

Further Analysis on Roles of Industrial Clusters and Application of Cobb -Douglas Model for Economic Measures

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ABSTRACT

The goal of This article focuses on analyzing FURTHER ANALYSIS ON ROLES OF INDUSTRIAL CLUSTERS AND APPLICATION OF COBB -DOUGLAS MODEL FOR ECONOMIC MEASURES in recent years. This study prefers to use synthesis and inductive methods. Colther et al (2024) mentioned challeges of this function such as those in application policy and econ modelling. We conducted this function with stata. And more important author modify The role of industrial parks is to help domestic enterprises have the opportunity to develop significantly. The economic development of many countries in the world has proven that the application of advances in advanced science and technology is a factor that promotes and stimulates the rapid development of the industrialization process and add Value on econoc growth. Last but not least we analyze related laws/rules on optimal economic policy and economic development.

Keywords: factors, R&D, innovation, cobb douglass, industrial cluster, economic development

1. Introduction

First of all, theories of Keynes related to supply creating demand, as well as "totalitarian states" than free market policy. Also MP (marginal productivity) will determine rate ò salary ò wage.

Next is the factors that determine income level including money supply MS aswell as investment and savings.

He also presented theory of liquidity preference (complex one) but not integrated totally with the rest so let for John Hicks: with IS-LM model below.

(source: wiki.org)

Moreover, Macroeconomics is the study of the factors applying to an economy as a whole. Important macroeconomic variables include the overall price level, the interest rate, the level of employment, and income (or equivalently output) measured in real terms.

(source: wiki.org)

Also, The role of industrial parks is to help domestic enterprises and economy as a whole have the opportunity to develop significantly.

Hence, we select this research topic:

“FURTHER ANALYSIS ON ROLES OF INDUSTRIAL CLUSTERS AND APPLICATION OF COBB -DOUGLAS MODEL FOR ECONOMIC MEASURES”

2. Previous studies

We summarize in below figure:

Figure 1 - Previous studies

Eistein (2011)	With adolescence comes the cessation of physical growth and the system's energy and resources develop other more refined aspects of the individual
Catalin et al (2015)	break various aspects concerning the Cobb-Douglas production function. On the one hand were highlighted conditions for the existence of the Cobb-Douglas function. Also were calculated the main indicators of it and short and long-term costs. It has also been studied the dependence of long term cost of the parameters of the production function. The determination of profit was made both for perfect competition market and maximize its conditions. Also studied the effects of risks and stability and the production efficiency problem
Raworth (2017)	Kate Raworth, an economist at Oxford University also critiques the economic growth model and suggests that pursuing profit is worthless if it is at the cost of humanity. She suggests a different economic model, called doughnut economics, which balances social equity and progress within the environmental constraints of growth, requiring new values, new priorities and new metrics
Pendhakar et al (2008)	study whether software development effort exhibits Cobb-Douglas functional form with respect to team size and software size. We empirically test this relationship using real world software engineering data set containing over 500 software projects. The results of our experiments indicate that the hypothesized Cobb-Douglas function form for software development effort with respect to team size and software size is true. We also find increasing returns to scale relationship between software size and team size with software development effort
Shiedom (2021)	Some assumptions underlying the neoclassical economic model that need re-examining are the ideas that self-interest drives all economic behavior, success comes from competition, not cooperation, encouraging consumption for its own sake, giving owners priority over other stakeholders, and that income translates into more happiness. Redesign of economic systems requires consideration of social capital, natural capital, intellectual capital, compassion capital, trust capital and spiritual capital to name a few. Examples of alternative systems using these capitals are the collaborative economy, the circular economy, the creative economy, the gift economy, the sacred economy and the regenerative economy

(source: author synthesis)

3. Methodology

Methodology

-**Study uses comparative/** synthesis methods used in the paper, combined with analytical and inductive methods, and also, Authors use scientific results as reference.

4. Major findings

4.1 Overview

According to vnmedia.com, Vietnam's labor productivity has recorded impressive growth, higher than many countries in the region. However, absolute labor productivity is still low compared to developed countries.

According to the latest report of the World Bank (WB), Vietnam is considered a global economic star with the fastest GDP growth rate in the world over the past 30 years.

From 1990 to 2021, Vietnam's GDP per capita increased at an average annual rate of 5.3%, faster than any economy in the region except China.

This achievement is thanks to Vietnam's three factors: rapid capital accumulation, abundant labor supply and high productivity growth. However, the WB also noted that to maintain this economic miracle, Vietnam needs to focus on productivity growth.

Moreover, despite challenges to global situation such as Russia-Ukraine war, low growth in many world economies, CPI cooled down but high, increasing public debt, etc.

Next we analyze:

4.2 Roles of industrial clusters/zones in economic growth (or promoting economy)

The internal structure of the industrial sector has shifted positively towards reducing the proportion of the mining sector and increasing the proportion of the processing and manufacturing sector in GDP. In the period 2010 - 2020, the proportion of the mining sector has continuously decreased (from 9.1% in 2010 to 5.55% in 2020). Meanwhile, the processing and manufacturing industry has been continuously expanded and accounted for the highest proportion in the industrial sectors with its contribution to GDP increasing continuously over the years (from 13% in 2010 to 16.7% in 2020). Supporting industries have been promoted and strengthened, especially in Vietnam's key manufacturing sectors such as textiles, footwear, electronics, agricultural processing industry, etc. Initially forming a supporting industrial ecosystem and increasing the localization rate. The success in industrial development cannot be denied by the leading role of priority industries, one of the industries that is interested in promoting development through policy mechanisms issued by the Government. In fact, through each stage of development, the leading role and contribution of priority industries in the industrial structure is increasingly important. However, the development of priority industries in the recent period also has some shortcomings. Resolution No. 23-NQ/TW dated March 22, 2018 of the Politburo on the orientation of building a national industrial development policy to 2030, with a vision to 2045, stated that: "competitive capacity and the ability to participate in regional and global value chains are still very limited, industrial production is mainly processing and assembling, with low added value; there is no spearhead industry playing a leading role; many priority industries have not achieved their set goals; The supporting industry is underdeveloped, the localization rate of industries is low". The cause of this problem is clearly stated in Resolution 23-NQ/TW as: "the selection of priority industries and key industries is still scattered; the policy on developing supporting industries is not consistent, the feasibility is low...."

Thus, it can be seen that the selection of priority industries is not really focused, key, it needs to be clearer and more importantly, it is important to determine the right time, because each stage has different industry priorities to suit the socio-economic development and development trends of the world and the region. The spread out, lack of focus and key points in determining priority industries are shown through each stage of determining priority industries of our country in the past period as follows:

- In 2007, Decision 55/2007/QĐ-TTg dated April 23, 2007 approving the List of priority industries, spearhead industries for the period 2007-2010, with a vision to 2020, identified priority industries as follows: Textiles (fibers, fabrics, silk, exported clothing, raw materials); Leather and footwear (exported footwear, raw materials); Plastics (household plastics, packaging, bottles, tubes, etc.; technical plastics);

Processing of agricultural, forestry and aquatic products; Steel (steel billets, special steel); Mining and processing of aluminum bauxite; Chemicals (basic chemicals, fertilizers, petrochemicals, pharmaceuticals, cosmetics); Mechanical engineering (automobiles, shipbuilding, complete equipment, agricultural machinery, mechatronics); Electronic equipment, telecommunications and information technology; Products from new technology (new energy, renewable energy, software industry, digital content).

The State has issued many policies to attract FDI capital in Vietnam, allowing for the diversification of investment forms including capital, technology, human resources, etc. to stimulate strong growth in investment capital. Policies are increasingly focused on by the State when shifting from "attracting at all costs" to "selective attraction", choosing to attract capital based on economic - social - environmental efficiency instead of focusing only on financial efficiency and project scale. To better understand the diversity in this investment model, readers can refer to the article on "types of industrial parks".

The role of industrial parks is to help domestic enterprises have the opportunity to develop significantly. The economic development of many countries in the world has proven that the application of advances in advanced science and technology is a factor that promotes and stimulates the rapid development of the industrialization process.

The structure of the national economy tends to gradually shift to a modernized, industrialized market economy and proactively integrates into the international economy. Some statistics in the socio-economic situation report show that Vietnam is receiving investment projects from more than 100 multinational enterprises worldwide.

4.3 Cobb Douglas function application

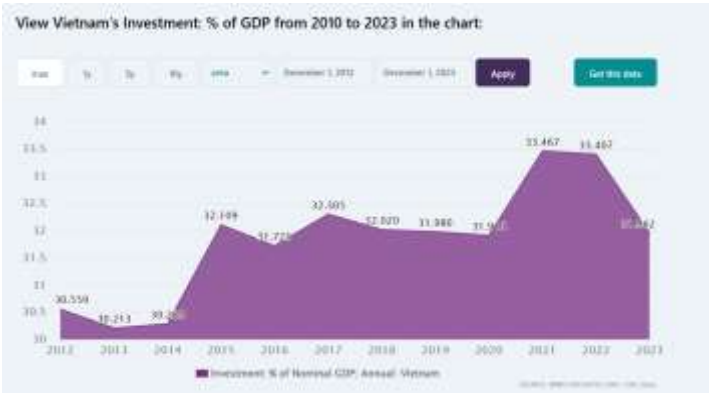
Next we propose a quantitative model:

First the function is:

$$f(L, K) = Y = AL^{\alpha}K^{\beta}$$

$$\log(Y) = \log(A) + \alpha \log(L) + \beta \log(K)$$

Next, we use data:



And:



Running stata giving us results with OLS regression

Measuring effects of labor and capital on production (Y) we see below model:

4.2 Quantitative model

We build with stata below model:

Use Cob Douglas function (simple) we have:

$$Y = x_1 + x_2 + k$$

$$= \log(\text{Labor}) + \log(\text{Invest})$$

. sum Labor Invest

Variable	Obs	Mean	Std. Dev.	Min	Max
-----+-----					
Labor	24	53.12917	1.88784	49.07	56
Invest	24	27624	11260.59	3018	33467

. reg f x1 x2

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Source	SS	df	MS	Number of obs	=	24
Model	.107228526	2	.053614263	F(2, 21)	>	99999.00
Residual	1.6002e-07	21	7.6202e-09	Prob > F	=	0.0000
				R-squared	=	1.0000
				Adj R-squared	=	1.0000
Total	.107228686	23	.004662117	Root MSE	=	8.7e-05

f	Coef.	Std. Err.	t	P> t	[95% Conf. Interval]
x1	.0725895	.0005249	138.29	0.000	.0714979 .0736811
x2	.0760421	.0000207	3677.44	0.000	.0759991 .0760851
_cons	1.58619	.0021427	740.26	0.000	1.581734 1.590646

. reg f x1 x2, nocons

Source	SS	df	MS	Number of obs	=	24
Model	166.674946	2	83.3374729	F(2, 22)	>	99999.00
Residual	.004175944	22	.000189816	Prob > F	=	0.0000
				R-squared	=	1.0000
				Adj R-squared	=	1.0000
Total	166.679122	24	6.94496341	Root MSE	=	.01378

f	Coef.	Std. Err.	t	P> t	[95% Conf. Interval]
x1	.4594329	.0077990	58.90	0.000	.4432572 .4756086
x2	.0809943	.003088	26.23	0.000	.0745901 .0873986

. reg f x1 x2

Source	SS	df	MS	Number of obs	=	24
Model	.107228526	2	.053614263	F(2, 21)	>	99999.00
Residual	1.6002e-07	21	7.6202e-09	Prob > F	=	0.0000
				R-squared	=	1.0000
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_cons	1.58619	.0021427	740.26	0.000	1.581734 1.590646

Next we test vif:

. vif

Variable	VIF	1/VIF
x1	1.06	0.945538
x2	1.06	0.945538
Mean VIF	1.06	

. corr x1 x2

[obs=24]

	x1	x2
x1	1.0000	
x2	-0.2334	1.0000

(source: author analysis)

5. Discussion

We will discuss related laws on economic development and optimal economic policy

First, Choi (2011) showed that in Korea case, The formal rule of law was there indeed in the background. But it was goal-oriented government officials armed with the special legislation-provided instruments, rather than judges and lawyers, who had primarily helped to move people to engage in industrial activities. It is first of all because Korea simply had no capital, no skill and no technology in the early stage of economic development. In any case, the existence of the formal legality differentiates Korea at that time from China today because China does not have a liberal constitution providing for party pluralism, freedom of speech and other human rights. China has only recently begun to adopt civil law (property law) and other laws that are essential for market economy, but not politically liberal law for pluralism and freedom of speech. The formal liberal democratic law had a profound educational impact on Koreans, especially on students and intellectuals. Even governmental authoritarian practices had the reverse impact of making Koreans confirm their liberal conviction in their hearts. Anti-authoritarian democratic and labor movements took the form of activists claiming human and labor rights provided in the written Constitution. And Conceptually, it is difficult to relate law to economic development. Many literatures on law and economic development tend to invariably associate the rule of law with development,³⁾ following in the footsteps of the Weberian proposition the “formal-rational law” as a principal facilitating element or a prerequisite of economic development.⁴⁾ The Korean experience, however, seems to repudiate such association because Korea attained leap-frog development during its authoritarian regime which appeared to contradict the rule of law.

Second, Robert M (2023) mentioned that The sustainable development goals (SDGs) and social and environmental frameworks of key institutions determine the degree of influence international law has within development. The chapter considers how international law significantly changed its scope and depth over the past decades. It clarifies that SDGs are not legally binding, but they are soft laws intended to change behaviours through implementation in policies and activities and increase international trade.

Moreover, information economics and contract theory have a great impact on economic analysis. With regard to information asymmetry—the situation in which some players have private information not known to other players—the market is not always efficient. One typical kind of information asymmetry is moral hazard, which occurs when some players’ (“agents”) actions are not observable or verifiable to other players (“principals”). In this case, the design of mechanisms, such as contracts that incentivize agents, is important. Another type of information asymmetry is adverse selection, which occurs when the information that some players retain is hidden from other players. In this case, the design of mechanisms that help to draw out the hidden information is important. More recently, the problem of incomplete contracts, in which every possible contingency is not included in contracts, has drawn attention.

6. Conclusion

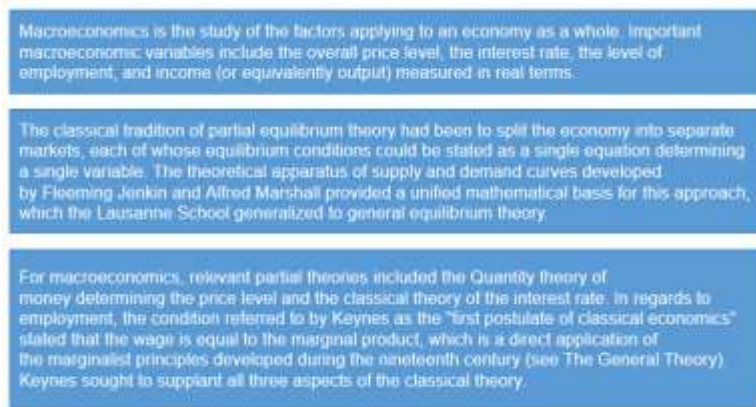
In above regression model, $vif = 1.06$ means acceptable, so our model has no serious multicollinearity.

Moreover $p \text{ value} < 0.05$ meanings our model has statistical meanings

And coefficient of $(x_1) = .072$ and that of $x_2 = .076$ meanings.....when x_1 change % there will be change in total production.

Finally we see below figure:

Figure 2 - Macroeconomic



(source: wiki.org)

Last but not least, on the roles of industrial zones:

Decree 35/2022/ND-CP was issued by the Government to provide detailed guidance for projects and enterprises investing in industrial park infrastructure to encourage and support the impact of industrial parks on the urbanization rate of areas adjacent to industrial parks.

During more than 30 years of promoting the development of the industrial real estate market, Vietnam has established a total of more than 620 large and small industrial parks in 61 provinces and cities across the country. Explore the list of "industrial parks in Vietnam" to seize potential investment opportunities for your business."

The benefits of industrial parks contribute to the transfer and improvement of technology, management experience, and production skills in the process of international economic integration. The technology transfer process is diversified in many forms such as: training workers to use modern machinery, equipment and production technology, modern machinery is transferred for production, etc.

Positive results have been demonstrated through the ability to use advanced technology and the gradually improved production skills of the workforce in industrial parks.

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