

Are There Laws of Production?

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Abstract

The article *Are There Laws of Production?* published in the *American Economic Review* in 1949 roused a great deal of interest among specialists, it has often been quoted and reprinted on several occasions. In the article Paul H. Douglas presented the results of his many years of studies. Having processed a great deal of statistical data, using the production function suggested by him together with C.W. Cobb, Douglas attempted to determine the share of labour and capital in the final product of the manufacturing industry in a number of countries and regions. The results were as follows: there was a surprising constancy in the share of labour and capital within individual countries throughout the research period and the returns from additional inputs of labour and capital were practically constant. For the US, Australia and South Africa the share of labour was close to $2/3$ and the share of capital was $1/3$. For New Zealand and Canada the share of labour was lower and capital higher, but the shares remained stable throughout the entire period of observation. The author suggested that results such as these could not be random and there was clearly a law of production, which may explain the current shares of labour and capital in a manufactured product. If we take into consideration the well-known fact that the share of consumption in the GDP is very close to $2/3$, the conclusions drawn by Paul H. Douglas seem entirely reasonable and require a certain kind of explanation. Let us try to analyze the results obtained and respond to the question, which is as of yet unanswered: Are there laws of production?

Keywords: Production function, Capital, labour, Profit, Laws of production

1. Introduction

In 1948, an article was printed in the *American Economic Review* entitled *Are There Laws of Production?* The author of the article Paul H. Douglas, who was well-known for jointly proposing, together with C. W. Cobb, the use of a production function such as $P = bL^kC^{1-k}$, presented the results of his many years of research of the manufacturing industry in a number of countries. The main aim was to establish values for the coefficients k and $1-k$. Functions such as the Cobb-Douglas function are interesting because the exponents reflect the share of the factor of production in the manufactured product (Samuelson, 1979; Robinson, 1934) and, therefore, the work was to determine the share of labour and capital in the manufacturing industries. After a number of critical observations (Durand, 1937) it was decided upon to substitute the coefficient $1-k$ for the coefficient j , which would be determined independently of k . Indeed, if the sum of the coefficients equals one, this signifies a constant return of factors inputted into production and this still needed to be proven. If the sum of the exponents is greater or lower than one, this will demonstrate whether production is developing faster or slower than the speed of the involvement of additional production factors in the economy. Looking ahead, we would like to note that this approach did not change much: the sum of the exponents in all the studies was close to one.

It must be said that matters regarding the measurement of the share of labour and capital in a final product have never been of special interest to anybody. There has been, of course, active discussion of issues associated with the following questions: which other factors, aside from labour and capital, take part in the production process, whether they should include the services of a manager or owner of an enterprise, whether to include rent or interest in the final product cost? There has been interest in discussing such events as the falling, rising, or constant yield from the scale of production or a dependency of expanding the production of goods on the involvement of particular additional factors in various sectors of the economy. (Reder, 1959; Walters, 1963; Alchian, 1959). However, there has never been any kind of significant research into the percentage relation between labour and capital. Douglas' work was, without doubt, a highly significant event, but it must be admitted that this spark never did kindle a flame. I will give my personal opinion on this situation. Firstly, towards the beginning of the last century, Marx's labour theory of value and its predecessor, Ricardo's theory of value, which many people rightly call the 93% labour theory of value (for example: Stigler, 1946), firmly won their places under the sun. Despite criticism from prominent economists, these theories acquired numerous followers throughout the world. Ricardo and Marx justifiably considered capital to be an intermediate good, the value of which is determined by labour costs on its production. For this reason labour is a primary and deciding factor. (Dobb, 1945; Sweezy, 1942). Furthermore, it is exclusive, based on Marx's premises, or it should be considered that it determines 93% of the cost of a final product if following Ricardo. Therefore, insufficient attention towards the study of capital or, in other words, the intermediate good, is completely understandable. Secondly, it was clear that nobody was in any doubt whatsoever that the amount of capital per worker constantly increases. This is why the ratio between capital and labour changes over time. Also, in various industries this ratio has always been and remains different, which, incidentally, created an impassable barrier for

Marx's theory of exploitation. The lack of a stable dependency between labour and capital did not encourage a rise in interest in the analysis and explanation of available statistics. This gap was partially closed by production functions that appeared in economical science and that were intended to somehow explain the process of converting capital and labour into the manufacture of the final product. (Walters, 1963). We must note that the lack of a defined dependency between the amount of capital and the amount of labour participating in the production process is far from obvious. Of course, it is rather problematic to look for a relationship between items, meters and kilograms. It is strange to look for a relationship between the amount of labour and the amount of capital, despite their extremely bold use in production functions. An attempt to establish a relationship between labour and capital expressed in cost units would be much more justifiable. This approach enables us to immediately make some interesting observations. The price of capital sometimes increases, but decreases much more frequently. The cost of labour, if we disregard periods of economic hardship, has a clear tendency for growth. Given the continuous quantitative increase in capital, confirming whether over time the relation between the cost of labour and the cost of capital in a certain country or industry changes or not becomes difficult. Will the fact of equalization of the rate of profit in various industries not serve as confirmation of the similar relationship between the share of labour and capital in the final value of a product in all sectors of the economy? This is all very interesting, but here we must stop and continue the discussion of Douglas' results.

At the end of the 1920's, using data from American manufacturing industry from 1899 to 1922, Paul H. Douglas attempted to determine the value of the labour exponent k using the method of least squares. It turned out to be 0.75. It was established that the discrepancy between the theoretical value of the product, which was determined using the production function and the real value was small. The most significant variations were observed in the years of the depression and maximum economic activity. This was explained simply by the incomplete nature of the indexes of labour and capital. The indexes measured the number of factors of production rather than the degree of their relative use. Evidently, during the years of depression the usage level of equipment was low and employment was part-time. During the years of prosperity, equipment was used extremely intensively and employees were hired to work overtime. Therefore these discrepancies were more likely an additional confirmation of the overall value of the formula for normal periods. Further confirmation was received from income analysis performed by the National Bureau of Economic Research. It was established that the share of labour in the net value of an industrial product from 1909-1918 was 74.1%, i.e. almost exactly corresponded to the value of the exponent for labour.

These results looked promising and Cobb very quickly joined in the analysis. He calculated the indexes of labour and capital in manufacturing industry in Massachusetts for the period from 1890 to 1926 and found that the value of k was 0.743. A similar study carried out for manufacturing industry in New South Wales for the period from 1901 to 1927 gave a value of $k=0.65$. In 1937, data was analysed for the industry in Victoria for the period from 1907-1927 and the k value was 0.71. After the war, studies were carried out for American manufacturing industry in the following years: 1889, 1899, 1904, 1909, 1914 and 1919, for Canada in 1923,

1927, 1935 and 1937, three studies for Victoria in 1910-1911, 1923-1924, 1927-1928, one study for New South Wales in 1933-1934, five studies for Australia in 1912, 1922-1923, 1926-1927, 1934-1935, 1937-1938. Douglas's students added to the studies with data for Queensland for 1937-1938 and New Zealand for 1926-1927. Structural analysis was also carried out for South Africa. As a result the following values for the exponents were obtained. For American manufacturing industry the k value was in the range of $0.63-0.64$ and $j = 0.34$, for Australia the average value of k was 0.60 and $j = 0.37$, for South Africa in 1937-1938 k was 0.66 and $j = 0.32$. The data for Canada and New Zealand were slightly different: the value of the exponent of labour was lower and the exponent of capital was higher (for Canada - $k = 0.47, j = 0.52$, for New Zealand - $k = 0.42, j = 0.49$).

What conclusions do the results presented allow us to make? There is a surprising constancy in the share of labour and capital throughout the period of observations in each of the countries studied. For the US, Australia and South Africa the share of labour in manufacturing industry was close to $2/3$ and the share of capital – close to $1/3$. For Canada and New Zealand there were slightly different results. This can undoubtedly be linked to the particular features of recording and gathering statistical data in the different countries. This may also reflect differences and peculiarities of development of economies in these countries. However, the idea seems highly interesting. With an increase in capital by 1% in countries such as the US, Australia and South Africa, the product increases by $1/3\%$ and with an increase in the number of hired workers by 1% , production increases by $2/3\%$. For a balanced and optimum expansion of production, the amount of capital and labour must be increased in the ratio of 1 to 2 . In this case production will be as effective as possible and there will be no reduction in output: with an increase in costs by 1% production will increase by 1% . These conclusions seem very interesting and as noted by P.H. Douglas, they cannot be called a mere coincidence. The results obtained must without doubt be explained by a certain important dependency, or, in general, by a certain law of production. But what does it consist in and what it is its essence? Why, after spending a certain sum of money on acquiring additional capital, should a manufacturer spend exactly twice as much on hiring additional labour? What mechanism forces the manufacturer to do so? The answers to these questions were not found. We would like to highlight another, now widely-known fact that involves the strange constancy in the share of consumption in the GDP. (Reder, 1959; McConnell and Brue, 2005). That share is $2/3$. To consider this a coincidence would be entirely unreasonable. Let us try to understand all of this and provide a plausible explanation for these facts. To start off with, however, we need to discuss the nature of savings and investments, since it is they that are responsible for the generation and arrival of additional capital. And the ratio between consumption and savings determines the share of labour and capital in the end product.

2. The Labour Theory of Value

For some reason, when discussing Karl Marx's labour theory of value, a very important circumstance is overlooked. If we assume that the value of the end product, aside from the payment for labour, includes payment for the use of capital and a certain profit for the owner of a production facility, then how does it turn out that the end product is bought? It is evident that the total salary of the workers is certainly lower than the cost of end products and

services. Who acquires all this and for how much money? Even if we take into consideration that capital is the waged labour of workers engaged in the production of capital goods, salaries are obviously insufficient to purchase all of the goods manufactured. The salary is lower than the cost of the goods by the size of the profit. There are profits, however, we can clearly see them in real economic life. Profits usually go towards acquiring additional capital resources and this means that they are used to pay for labour in the capital production sector. But capital sector enterprises also receive profits. This means that the value of all salaries is lower than the overall cost of the end products. Furthermore, how can we explain the existence of savings and investments? The salaries are not enough to even purchase consumer goods. How can there be savings?

To begin with, let us consider the steady state economy of simple production. In this economy the same number of goods is produced each year. There are no profits, investment or savings. This is due to salaries being equal to the overall cost of all goods and services rendered. All the wages are spent on consumption and the owner of the production facility has to spend all income on the payment of labour. Consequently, nobody has the means to make savings and investments and therefore in an economy of this type there can be no additional capital. A steady state economy is of little interest when discussing the relationship between labour and capital. It is only useful to note that the shares of labour and capital in an economy of this type are constant and do not change at all with time.

Let us digress slightly from the topic of discussion and highlight some of the interesting features of a steady state economy. Firstly, salaries being equal to the cost of all products manufactured make exploitation, which really concerned Marx and his followers, virtually impossible. Individual manufacturers may indeed have an additional product or profit, but only at the expense of other manufacturers. Workers in one industry may suffer while others benefit. On the whole, however, workers receive the full cost of a manufactured product. Otherwise they will not be able to buy back all of the products. Of course, owners also consume goods and services, they need to eat and have somewhere to live. However, in the competitive environment their appetites are very limited. If they expand personal consumption and reduce labour payments they will put their enterprises at risk. More modest entrepreneurs will, for example, have the opportunity to lure the most productive workers and gain a competitive advantage. They may offer their own products at a lower price and in time conquer the entire market. They may improve labour conditions, allocate additional funds for training and raise employee motivation. The outcome of the battle in this case is predetermined. It is a well-known fact that marble stairs and golden toilet bowls are often signs of imminent decline and ruin. It is clear that the fewer owners there are on the market, the more opportunities there are for exploitation. And if, following the recommendations of Marx, all property will belong to the government or to some central authority, then in this case exploitation becomes virtually inevitable. In a centralised economy there is nothing to prevent paying low wages and unjustifiably expanding the army of officials and representatives of the security ministries. By not creating anything of use or creating useless goods and services, some people will spend their salaries on consuming the required products. For this reason a worker's salary in an economy such as this is not equal to the marginal

product and exploitation becomes unavoidable. Some workers will receive a salary that is greater than their marginal product whilst others will have a salary that is much less than the marginal product. Therefore, Marx's recommendations fall into unwarranted optimism. Only under the conditions of a free market economy are salaries equal to a marginal product, or are at the least similar to one another. Looking ahead, we note that this equality will also be present in a developing economy, regardless of whether there are profits, savings or investments. It is evident that Marx's labour theory of value is true, but in a free market environment we need to exclude all mention of exploitation.

Secondly, in a steady state economy technologies do not change and are well-known to everyone. All manufacturers use the most advanced technologies that are available at a given time. Otherwise, there would be a real opportunity to increase the output of goods and services and there would be economic growth. An economy such as this is at the limit of its production capacities. All enterprises use their existing production resources with the same level of efficiency. The marginal product of resources is equal to their price, therefore there are no profits. The steady state economy markets are very much like perfect competition markets. The profit of one manufacturer will definitely cause a loss in another, competition is irreconcilable and a bitter struggle. And a struggle such as this does not depend on the number of participants. Even if the entire economy consists of one monopolist the revenue will remain the same. They will receive exactly as much as they pay workers, as they are the only buyers of their goods and services. In order to break free from the tenacious grip of perfect competition and receive a profit we need to introduce certain production and/or managerial innovations that are able to significantly increase the productivity of labour. An enterprise such as this receives profit because the cost of labour is determined by the average productivity of all workers, including those working at slower enterprises with a lower level of productivity. It is evident that enterprises working with old technology will begin to suffer losses. The marginal product at a leading enterprise will be greater than the salary and at all other enterprises the opposite will be true. A successful enterprise will temporarily gain a monopoly advantage and competition will become imperfect for such an enterprise. Events such as these will cause innovations to be implemented all around, economic growth will appear and will stop when all enterprises implement existing innovations. The economy will reach the limit of its production capacities and competition will once again become perfect. Is this not the cause of the cyclic nature of economic development? With this approach an economic crisis comes about when the economy reaches the limits of its economic capabilities and falls into a state of perfect competition. The lack of profit does not allow credit received during a period of prosperous economic growth to be returned. Many enterprises cease operations, unemployment rises and moods become more negative. Let us stop here because this is a separate topic of discussion.

The features of the steady state are easily illustrated using a small, closed economy as an example. Imagine a small country where there lives an owner of an enterprise (he or she is a capitalist and an exploiter) and ten workers. The enterprise produces food that is consumed by the workers. The owner pays the workers 100 currency units. After selling the products the owner invariably has 1,000 currency units. After a certain period of time the owner grows

tired of this charity and he decides to become an exploiter. He or she now pays each worker 90 currency units. However, very soon everybody discovers that in actual fact nothing has changed at all. The workers continue to buy all the products as they did before, their real salaries have not changed. The nominal salary has gone down, but prices for food have also gone down. Having saved 100 units, after the sale of the goods the owner will now receive only 900 currency units and he or she will still have 1,000. Of course, being concerned with the situation he or she may rush to buy up the goods to spite everybody. But on the whole they do not need this, they need capital that will bring in additional income. How can this be obtained without causing damage? We will answer this a little later, but now let us discuss once again the results obtained.

It is very clear that in a closed economic system at any time the following equation must be true:

$$pQ = wL, \quad (1)$$

where p – price of products manufactured, Q – product quantity, w – cost of labour (wages), L – number of people working. In this case all of the products will be bought and all of the wages spent. On the other hand for a single enterprise the production function will be as follows:

$$pq = wl + rk, \quad (2)$$

where r – price of capital, and k – amount of capital. The cost of capital is the wages of the employees producing capital goods and equation (1) will be true for the whole economy. But in this case where are the profit, investments and savings? There are none in a steady state economy and there can never be. In an economic crisis when economic growth stops, profits, savings and investments go down to zero. They only appear when the opportunity arises to increase the productivity of the use of resources, when innovations are implemented into the production process, when enterprises purchasing resources at market prices produce more products than they used to. The marginal product of a resource is greater than the fixed market price for the resource. The difference between them is what causes profits, savings and investments. They only occur under conditions of economic growth, which is what we shall now discuss.

3. Where does Capital Come from?

Let us return to our small country where there is one owner of a firm and 10 workers. After unsuccessful attempts to earn profit by reducing wages, the owner very quickly finds another and the only acceptable opportunity of increasing their wealth. In order to do so the owner needs to turn from being an unsuccessful exploiter to an innovator. By introducing new technological solutions into the production process and improving management the owner will be able to increase the productivity of labour. Now 9 people will be able to produce as many products as used to be produced by 10. The entrepreneur will continue to pay the workers 100 currency units so that earnings do not decrease. However, the owner sends one worker to manufacture a new and improved oven to bake bread for instance. As the cost of one worker is 100 units a month, over this period of time the owner will receive capital of

100 units. This capital will be the owner's materialized profit. Whilst the cost of labour of a worker producing capital goods will be nothing more than savings and investments. The company rejected an immediate increase in consumption in favour of a greater increase in consumption in the future. The production of consumer goods could be immediately increased if the worker worked at their usual place because the productivity of labour is greater. However, the production of additional capital is a more favourable alternative. After putting the new oven into operation, the owner of the enterprise and the company receive double the benefits: production increases due to the fact that the worker has returned to their usual place of work and also because a new oven has been put into operation. The company puts off increasing consumption today and the saved labour resources go towards creating additional capital, which will help to significantly increase consumption in the future. The people save and invest. In this example the entrepreneur could have not hired a worker to create capital, but have left them to do their usual task – produce consumer goods. As a result of the increased productivity of labour, there will be more goods on the market and they will become less expensive. Therefore, workers may temporarily leave the consumption of goods at a fixed level and save some money. This money may be offered to the entrepreneur as a form of credit. Aware of the fact that with the credit the entrepreneur will pay for labour to create capital, which will bring profits, the workers agree to provide the money with a certain rate of interest. In a developing economy this is how or nearly how savings, investments, profits and interest occur, which are impossible in a steady state economy. They are only possible under conditions of economic growth. Equation (1) will undoubtedly be true in a developing economy, but it must be understood that wages paid at a certain moment in time go towards purchasing goods manufactured in the previous period. At the same time it is also payment for future labour. And if future labour becomes more productive, this is when the opportunity will arise to receive profit and create capital. But when production increases, the workers will inevitably receive the full cost of their labour. Is this exploitation? No. The increase in the productivity of labour is undoubtedly the merit of the person managing the production process. Additional capital is the entrepreneur's merit for effective use of existing resources. The workers receive everything in full, with their salaries they buy all of the consumer products, their real salaries rise steadily. Where is the exploitation in this and what is the entrepreneur stealing from the worker? Nothing. The entrepreneur is accumulating capital which will bring benefits to all: additional capital increases the productivity of labour, remuneration for labour inevitably rises. It rises to such a degree that it is able to fully cover all of the manufactured consumer products. Consumer products are fully covered by wages.

Let us make our small country a little more realistic. There are now two firm owners. They both use the same technology and exactly the same number of workers are employed at their firms. Due, however, to the fact that the personal consumption of one of the entrepreneurs is slightly higher, the salaries at this firm are inevitably slightly less. The owner cannot really pay more because this will incur losses. A situation such as this cannot carry on for long. The other entrepreneur has a perfect opportunity to conquer the market and drive out the competitor. To do this the owner may slightly lower salaries and set them at a level slightly higher than the competitor and with the money saved hire an additional worker. This procedure can be continued for a relatively long time. After each worker leaves, the earnings

at the first entrepreneur will go steadily down and in order to maintain consumption the owner will be forced to constantly lower salaries. Furthermore the second entrepreneur may use credit and he or she will be given it with pleasure because things are going very well at the company: production is constantly increasing. We notice that the productivity of labour at the enterprise of the first entrepreneur will be inevitably lower because the greater personal expenses on consumption do not allow capital to be increased at the same rate as with the competitor. In any case the outcome of the struggle is predetermined. By reducing investments and increasing personal consumption the entrepreneur is taking a fatal risk. Money spent on luxury items may be spent on expanding capital and increasing the productivity of labour, which would weigh heavily in a future competitive struggle.

Let us leave our small country and finally return to the discussion of the share of labour and capital in the end product.

4. Labour and Capital. The Laws of Production

As follows from equation (2), the increase in production of a single enterprise will be:

$$d(pq) = d(wl) + d(rk) \quad (3)$$

The entrepreneur finds a way of increasing the productivity of labour by introducing new technologies into production for instance. Let us stipulate in advance that a unit of cost will be the cost of one unit of the end product. A unit of cost must be chosen because in an economy it is relative prices that are important not absolute prices. Naturally, at the beginning of a production cycle the entrepreneur pays the same wages as before the new technology was introduced. There should not be any objections to this, the workers still receive everything in full, they buy up all the products and equation (1) is satisfied. After the completion of the production cycle and the sale of the manufactured goods, the entrepreneur receives a profit, since the workers produced more than in the previous cycle. The profit $d(pq)$ will equal the growth in the productivity of labour $d(wl)$:

$$d(pq) = d(wl)$$

With their profit in their hands the entrepreneur makes a decision on where to put it. There are three options: to use the profit to acquire capital, to increase workers' salary, or to spend all additional funds on personal consumption. Acquiring additional capital the entrepreneur puts profit towards paying for the salaries of workers producing capital goods. Equation (1) is satisfied. And since all the profit is invested in additional capital the increase in production of consumer goods for the whole period will be

$$d(wl) = d(rk),$$

then the increase in the production of consumer goods for the whole period will be

$$d(pq) = d(wl) + d(rk) = 2d(wl) \quad (4)$$

An excellent result. An increase in consumption two times greater than the initial investment in capital. The increase in real salaries is two times greater than the volume of investments. It is for this reason that in a closed economic system the cost of the workforce is twice as great

as the cost of capital. It is for this reason that the cost of consumer goods and services produced is twice as high as the volume of investment and the share of consumption is $2/3$ of the country's GDP. It is obvious that the shares of the cost of labour and capital at the level of an individual enterprise can in no way be considered a closed economic system. Capital goods are usually acquired by a company from other manufacturers. However the shares of labour and capital in a single country must be close to $2/3$ and $1/3$ respectively, if the country's economy is sufficiently closed. Obviously active foreign trading has become the main reason for discrepancies in the figures that Douglas received for the exponents of labour and capital for different countries. The economies of Canada, New Zealand, South Africa and Australia were dependent on imports from England and actively exported their goods there and, therefore, they can in no way be considered closed. Consequently there are laws of production, there is a mechanism which forces enterprises to spend twice as much on employee wages than on investments. Let us discuss two other methods of an entrepreneur using profit, but looking ahead we would like to note that they bring us to the same results. The second option for an entrepreneur is to pay all of the profits to the workers. The increased wage allows workers to keep consumption unchanged and make savings which go to other entrepreneurs (or to the same entrepreneur) in the form of credit and are allocated for investments. If workers decide not to save and increase consumption then manufacturers of the consumed goods receive the additional income. Their profit goes towards expanding investments. For this reason the result of the method being discussed of using profit is similar to the conclusions presented above. Finally, if an entrepreneur places all profits on their personal consumption they increase the incomes of other producers of goods and services. The additional profit received will go towards investments. Therefore, the relationship between labour and capital will not be affected. The second and third options of using profits seem less logical than the first. Why? The entrepreneur understands perfectly that having received a profit as a result of increased productivity of labour they may receive even more by investing additional funds in the purchase of capital. They receive double the benefits: production at their enterprise increases due both to an increase in the productivity of labour as well as additional capital. In all of the cases presented profit turns to investment in the end. However, this kind of development of events does not happen all the time. Causes may be an inadequate investment climate or a lack of profitable projects during a period of economic downturn, when real profits of manufacturers are significantly reduced. Profits go towards increasing salaries or they become the income of the owner of the enterprise. In this case profit goes towards purchasing consumer goods and services. The lack of investment does not allow production to be expanded actively because taking into consideration equation (1), the situation leads to an increase in prices for goods and services. It is possible that this may be the explanation for high inflation in countries where market freedom is restricted by high administrative barriers. An increase in prices is also observed during a period of economic downturn when the opportunities for profitable investment disappear.

In discussing with colleagues the possible connection between labour and capital, the greatest level of interest is always raised by the search for a method, using which entrepreneurs can invest profit that would contradict all of the conclusions drawn above. Invariably, however, it turned out that an initial increase in the productivity of labour in all cases we examined leads

to an exactly twofold increase in nominal or real consumption. The greatest difficulty was caused only by the case of investing profit obtained into the recruitment of an additional worker. Let us therefore briefly address this. My opponents thought it fundamentally significant that, in this case, there are two possibilities: the transfer of the worker from another industry and the hiring of an unemployed free labour agent. They believe that the transfer of a worker to a sector for the production of final products fundamentally alters the relationship between the cost of labour and the cost of capital. Of course, such transitions of workers are possible. But it must be taken into consideration that the transition from one sector to another and back are two very equally probable events. The salaries in different sectors are equal, in any case they tend to equalize. If there is an increase in productivity in the consumer goods production sector, then the resultant profits become a source of investments in the capital goods production sector. Salaries increase in all sectors. With an increase of one of the terms in the right-hand side of the equation (2) the second term also increases momentarily. The left-hand side, which represents consumption, becomes twice as large as the initial increase. A free worker can gain employment in any industry of the economy. Equality of salaries in industries does not enable the relationship between labour and capital to be altered. We can look at things slightly differently. An increase in productivity and salaries in one of the industries will attract an additional workforce. The amount of capital per worker decreases, which leads to the cessation of the growth of labour productivity. The increasing competition sets the salaries in that particular industry at the same level as the average salary in the whole economy. Salaries and productivity in all industries inevitably equalize. In the end it must be said that dividing the economy into sectors of final products and capital goods has a rather arbitrary nature. A car and a computer can be both capital goods and consumer goods. A single building or premises can be used as a place of residence and as an office or a production facility. It was Marx who taught us to place excessive importance upon the intermediate goods production industry. This is what his theory of exploitation demanded. It was because of Marx that many people began to name the system of private ownership and free entrepreneurship as capitalism. We have always regarded and continue to regard investments exclusively as a deposit of funds for the acquisition or improvement of capital goods. However, everything is gradually changing. Today we have the opportunity not only to invest in the construction of a plant or the purchase of machinery, but also to invest funds into human capital. This is all that I would like to say.

5. Conclusions

Under the conditions of a steady state economy there are no profits, economic growth, savings or investments. There are valid reasons for this. In both developing and steady state economies at any moment in time the total cost of all consumer products manufactured must equal the wages of all workers involved in production. For this reason in a steady state environment the total earnings and costs of manufacturers are constant and equal to one another. If manufacturers attempt to save in a steady state economy they will inevitably begin to suffer losses. Their costs which include the salaries of workers producing consumer and capital goods will exceed earnings by the value of savings. A reduction in earnings will

immediately lead to a reduction in salaries, therefore it is extremely difficult to save under these conditions. And it does not make sense to do so under such conditions: enterprises do not have the option of taking credit, there are no profits and there is nothing to pay interest rates with. Even if all the money of the hired workers is used to purchase goods the enterprises will only be able to cover their expenses. A steady state economy is an economy in a state of economic crisis. There are no profits, investment, savings, interest rates or economic growth. This situation occurs when the economy reaches the limits of its production capacities, when all or almost all of the enterprises use their existing resources to the maximum effect. The only possibility of overcoming this situation is to implement innovations which will help to significantly increase the productivity of labour. Having paid the established market price for labour at the beginning of the production process, in the end the manufacturer receives a certain increase that occurs due to the implementation of innovation. Manufacture of goods increases and earnings become more expenses. In a developing economy there is profit which goes towards acquiring additional capital. Additional capital is needed for the efficient functioning of an enterprise.

The successful entrepreneur and the company as a whole receive double the benefits: production increases due both to the increase in the productivity of labour, as well as the additional capital. This is the reason why consumption is twice as high as investment and is $2/3$ of the GDP. Figures of the exponents for labour and capital in the Cobb-Douglas function and consequently the share of labour and capital in the end product are $2/3$ and $1/3$ respectively. The laws of production that Douglas talked about do exist. In a closed economic system funds used to increase salaries and hire additional workers are twice as high as the funds invested in the purchase of additional capital. And this does not depend on which country, region or industry we are looking at. This is how it always has been and this is how it always will be and these, therefore, are the laws of production.

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