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The knots prevent the development of economy: The case of Vietnam

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Abstract
Although GDP of Vietnam well grew during the past ten years. However, the economoy of Vietnam is now facing two difficult challenges are known as two knots which are institution and transportation infrastructure. This paper analysizes these two knots by quantitative method using multivariable linear regression (MLR). The highlight findings are five variables of infrastructure include Road length, Airport connection to world, Rail length, Fixed broadband subscriptions and Fixed telephone subscriptions impact on economy. And four variables of institution consists of Voice and accountability of people and government, Policy quality and policy implementation, Rules and law compliance and Corruption control impact on economy.

Keywords: barriers, economy, institution, transportation infrastructure, Vietnam

1. Introduction
The year 2020 is considered a year of great difficulties and challenges for the world economy including Vietnam. The world economy is forecasted to have the most severe recession in history, with the growth of major economies all falling deeply due to the negative impact of the Covid-19 epidemic. However, Vietnam's economy still maintained its growth with an estimated GDP growth rate of 2.91%. Although GDP growth of Vietnam in 2020 reached the lowest in the period 2011-2020. However, facing the negative impacts of the Covid-19 epidemic, Vietnam was a success country that have the growth rate in the highest group of the world. Vietnam is one of three countries in Asia that are China and Myanmar that has positive growth. In the year 2020, the scale of Vietnam's economy reached more than 343 billion USD which is surpassing Singapore at 337.5 billion USD and Malaysia at 336.3 billion USD, making Vietnam became the country with the 4th largest economy in the Southeast Asia after Indonesia was 1,088.8 billion USD, Thailand was 509.2 billion USD and the Philippines was 367.4 billion USD).
Besides the above success, Vietnam are facing two difficult challenge barriers that are institutions and infrastructure. The objective of this paper is to analyses the impact of institutions and infrastructure by quantitative method that using multivariable linear regression. Thare are eight quantitative independent observed variables of infrastructure and six qualitative independent observed variables. The content of paper are intruction is section 1, section 2 is literature review, section 3 is methodology consists of 3.1 is study model, 3.2 is variables, 3.3 is formula and 3.4 is hypotheiss, section 4 will be data source, theoretical basis will be describe in section 5 including 5.1 is infrastructure and 3.2 is institution, section 6 is study resutls, discussion is section 7, and finally conclusion is section 8.

2. Literature review
The technological capabilities, productivity growth in agriculture, effective investment, innovative capabilities and the role of policy makers in developing economies (Paulo N. Figueiredo, 2016) [1]. In China, there is not only energy savings opportunities, but also primary challenges and deficiencies about energy savings technologies and products policies mechanism promote the economic development (Jian Hou, Peidong Zhang, Yong sheng Tian et al., 2021) [2]. Environmental impacts, greenhouse gas emissions, carbon footprints are challenges to the economy development implementation (Vigneshwaran Shanmugam, Rhoda Afriyie Mensah, Michael Försth et al., 2021) [3]. Seeking a clean and self-sufficient energy source, the challenges of China is transition to hydrogen economy (Xusheng Ren, Lichun Dong, DiXu et al., 2020) [4]. According to Abdullah Yildizbasi (2021) [5] that "Renewable energy technologies play a crucial role in reducing the energy consumption by exploiting natural energy resources. With the increase in the trend towards the use of renewable energy resources energy distribution networks have become more complex, this is the challenges of blockchain faced during the integration to a circular economy are presented" The challenges in circular economy with Industry 4.0 are ack of automation system virtualization, unclear economic benefit of digital investment, lack of process design, unstable connectivity among firms and employment disruptions (Asma-Qamaliah

Abdul- Hamid, Mohd Helmi Ali, Ming-Lang Tseng et al., 2020) [6]. In India, climate change, lack of availability of capital, and unfair wages are the top challenges the economy (Ramaganesh Marimuthu, Bathrinath Sankaranarayanan, Syed Mithun Ali et al., 2021) [7]. Lack of developed standards, Lack of government policies, poor regulatory frameworks and certification programs are the key challenges in emerging economies (Sunil Luthra, Sachin Kumar Mangla, Gunjan Yadav, 2019) [5]. Plastic packaging waste flow is generally not available, especially for developing countries such as Brazil. The major national challenges are information systems needed to be improved, informal waste collectors needed to be socially and productively included in the management systems, and recovery systems need to develop towards a circular economy (Isabella Pimentel Pincelli, Armando Borges de Castilhos Júnior, Marcelo Seleme Matias et al., 2021) [9]. Challenges of adsorption for ammonium recovery from municipal wastewater, innovative municipal wastewater reclamation processes coupled with ammonium recovery, and municipal wastewater reclamation and resource recovery should be addressed under the framework of circular economy (Xiaoyuan Zhang, YuLiu, 2021) [10]. Need to overcome challenges in three important areas which are building democratic and re-distributive economies, regenerating the environment without commodifying, and facilitating international alliances without imposing a particular set of values (Peter Howson, 2021) [11]. The biologization of the economy relies not only on food, feed, or bioenergy production but also on a holistic use of the potential of biogenic resources. The challenges are requires special knowledge in pretreatment, conversion, and downstreaming to obtain pure products of choice and create high value of the economy of rural areas (Daniel Pleissner, 2020) [12]. Emerging economies are India, China and Brazil etc., face challenges to adopt food safety practices in their food supply chains. Considering food industry's operations and processes, this study identifies twenty five challenges to the food safety initiatives involving the opinions of practitioners from six major Indian food producers and academic experts. The challenges are grouped into five categories which are knowledge, finance, and global organization and policy (Sachin Kumar Mangla, Arijit Bhattacharya, Alok Kumar Yadav et al. 2021) [13]. Challenges of ash-related issues during thermal conversion and economy viability, involving the properties improvement of torrefied biomass, applications on combustion and gasification (Yanqing Niu, Yuan Lv, Yu Lei et al., 2019) [14]. The economy of Zimbabwe has deteriorated over the years with hyperinflation. Investment in the steel industry that is the key field of both domestic and foreign markets and there are many challenges that it is still facing (Loice Gudukeya, Charles Mbohwa, Paul T Mativenga, 2019) [15].

3. Methodology

3.1 Study model

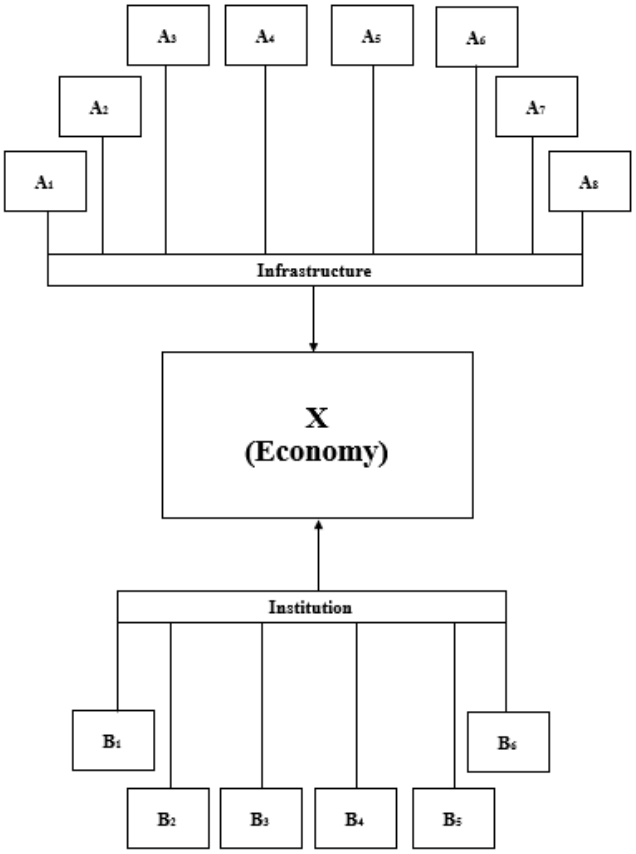

Fig 1

3.2 Variables

Infrastructure is A has eight independent quantitative observed variables which are A_1, A_2, A_3, A_4, A_5, A_6, A_7 and A_8.

A_1 is road length, the unit is km.

A_2 is inland water way length, the unit is km.

A_3 is air way, the unit is airlines.

A_4 is airport connection to world, the unit is airports.

A_5 is rail length, the unit is km.

A_6 is internet subscribers, the unit is number of 1,000 ADSL.

A_7 is fixed broadband subscriptions, the unit is subscriptions.

A_8 is fixed telephone subscriptions, the unit is subscriptions.

Institution is B has six independent qualitative observed variables which are B_1, B_2, B_3 B_4, B_5, and B_6.

B_1 is voice and accountability of people and government, the unit is score.

B_2 is political stability and there is no violence or terrorism, the unit is score.

B_3 is efficiency of government at subauthorities, the unit is score.
B_4 is policy quality and policy implementation, the unit is score.
B_5 is Rules and law compliance, the unit is score.
B_6 is corruption control, the unit is score.
X is dependent variable, represents economy, X depends on eight independent quantitative observed variables of infrastructure and six independent qualitative observed variables of institution.

3.3 Formula of X.

$X = a_0 + a_1 A_1 + a_2 A_2 + a_3 A_3 + a_4 A_4 + a_5 A_5 + a_6 A_6 + a_7 A_7 + a_8 A_8 + u$

$X = b_0 + b_1 B_1 + b_2 B_2 + b_3 B_3 + b_4 B_4 + b_5 B_5 + b_6 B_6 + u$

u is the variables out of infrastructure and institution for example emission factor of CO_2 and SO_2, environment, air polution etc. that this paper does not analyze u.

According to Keshab Bhattarai (2015, p. 55) and Jeffrey M. Wooldridge (2020, p. 126). Null Hypotheses (H_0) and Alternative Hypotheses (H_A) in this study are as below:

H_0: $a_o = 0$, $b_o = 0$

H_0: $a_1 + \ldots + a_8 = 0$, $b_1 + \ldots + b_6 = 0$

H_A: $a_o \neq 0$, $b_o \neq 0$

H_A: $a_1 + \ldots + a_8 \neq 0$, $b_1 + \ldots + b_6 \neq 0$

$H_A > 0$: accepting the hypothesis that independent variables impact on X. It means the independent variables A_1 to A_8, B_1 to B_6 impact on X

$H_A < 0$: accepting the hypothesis that independent variables do not impact on X. It means the independent variables A_1 to A_8, B_1 to B_6 do not impact on X

3.4 Hypothesis

The A_1, A_2, A_3, A_4, A_5, A_6, A_7 and A_8 impact on X.
The B_1, B_2, B_3 B_4, B_5, and B_6 impact on X.

4. Data source

The data is between 2010 - 2019 which author consolidated from World bank

5. Theoretical basis

5.1 Infrastructure

Poorly designed transport infrastructure will affect passengers and the wider issues related to government policy (Andree Woodcock, Slobodan Topolavic, Jane Osmond, 2013, p. 329). There are two aspects that can be emphasized on the importance of critical infrastructures which are the view of the critical infrastructure affects the well-being of the community and the consideration of the appearance frequency as well as increasing losses of human and property associating with natural, man-made and events (Bogdan I, Vamanu Adrian V, Gheorghe Polinpapilinho F. et al., 2016, p. vii-viii).

5.2 Instituion

Institutions have an impact on economic growth and development through two channels are supporting open and more efficient markets and supporting economic growth and poverty reduction (World Bank, 2002). A high-quality administrative institution system implements on a strict reward and punishment system will help control corruption (Easterly, 2002).

6. Study results

6.1 Result of relations of eight independent quantitative observed variables A_1, A_2, A_3, A_4, A_5, A_6, A_7, A_8 and dependent variable X.

Table 1: MLR result the relation of X and infrastructure (A_1, A_2, A_3, A_4, A_5, A_6, A_7, A_8)

Independent variables	R square (RS)	Adjusted R Square (ARS)	Significance F (SF)	Coefficients	Value of Coefficients (VC)	P-Value (PV)
A_1, A_2, A_3, A_4, A_5, A_6, A_7, A_8	0.99999556	0.99996	0.00461177	a_0	-285618.26	0.05266179
				a_1	2.31190684	0.03584494
				a_2	-3.1337576	0.04434712
				a_3	-0.2193917	0.03269479
				a_4	0.2928421	0.03122727
				a_5	10.9826675	0.02895242
				a_6	-8710.3059	0.07860304
				a_7	8.71472378	0.07855276
				a_8	0.00428139	0.09682097

Table 1 shows RS = 0.99999556 (99%), ARS = 0.99996 (99%) is the evidence that the model built is suitable and very strong statistical significance.

a_0, a_1, a_2, a_3, a_4, a_5, a_6, a_7, a_8 are all $\neq 0$, it rejects H_0 at the significance F level 0 is 0.00461177. $a_1 = 2.31190684$, $a_4 = 0.2928421$, $a_5 = 10.9826675$, $a_7 = 8.71472378$, and $a_8 = 0.00428139$ which are all > 0 and conclusion is they impact on X.

$a_2 = -3.1337576$, $a_3 = -0.2193917$, $a_6 = -8710.3059$ which are all < 0 and conclusion is they do not impact on X. PV of a_0, a_1, a_2, a_3, a_4, a_5, a_6, a_7, a_8 are 0.03584494, 0.04434712, 0.03269479, 0.03122727, 0.02895242, 0.07860304, 0.07855276 and 0.09682097, respectively that all are small value, indicating they are at high statistical significance.

6.2 Result of relations of six independent qualitative observed variables B_1, B_2, B_3 B_4, B_5, B_6 and dependent variable X.

Table 2: MLR result the relation of X and institution (B_1, B_2, B_3 B_4, B_5, B_6)

Independent variables	R square (RS)	Adjusted R Square (ARS)	Significance F (SF)	Coefficients	Value of Coefficients (VC)	P-Value (PV)
B_1, B_2, B_3, B_4, B_5, B_6	0.95253587	0.85760761	0.04270731	b_0	795.901228	0.09656619
				b_1	271.507322	0.40440482
				b_2	-42.845685	0.71786127
				b_3	-166.1665	0.29025635
				b_4	306.774519	0.07100912
				b_5	58.760582	0.42781661
				b_6	120.284735	0.59219158

Table 2 give information is RS = 0.95253587 (95%), ARS = 0.85760761 (86%) is the evidence that the model built is suitable and strong statistical significance.

b_0, b_1, b_2, b_3, b_4, b_5, b_6 are all $\neq 0$, it rejects H_0 at the significance F level is 0.04270731.

b_1 = 271.507322, b_4 = 306.774519, b_5 = 58.760582, b_6 = 120.284735 which are all > 0 and conclusion is they impact on X.

b_2 = -42.845685, b_3 = -166.1665 which are all < 0 and conclusion is they do not impact on X.

PV of b_1, b_2, b_3, b_4, b_5, b_6 are 0.40440482, 0.71786127, 0.29025635, 0.07100912, 0.42781661, 0.59219158, respectively that all are small value, indicating they are at high statistical significance.

7. Discussion

The MLR models of economy and infrastructure has RS = 99%, ARS = 99%, FS = 0.00461177 which has five independent quantitative observed variables are a_1 = 2.31190684, a_4 = 0.2928421, a_5 = 10.9826675, a_7 = 8.71472378, and a_8 = 0.00428139 impact on X.

And there are three independent quantitative observed variables are a_2 = -3.1337576, a_3 = -0.2193917, a_6 = -8710.3059 do not impact on X.

The MLR models of economy and institution has RS = 95% and ARD = 86%, FS = 0.04270731 that has four independent qualitative observed variables are b_1 = 271.507322, b_4 = 306.774519, b_5 = 58.760582, b_6 = 120.284735 impact on X.

And two independent qualitative observed variables are b_2 = -42.845685, b_3 = -166.1665 do not impact on X.

8. Conclusion

Based on the analysis results presented in table 1 we can conclude is (A_1) Road length, (A_4) Airport connection to world, (A_5) Rail length, (A_7) Fixed broadband subscriptions and (A_8) Fixed telephone subscriptions impact on economy (X). And (A_2) Inland water way length, (A_3) Air way and (A_6) Internet subscribers do not impact on economy (X).

And the according to the analysis results presented in table 2 we can conclude is (B_1) Voice and accountability of people and government, (B_4) Policy quality and policy implementation, (B_5) Rules and law compliance and (B_6) Corruption control impact on economy (X). And (B_2) Political stability and there is no violence or terrorism and (B_3) Efficiency of government at subauthorities do not impact on economy (X).

Implications: based on the analysis result and presented at conclusion section, the authorithies of gorvernment can refer to which variable impact and which variable do not impact on economy in order to have suitable solutions.

Limitations: the data is from 2010 to 2019, so that the lag is two years.

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