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# Appropriate Wage to Economies of Scale for Growth

## *An Exploratory Study on New Paradigm for Development*

Djamester A. Simarmata<sup>1</sup>

### *Abstract*

Since long the economies of scale is mainly acknowledged in microeconomics. Alas, in macroeconomics field, the prevailing principle is the constant return to scales by rejecting the economies of scale without justifiable reasoning. But fixed costs and indivisibilities are widely present in the economic activities. Urbanization takes benefits from economies of scale. Presently the idea of economies of scale in macroeconomics is in the ascent stage. The principle states that higher volume of production will have a declining unit cost. Higher production volume is assumed to respond to higher demand, which is enabled by higher labor wage. Raising labor wage rate does not necessarily increase unit cost of production. The wage could be a weighted wages in the sectors of the economy. It is expected that the rise in the labor wage should be less than the decrease of the unit cost, enabling higher sales. Aggregately it leads to a rise in the whole country production or Gross Domestic Product, entailing more jobs creation. A conclusion is that under appropriate conditions the increase in the labor wage rate will raise the GDP, associated with more jobs and better income distribution. This is a potential new developmental paradigm where the increase in the labor wage entails a rise in the GDP, providing more jobs and better distribution of income.

*Key words: economies of scale; increasing return to scale; labor wages; industry; interlinked; unit cost reduction; distribution of product.*

*JEL classification: O12, O11, O14, O15*

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## Introduction

During the beginning months of 2012 there were two big demonstrations of labor in Jakarta, demanding the increase in labor wage rate. The firms respond with the arguments that one of the ways to defend the firms' survival and competitiveness is by holding an appropriate low wage rate and the flexibility of the labor market.

But from the other side the data on Gini coefficients of income have been steadily rising since 2002. In 2002 the Gini coefficient for income is 0.32 while in 2011 it has been 0.41. In addition to that, the big and medium corporations' data indicate that the whole expenditure for labor in 2010 is only 10 percent from the value added, while in the capital city, Jakarta, it is only 5 percent. There is a growing inequality in Indonesia.

This is an important topic in economic development. It is needed to search for theories, capable of explaining that situation. In that effort the paper presents the economic laws and principles, which could be employed to tackle those issues.

In his monumental book Adam Smith (1776) states that the division of works is the sources of economic wealth, leading to better economic development of a country and the improvement of the welfare of its population. But Smith declares that the division of works is limited by the extent of the market, which is a demand side. One way to raise the demand is by increasing the wage. The question is how much to increase the wage and how is its impact on the unit cost of productions?

Nowadays it is well-known that specialization, another terminology for the division of works raises the productivity of any worker proven by many empirical studies. The higher the frequency of doing any task the higher the productivity, which is presented by the learning curve. Smith had observed that by the division of works, a group of workers produced 240 times the amount of pins that they could manufacture if each worker dealt with the production from start to finish. It has been shown that the learning curve and the high production volume are going hand in hand to raise the productivity.

The idea of the extent of the market from Smith is associated with an effort to search for an enabling scheme to increase the purchasing power of labors, which are also the consumers. The labors will have a higher demand if their income rises, which could be obtained if the wage rates of the labor forces increase. The increase in demand will be transformed into an increase in the production volume. But here it needs a restriction that

the domestic demand is assumed to be elastic and its satisfaction is mostly fulfilled by the domestic products. Hence it is assumed that the role of the imported goods to satisfy the domestic demand is negligible as in a closed economy.

This article consists of eight parts: Introduction, The Problem Formulation, Literature Review, EOS and Economic Growth, Unemployment and Coordination Failure, Role of CRS in the Inequality Formation, the Non-Neutrality of Money in IRS Environment, EOS and Developing Countries, and Conclusion.

### The problem formulation

There have been many articles and analysis on the presence of the increasing return to scale (IRS) in the macroeconomics field, but unfortunately it has no significant impact on the prevailing economic theory. The acknowledgement of the IRS in the macroeconomic theory will have significant influential effects on the national wage setting. The law of economies of scale (EOS) has important conclusion, namely an increase in the production volume will be followed by a reduction in the unit cost. If the decrease in the unit cost is transformed into a decline of the selling price, the sales volume will increase, and the production volume as well, which then provokes an increase in labor demand. As before the products are assumed to be elastic. If the reduction in the unit cost is not transformed into higher wages the profit level of the corporation will increase, raising more funds for investment and which could push-up the labor demand. Or it could be transformed into a rise in wage and the profit level, but with the sum to be equal to the unit cost reduction.

The effects of the EOS could be differently expressed: the cost saving is just the result of the increase in the size of the physical production, required by the higher production volume. In this respect a decrease in the unit cost of production does not necessarily due to technological advancement. Otherwise stated an increase in the size of the production volume provokes a decline in the unit cost of production. It could happen in a production unit until a certain level of capacity utilization. Or it could happen in the aggregate, which will be limited by the aggregate demand.

There is a circular process here, where an increase in the demand due to an increase in the wage rate entails a reduction in unit cost, leading again to higher demand or profits, entailing an increase in the production and/or investment. It could happen continuously.

By assuming the vintage capital, integrating the technological advancement in the new production process, the double positive impacts in the form of unit cost reduction will be much higher. A new additional production units due to an increase in demand embodies the latest technology and hence more productive. The rise in the individual labor income leading to increased aggregate demand does not only increase the volume of the existing products, but usually also increase the variety of the demanded goods. It could be leading to a need of new division of works, or new specialization.

The problem posed by Smith, where the extent of the market is the constraint for the specialization could be solved with the help of the law of IRS or the EOS arguments. By joining the points from the many researches on the topics of IRS or the EOS this paper proposes a new macroeconomic paradigm, for which labor wage should not be as low as possible as the usual argument maintains. This is contradictory to the business as usual assumption, where the main thesis is that to get the lowest unit cost of production is only based on the lowest labor wage. To the author this is a fallacy of composition. The paper proposes a new thought to economic growth, where the low wage is good for a firm in isolation but is damaging for the firms as a whole. On the other side, higher wage could appear infer damage, but under certain conditions it could lead to lower unit cost of production. Both cases belong to the fallacy of composition argument.

Now the problem at hand is as follows: aware of the EOS or IRS, we really have new basis for the macroeconomic theory in relation to the national labor wage. The wage level should not be low but will be determined by the interplay of the EOS, the wage level, and the level of specialization in the economy as a whole. The new paradigm is expected to result in a relatively more equitable distribution of GDP. This is related to the thesis that low labor wage level entails low purchasing power and low aggregate production volume, resulting in a low GDP of the respected countries.

## Literature Review

It is clear, the extent of the market [Smith, 1776 pp 27] is the starting point of the analysis, and the EOS or the IRS is the working horse for this argument. This literature survey is only collecting the results or conclusions from the related research articles. The author conducts an exploratory research, without doing new theoretical analysis or new

empirical research. In sum this paper only picks and combines the results and materials from the available articles and publications and then blends them to the intended target of its author in formulating a new thought on the macroeconomic analysis, especially in the role of wage level in the context of developing countries.

In this article, the law of economies of scale refers to the simple concept, without differentiating according to all of its varieties [Junius, 1999]<sup>2</sup>. Based on the very simple concept, the increase in the production volume due to a rise in demand is beneficial, reducing the unit cost of production, which could be allocated to a rise of the wages of the labor force or in the corporations' profits. The increase in the production volume in response to demand will be followed by a rise in the corporation sales, which is generally transformed into higher profits as a whole. The matched rise in sales should be enabled by the rise in purchasing power of the masses of the labor force in general, which is in return attributable to the rise in labor incomes or the labor wages. In this article a rise in wage is in conjunction to the reduction in the unit cost, entailed by the higher production volume. There is a circularity argument here.

The debate on the role of increasing return to scale in macroeconomics has been quite long, where the work of Allyn Young [1928] was well known. Veblen's works was really preceding Young. But in reality the grand-father of this idea was Adam Smith himself. Alas Smith switched to the constant return to scale concept when he explained the theory of value in the next section of his work [Smith, 1999]. Marshall [1890], the father of the marginal analysis in economics, acknowledged the presence of economies of scale, but unfortunately he relegated it to the so-called external economies of scale, in order to keep the then body of economic theory intact, defending the constant return to scale (CRS) principle [McCombie and Roberts in Berger, 2009, p. 13]. Since then, the EOS did not belong to the core of the macroeconomic theory and almost neglected until the recent publication of the endogenous growth theory.

Venables, J. A. [2008] states that: «Increasing returns arise through a wide variety of mechanisms, some narrowly technical and others to do with wider socioeconomic feedbacks. Increasing returns may be internal to the firm—average costs falling with the

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<sup>2</sup> To the knowledge of the writer, a detailed presentation of the economies of scale is published by Junius, K. (1999).

length of the production run—but their implications for the performance of the economy are greatest if they are external, between rather than within economic units.» Venables joins Marshall on the presence of the external economies of scale, but with a significant difference where Marshall relegated all the increasing return to the external effects.

One could be surprising as to why the glaring facts of the presence of economies of scale in real life have been discarded from the body of economics science. Some reasons are proposed, namely in an effort to defend the pure competition principle. By applying the Euler's theorem<sup>3</sup>, if the factors are paid their marginal products, the product will be totally exhausted, provided the system obeys the law of constant return to scale. This is the principle that is protected by the neoclassic theorists. But other motivation could have been ideological, since by applying the marginal productivity theory, factor rewards are determined by the technical condition of the production, avoiding the debate and the opposition of the Marxian concept of surplus value of labor [Dobb in Berger, 1973, p. 14].

According to Alesch and Dougharty [1971], there are four characteristics of the relation between the unit cost of output and its volume: economies of scale, the unit cost declines with an increasing volume of production; diseconomies of scale, the unit cost rises with the rise in production volume; constant return to scale, the unit cost is the same for whatever the volume of production; and a U shaped cost-curve having a minimum unit-cost at a certain volume of production. As previously, technical or mathematical arguments are used to avoid the debate on the labor surplus value proposed by the Marxian economic theory. Being CRS, paying production factors based on its marginal products, no more left as a surplus and the debate is stopped.

In the literature of economies of scale, the work of Junius [1999] is the most extensive one. Firstly it is subdivided into internal economies of scale and external economies of scale. The internal economies of scale consist of two sub-classifications, namely the static and the dynamic EOS. The external economies of scale consist of static and dynamic EOS, where the static EOS consists of localization and urbanization EOS. For this paper, such a detail is not too important in an effort to seek out a relation between the EOS and the labor wage level in the industries or in the countries as a whole.

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<sup>3</sup> Euler theorem:  $f(x,y) = x \cdot f_x + y \cdot f_y$ , which is only valid if  $f(x,y)$  obey constant return to scale. This is the principle that is defended by the neoclassical economics.

There is an important concept in this case, namely the minimum efficient scale or MES. The MES is the size of the firm at which the long run average cost curve starts to being flat such as a doubling of output leads to an insignificant reduction of unit costs, namely by less than five percent [Junius, p. 13]. Lyons [1980] stated that for most trades in England the MES is less than 250 employees. According to Johnston the product-unit-cost versus firm-size relation approaches the L-curve instead of the U-curve.

Junius writes down three indicators for direct or indirect measures of the strength of the EOS in the industry, namely: a) Price-Cost Margin or Lerner Index, which is the ratio of the price minus marginal cost divided by the average cost, showing the market power of a firm, b) n-Firm Concentration Ratio showing the proportion of the total sales of n-largest firm, c) Herfindahl-Hirschman Index, which is the sum of the squared market share of all firms in the industry and increases with higher concentration of production. High n-Firm Concentration Ratio is closely related to firms within an urban area.

Another article [Thomas, 2003] analyzed the role of the EOS, technical progress and regional disparities in the Indian industry within the period of 1959-1998. He used the econometric analysis to see the presence of the EOS in the Indian industries by regressing the value added per labor on capital per labor and labor. He found the presence of EOS but with different significance. Different states with different industry level gave different importance of the EOS embodied in the industries within the country. The work of Thomas contributes to the new approach on the analysis of the non-convergence of the regional or provincial development in one country like Indonesia<sup>4</sup>. The Thomas approach is based on the theory of non-equilibrium theory as proposed by Kaldor, Veblen, Young, Myrdal, and still many other late comers to the issue. Unfortunately the mainstreams economic research approach is until now based on the convergence criteria from Solow (1956) with a suspected flawed result.

One influential article on increasing return and economic growth [Romer, 1986] has become a path-breaking work countering the concept of constant return to scale. In a time span of thirty years since the publication of the works of Robert Solow [1956], Romer has been influential in provoking further work on the issue, in the sense it has been

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<sup>4</sup> Several studies in Indonesia confirm the discrepancy of the regional development since the year of 2000, the starting year of the regional autonomy in the government.



corroborating the similar idea before, namely from Young [1928]. As a matter of fact, the well known author and Nobel laureate Samuelson has written in his economics textbook [1964, 6<sup>th</sup> edition] that the EOS or IRS is related to mass production, without mentioning it in the context of macroeconomics.

The article of Romer [1986] was especially a great challenge to the assumption of the hailed-work of Solow [1956]. None the less some inconsistent arguments exist in the article of Romer. For example, in his two-period model he assumed the equality of the number of firms and the number of consumers, which is quite unrealistic. But the use of optimal control theory at the time of its publication was too difficult for the general readers, which became a handicap for its dissemination.

The new publication exploring the importance of economies of scale in the economies in general is from the World Bank [WDR, 2009]. In almost all chapters, the issue of economies of scale is discussed either directly or indirectly. But chapter 4 is largely elaborating the issue in the context of the economic science as a whole, without limiting the scope to microeconomics. The publication is an all-encompassing report on the issue of economies of scale as far as the author knows. As the title shows, the report is mostly stressing on the issue of geography with a special topics on urban areas. It derives the content of its report from all over the world, making it rich in the combination and blending of the scientific values of the localized realities of the countries. Due to its wide spectrum of its exploration, the author concludes that any economy obeys to the EOS as a whole, even though some parts could be experiencing an almost constant return to scale in isolation. In the aggregate, through the interaction of the internal and external EOS, the whole economic system will be obeying the laws of the economies of scale. The degree of the interaction between industries will be visible through the Input-Output table.

### The EOS as a New Paradigm for Growth

The literature study has concluded that the economic system of a country as a whole obeys the laws of the EOS, even though a production unit in isolation does not do so. But the presence of fixed cost or any initial effort or cost to start an activity is certainly entailing the presence of the EOS even though it might be small in some sectors. But the most important channel for the injection of EOS to other activities is through the

interlinkages between activities as represented by the Input-Output table of the economy. The presence of the external EOS is guaranteed by the network of infrastructure, as the roads or highway system, telecommunication, irrigation and water distribution system, and so on, containing the natural monopoly characteristics. The larger the size of the infrastructure and the wider its operational scope, the less the unit cost of the output. Of course there must be an optimal match between the capacity provided and the demand.

It has been said before that one of the most important issues taken from the EOS is the reduction in the unit cost resulting from the increase in the production volume of a firm. The issue here is how to transform the reduction in the unit cost into demand. It seems that we are dealing with the demand problem or in the terminology of Smith the extent of the market, which is in analogy to the Keynesian view on the effective demand.

A market channel for the transformation is through pricing, where the reduction in the unit cost of production due to the rise of the production volume is the basis for reducing the selling price of the goods in question. But it requires a precondition that the market is competitive and fulfill other necessary condition. As a rule of thumb the demand will be higher if the price decline. Or the demand will increase if the incomes of the buyers rise. Hence there are two ways to increase the demand: reducing the price and increasing the purchasing power. The two systems could be realized by employing different formula for transferring the unit cost reduction either reducing selling price or increasing of the labor wage. In all of the discussions, the price is assumed to be constant.

From the other side, even if the prices of the goods stay unchanged at the same level as before, it entails more sales if there is higher purchasing power of the consumers due to the rise in wage. In either case, either a reduction in price of the produced goods with an unchanged wage level, or a rise in wage with an unchanged price, it will be followed by an increase in demand. The continuing process is a sequence of movement from one round of production to the next round, provoking a cumulative and circular causation in benefits. Higher wage triggers higher demand then followed by higher production volume with a lower unit production costs. Lower unit cost is equivalent to higher purchasing power. This is a virtuous circle process entailing a higher demand and then production volume, transformed into higher economic growth compared to the situation without appropriate rise in the wage rate. This is a *new paradigm of development*, which is

contrary to the business as usual practices where the labor cost in the form of wages were squeezed down to a low level. But this has a consequence of a contraction of demand of the masses of the labor, reducing the extent of the market. So the extent of the market could be improved subject to smart wage manipulation.

By following the prevailing corporate point of view, where the wage should be as low as possible, the purchasing power will be low, leading to low volume of demand and then low volume of production. According to the law of economies of scale a low volume of production results in a higher unit cost of production, which then reduces the existing purchasing power. The present view sees the labor wage only as a cost, forgetting its role in the demand formation of the masses of the workers, which are the majority of the population of any country. The optimal level of wage is where the corporation is still profitable at least as profitable as before the change in the wage rate is implemented, and at the same time the labor is capable to get a decent life. The *wage* is like a sword with double edge: *a cost of production and a purchasing power*. Any analysis forgetting the simultaneous role of the two sides of the wage is flawed. It is like the situation where it is confronted the demand and the supply side to reach equilibrium, the purchasing power of a labor in a group of demanders must be confronted to its cost in the supplier side.

### *Economies of Scale, Wage and Developing Countries*

In the context of an economic development, low volume of produced goods that has to be transported to other places will be economically requiring low grade of road. Such low grade road will allow only operating small trucks with a much higher cost per ton of transported goods [Simarmata, 1988, p. 100]. It will have a high transport cost forcing to increase the selling price of the goods in the destination place. These goods could be as input to further processing, entailing a higher input costs with an effect of higher output prices. If the quality of the roads is also the same, the end selling prices of the goods in the market places will be much higher due to cumulative transportation costs of either the input or raw material goods, intermediate goods, and the finished goods. This leads to the underdevelopment. This is a digression to the present topics, but is related to the developing countries, with low production volume, hence low quality of transport, becoming an unfavorable external EOS with high cost [Simarmata, 1988, pp. 93-96].

Reiterating the previous argument, starting from any initial level of wage rates, an increase in the wage rates will lead to a higher demand and then a higher volume of production resulting in a decrease in the unit cost of production. The whole economic system has different levels of capacity utilization, and a significant portion of them is expected to be in a state of declining unit cost following the increase in production. The reduction of the unit cost can be designated to compensate the previous wage rise. But it must be so that the increase in the wage rate should be less than the decline in the unit cost due to the economies of scale. The difference, if any, could be allocated to raise the profit of the corporation. By a smarter planning, the new price could be set a little lower than the old or previous prices, inciting the people in general to buy more goods due to price decline and psychological incentive.

Just by increasing the wage rate entailing a rise in purchasing power, it will raise the demand and then the production volume. If the economies of scale in some part of the economy have not been exhausted, there will be a second round of the reduction in the unit cost of production. Would it be totally exhausted in that subsector of the economy, there is a high possibility of the other subsector starting to experience the exploitation of the positive effects of the economies of scale through a circularity channel. Such a repetition of the shifting place of the subsectors experiencing the economies of scale effects will lead to the cumulative-circular causation process for all the subsectors. In the end it will be encompassing the whole economy even though not simultaneously.

Ideally the increase of the wage rate should be applied by all firms in the country, especially in the formal sector. But it could be implemented by a single corporation or an economic unit, wherein the EOS is more significant than in the other corporations. A stepwise approach, beginning from one or a group of corporations having the highest EOS leading to the next lower EOS will be economically beneficial, where the process will spread from the highest profit rate corporation group to the lower profit rate, until covering the whole economy. But as it was concluded in the literature study, the presence of the external EOS will make the unit cost of the whole economic sectors decline, even though the unit cost of a production system in isolation does not decline. But, due to the declining costs of the inputs, the output costs of these CRS firms will also decline. This is due to the inter-linkages between sectors of the economy as is shown by the IO table.

In its 2007 report, the International Monetary Fund states that the flexibility of wage will increase the welfare gains in addition to higher employment absorption [Vergeer and Kleinknecht, 2010-2011, pp 67-69]. But the researchers in the Continental countries are not of the same opinion. There is a significant difference between the Anglo-Saxon and the Continental labor market. The Anglo-Saxon countries are the adherers to the labor market flexibility, in contrast to the Continental countries which adopted a more rigid labor market [Vergeer and Kleinknecht, 2010-2011]. The just cited study showed that labor market flexibility did not lead to higher GDP growth or higher productivity in the Anglo-Saxon countries. But higher wage rate did not penalize the Continental economy to a lower growth and lower productivity. The flexible labor market did have a higher employment absorption but with a lower wage rate and also a lower productivity and longer working hours. The unemployment rate is higher in the Continental countries, but they have a much higher unemployment benefits. The facts lead to a conclusion that the flexibility of the labor market does not guarantee the higher welfare of the population. And another fact is that the inequality situation in the Anglo-Saxon countries is higher compared to that in the Continental countries.

A short conclusion of the above explanation is that a well planned arrangement of an increase in the wage rate will not be destructive to the economy. What is more, the first effects of the wage rise will be mutually reinforcing in a circular way, leading to virtuous cycle in the economic development. This is a new paradigm of development which is based on the demand management, but without neglecting the supply side of the economy. As it was stated before the labor wage has a dual role: as cost component for the firms and as a purchasing power for the labor force. This should be managed appropriately, where too low wage will put the limited purchasing power of the labor-consumers, which will kill the firms; while if the wage is determined too high, the selling price will also be high, limiting the size of the market, killing the corporation. The two points of views converge to the negative results for the firms. And it is due to the neglect of the principle of the EOS in the firms, and both are based on the “egoistic” point of view, either from the labor side or from the corporation side. The two sides should be compromised.

Based on the previous discussion and analysis, under a suitable arrangement the rise in labor wage does not necessarily raise the unit cost of production. The prevailing view at

the present time is so that the rise in wage will be followed by the price hike, which is not based on real calculation but only based on supposition or an untested rule of thumb. The economic analysis of the increasing return in the economy as a whole or per unit of economic activity does not justify “the mainstream economics” conclusion where the economy in the aggregate is assumed to experience the CRS.

### *EOS and the Aggregation Process*

Any economy consists of several sectors. The challenge is to find out the prevailing economies of scale characteristics of each sector. According to the World Development Report in 2009, the economic sectors are not subject to the same degrees of economies of scale [WDR, 2009, p. 128]. Heavier industries have higher internal economies of scale. As a rule of thumb, manufacturing sector has higher degrees of economies of scale compared to that prevails in agriculture, mining and generally the service sectors.

Hence it is imperative to find out the pertinent economies of scale characteristics of each sector of the economy. The ideal required condition is the homogeneity of the sub-sectors, which is very difficult to fulfill. In the case of Indonesia, the economy consists of nine sectors, which are still heterogeneous in that respect. Kaldor built on Verdoorn’s empirical study stated that the engine of growth of the economy is the manufacturing sectors [Berger, 2009]. According to him this is the sector where the economies of scale in production could be obtained and easily observed. Based on Kaldor-Verdoorn statement it could be concluded that the different development pattern of one country from the others is attributable to the different roles of its manufacturing sector in the economy. This conclusion has an important consequence for the development strategy, where the role of the manufacturing in the economy should be deliberately put forward in its planning. This could lead to the old proposition, where the role of primary sector has to be replaced or at least complemented by the industrial sector [Prebisch, 1950 and Singer, 1950]. They both argued that there was and there would be a continuing secular decline in the terms of trade of primary commodity exporters. Even though it is not true in its totality, the proposition should be considered seriously due to the EOS arguments, where the manufacture sectors are the most suitable activities in this respect.

The aggregation of the whole production system either consisting of big corporations and small family production units, together will have the same lumped characteristics, obeying the law of increasing return to scale inside the macroeconomics context. By analyzing the aggregation process there is no annihilating potential on the economies of scale of one unit of production with that of another except the degrading impacts of the negative externalities. Corruptive unification of the economies of scale from several components is still not identifiable. Hence the macroeconomics trait of the production units endowed with the laws of economies of scale will preserve its characteristics during the aggregation process. Hence the macroeconomics system is subject to the declining tendency of the real unit cost of production in line with the growing magnitude of the GDP. It is very important for macroeconomics as a science. In addition to the science argument, it will have a decisive consequence for policy formulation, especially in the domain of wage formulation. Raising wage appropriately will be advantageous.

The myriad of the corporations in the economy are interlinked by many networks of infrastructure, like road system networks, railway, ports and airports, telecommunication, water pipe system, and so on. It is well known that any network is endowed with the natural monopoly, embodying the EOS to a large volume of production. This will be the manifestation of the external EOS as was presented in the literature study before.

The reduction of the unit cost of aggregate production due to the rise in the volume of production is a vital source for the labor wage increase, without additional cost for the corporation, or which is not due to the technological advancement as was the conclusion from the Solow model. It means that the increment of the physical dimension of the production system will be beneficial just due to the increase of the physical size of the production units. This could be regarded as a bonus of the size. The other beneficial effects is due to the repetition of doing the same task, ending in the rise of the dexterity of the worker, increasing the labor productivity, which is called the dynamic economies of scale. Learning by doing is a positive side effects provided by economic growth.

There is a positive interplay between the greater physical size of the production system and the rising improvement of the skill of the labor force due to the high production volume. Otherwise stated, it is a multiple benefits du to simultaneous economies of scale and the human capital accumulation due to the learning by doing.

One of the critical issues in this discussion is the impacts of the production system operating at full capacity to the whole economic costs characteristics. Information and data on capacity utilization shows that industries are rarely working at full capacity. The concept of capacity itself is numerous, depending on the person or expert who defines it. Elmaghraby [2011] lists several related terminologies, like *true capacity*, *design capacity*, *effective capacity*, *theoretical maximum capacity*, and so on. Due to the many definitions of capacity, he proposes three definitions, namely *the operational capacity*, *the planned capacity*, and *the (actual) utilized capacity*. What can be said in this case is that even with the same definition, the capacity could be different from one situation to the other, which depends on the other parameters related to the production planning. Hence in order to arrive at the practical use of the concept, the capacity should be related to the situation leading to the maximization of the firm profits. At the firm level, the concept of capacity is fuzzy. Hence in the aggregate the firms are assumed to make a great effort to operate at the prospective level, rendering the profits maximum, without bothering on individual capacity utilization. It brings with it an inexactitude but the whole picture confers a useful approximation to the aggregate cost characteristics of the economy.

One of the conclusions on the discussion of capacity utilization, the macroeconomics concept seems neglecting the realities in the firms or the enterprises. Hence it needs new direction to reduce the separation between the micro- and macroeconomics knowledge.

## Unemployment as Coordination Failure

In his paper, Weitzman, M.L. [1981] stated that:

"Unemployment equilibrium" is persistent involuntary underutilization of the major factors of production, caused by insufficient aggregate demand. The market system suffers from a "failure to coordinate" the desired consumption and production plans of all agents because the unemployed lack the means to communicate or make effective their potential demands.

He raised two issues of the market system, namely the "insufficient aggregate demand" and "the failure to coordinate". This is contrary to the thesis of "invisible hands", since the market cannot coordinate the supply and demand by the market price mechanism only. But the failures are not limited to the demand side as Weitzman said; the supply side has contributed to the failure through an incorrect appreciation of the potential consumption from the production factors and agents in the economy. The market cannot detect the



presence of economies of scale in the production system on the supply side which could raise more demand due to the reduction in unit production cost. The unit cost reduction could be passed on to the consumer through a decrease of the selling price; or it could be passed on to the profit level of the firms, generating more investment, hence raising the capital goods demand. In either case the demand will rise and the demand for labor usually follows suit. Here the origin of the demand increase is through the elaboration of the production system, by detecting the presence of the economies of scale in it.

There is an unsatisfied demand, but unfortunately could not be realized due to the lack of means to do so. From the production side the capacity to do more is realizable, but it is blocked by the concurrent unavailable demand. Here comes the potency of the previous law of economies of scale, where the rise in production will be followed by a decline in the unit cost. A temporary bridge could be elaborated as is presently common through the consumption loans, which enables the system works as if the supply and demand is in equilibrium. Unfortunately this potentiality is hidden in the system, because the economic science does not provide this information to the general public. In reality it provides positive effects both for the consumers and the producers, leading to more jobs and higher economic growth. This is a technical matter, but it could make the situation differ.

Weitzman further wrote «Each firm is a specialist in production, while its workers are generalists in consumption. Workers receive a wage from the firm they work for, but they spend it almost entirely on the products of other firms » [Weitzman, 1981, p. 2]. This is an expression of the interlinking operation of all the firms in the economy. The previous citation on the insufficient aggregate demand does not elaborate the positive impacts of the rise in the production volume with a reduction in the unit cost of production. It is here proposed, that the reduction of the unit cost of production is to be used to rise the wage of the workers. The increase in wage, as an example from Henry Ford's policy in 1914 in his automotive factory, triggered the rise in labor productivity. The modern terminology for the rise in productivity in relation to the wage rise is the *efficient wage*.

*Henry Ford introduced the five-dollar day in 1914, which was much higher than the prevailing wage level at that time in other similar industry [Raff and Summers, 1986]. Ford's innovative policy on labor wage is sometimes labeled "welfare capitalism". One of the consequences of the Ford's policy was the appearance of the new American middle*

class, because he was the first manufacturer of a “luxury” item to pay his workers enough to afford the product they built. Affordability is closely tied to the wage level. Raff and Summers show a significant reduction of selling price of the Model T car after the introduction of the *five dollar day in 1914*. The author is of the opinion that the good performances of the Model T car factory are attributable to the efficient wage system and the EOS effects on raising the productivity of that automotive. Hence the increase in the wage level will have a non technical effect in raising the productivity in addition to the EOS technical effects. Otherwise stated the wage increase has double positive effects.

The coordination failure in this paper is understood as the inability of the policy maker to devise the wage magnitude to such an appropriate level so that both the “hidden demand” and “efficient wage” potentials are not exploited suitably. The coordination instrument is an *ex-ante* arrangement of the level of wage increase as a proportion of the expected unit cost reduction due to the increase in the production volume. There should be an intentional arrangement from the two sides, the owners or the managers and the labors force of the firms, to achieve a joint solution on the social-wide problem related to this big issue of labor wage. The labor wage should not be seen as a cost factor only, but also as a purchasing power of the labor group.

Failing to have an appropriate coordination on the economy leads to welfare loss for the society as a whole. Colander [2008] said «From Keynes’ *How to Pay for the War* [1940], the coordination failure sees the underlying cause of the macro problems as the existence of a macroeconomic externality, in which individual do not lead to desirable results for the entire society». The individual actions could be interpreted as the failure of the corporation’s management to acknowledge and publicize the presence of the EOS in production sector that leads to unit cost reduction resulting from the rise in production volume. Otherwise, labors could demand a higher wage rate than the unit cost reduction due to productivity increase, provoked by the EOS or and the suitable efficient wage. The coordination failure will lead to social and economic problems in many dimensions.

After presenting the efficient wage system from Henry Ford, it is now opportune to say that beside the advantage from the EOS in relation to the increase of the labor wage there is another source of advantage related to the psychological thrust in working. The rise in the wage rate motivates the workers to perform better, a rise in loyalty to the firm.

This conclusion has been the results of several studies on the issue of efficient wage in the corporations, which have been related to the loyalty of workers to the firm employing them [Raff, *et al* 1986, Katz, 1986, and also Brown, S. *et al*, 2007].

The previous explanation has a relation to the concept of *encompassing interest*, which is attributable to Mancur Olson [Colander, 2008]. It is clear that the present widely accepted truth of the greedy principle in business is contrary to this encompassing interest argument. The greedy principle justifies the concealment of the EOS from the general public and labors, enabling the corporations to take over the whole cost-saving from the higher production volume due to the economic development. Surprisingly such a saving could be achieved by increasing the labor wage, entailing a rise of the demand for the product, provoking an increase of production volume with a decline in the unit cost of the product. The wage increase could be only one part of the saving in the unit production cost, meaning without unit cost increment. By this approach, it could result in either a constant profit margins as previously obtained or an increase, which depends on the management allocation policy of the cost saving. And the cumulative causality effects are expected to raise the economic growth. The potential cost saving by the increase in the production volume should be exploited positively for the growth of the economy, by appropriately raising the wage level of the workers. But it is based on the assumption of the absence of greedy practices in the business corporations.

From a negative point of view, higher profit is opening the way for firms to employ the labor-saving technology to replace labors. It is a real threat for the labor force because if they demand a higher wage, they are under threat to be fired, because the labor flexibility is now part of the labor law in many countries, including Indonesia. The continuous rise of inequality in income and wealth within a country like Indonesia and between the advanced and the less developed countries has to be an indicator of these processes, where the labor wage is not appropriately designed on the basis of economic justice principle.

### CRS Leads to Growing Unequal Distribution of Income (then Wealth)

By following the neoclassical formula for paying the production factors according to the marginal cost, the labors are disadvantaged. In a simple concept of the production

function where the factors of production consist of labors and capitals, the product of the system is intended to be exhaustively paid to those factors. It will be achieved by using the Euler's formula, namely:  $Y = f(K, L) = f_k K + f_l L$ <sup>5</sup>. The pricing rule based on marginal product principle will attribute an amount of  $f_l L$  from  $Y$  to the labors and the rest, which is equal to  $\{Y - f_l L\}$  will be attributed to capital. But if the production function is obeying the IRS regime,  $\{Y - f_l L\} > f_k K$ , because  $Y \geq f_k K + f_l L$ . Hence under the IRS regime the wage share is lower than the wage share under the CRS regime. Hence the IRS function violates the Euler's formula. The next source of the labor loss is related to the prevailing practice of mark-up pricing in business. Based on these practices, labor as a production factor will be doubly disadvantaged, especially if the capital structure is dominated by equity capital. In this pricing rule the part of the labor cost is included in the calculation of the cost upon which the mark-up is added on. The mark-up pricing is also a dominant price setting adopted by firms in the euro-zone area [Fabiani, S. *et al*, 2005, p. 5]. According to Lucas, [Lucas, M. R., 2001] the actual business practice adopts a full cost plus approach, hence the existence of the reality gap. It means that the conventional wisdom, based on the neoclassical economic theory of the firm is almost neglected in practice by the practicing accountants, and hence in the world of business. The neoclassical theory proposes the use of the relevant cost concept, which is another expression for incremental cash flows or marginal cost regime, given the time scale implied by the decision.

There are many other articles on the pricing practices in the business world, namely the Post-Keynesian streams of thought [Coutts and Norman, 2010], Kim [Kim, 2011] who theorizes the mark-up pricing, while another author [Gu, 2009] explains the role of the Post-Keynesian approach in the determination of the industrial prices in the United States. The economic structure for Gu is different to the assumption of the neoclassical economics, namely perfect competition. The heterodox thought starts from economic reality, where the economy works in an oligopolistic environment. The pricing approach is based on the mark-up pricing in the framework of Post-Keynesian system. This method is really the most wide spread practices in the business world, where the concept of marginal cost is incomprehensible for them.

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<sup>5</sup>  $F_k$  and  $f_l$  are the derivative of the production function to factor of production capital and labor.

### ***More on Mark-up Pricing:***

As previously stated, the setting of price is not based on the marginal cost as in the books but is using the mark-up formula or Lerner index:  $B = (P-MC)/P$ , or  $B = 1 - 1/\mu$ . Then the average mark-up index, namely the ratio between prices and average costs (AC) is expressed as:  $\mu^a = P/\{(wL + rK)/Q\}$ . Here  $w$  = wage,  $L$  = labor,  $r$  = rent,  $K$  = capital, and  $Q$  = total value added. The higher the mark-up ratio the higher the proportion of the value added to the capital. It is so because the assumption of the CRS of the production system. Analogically to the IRS in the production system, as it was shown previously,  $f_L = w$ , and  $f_K = r$ , hence  $wL+rK < f(K,L)=Y$ . By using this formula, the mark-up index will be higher with a consequence of lowering of the labor portion in the value added. Hence, mark-up pricing also put labor at a disadvantage.

The contention against those pricing principle is its high preferences to the favorable attribution of the value added on capital and disadvantaging labor as another factor of production. This is contrary to the principle of Henry Ford, who is popularly interpreted as saying that he set the labor wage at such a level so that the workers are capable to buy the cars for them, increasing the market for the cars they produced. This is very important for the progress of the economy as a whole, where it is absolutely necessary that the population at large is sufficiently endowed with the required income to buy the products of the industries. It is assumed the sources of income for the industrial labors are only from their occupational wages.

By confirming that the CRS principle is the only principle reigning in the economy as an aggregate, justifiable source for raising the labor wages is closed, except through a reduction of the capital share in income. Lowering the share of capital will incite either the owners or the management of the corporation to declare the potential degradation of the production system. The arguments could run as follows, that the available funds for new investment or for the replacement of the depreciated capital or parts of them will be insufficient. The consequence is clear, either a deterioration of the capacity to absorb the new employment or worse it could lead to declining work place at the existing industry.

After having the information of the high potential of the presence of the EOS in the industrial sectors especially in the manufacturing sub-sectors, it is inferred that the CRS assumption could have been subject to information distortion. Or it could be derived from

a flaw in economic theory. As was stated above, Alfred Marshall acknowledged the presence of the internal EOS in the production system, but alas he relegated it all to the external EOS. Wherever it comes from, the denial of the internal EOS in the production systems has been a source of economic distortion, especially for the countries in the stage of economic development. It could be stated that the good governance has been neglected leading to the disadvantage of the more equitable distribution of income and to a loss of the potentially higher achievable economic growth. It could be expressed that the lost economic growth opportunity is partly attributable to the hiding of the economic truth and the other part is attributable to an intentional effort by a small group of the economic actors, which is mentioned by Mancur Olson as “specific interests”.

The Olson’s “encompassing interests” is interpretable as the way to raise the wage of the labor but will not raise the unit cost of production, raising general welfare. Otherwise expressed, any policy which will improve the welfare of the whole population but by holding the cost to the minimum is included as an encompassing interest policy. But by generalizing the previous results with a condition of proper design of the labor wage, it will open the door for a probably higher economic growth, enabled by the cumulative circular causation. Because the origin of the process is by an increase in the labor wage, it will be accompanied by a more equitable distribution of social product.

### Non-Neutrality of Money in the IRS Economy

One important issue to be discussed is the non-neutrality of money in some sectors of the economy endowed with dominant increasing return to scale activities. Under the perfect competition economy the usual assumption is that an increasing amount of money will have no effect on the real sectors, which is well known as the neutrality of money. It is shown in the figure 1A. In the perfect competition case, the supply curve is always horizontal, while the marginal cost is rising. An increase in the money supply will have an impact of raising the price level proportionately, and the quantity of demand will be the same as previously when the price level is lower (see figure,  $Q = Q'$ )

But in an economy with IRS environment, it is not so. If there is an increase of the amount of money in circulation, it will have a real effect, through an increase of the demand followed by a reduction of the unit cost of production then in the price of the

product. This is shown by the line  $E_1E_2L$  in figure 1B. If the pricing rule is following the mark-up system, the price will be fixed accordingly. Under the rule that the labor-wage is fixed to be equal to the marginal product of labor, there will be an increasing share of the income to the owners and/or management of the corporation.

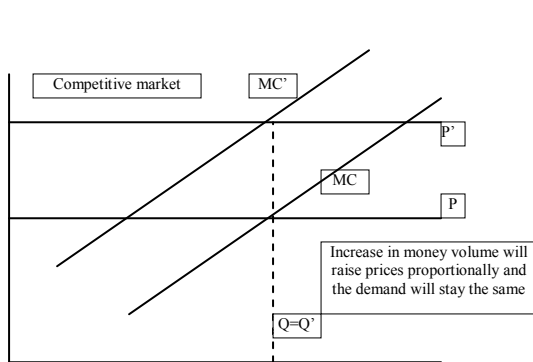


Fig 1A. Perfect competitive market

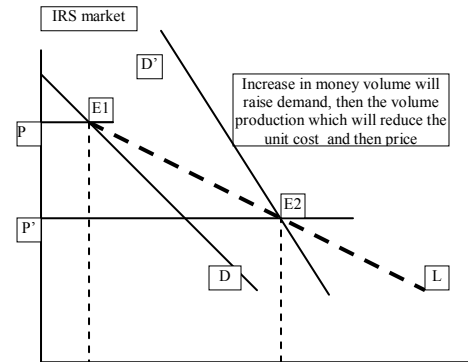


Fig 1B. Economy with IRS

Hence the increase of money in circulation is another channel for building up of the inequality of income distribution in the economy, in addition to the previously discussed cases. The gains due to the reduction in the unit cost provoked by the increase in the demand should be redistributed appropriately and justly to the factors of production. If not it will have a worsening distribution of income in the economy. Hence the amenable impacts of the IRS in the form of a reduction of production unit cost in the economy will have negative effects if the gain in productivity is not redistributed appropriately.

### The potential of EOS is widely available in Developing Countries

The economies of the less developed countries are still in the stage of development. They have a great potential for development and the present production systems are still in the small scale, especially in the industrial sectors and the infrastructures. Most of the essential required industrial sector for development is from the heavy industries, namely steel industries, chemical industries, and so on. In addition to that the infrastructures are still lacking, which are the sources of the external economies of scale to the almost all the industrial sectors. For Indonesia, the simultaneous presence of road network and the ports are badly needed for the agriculture sector. The strategic industries and the infrastructures

are forming the base skeleton for providing beneficial economies of scale for the economy as a whole.

The infrastructures will be very decisive for the formation of the external economies of scale, namely the road network, ports, railways, electricity, telephone, gas distribution system and so on. The rise on demand on the products of these basic industries and public utilities and public goods are decisive in the whole reduction of aggregate unit cost of production. For an archipelagic country like Indonesia, the role of the sea transportation is decisive, and the system is subject to the port network system. The network system has the natural monopoly characteristics, which is the phenomena of large EOS.

The economies of scale in the infrastructures and public utilities are of the group of the external EOS, which will have economy-wide positive effects in the form of reduction of the input price into many economic activities, which by itself is only having small EOS or almost with CRS. Taking this information into account, the strategy of any countries in the infrastructures construction are very important for the whole development process. For a country where the majority of the population is still bound to agriculture activities, the rural road networks have to be provided properly. The definition of the balance in the road subsystems, namely between the arterial, collector and local or rural roads must be analyzed appropriately, so that the whole economic impacts are of the optimal one.

In relation to the present level of development in the industrial sectors, the issue of the EOS is an aggregate or macro phenomena. The improvement in one subsector or even in a strategic industry will have large effects for the sector as a whole, including for those firms which separately for each firm are not endowed with the EOS. Economies of scale as a macro-phenomena is defined as «economies due to the emergence of new processes, new-subsidary industries or inter-branch specialization within manufacturing (Salter, 1960, pp. 140-147; Bairam, 1987, cited in Thomas, 1986); or economies due to which a general industrial expansion benefits all industries because each of them are part of “an interrelated whole” (Young, 1928, pp. 538-9, cited in Kaldor then in Thomas, 1986)». These citations are converging to the same conclusions as presented before. The extent of the EOS effects is easily tractable through the Input-Output table.

All these benefits related to the EOS are largely available to be exploited in the developing countries, “thanks” to its underdevelopment. Such vast opportunities for EOS



exploitation are not available any more in the developed countries, except by new technology advancement. The developing countries are lucky in the sense that they have an opportunity to learn from the experiences of the now developed countries, without having to experience the previous time-cost of technological development. But it has to be kept in mind that many industries are of the CRS group, and are only benefiting from the presence of external EOS in the economy as a whole. The outputs from those IRS production establishments with a lower unit cost will be entering those CRS industries as inputs, hence with a lower production costs.

It is interesting to see the strategy of any country in its effort to industrial catching up. When Germany was still backward compared to Britain, the country embarked on a great effort to catch up. Herschenkron [1962] describes his observation on the process by generalizing the conclusion by the following thesis: “[t]he more backward a country’s economy, the more pronounced was the stress in its industrialization on bigness of both plant and enterprise ... [and] the greater was the stress upon producers’ goods as against consumer goods”.

Instead of speaking the issue of the EOS, he uses the terminology of the bigness of both plant and enterprise. And he does not touch the important consequence of the issue of bigness to the unit cost of production. Nonetheless it is clear that within the catching up process the bigness of the plant and corporation has a significant role to play. Alas, the size of the plant and corporation is presented without touching its subsequent effects to other industries through the decline of its unit cost of production. In the case of Germany, the situation of being less developed compared to Britain enabled it to progress faster by exploiting the size of the plant and corporation, which is the equivalence of the EOS.

The same strategy is adopted by Japan in its catching up process, which is later taken over by the Korean. In spite of that, this paper does not treat other important issues which are very important to development, namely financing, institutions building, human capital provision, and so on. The paper is only concentrating on one neglected law in economics, namely the economy of scale or the increasing return to scale to be combined with the increase in labor wage as another source of benefits for development. A suitable mixture of the labor wage and the economies of scale will be a new ways to development.

Hence the state of underdevelopment provides ample opportunity for exploiting the size issues of the industries for economic growth. The ample availability of the EOS to be exploited is a grand avenue for accelerating the development process, under the condition of the availability of well prepared path. The market should be complemented by a sound preparation and calculation of the cost-benefits analysis of the steps within the strategy to be implemented. It means that the market alone cannot guarantee the achievement of a development strategy successfully.

In addition to those previous mentioned benefits of the proposed new paradigm, based on the allocation of the unit cost reduction to wage and profit increase, the issue of just functional distribution of the value added could be easily obtained. The system of good governance, either in the enterprise level or in the macroeconomic level will reinforce the process of the new development paradigm. The open acknowledgement that the EOS or the IRS is a living fact in economic life will open the dialogue on the just distribution of incomes in personal or the functional perspective either in the firm or national level.

## Conclusion

After the literature exploration of the issue of EOS in the development process, it is concluded that the EOS is a living phenomena in developing countries, readily available to be exploited for the economic growth. The developing countries are endowed with so many sectors having high EOS in its industrial establishment as exemplified by the countries embarking on the catch-up effort. From this conclusion, the old paradigm on the importance and vital role of strategic industries for development has to be revived.

It is also clear that increasing the wage for the labor-mass is a response to the anxiety of Adam Smith about the limited extent of the market, or the insufficiency of demand. The rise in wage will be followed by greater amount of demand, a larger market. By an assumption that the demand for the goods in question is elastic, the production volume will be also rising, leading to lower unit cost of production. By the process of circularity in the production system as a whole, it leads to cumulative circularity causation, which will subsequently demand greater and greater volume of production.

The reduction of the present unit cost of production with the previous one could be used to reimburse the initial increase in the labor wage, or if the unit cost reduction is

only partly allocated for the wage increase then the difference could be used to increase the profit rate of the firms. The literature study has revealed that the increase in wage will have an economy-wide effect for economic growth, in tandem with the investment multiplier according to Keynes, if one part of the unit cost reduction is attributed to the increase in the firm profit. A study has to compare the magnitude of the two effects.

The source of the decline in the unit cost of production is not necessarily due to the internal EOS of the corporation. It could be derived from the external EOS, due to a decline of the unit cost of the input to the production system under consideration. The Input-Output table represents the picture of the interrelationship between the sectors of the economy as a whole. I-O table gives the amount of input from each sector to an observed sector. So even though the observed sector does not have EOS, if the other sectors delivering inputs are of the EOS activities, it will have a decline in unit cost.

The developing countries have many industries or production system endowed with EOS, readily exploitable for economic development, under the condition that the system has been prepared properly. The market should be complemented but not replaced.

The economy must be transparent in a sense that the hidden information in the system must be opened to the public. An example is the transparency on the “surplus” of the product over the cost should be hold and then it has to be justly distributed, not to be amassed by the managers and or the owners of the corporations secretly. By this way, it is expected that the trend of the intensifying inequality in the income or wealth distribution within any country could be attenuated. This should be one of the ways to social peace.

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