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# The Trinity Growth Theory: A Theory of Wealth and Poverty

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# **THE TRINITY GROWTH THEORY: A THEORY OF WEALTH AND POVERTY<sup>1</sup>**

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## Abstract

A presentation of the Trinity Growth Theory, decomposed into its three parts, is made: the EGOIN Theory, the Triple C Theory and the S Curve Theory. Professor Lim Chong Yah uses the Trinity Growth Theory to explain why growth levels and why growth rates differ among nations, why these two important world economic phenomena also exist among different provinces and cities within a nation, and why the world economy, viewed against world economic history, has grown so unprecedentedly in the last 60 years after World War II.

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## **FIVE FUNCTIONS**

The Trinity Growth Theory has two basic functions: one, to explain why growth levels differ among nations, and two, to explain why growth rates differ among nations. Three additional important corollary functions of the theory will be added: one, to explain why growth levels and growth rates are different among provinces and cities within a nation; two, why growth rates differ over time within a nation; and three, taking the world as a whole, why growth levels and growth rates differ inter-temporally. These five phenomena are central to the study and understanding of growth and development economics. Another way of putting the five functions is: why do growth levels and growth rates differ and differ so much between and among different economic entities over space and over time? Is there a formula or theory for the explanation? Economic entities here refer to nation states, provinces and cities within a nation and the world economy as an entity. Differences in achievements of companies or firms, though important to know, are outside the purview of this research and inquiry.

## **THREE PARTS**

The Trinity Growth Theory has three parts: Part I, the EGOIN Theory; Part II, the Triple C Theory; and Part III, the S Curve Theory. The commonality of the three parts is the EGOIN.

## **EGOIN THEORY**

My half-a-century old research and study concludes that growth levels differ because their  $\Sigma$ EGOINs differ and growth rates differ because their  $\Delta$ EGOINs differ. But what is EGOIN? It is a composite concept for total factor input. It is the quantity and quality of this total factor

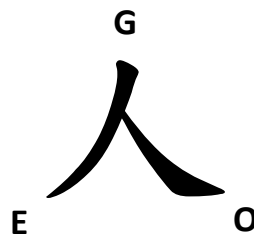
input that determines the level of output or GDP. The higher the EGOIN, the higher the output, and vice versa. From total factor input, one gets total factor input productivity, which is the input side of the equation for total output or GDP. One must expect  $\Sigma$ EGOIN to be several times higher, maybe 2 to 5 times higher than the output, GDP, as the corresponding narrower concept of incremental capital-output ratio (ICOR) shows.

### **EGOIN COMPONENTS**

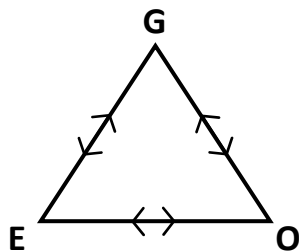
EGOIN may be decomposed into five parts. E stands for entrepreneurship, G for government, O for ordinary labour, I for investment in physical capital and N investment in natural capital. O denotes ordinary labour, E and G special labour. Together, they constitute the neo-labour theory of value. E, G, and O constitute total human capital, I physical capital and N, natural capital. Together, EGOIN may also be called total economic capital, and reflects the economic capability of a nation.

### **E, G, AND O AS CO-DETERMINANTS**

The three human components of EGO may be expressed with a Chinese word 人, meaning human, thus:



Note that G is the head, and E is the left-hand entrepreneurship and O the right-hand ordinary labour. Without G, the economy or country becomes a headless chicken. It will initially dance round and round and soon collapse. Similarly, without E and O, the head (G) has no body, no framework. It can neither walk nor run, far less lay eggs. The three E, G, O are integral social partners. They constitute the whole of the human society, though the parts each play differ and may differ widely. Their symbiosis, in totally different degrees in different economic entities, is there. The three parts and their relationship can also be presented in a triangle diagram, thus:



Together, the three social partners form the economic pyramid. Removal of any one pillar, the economic pyramid collapses. Because of the importance of all the three human determinants, the EGOIN may also be termed the human theory of development and underdevelopment, or the human theory of wealth and poverty. The assumption is that the economy is man-made. Man forms the core in the EGOIN Theory. The aptitude and attitude of man constitutes the core of the EGOIN Theory. In parts, it would be the aptitude and attitude of the government (G), and the skills and orientation of the people (E and O).

The apex of G is the critical political leadership. The body is the often omnipotent accompanying and supportive bureaucracy or Civil Service. Together, they produce public goods and services, normally mainly or wholly services, such as the all-important public law and order,

judicial services, defence, and external relations. They also formulate and implement economic policies, including monetary and fiscal policy. They might even run and manage economic and social agencies. G, in short, may be referred to as public governance. In my book *Development and Underdevelopment* (1991), I tried to differentiate between good G and bad G:

*“What is a good G? The first best scenario is that it must be competent, it must be frugal, it must be humane, it must be trustworthy and above all, it must put public interest above self-interest. In short, in the economic sphere, it must promote the development and E, O, I and N; a conducive environment for investment and development. This is particularly important for low-income countries. Conversely, a bad G is inept, spendthrift, corrupt, inhumane and promotes neither E and O nor I and N. Colonial regimes tended to promote I and N, but not E and O. Ancient potentates tended to promote their own self-preservation and seek their own self-glorification. The remains of their activities today, such as the still imposing forts and palaces of Maharajahs in Rajistan, the Ming Tombs and the Summer Palace in Beijing and the Pyramids in Egypt are but several examples of their undoubted achievements in self-preservation and self-glorification.”*

The short-term for E is employer, or entrepreneur. Employer normally owns the firm and brings the factors of production together. His (or her) functions include organization, coordination and management. Many employers are also entrepreneurs. Any of the following four functions or innovations would describe entrepreneurship adequately: (1) discovering a

new market for the product or service, (2) discovering a new and cheaper factor of production or material input, (3) producing a new product or service, and (4) reorganizing or re-arranging of factors of production to reduce costs. Inventions per se are not entrepreneurship, unless they are put to commercial use. And entrepreneurship, as Joseph Schumpeter (1934) pointed out, can come from different ethnic, class or academic disciplines, and I would add probably more so from the modern hard sciences, particularly engineering, and social sciences, including law, accountancy and economics. To me, entrepreneurs are shining stars in the economic firmament. They are the starting point in the EGOIN.

Labour or ordinary labour is normally used as a denominator for measuring productivity with the use of real GDP as the numerator. This measurement is labour productivity, not total factor input productivity, which should include the important and indispensable contributions by government (G) and employers (E). Differences in labour productivity are often shown as differences in the talent pyramid, which is often used to reflect the educational pyramid of a country.

### **I AND N AS CO-DETERMINANTS**

Though economies are built by man, but man's ability to build an economy is a function of its accumulated capital investment (I), or more precisely  $\Sigma I$ , which refers to existing physical infrastructure such as roads, bridges, mass rapid transit, airports and airplanes, seaports and ships, dams and irrigation facilities, schools, polytechnics, universities, and other institutions of learning, hospitals and other healthcare centres, factories and shops, and not to forget, computers, mobile phones and tablets. Indeed, when one visits a developed country, one is



struck by the better development of its physical capital ( $\Sigma I$ ), or infrastructure, and vice versa. Similarly, when the growth rate of a country is high, inevitably its additional investment ( $\Delta I$ ) is high. The following growth formula, of the Harrod-Domar Model variety, has validity.

$$\frac{\Delta Y}{Y} = \frac{S}{Y} \cdot \frac{\Delta Y}{I}$$

where  $\frac{\Delta Y}{Y}$  refers to the rate of growth,  $\frac{S}{Y}$  refers to the rate of savings, and  $\frac{\Delta Y}{I}$  the inverse of the capital-output ratio or the productivity of capital. Here  $S$  is assumed to be the same as  $I$ , so the higher is  $\frac{S}{Y}$  or  $\frac{I}{Y}$ , the higher is the growth rate, given the ICOR,  $\frac{I}{\Delta Y}$ .

To complete the EGOIN, we must bring in the  $N$  factor, the natural resources or natural capital. Here, we refer to utilized  $N$ . Unutilized  $N$  remains unutilized, and does not contribute to GDP growth level and growth rate. Natural resources normally refer to wasting assets like fossil oil, gold, tin, coal, iron-ore and diamond mines, and non-wasting or renewable natural resources like palm oil, rubber, sugar, wheat, rice, soya beans, corn, etc. However, we must also include location as a natural resource. Locational advantages like proximity to a river mouth or the cross-roads of shipping routes also confer certain advantages to the economic centres concerned.

In assessing the EGOIN of a centre, we cannot as a rule assign equal weightage to each of the five co-determinants, as they can be different across centres and over time.  $N$  is quite obvious. Natural resource endowment varies among centres. They can also vary over time in the same centre. New oil fields may be discovered or old gold mines have exhausted their gold. Similarly, one locational advantage emerges because of changes in trade routes such as the

building of the Suez Canal or Panama Canal. Similarly, the O factor plays a much more important role in a centre after enormous investment in human capital than before when illiteracy was rampant. Changes in the G factor through changes in policy options can play a critical role in GDP growth rates, such as after Deng Xiaopeng's opening up of China and the decades before it under Chairman Mao, or decades before Chairman Mao when G in China went on an unending downward tailspin.

### **EGOIN AND CAUSALITY**

In short, to restate, growth levels differ because  $\Sigma$ EGOIN differ. Growth rates differ because  $\Delta$ EGOIN differ. Note that Government (G) is an integral part of the EGOIN Theory, so is natural resource (N).

Among nations the quality of G can differ enormously. But within a nation, when comparisons are made among different provinces and cities, the role of a common G is also there in addition to the provincial G or city G, and these may differ in aptitude and attitude. With a common national G, the differences among centres within a nation may be thus attributed to differences in E, O, I, N and provincial G or city G, or more commonly, different combinations of the five variables. The commonness of such well-developed cities beginning with the letter S such as Singapore, Shanghai, Sydney, San Francisco, Stockholm and Santiago, has much to do with their locational advantages as initial and present seaports, rather than because of the common S letter beginning in the English language. Coincidental commonness is not common causality, as in  $\Sigma$ EGOIN or  $\Delta$ EGOIN.

EGOIN is a multi-causal theory, not a uni-causal one. Though the contributions of different determinants differ from centre to centre and from time to time, none can claim to be the only determinant.

Is there technology in the EGOIN Theory? Yes, of course. The all-important technology is embodied not just in O, but also in E, G, I and N; technology is frozen with past physical investment ( $\Sigma I$ ) though. E, G and O, it should be noted, are active agents, whereas I and N are passive agents. Of the five co-determinants, the volatility of G is the most notable, as compared with E and O. The volatility of G often accounts for short-term and even long-term changes in the GDP and employment level. As for O, the Chinese have a saying “十年树木，百年树人” serves to drive home this point of relative stability of O very well. The Chinese proverb claims that it takes 10 years to grow trees, but 100 years to nurture a generation of well-educated man. In other words, the attributes of factor O (and E too) are much more stable than the co-determinant G. It is the relative stability of O and E that constitutes enormously to the stability in growth levels and growth rates in economic entities. But when G changes drastically, it may have its important impact on I (investment) and maybe on O (migration) and N (operation) as well. The chain reaction, both positive and negative, may be there and should not be ignored.

EGO may be construed as a theory of motivation. But this paper deals with the wherewithal of wealth creation, rather than the motivation or the will to progress, which is assumed to be there in G, E and O, particularly following the huge investment in human capital after the World War II in the form of mass education. When we speak of the aptitude and

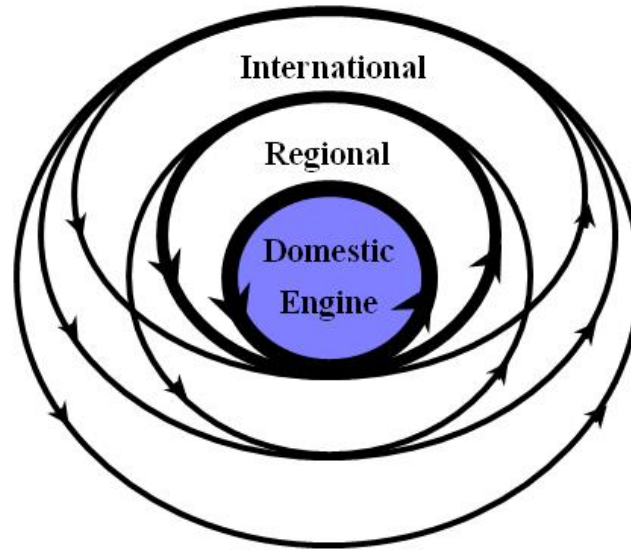
attitude of E, G, and O, we imply differences in the collective will to progress in different economic entities over space and over time.

### **TRIPLE C THEORY**

The EGOIN Theory thus far presented does not emphasize enough on the increasingly globalized nature of the world economy. Different nations in varying degrees are connected through transportation and communication links, through trade, visible and invisible trade, capital flow, short-term and long-term capital flow like FDI, and the rather invisible but crucial and critical flow of knowledge, especially technological and institutional knowledge. The following diagram shows the linkages: linkages within the nation, regional linkages, and global linkages among nations. Thus, as the diagram shows, a national economy is run by three engines: the domestic engine (the EGOIN), the regional engine and the global engine, which is the sum of all national EGOINs:  $\Sigma\Sigma$ EGOINs.

Triple C means circular cumulative causation. The circular cumulative causation factor can operate over space and over time. The initial stimulus or investment can spread from the original centre to the other centres and vice versa. It can also spread over a time period through the combined multiplier and accelerator process.

Diagram 1: The Triple C Theory (The C Factor)



When East Asia had an exchange rate crisis in 1997-98, it witnessed the negative or reverse working of the regional engine. When East Asia went into a crisis in 2008, it saw the negative or reverse operation of the global engine. When Sri Lanka, Myanmar and North Korea experienced stagnation in their economy in recent decades, it was essentially the malfunctioning of the domestic engine (EGOIN). The positive global and regional growth engines just passed them by, and still passed it by in the case of North Korea.

Thus, we may say that the higher the  $\Sigma C$  (cumulative connectivity factor), *ceteris paribus*, the higher is the growth level; and the higher is  $\Delta C$ , the higher is the growth rate of an economic entity. Alternatively, one may explain such differences by their differences in their EGOIN and their connectivity,  $\Sigma C$  for levels and  $\Delta C$  for rates.

## S CURVE THEORY

The S Curve Theory divides the world's numerous national economies into three very broad entities. Well-known and much adored and much-loved three animals are used as separate identities. They are turtles, for the lowest income group; horses, for the rising income group, and elephants for the highest income group. My research shows that the turtle economies have poor  $\Sigma$ EGOINs, consequently, they are economically poor. They also have poor  $\Delta$ EGOINs, consequently, they have low growth rates. If both levels and rates are persistently poor, they are in the low-level equilibrium trap.

The horse economies exhibits high growth rates, because they have higher  $\Delta$ EGOINs and one may add, high  $\Delta$  connectivity or  $\Delta C$  factor.

The elephant economies have high growth levels but slow growth rates. They have, in other words, high  $\Sigma$ EGOINs and high  $\Sigma C$  factor but low  $\Delta$ EGOINs and low  $\Delta C$  factor. Examples of such economies are the USA, the European Union and in Asia, Japan. If those economies have persistent low  $\Delta$ EGOINs and low  $\Delta C$  factor, they are in the high-level equilibrium trap.

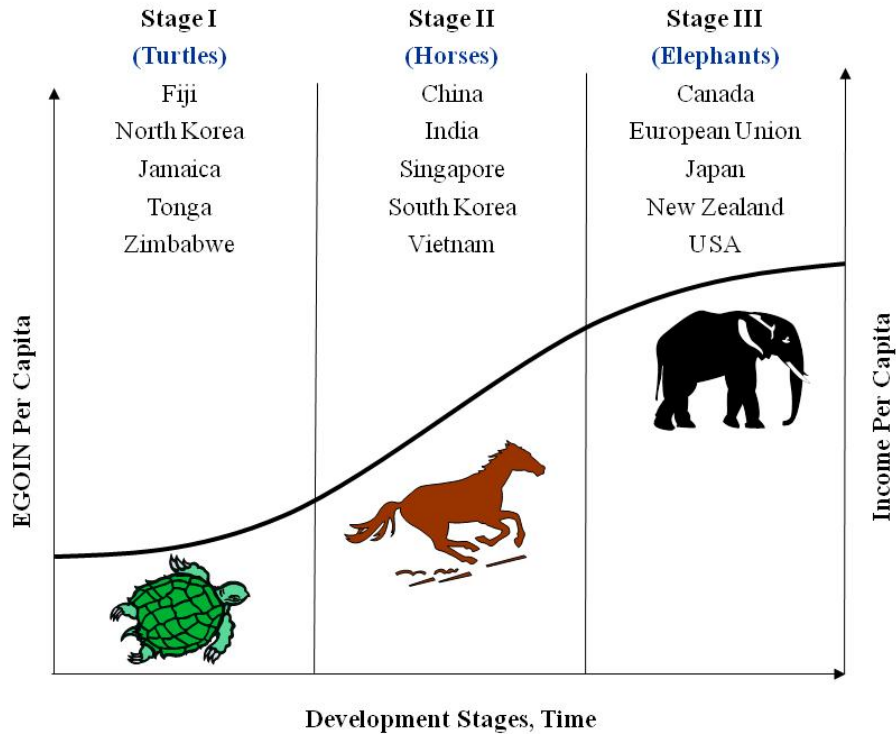
Table 1 shows the detailed salient features of the three types of economy by their EGOIN level. The stages of industrialization is one of the common delineating features with turtles classified as pre-industrial economies, horses industrializing economies and elephants, post-industrial economy. Another common delineating feature is the rate of capital formation ( $\Delta I$ ) with horses displaying high  $\Delta I$ , and elephants and turtles low  $\Delta I$ . Diagram 2 shows the S Curve in a graphical form. There is much more development potential, both in physical and

human capital development, in the horse (and turtle) economies than in the elephant economies.

Table 1: Differences in Characteristics

<b>Turtles</b>	<b>Horses</b>	<b>Elephants</b>
<b>Low growth rates</b>	<b>High growth rates</b>	<b>Low growth rates</b>
Low consumption society	Medium consumption society	High consumption society
High population growth rate	Transition population growth	Low population growth rate
<b>Low savings and investment rates</b>	<b>High savings and investment rates</b>	<b>Low savings and investment rates</b>
<b>Pre-industrial</b>	<b>Industrializing</b>	<b>Post-industrial</b>
Low knowledge-based	Advancing knowledge-based	High knowledge-based
Low $\Sigma$ EGOIN	Medium $\Sigma$ EGOIN	High $\Sigma$ EGOIN
Low $\Delta$ EGOIN	High $\Delta$ EGOIN	Low $\Delta$ EGOIN
Low $\Sigma$ TC	Medium $\Sigma$ TC	High $\Sigma$ TC
Low $\Delta$ TC	High $\Delta$ TC	Low $\Delta$ TC

Diagram 2: S Curve Theory



A word of caution: although only three animals are used in the metamorphosis process, it does not mean overnight or over a year or two, the economy changes from a turtle to a horse or a horse to an elephant, as a caterpillar suddenly changes into a butterfly. The transition process is not normally abrupt. It is normally a slower, less perceptible process. Normally, if there is a collapse of a government and no viable government succeeds, the horse economy can slide down or take a U-turn. The rider (G) may fall from the horse. The new rider may, however, gallop the horse to its former speed. Thus, of the EGOIN co-determinants, G as stated earlier, can be the most volatile, and in specific locations, one cannot rule out N in volatility either. Normally, however, the EGOIN of a nation or a province or a city is quite stable, in a



descending order of stability from the globe, the nation, the province or the city. There is the averaging process to be considered.

The S Curve is not an iron-law. It is only a tendency. And different economies have different S Curves, but we maintain that increasing returns to scale and increasing externalities (horse economies) are followed by decreasing returns and declining externalities (elephant economies). Why turtles remain as turtles is in fact a theory of poverty or underdevelopment, and why economies metamorphose to become horses is a theory of affluence. Why horses converge with elephants is a theory of convergence. Why horses diverge from turtles is a theory of divergence.

### **PREDICTIVE VALUE**

A theory should have three values: (1) diagnostic value, (2) prescriptive value and (3) predictive value. A predictive value often precedes a prescriptive value.

In our Trinity Growth Theory diagnosis, we not only have a prominent existence of horse economies but also the continued expansion of this group in the post-World War II world. In Asia, it started with the galloping growth rates of Japan in the 1950s, 1960s and 1970s, followed closely by the quartet horse economies of South Korea, Taiwan, Hong Kong and Singapore, and then by the other newly emerging horse economies, in random order, of China, India, Malaysia, Thailand, Indonesia, Vietnam and others. What is the causality? The Trinity Growth Theory attributes this to the ascendancy of their EGOIN and the rise in their C factor. But if one factor in their EGOINs that stands out above others in the long-run perspective, it must be the

common rise in the O factor, the talent pyramid. Never in the history of the developing world had there been so much investing in human capital than after World War II, following the desire of these nations to catch up with the West, and to catch up with each other. The will to progress has been there, though the intensity varies from country to country.

Of course, improvement in corporate governance (E) and public governance (G) must have also contributed importantly to economic progress of the economic entities. It means the EGO has been uplifted over the years and over decades. The enormous advance in EGO has enabled more of I and N to take place, both quantitatively and qualitatively. The world too has become more globalized, which means in our terms, more and better connectivity (C). And the great contributions of E, G and O should be acknowledged. Similarly, public governance (G) in a globalized world should not overlook the enormous contributions to world development of post-WWII world institutions like the World Bank, IMF, ILO, WTO, and the United Nations, and in Asia, the Asian Development Bank.

Looking ahead, since O, and together with it E, is relatively stable and very likely to continue improving, one can expect a continuation of high growth rates in these Asian economies, except Japan, which has in the last two decades or so graduated to the elephant class.

But will the West and Japan continue to display slow growth rates in the foreseeable future? If we go by the Trinity Growth Theory, it will be because both  $\Delta EGOIN$  and  $\Delta C$  have found it difficult to have impressive growth rates. The eurozone scheme should be viewed as a serious attempt to break away from the high-level equilibrium trap but with disastrous

consequences. So, with the relative stability of the EGOIN and also the C factor, one should expect the elephant economies, found mainly in the West, to cruise along at the elephant speed of 1% to 4%, instead of the horse speed of 5% to 10%.

Singapore should be classified as an elephant economy if we use persistent very high per capita income as a yardstick. But if we use GDP growth rate as a criterion, then she should still be classified as a horse economy, having, for example, 6.4% average growth rate per annum for the last 10 years. She has been able to retain her high growth rates, as a prescriptive strategy, through the change in her  $\Delta$ EGOIN, by attracting not just more foreign investment ( $\Delta$ I) but more distinctively, importing more foreign labour ( $\Delta$ O); the last factor is not the policy option followed by, say, Japan.

As for the turtles, my research shows that their numbers are decreasing by the decades, because of the rise in their  $\Delta$ EGOIN and the  $\Delta$ C factor. One must therefore expect their incidence of poverty to decline notably as they move into the horse camp, following the lead taken by the East Asian economies like Japan, South Korea, Taiwan, Hong Kong, Singapore, China, Malaysia, Thailand, Vietnam and Indonesia. The most prominent of the non-East Asian nation that is speeding up very rapidly in the last few decades or so is undoubtedly India.

If we go by the rapid rise in the EGOIN and the C factor in the horse economies, and the increasing tendency for more and more turtle economies to metamorphose into horse economies, including outside Asia, one should remain optimistic about world economic development, notwithstanding the current serious setbacks facing many developed elephant economies. But this prognosis is for the medium-term and long-term, which some of us, like the

writer, would not be able to see or know. But that does not need to dampen the optimism and sanguineness for the future, a future for the world without abject poverty, and that would be for the first time in the history of mankind. Hallelujah. Who says economics is a dismal science?

Angus Maddison (2007) pointed out with statistical evidence in *“Contours of the World Economy, 1-2030 AD”*, that the world economy has grown much more rapidly in the last 50 years after 1950 than in any other periods of human history.

### **CONCLUSION**

Why do nations differ in growth levels? It is because, in my diagnosis, they differ in  $\Sigma\text{EGOIN}$  and in  $\Sigma\text{C}$ . Why do nations differ in growth rates? Because they differ in  $\Delta\text{EGOIN}$  and in  $\Delta\text{C}$ . Why do provinces and cities differ in growth levels and growth rates? Because they differ, in the extension of my diagnosis, in  $\Sigma\text{EGOIN}$  and in  $\Sigma\text{C}$ , and in  $\Delta\text{EGOIN}$  and in  $\Delta\text{C}$  respectively. Why do national growth rates change inter-temporally? Because the stages of development change over time, with low  $\Delta\text{EGOIN}$  and low  $\Delta\text{C}$  to begin with (turtle economies) and high  $\Delta\text{EGOIN}$  and high  $\Delta\text{C}$  at the horse stage and then decline in  $\Delta\text{EGOIN}$  and  $\Delta\text{C}$  at the elephant stage. What about the world economy? Taking the averaging process into consideration, my prognosis is that it would continue to grow at a respectable speed, because both  $\Sigma\Sigma\text{EGOIN}$  and  $\Sigma\Sigma\text{C}$  have shown sure signs of moving at respectable speeds, taking the world as a whole as in the past 60 years after WWII, though the centres of growth have shifted and diversified and will continue to shift and diversify, as is to be expected under The Trinity Growth Theory.

## Readings on Same Topic

LIM Chong Yah (1990), "The EGOIN Theory of Development and Underdevelopment". In *Development Strategies for Third World Countries*, Chinese Association for International Studies, pp 13 – 42.

LIM Chong Yah (1991), *Development and Underdevelopment*, Longman, 255 pages.

LIM Chong Yah (1996), "The Trinity Growth Theory: The Ascendancy of Asia and the Decline of the West" *Accounting and Business Review*, Vol.3, No 2, pp 175-199. Also appeared in *Economic Essays by Lim Chong Yah*, (Eds, Hooi and Koh), World Scientific, 2001.

LIM Chong Yah (1997), "The Low-Income Trap: Theory and Evidence", *Accounting and Business Review*, Vol.4, No 1, pp 1-19. Also appeared in *Economic Essays by Lim Chong Yah*, (ibid).

LIM Chong Yah (2009), Chapter 13, "Trinity Development Model and Southeast Asian Development", *Southeast Asia: The Long Road Ahead* (3rd edition), Singapore: World Scientific.

LIM Chong Yah (2010), "The World Bank Spence Commission Report and the Trinity Growth Theory", *Singapore Economic Review*, Vol. 55, No 1, March 2010, pp 49 – 58.

SNG Hui Ying (2010), *Economic Growth and Transition: Econometric Analysis of Lim's S-Curve Hypothesis*, Economic Growth Centre Research Monograph Series, World Scientific, 130 pages

ZENG Zicheng Frank, LU Junhong and WONG Dehan Vincent (2012), *Determinants of Economic Growth: Econometric Analysis of Lim's EGOIN Theory*, Final Year Project, School of Humanities and Social Sciences, NTU.