effect of 0.577. Thus, R&D Transfer has proven to be able to create new applied research and technology that encourages the creation of market openness for entrepreneurs so that they can compete in the global market and lead to an increase in the National Export Rate. Therefore, the practical implications of this study show that countries need to encourage the existence of R&D Transfer through the fulfillment of Physical Infrastructure and Government Support to increase market opening for increased exports.

Keywords: *Physical Infrastructure, Government Support, R&D Transfer; Market Openness; National Export Rate*

INTRODUCTION

Global economic issues related to the Russia and Ukraine war and economic recession cause prices to rise, and the scarcity of state commodities from the stalled export-import process changes the country's priorities in developing the economy. In particular, the role of Russia and Ukraine contributed to the decline in export rates, including energy-producing fuels such as coal. Global economic issues related to the Russia and Ukraine war and economic recession cause high prices, and the scarcity of state commodities from the stalled export-import process changes the country's priorities in developing the economy. In particular, the role of Russia and Ukraine contributed to the decline in export rates, including energy-producing fuels such as coal. However, coal is a non-renewable resource with potential energy scarcity. Many researchers emphasize the development of renewable industries as a new alternative to current energy sources that can overcome the problem of resource needs and scarcity (Li. et al., 2021; Yikun et al., 2021; Zhiznin et al., 2019). This phenomenon impacts the development of renewable energy, namely electricity sourced from solar panels, batteries, and geothermal, as there is a massive increase in the trend of electric energy personal vehicles issued by Tesla, Hyundai, and Wuling companies. Data says that China, one of the exporters of electric-based vehicles, has seen a surge in sales of more than 10 million, with a market dominance rate of 60% in 2022 (CNBC, 2023). Thus, it is crucial to involve R&D Transfer to encourage Market Openness in increasing the National Export Rate.

Market Openness is carried out through the implementation of the Free Trade Agreement. EFTA, LAFTA, NAFTA, ASEAN, and the Asia Economic Community (EAC) are examples of regional

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trade agreements that several countries have formed from certain regions to facilitate transactions between countries in terms of foreign policy. This policy provides significant results for the country's economic growth. As an example, reported by thebalanceofmoney.com, the three members of NAFTA, namely Canada, the United States, and Mexico, experienced economic growth from $290 billion to $1.23 trillion between 1993 and 2019. In addition, NAFTA also reduced food commodity prices by more than $2.7 billion every year with savings on export-import costs between countries (Amadeo, 2020)

This study raises two problem gaps, namely the research gap in the form of theoretical gaps and the phenomenon gap in the form of actual events. The research gap raised in this study is in the form of an insignificant relationship between Government Support and Market Openness (Umami et al., 2021). The study states that government intervention resulted in market failure, although in certain cases. This is due to the fragile political and economic system and the politics of interests that continue to occur, resulting in market failure. Another Gap problem that was raised in this study is the phenomenon gap. This Gap refers to the case of the world export rate that dramatically downturn from 28.3% to 26.4% in 2020, the worst decline in a decade (World Bank, 2021).

This research contributes to the body of knowledge on the Endogenous Growth Theory (Romer, 1994). The theory explains the endogenous factor in national economic growth. It highlights the importance of R&D Transfer to creating new entrepreneurial opportunities by creating global market openness. Market openness is brought by the new product trends on the global market, such as the electric fuel vehicle. This trend can create new opportunities for entrepreneurs to increase the National Export Rates. However, the opportunity will not be achieved if the government supports policy and the infrastructure does not provide a supportive environment for Entrepreneurs to grow. Thus, the purpose of this study is to developing a model by involve the role of supportive government and the existence of adequate physical infrastructure in increasing the R&D transfer of the country and developing new market openness for entrepreneurs, which leads to an increase in the National Export Rate.

LITERATURE REVIEW

This section explains the theory of Endogenous Growth, which is the basis of research, as well as Government Support, Physical Infrastructure, R&D Transfer, Market Openness, and Export Level as variables raised in this study.

Endogenous Growth Theory

Endogenous growth theory develops the paradigm of a country's long-term economic growth through endogenous factors that exist in the country's economic system (Romer, 1994). One of the critical factors in endogenous growth theory is the existence of Research and Development (R&D) Transfer. R&D Transfer can produce state innovation power and more modern system efficiency by accumulating national knowledge and information technology (Wang et al., 2021). The existence of this accumulation is not limited to the national scope. The development of R&D Transfer can also increase collaboration and knowledge and technology networks between countries through economic cooperation. This economic cooperation will create ease of access between countries, increasing market openness between countries. The ability of R&D Transfer in long-term economic development and increased Market Openness makes R&D Transfer a trend of researchers in global economics and business today (Cadil et al., 2018; Lee et al., 2023; Paramati et al., 2021; Wang, 2021).

Government Support

Government support is a form of government support for entrepreneurs as actors in entrepreneurial activities for their role as policymakers in a country (GEM, 2020; Saberi & Hamdan, 2019). The policy intended is a government policy that supports entrepreneurs to survive during crises and the dynamics of global market competition (Kede et al., 2021). Thus, it's bringing in the form of an influx of foreign investment, ease of regulation, and easy access to export-import activities. (Davis et al., 2019; Sokolov et al., 2022)

Physical Infrastructure

In the sense of GEM, physical Infrastructure is a public good or service facility supporting economic activities and national development (GEM, 2020). Physical Infrastructure is an essential driving force to achieve rapid economic growth in the country through increased productivity in entrepreneurial activity (GEM, 2020; Gómez-Caicedo et al., 2022). For example, marketing activities will be easy with a stable internet network, and entrepreneurial logistics activities will be much more efficient with more modern logistics recommendations.

R&D Transfer

Research and Development Transfer is defined as the existence of applied research and technology development in a national industry (GEM, 2020). This development aims to increase the competitiveness of a country in the global economy (Romer, 1994). Increasing competitiveness is formulated by the high innovative power of a country's human resources in the use of renewable technology to formulate products and services that can answer the challenges of the global market increasing competitiveness is formulated by the high innovative power of a country's human resources in the use of renewable technology to formulate products and services that can answer the challenges of the global market (Piekkola & Rahko, 2019). The existence of the current information age with knowledge and technology can increase competitiveness, and global market needs for innovative products and services that can apply renewable technology in it.

Market Openness

Market Openness is a definition of federal economic and regulatory restrictions on the opening of new markets and the existence of global markets (GEM, 2020). Market Openness will make it easier for economic actors to carry out global free market activities (Mazumdar et al., 2019). This free market activity includes international trade activities with easy access to taxes, entry fees, and administration in certain countries that have entered into reciprocal trade agreements to expand their international market reach (Putri & Purwana, 2021). This expansion of the international range is expected to expand demand for goods and services products that can increase national export transactions.

National Export Rate

The National Export Rate is one of the critical parts of calculating national economic growth through GDP (Manzoor et al., 2021). This is because the existence of net exports, which result from reducing national exports and imports, is directly proportional to the value of the country's GDP. The higher the net export, the higher the value of a country's GDP (World Bank, 2021). Furthermore, the national export rate becomes the metric to assess and evaluate the level of economic integration in a country into the global marketplace. A higher export rate typically indicates a greater economic-reliance on international trade; it also provides valuable insight into the health, dynamics, and competitiveness of the economic rate in a country. The National Export rate will lead the evaluation

of the policy, economic-environment support, and the internationally oriented economy that is applied in a country. Therefore, the National Export Rate is crucial to develop and to improve the national economy.

Physical Infrastructure and R&D Transfer

Physical Infrastructure is attached to the ease of industrial production distribution facilities and the fulfillment of access to national knowledge (Nair et al., 2020). The fulfillment of these facilities and facilities will increase collaboration between researchers and industry and the accessibility of national and global knowledge and technology (Dua et al., 2023). Thus, it can create collaboration between national, regional, and global researchers that produce the latest applied research that can be implemented in industry. The proposed hypothesis is as follows:

H1: Physical Infrastructure has a significant effect on R&D Transfer

Government Support and R&D Transfer

R&D Transfer of a country is created through the existence of a supportive environment that supports national innovation power (Shin et al., 2019). This supportive environment can only be created when the government, as a policy maker, encourages knowledge development regulations in educational institutions and industry (Kim et al., 2023). This regulation will increase collaboration that produces various renewable applied technologies for developing entrepreneurial business activities (Deng et al., 2019). The creation of various applied technologies will increase national competitiveness in global industrial competition. The proposed hypothesis is as follows:

H2: Government Support has a significant effect on R&D Transfer

Physical Infrastructure and Market Openness

Physical Infrastructure is an essential factor in the country's economy (Tang & Abosedra, 2019). Having adequate roads and transportation facilities makes it easier for national business processes to produce goods and services (Holienka et al., 2016). The ease of this business process will create global competitiveness by reducing logistics costs and efficiency of production costs of superior national export products (Olyanga et al., 2022). Thus, creating market openness for entrepreneurs to enter the global market competition is important for national economic growth. The proposed hypothesis is as follows:

H3: Physical Infrastructure has a significant effect on Market Openness

Government Support and Market Openness

Government Support refers to government regulation and initiatives to increase national economic activity (Raghutla & Chittedi, 2021). The existence of regulations and initiatives encourages the creation of market openness for entrepreneurs (Bogoslov et al., 2022). Market openness through regional cooperation and intra-industry cooperation creates ease and waivers on trade regulations between countries (Chuang, 2015). This market openness will be able to bring the results of national industrial production to compete in the global market. The proposed hypothesis is as follows:

H4: Government Support has a significant effect on Market Openness

R&D Transfer and Market Openness

Technology transfer, information, and learning in R&D Transfer create newness in the national economy through increased industrial business innovation power (Abdul & Yongwen, 2023). The power of industrial innovation is also related to the global market trend that is getting closer to technology-based products (Lee et al., 2020). The need to fulfill global product trends will create collaborations between national and international institutions (Husamah et al., 2022). The collaboration will create new market openness to exchange applied research and development results for the industry. The proposed hypothesis is as follows:

H5: R&D Transfer has a significant effect on Market Openness

Market Openness and National Export Rate

Market openness is important for entrepreneurs to enter and compete in the global market (Dritsaki & Stamatiou, 2019). Market access is strengthened by simplifying regulations that facilitate export and import activities. This regulation can be simplified through regional agreements between countries and intra-industry (Elewa, 2019). The existence of this agreement provides benefits for both parties to increase state exports that are directly related to national economic growth (Lebdioui, 2019). The proposed hypothesis is as follows:

H6: Market Openness has a significant effect on National Export Rate

RESEARCH METHOD

This research refers to the positivism paradigm–the researchers are outsiders without intervention in research results (Saunders et al., 2003). In addition, this study is confirmatory deductive research through endogenous growth theory as an umbrella theory that forms five constructs in this study.

Data Collection and Sample

This study used secondary data from the global Global Entrepreneurship Monitor (GEM) survey agency. GEM released National Expert Survey (NES) data, which results from a survey of 36 experts in the field of economics-entrepreneurship in each country to test the Entrepreneurial Framework Condition (EFC) every year. Data processing in this study uses a Structural Equation Model (SEM) with SmartPLS 3.0 application. The amount of data used in this study was taken from 68 GEM countries spread across continents and a total of 139 data. In addition, this study also took data through Export Rate from the World Bank for the National Export Rate construct even though the sample adequacy criteria in this study have been met, namely with the provision of 100-300 samples for SEM (Hair et al., 2018).

Variable Measurement

Normality Testing

The first test is data normality testing using Kurtosis and skewness values. The skewness value can indicate whether the data distribution tends to the left, to the right, or symmetrically. While the kurtosis value provides, the idea of data distribution tends to be flat or curved. The rule of thumb of this test is value ± 2.0 (Hahs-Vaughn & Lomax, 2019). Table 1 shows the results of the normality testing of this study data.

Table 1. Normality Testing

	Rule of thumb	Kurtosis	Skewness	Result
R&D Transfer	±2.0	-0,4112	-0,0503	Normal
Government Support	±2.0	-0,1737	-0,0869	Normal
Market Openness	±2.0	0,1289	0,2932	Normal
National Export Rate	±2.0	-0,0477	0,8134	Normal
Physical Infrastructure	±2.0	1,1749	-0,4260	Normal

Source: SmartPLS 3.0 Data Processing Result 2023

As shown in Table 1, the processed data has been normally distributed with Kurtosis and Skewness values close to normal so that the processed data can be continued into the data testing stage.

FINDINGS AND DISCUSSION

This section describes the findings of the data analysis conducted as well as a discussion of the elaboration of hypothetical relationships built in the study.

Data Analysis

Convergent Validity

The initial test carried out is convergent validity testing. This test measures item Loadings, Average Variance Extracted (AVE), and Composite Reliability (C.R.). This calculation yields a value of 1,000 in all tests. So it can be concluded that valid data reaches a cut-off of >0.6 for loading factor, >0.5 for AVE, and >0.6 for C.R (Hair et al., 2018).

Discriminant Validity

Measurement of discriminant validity aims to ensure that each concept of each latent variable differs from other variables (Ghozali, 2008). The discriminant validity in this study has fulfilled the rule of thumb for each parameter.

Table 2 shows that all AVE root values of the Fornell-Lacker Criterion in each construct are greater than their correlation with other variables (Hair et al., 2018). For example, if the root value of AVE R&D Transfer in Table 5.1 is 1,000, then the root AVE is 10,000. The value of 10,000 is greater than its correlation with other constructs, namely with Government Support of 0.7232, Market Openness of 0.8209, National Export Rate of 0.1623, and Physical Infrastructure of 0.5122. Similarly, other latent variables that have AVE root values = correlation with other constructs.

Table 2. Fornell-Lacker Criterion Result

	R&D Transfer	Government Support	Market Openness	National Export Rate	Physical Infrastructure
R&D Transfer	**10.000**				
Government Support	0.7232	**10.000**			
Market Openness	0.8209	0.6816	**10.000**		
National Export Rate	0.1623	0.0838	0.2280	**10.000**	
Physical Infrastructure	0.5122	0.3982	0.5992	0.2500	**10.000**

Source: SmartPLS 3.0 Data Processing Result 2023

The subsequent measurement of discriminant validity is Heterotrait-Monotrait Ratio (HTMT). HTMT will show the correlation ratio between constructs and the correlation in the same construct for each pair of constructs tested. A rule of thumb of <0.90 indicates that the construct has good convenience and discriminant consistency. Table 5.3 shows the HTMT measurement results that have met the rule of thumb 0.90 (Hair et al., 2018).

Table 3. HTMT Result

	R&D Transfer	**Government Support**	**Market Openness**	**National Export Rate**	**Physical Infrastructure**
R&D Transfer	0.0000	0.0000	0.0000	0.0000	0.0000
Government Support	0.7232	0.0000	0.0000	0.0000	0.0000
Market Openness	0.8209	0.6816	0.0000	0.0000	0.0000
National Export Rate	0.1623	0.0838	0.2280	0.0000	0.0000
Physical Infrastructure	0.5122	0.3982	0.5992	0.2500	0.0000

Source: SmartPLS 2023 Data Processing Results

Based on the results of convergent and discriminant validity measurements, it can be concluded that the model in this study is valid.

Reliability Testing

Reliability measurement in a study aims to evaluate the extent to which the instrument used in research is consistent and reliable in construct measurement. Reliability measurement in this study uses two parameters, namely through the results of Cronbach's Alpha and Composite Reliability. The Cronbach's alpha and composite reliability calculation with a rule of thumb of >0.6 (Hair et al., 2018). The results of this calculation show each score of 1,000 so that it has a value above the rule of thumb. Thus, Chronbach's Alpha and Composite Reliability calculations show that the instrument used is reliable and can be relied upon to make construct measurements.

Multicollinearity Testing

Multicollinearity testing aims to determine the indication of collinearity between the variables studied. This test uses the number calculated by the Variance Inflation Factor (VIF) on each construct with a rule of thumb of >0.9 (Ringle et al., 2022). If the result of the VIF calculation is greater than 0.9, then the variable does not have multicollinearity and can be used in the model. The calculation of multicollinearity in this study obtained a figure of 1,000 for all constructs. Thus, the test results show no multicollinearity in the model, and the model can be used for research.

Model Fit Testing

Fit model testing is used to determine the accuracy of the model used. The goodness of Fit is used as an evaluation value to fulfill SEM assumptions. The goodness of Fit in PLS-SEM using Smart PLS has three categories of fit models, namely SRMR with a rule of thumb of <0.08, NFI >0.90, and RMS Theta with 0 to 1,000, Chi-square >3,000 (Hooper & Coughlan, 2008; Ringle et al., 2022). Table 4 shows the Goodness of Fit values of the model.

Table 4. Model Fit Result

Model Fit	Rule of Thumb	Value	Result
SRMR	<0.1000	0.0352	Fit
NFI	>0.9000	0.9871	Fit
RMS_theta	0-1.000	0.5088	Fit
Chi-square	>3.000	4.3406	Fit

Source: SmartPLS 2023 Data Processing Results

Thus, from the result above, it can be concluded that the research model has been fit.

Hipotesis testing

After testing the fit model, testing the hypothesis built into the model is carried out. This hypothesis is tested using SmartPLS based on testing the inner model through significance values between constructs, t-statistics, and p-values from bootstrapping results. The following are the results of path analysis in SmartPLS 3.0:

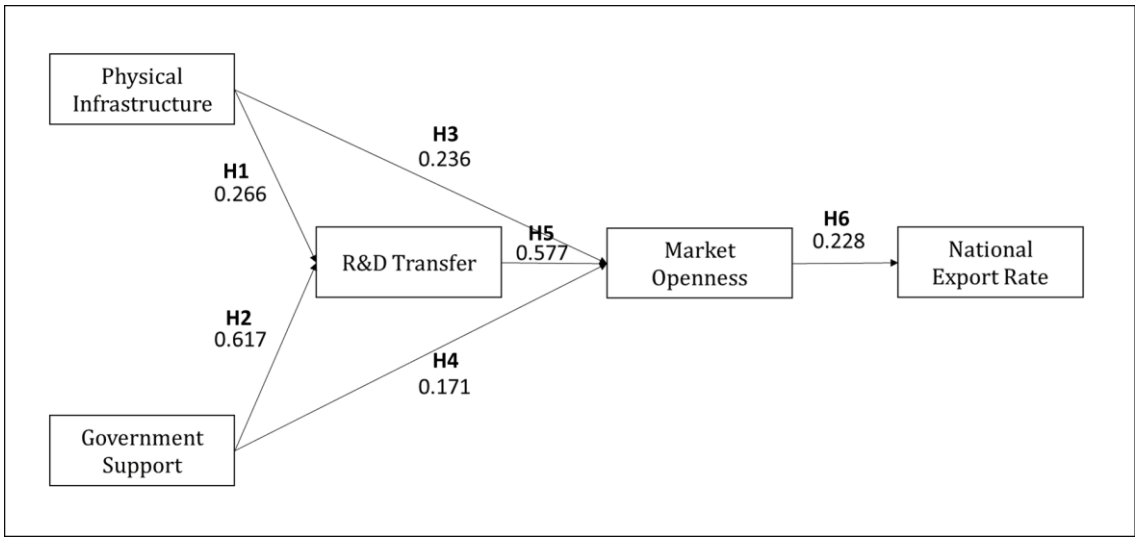

Figure 1. Hypotheses Testing Result

Figure 1 shows the results of the path coefficient showing the value of direct effect on each hypothesis through P-Value with a rule of thumb of <0.05 and t-statistic with a rule of thumb of >1.96 (Ringle et al., 2022).

The Direct Effect is used to measure the influence between each latent variable. Here are the direct effect results of each variable:

Table 5. Direct Effect Hypothesis Testing Result

Hypothesis	Relationship between Variables	T Statistics (|O/STDEV|)	P Values	Result
H1	Physical Infrastructure -> R&D Transfer	40.657	0.0001	**Accepted**
H2	Government Support -> R&D Transfer	98.614	0.0000	**Accepted**
H3	Physical Infrastructure -> Market Openness	45.404	0.0000	**Accepted**
H4	Government Support -> Market Openness	27.026	0.0071	**Accepted**

Hypothesis	Relationship between Variables	T Statistics (|O/STDEV|)	P Values	Result
H5	R&D transfer -> Market Openness	81.340	0.0000	**Accepted**
H6	Market Openness -> National Export Rate	29.506	0.0033	**Accepted**

Source: SmartPLS 2023 Data Processing Results

Thus, Table 5 shows that the test results of **all hypotheses are accepted** with P values of <0.05 and t-statistics >1.96. Table 6 displays the mediating effect on each path that displays the results of mediation by comparing direct and indirect effects, as follows:

Table 6. Indirect Effect Hypothesis Testing Result

Mediating Effect	Direct Effect	Indirect Effects	Result
government support -> R&D transfer -> market openness	0.171	0.3558	Partial Mediation
physical infrastructure -> R&D transfer -> market openness	0.236	0.1537	Partial Mediation
R&D transfer -> market openness -> national export rate	0	0.1315	Full Mediation
government support -> market openness -> national export rate	0	0.0389	Full Mediation
physical infrastructure -> market openness -> national export rate	0	0.0538	Full Mediation

Table 6 shows how variable R&D transfer and market openness can mediate in each relationship.

DISCUSSION

H1 Accepted. Physical Infrastructure has a significant positive effect on R&D Transfer. This statement is in line with the study (Khezri & Muhamad, 2023; Villegas-Mateos, 2021). Physical Infrastructure includes telecommunication networks, transportation, energy, and other supporting facilities that support the development of entrepreneurs (GEM, 2020). Researchers need internet access to collaborate virtually with global researchers in implementing R&D. The existence of these facilities plays an active role in exchanging knowledge and technology at home and abroad. Easy access to communication and guaranteed national connectivity make it easier for the industry to continue actively participating in applied research development collaboration with national research development centers. In addition, the feeling of reliable and stable energy resource facilities provides greater opportunities for the industry to implement applied research results optimally.

H2 Accepted. Government Support significantly affects R&D Transfer align with (Davis & Meyer, 2004; Moeini Gharagozloo et al., 2022; Tran & Kocaoglu, 2009). The development of R&D in a country cannot be separated from the existence of government support related to the policies set. This government policy includes establishing strategic partnerships between the public and private sectors and research incentives that can provide strategic impact in the form of applied research results that can be applied in industry. In addition, the government can promote and market research and renewable technology results through campaigns and exhibitions that will help the visibility and attractiveness of the industry both nationally and globally.

H3 Accepted. Physical Infrastructure significantly affects Market Openness align with (Bronnmann et al., 2020; Yi et al., 2022). Market Openness is access for the industry to develop to compete in the global market. This access can only be achieved when the national Infrastructure is well met. As well as the existence of telecommunications infrastructure that provides accessible communication flows both nationally and abroad, as well as transportation and logistics facilities that provide industrial convenience to carry out import and export activities. Thus, this physical Infrastructure will help reduce physical barriers for the industry in competing in the global market.

H4 Accepted. Government Support has a significant effect on Market Openness. This statement aligns with (Farinha et al., 2020; Huynh et al., 2021; Vatavu et al., 2021). Government Support is the opening gate for Market Openness through the formulation of policies in the form of a legal framework to encourage fair competition, the removal of trade barriers, and justice and international trade. This policy can be implemented through domestic regulations and international cooperation between related countries. International cooperation decisions result from diplomacy and negotiations that form beneficial agreements for the development of entrepreneurs through strengthening national economies in the countries concerned, such as ASEAN, AFTA, and AEC.

H5 Accepted. R&D Transfer has a significant effect on Market Openness; it is aligned with the study (Fasanya & Akinde, 2019; Raghutla & Chittedi, 2021). The latest applied research technology and results produced from R&D Transfer between countries. The establishment of R&D Transfer between countries opens a new international network in the form of collaboration and exchange of science and technology, the need to fulfill human resources, and the need to fulfill raw materials as well as the use of electrical energy in the automotive world which requires experts in terms of production and series of automation products and the basic material needs of electric vehicle batteries, namely lithium. Furthermore, the existence of R&D Transfer can provide a long-term positive impact through the existence of cost efficiencies in the application of renewable technology and the cross-existence of needs. This cross-existence of needs becomes the new market openness for entrepreneurs to compete.

H6 Accepted. Market Openness significantly affects National Export Rate (Anh Thu et al., 2019). Market openness can give entrepreneurs the advantage of increasing global market access through ease of regulation in trade between countries. The ease of this regulation is in the form of reducing or eliminating export tariffs and waivers on import duties of destination countries, as well as the relaxation of regulations that include export documents for entrepreneurs. Then, the economic environment will support the growth of entrepreneurs in the global market. Thus, it will create an increase in demand for products in the global market and be able to increase national export activities, which will lead to an increase in the export rate in the national Gross Domestic Product.

R&D Transfer can mediate the Physical Infrastructure and Market Openness. The availability of national physical infrastructure facilities drives the involvement of R&D Transfer in increasing market openness (Joglekar et al., 2022). Adequate physical infrastructure facilities impact easy access to information and communication, which leads to the success of collaboration to create applied research results for the industry. The existence of collaboration created by R&D Transfer allows the creation of new market openness to meet research needs, such as the need for experts and basic research support materials.

R&D Transfer can mediate Government Support and Market Openness**.** Through its role as a policy maker, Government Support is vital in improving national R&D Transfer through establishing strategic partnerships, incentives, and promotion of applied research results (Benito-Hernández et al., 2023). The establishment of this strategic partnership will lead to the continuity

of collaboration between national and international researchers who can create international networks that lead to market openness for sustainable access to knowledge and technology exchange.

Market Openness can mediate the R&D Transfer and National Export Rate. The opening of new markets through the existence of applied research and technology results significantly impacts increasing national exports (Li & Wang, 2023). It can be observed through the increasing need for raw materials to implement applied research results in countries that cannot meet these needs independently. The need for lithium metal in manufacturing electric-based vehicle batteries in various countries and the increase in coal needs in the European region to meet national electrical energy needs.

Market Openness can mediate Government Support and National Export Rate. Government involvement creates market openness and a supportive environment for entrepreneurs (Bakari & Jen, 2021) through negotiations and diplomatic cooperation of global economies that produce free market agreements to benefit the countries involved. This free-market agreement includes reducing or eliminating tariffs on export-import transactions between countries and simplifying regulations for related countries to increase entrepreneurs' attractiveness in the global market and national export transactions in the country's economy.

Market Openness can mediate the Physical Infrastructure and National Export Rate. Guaranteed national physical Infrastructure significantly affects entrepreneurs by fulfilling logistics facilities and strengthening telecommunications networks to access global markets (Zaninovic et al., 2023). Logistics facilities such as roads, ports, and airports will provide industrial logistics cost efficiency to reduce COGS and provide competitive prices in the global market. It can increase the global market appeal of entrepreneurial products. Thus, creating new market openness for entrepreneurs leads to increased activity at the level of national export activity.

CONCLUSIONS

As the basis of this research, endogenous Growth theory has provided answers to the research gap raised in the research, namely, R&D Transfer can be a bridge between Physical Infrastructure and Market Openness in partial mediation. The existence of R&D Transfer, which encourages an increase in knowledge and renewable applied technology, has an impact on the involvement of entrepreneurs as product providers to meet the needs of global resources in the implementation of applied research results. Thus, opening up new market opportunities increases entrepreneurs' competitiveness to compete in the global market, and it can provide opportunities to increase national export transactions.

In addition, this study also shows that Market Openness has succeeded in becoming a full mediation variable for the influence of Government Support and Physical Infrastructure on the National Export Rate. The role of government policies that positively impact entrepreneurs to develop products, such as ease of licensing and political diplomacy between state governments, provides opportunities for entrepreneurs to access greater new market openness in international trade through export activities. It answers the research gap that was raised in this study. The government support and National Export Rate can be mediated with Market Openness. The government had the responsibility of creating new ways to develop to provide new market opportunities for entrepreneurs to compete in the global market. This can be reached by creating new cooperation between country or a global company. This cooperation allows for the country's export activities, which can increase the level of foreign economic activity that can create a long-term positive economic impact by cross-existence of needs for each party.

This study provides managerial implications for the government in the form of the

importance of the existence of regulations to protect entrepreneurs in national trade. The UN, WTO, and national governments have direct involvement in solving problems in international trade, such as sea piracy, through the formulation of regulations that are able to protect entrepreneurs, especially in the Exclusive Economic Zone (EEZ). In addition, this study also shows the importance of state investment in R&D Transfer to increase the renewal of applied research and technology that has an impact on increasing patents of applied research results that can be implemented in entrepreneurial activities.

LIMITATIONS & FURTHER RESEARCH

This research is inseparable from limitations. The limitations of this study can be a reference for future research. This research focuses on Entrepreneurial Framework Condition (EFC) in global countries through National Expert Survey (NESS) data presented in GEM. Thus, this study has several limitations: (1) several variables are not considered due to the specific purpose of the study. The results may be more appropriate if the existence of internal entrepreneur factors in the Adult Population Survey (APS) is analyzed with the NES macro variables raised in the study. This combination of data analysis allows future researchers to measure the relationship between macroeconomic conditions such as government support, Infrastructure, and market opening to the ability of national entrepreneurs to form Start-Ups to increase Job Creation in sustainable national economic improvement. (2) Another limitation is the amount of data provided by GEM. This research will be more credible when GEM fulfills the completeness of the country as a whole survey institution. Apart from this, this research can already cover countries from all five continents worldwide.

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