

ON VALUE AND PRICE¹

A ‘creative’ mental labor embodied approach to theory

Hasan Gürak

Abstract

The theory of value and price holds a very crucial and central position in economics and has long been considered as the basic tool and as the ‘essence’ of all economic analysis including economic predictions. Producers as well as consumers, adjust their market behavior according to the price signals, which determine the allocation of their resources.

However, present value-price theories still fail to incorporate the key concepts such as ‘creative’ mental labor and technological progress. As the ‘modern’ theory fails to satisfy this condition, a need for an alternative theory arises.

The approach, here, is basically a ‘labor embodied’ or ‘labor-expanded’ approach, but somewhat distinct from the approaches of Classical economists. Though Classical theories acknowledge the ‘creative’ mental labor as both the genesis and a constant source of added value, it makes no claim to be an ‘invariable’ measure.

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*Where is the discussion of 'creative' mental labor
and technological progress in the theory of value
and price?* H. Gürak

INTRODUCTION

The fact that the proponents of the neoclassical model were unaware of the vital role of technological progress on economic growth until 1950s is inexcusable. Their well-known predecessors such as A. Smith, Ricardo and Marx were well aware of new technology's impact on growth, as were the businesspeople. But the dominant neoclassical ideologues had ignored or preferred not to acknowledge this until the 1950's. Probably they didn't know how to integrate it into their scientific (!) equilibrium models or how to manage the disequilibrium situations that occurred.

Since the 1950s, however, thanks to Solow and others, concepts like technological change and human capital have been 're-discovered' as a vital, essential and indispensable element of the growth theory. In addition, various studies attempt to indigenize other concepts like institutions, public expenditure, etc., to explain the growth process properly. Nowadays there is wide a range of endogenous growth theories constructed on the back of these re-discovered concepts. In spite of many shortcomings, the trend is promising and may enable contemporary economists to construct more realistic growth models which are capable of accounting for actual global economic facts and developments.

Meanwhile, however, the backbone of all these theories, i.e., the value and price theory, still fails to keep pace with developments in the theory of growth. It neglects to incorporate key concepts such as technological progress and 'creative' mental labor (**CML**) in its analysis. As a result, the 'modern' but sterile price theory is bound to fail to properly account for the price formation in the 'real' markets. Nor does it provide any appropriate or sound premises for the construction of any related economic theories that are affected or influenced by the price signals coming from the real markets.

THE HYPOTHESIS

The hypothesis presented in this paper is to show that 'all value, created or added' to natural resources originates from the efforts of the labor force that offers three kinds of services; **creative mental labor (CML)**, **mental labor (ML)** and **physical labor (PL)**. The former, creative mental labor is the 'creative' source that constantly introduces 'new ideas' i.e. 'new technologies', to transform natural and man-made products. The second, mental labor (ML) or human capital (H), as some say, refers to the human skills and experience acquired to make the most efficient use of new ideas or new technologies developed by 'creative' mental labor.

Both, the first and the second type of mental labor originate from the human brain. The third, 'physical labor' plays a complementary role in accordance with instructions issued by the brain. As this paper aims to analyze values and/or prices, all concepts and definitions refer to an exchange-economy in which, the natural resources are accepted as 'a given' and **creative mental labor is accepted as the genesis and incessant source of all the value 'created' or 'added'**.

The approach is basically a labor embodied approach, but somewhat distinct from the approaches of 'Classical economists' such as A. Smith, Ricardo and Marx. Though it acknowledges labor-power as the genesis and a constant source of all created or added value, it makes no claim for it to be an 'invariable' measure.

The investor or, synonymously, the capitalist assumes a risk and deserves some compensation, i.e., profit, for the risk assumed. Yet, some economists claim that the profit or the surplus value, is an 'unpaid' or a 'surplus' part of labor. Both arguments have a point. However, an investor would never assume the risk of loss associated with his/her investment unless there was a reward for the risk assumed; profit. Yet, the investor's capital does not create or add any value to the existing products. If there is no reward (profit), there would be no motive for investment, thus no surplus-value or profit. This is a dilemma. Perhaps a rational solution would be to make the laborers, who are claimed to be under-paid, the co-partners of investment and the accruing profit.

This study does not make any claim that exchange relationships in markets should be based on 'equal quantities' of the labor-time employed. In fact, regarding the distinct contribution of creative mental labor, which increases output (productivity), an 'un-equal' exchange relationship with regard to 'creative' mental labor seems to be a more rational and just solution.

Given the demand, new exchange relationships should be determined by the new conditions created by the 'new technologies', which are a result of the **creative contribution of the human mind**, i.e., 'creative mental labor', *cet. par.* In other words, the 'creative' faculty of the human mind is assigned a key role in all exchange relationships concerning relative values and price.

WHY A VALUE - PRICE THEORY?

The theory of value and price holds a very crucial position in economics and has long been considered both as the basic tool and as the 'essence' of all economic analysis including economic predictions. As we all know, producers as well as consumers, adjust their market behavior according to the price signals, which determine the allocation of their resources. Price signals are capable of influencing crucial variables like the growth rate, inflation, employment, etc. Therefore, it is imperative to have access to a competent value and price theory, which forms a logical, consistent and a reliable basis for all 'transactions'. As the 'modern' value-price theory fails to satisfy the last condition, a need for an alternative theory

arises.

A realistic value-price theory should not only be capable of explaining exchange ratios, (e.g., the relative values/prices), between two commodities, but also the market prices of all the commodities (tangibles) produced. In addition, a value-price theory should also be able to explain the price formation in the 'intangible' service sector, which appears to be the 'Cinderella' of contemporary value-price theories. Yet, the service sector in terms of output and employment accounts for the greater part of the GDP in modern economies and displays features distinct from the manufacturing sector producing tangible goods.

Perhaps most important of all, a value-price theory must be able to account for the past, present and future sources of all value generation, the transformation of these values into prices and the distribution of functional income between wages, profits and interest. Only then could one have a more realistic insight into, and a clear interpretation of, actual economic relations. Such a theory should also pave the way for the further development of both sound and realistic theories in the related fields like growth, trade, employment, etc.

Towards a New Mindset

As Schumpeter quite rightly pointed out:

"..... in practice we mostly do not start from a vision of our own but from the work of our predecessors or from ideas that float in the public mind." (Schumpeter, 1954; p. 562)

One of the purposes of this study is to escape from the old ingrained mindset, which has perennially shaped and influenced the mindset of all scholars of economics. This is not an easy task after decades of indoctrination. As Keynes, put it:

"The difficulty lies, not in the new ideas, but in escaping from the old ones, which ramify, for those brought up as most of us have been, into every corner of our minds." (Keynes, 1973; Preface)

In the following sections we will first analyze the exchange relationship where only physical labor (**PL**) is employed in a simple economy. Then, the analysis will concentrate on exchange relationships where 'creative mental labor' (**CML**) is incorporated into the model of a simple economy, followed by an attempt to convert values into prices.

A BRIEF HISTORICAL REVIEW

In contrast to the 'modern' approach, economic science before 1870s was treated more like an interrelated social science. Actual rather than fictitious economic relationships were the point of departure. The theory of value was considered to be the backbone of the political economy and concepts like 'economic justice' and 'economic equality' were not regarded as irrelevant.

Since the fruitless century-long attempts to make economic science an 'exact' science like astronomy and physics since 1870s by applying more and more abstract mathematical

reasoning to economic relationships, to free it from any kind of 'weakness of non-scientific factors; economic scholars have come a long way. For example, British economist Jevons once proudly claimed that his model of exchange relations did;

"... not differ in general character from those which are really treated in many branches of physical science". (Blaug, 1990,147)

The scientific (!) and exact models created were nothing but oversimplified idealizations, a hypothetical version of a reality, and models of a 'fictitious' economy. Marshall had foreseen this pathetic trend and warned economists to be cautious in their application of mathematical models and not to transform economic science into a branch of mathematics; but he did not succeed. In time, the natural sciences bowed to newer developments and discoveries and underwent drastic changes, upgrading itself in accordance with the new discoveries arising from Newtonian physics, while scientific (!) economics has remained faithful to the some outmoded criteria.

For many prominent economists, the neoclassical heritage still represents the '**holy grail**' of any analysis capable of revealing the scientific (!) nature of economic man and his actions. Any dissent from this holy fount of eternal truth is regarded as a grievous error, if not a 'mortal' sin. An outside observer can easily get the impression that the neoclassical ideology is the **final frontier** and the **ultimate stage** in economic thought. Naturally, all scholars do not agree. As Hicks put it:

"Economics is a social study. It is concerned with the operations of human beings, who are not omniscient, and not wholly rational; who (perhaps because they are not wholly rational) have diverse, and not wholly consistent, ends. As such, it cannot be reduced to a pure technics." (Hicks, 1983,289)

Hicks continues:

"Pure economics has a remarkable way of producing rabbits out of hats -apparently a priori propositions which apparently refer to reality. It is fascinating to try to discover how they got in; for those of us who do not believe in magic must be convinced that they got in somehow." (Hicks, 1983,367)

The critical and relevant question to our study is; do we have a logical, consistent and realistic value-price theory?

Unfortunately, there seems to be no positive reply to this question yet. The number of academic units and academicians with 'heterodox' orientation has been growing recently but, there seems to be no widely acknowledged consistent, logical and realistic 'alternative' theory so far. In this section, an attempt will be made to fill this gap by introducing a modified 'labor-embodied value-price theory' based on the distinctive contribution of 'creative' mental labor. Let us begin with the 'original' sources of 'value'

THE ORIGINAL SOURCES OF VALUE: NATURE AND LABORER

Let us begin with a definition of ‘value’. In economic terminology, the ‘value’ of a product, be it a commodity or a service, is; **the ‘relative worth’ that can either be exchanged for other products (exchange-value) or be used for personal consumption (use-value)**. The first, ‘exchange-value’, expressed in terms of market prices, depends partly on the labor expended now and in the past, e.g., cost of production, and partly on the demand for the specific product, given the competitive environment and the expected profit rate. The second is a subjective concept and its magnitude, given a certain level of income, depends on the ranking of products in accordance with one's subjective needs and preferences.

There are only two sources of value; laborer and nature. Nature provides us with a bounty of (un-)processed objects with use-values. The laborer creates and adds value to nature's bounty by transforming them, by using his/her mental and physical capabilities into commercially demanded products containing exchange-values. In other words, the past and present services of the laborer transform natural products into useful products either for immediate consumption or for use as the inputs of further production.

In a modern society, in order to initiate a value creation process, the capital owner, or the entrepreneur, has to have access to investment funds or capital (savings) to combine, purchase or hire, the material inputs for production such as raw materials, machinery, tools, energy, etc., in addition to pay for the services of laborer, e.g., their mental and physical labor.

For neoclassical economists, the capital of the entrepreneur is considered as one of the ‘productive’ factors in production. However, there is no universally acknowledged definition of ‘capital’ (Hausman, 1981). In some analyses, it appears in monetary form and in others, as physical inputs like tools, machinery and sometimes it refers to both. Both, money-capital and capital goods are the necessary ingredients of production but are certainly ‘not productive’ ones in the sense that the value-creating or adding laborer or nature, are.

Capital gives rise to the employment of productive laborers along with the implements of production, the cost of which is known in advance. In other words, capital can only transfer value to the product at the rate of its depreciation; nothing more, nothing less. It does not create or add any value to the inputs of production. Therefore, capital cannot be considered as a ‘productive’ factor.

THE LABOR & LABORER

Labor is embodied in products in the form of mental and physical labor. Thus, labor can be defined as;

“... the aggregate of those mental and physical capabilities existing in the physical form, the living personality, of a human being, capabilities which he sets in motion whenever he produces a use-value of any kind”. (Marx, Vol. I: 270)

The significance of qualified labor (CML and ML)

It is the ‘creative’ mental component of labor (**CML**) that generates the productive knowledge (new ideas), that account for the quantitative growth and qualitative improvement of physical objects as well as the quality of the services provided. The result of ‘creative’ mental labor (new technologies) can be divided into two groups:

1. **New products** (entirely new ones or old ones in a new form, which are usually accompanied by ‘new’ methods of production);
2. **Given products but a ‘new’ production processes** which normally reduce the cost per unit output

The impact of the first, the introduction of new products, is the source of long-run growth and the ever increasing wealth of nations and individuals, while the second, i.e., ‘the reduction of the unit cost of ‘given’ products by introducing a new method of production has only a limited impact on long-run growth.

However, there is another and very essential type of mental qualification required for the ‘efficient’ implementation of available technologies: mental labor (**ML**) or the quality of the laborers’ service or the human capital (**H**) based on their personal skills, talent, education and experience. The ‘creative’ faculties of human mind are essential for long-run growth but in the absence, or insufficiency of mental labor it would not be possible to produce sophisticated goods and services efficiently. In other words, the contribution of the creative mental labor would be limited and we would not be able to reach the contemporary standards of living that, some of us, all around the globe, so lavishly enjoy. A shortage and/or the inadequacy of mental labor are a situation we often encounter in all countries, but especially in developing countries.

Physical labor (**PL**) is a necessary ingredient of production but it is not sufficient on its own to increase the basic value of nature’s produce.

To sum up; ‘**Creative’ mental labor (CML)**, the source of all new ideas, is a sine qua none for long-run growth. **Mental labor (ML)** is essential for the efficient use of new ideas. **Physical labor’s (PL)** contribution is somewhat limited in comparison to the other two types of mental labor.

It would have no significance if there were no gifts of nature that could be transformed into ‘useful’ things. Men and nature are, therefore, the two indispensable and inseparable parts of a whole. They are the ‘**complementary productive factors**’ of wealth. All products, no matter how complex and sophisticated, can be considered as arising from nature's bounty, as production's raw materials. Thus, every product may be reduced, in the final analysis, to

nature and labor services. Or, to put it in William Petty's terms;

"... labor is the father of material wealth, the earth is its mother." (in Marx, Vol.I, 133-134)

Keynes, unlike many neoclassical economists had no problem with this notion.

"I sympathise ... with the pre-classical doctrine that everything is produced by labour..... It is preferable to regard labour ... as the sole factor of production." (Keynes, 1991,213-214)

CREATIVE MENTAL LABOR & VALUE GENERATION

The crucial question in relation to value/price formation is: **What are the conditions determining the relative exchange-values of products?** Is it the supply-demand conditions? Is it the labor 'embodied' in the final product/? Or is it determined by the labor commanded?

Value Generation - A Simple Model

Below, a simple labor-embodied model of value-generation will be reintroduced to see how the creative mental labor enters into the production process and how it effects the exchange relations in terms of 'relative values'.

Let us begin, like Adam Smith did, with the well-known '**hunter model**' and assume there are two hunters and no tools of production at all. Leaving aside, for the time being, the fundamental contribution of creative mental labor and let us assume that the two hunters in our model work physically 10 hours a day. The first one, Maria the impala hunter, acquires 2 impalas a day while the second, Rosa, the rabbit trapper, traps 4 rabbits a day. If they had lived in a self-sufficient society meaning that all the catch is consumed within the family of each of the hunters respectively, there would be no need to engage in any exchange relationship. In the absence of an exchange relationship, there would be no exchange-values, either. But, our hunters do exchange.

INITIAL EXCHANGE CONDITIONS

Given tastes and preferences, let's assume that at the end of the day, the two hunters exchange one impala for two rabbits, half a day's physical work for each of them, which is a 'fair exchange' with respect to the physical labor expended. Rosa consumes one impala and two rabbits; as does Maria. The supply-demand is in balance after the egalitarian exchange. The following equations explain it.

$$\text{Rosa's supply} = 4 \text{ rabbits} = 10 \text{ hours' physical labor (PL)} \quad (1)$$

$$\text{Maria's supply} = 2 \text{ impalas} = 10 \text{ hours' PL} \quad (2)$$

$$\text{Total supply /per day} = 2 \text{ impalas} + 4 \text{ rabbits} = 20 \text{ hours' (PL)} \quad (3)$$

$$\text{Rosa's consumption} = 1 \text{ impala} + 2 \text{ rabbits} = 10 \text{ hours' PL} \quad (4)$$

$$\text{Maria's consumption} = 1 \text{ impala} + 2 \text{ rabbits} = 10 \text{ hours' PL} \quad (5)$$

So far, our two hunters did not make any use of their ‘creative’ mental faculties in their daily work meaning there is no value created-added except the physical labor involved (**PL**). Rosa's five hours **PL** is exchanged for five hours of Maria's **PL**. Under the circumstances, the only way to increase the total added value is to extend the hunting time of the **PL**. But by assumption, 10 hours’ a day is the limit that they can work so, the total output cannot be increased beyond its present level. The best the community can do is to re-produce the given value the following day. Their wealth will never improve.

Assume that one day, one of the hunters; say Rosa, utilizing her ‘creative’ mental faculties develops an ‘idea’, a new trapping method (new technology) which enables her to double her daily catch from 4 rabbits to 8 rabbits within the same 10 hour time-span. To be more specific, let's assume that she makes some simple tools to assist her in order to trap more rabbits. Due to the new idea, considered solely ‘in terms of the physical labor time expended’ previously needed in trapping 4 rabbits, the value of Rosa's new daily production of 8 rabbits would increase from 10 to 20 hours of **PL**, however due to the new ‘new idea’ the hours actually employed are still 10.

$$\text{New total supply/per day} = 2 \text{ impalas} + 8 \text{ rabbits} = 20 \text{ hours PL} \quad (6)$$

But the total value generated is worth 30 hours in terms of **PL**.

Or, alternatively

$$\text{New total supply/day} = 20 \text{ hours PL} + \text{Rosa's creative mental labor (CML)} \quad (7)$$

Rosa’s **creative mental labor** contribution, her new technology, is worth 10 hours of physical labor. In other words, this additional-value is worth 10 hours of **PL** and in actual terms it means that Rosa’s productivity has increased by 100 percent a day, in terms of **PL**. The community has become richer.

What would happen to the exchange relationship with the other hunter Maria now? Previously, there were 2 impalas and 4 rabbits in the market. Now, there are 2 impalas and 8 rabbits. With regard to the new situation, the exchange relations will have to change. What would the new exchange ratios look like?

‘UNFAIR’ EQUILIBRIUM

Case:1-A:

Following in the footsteps of the Classical economists, one can argue that after Rosa's creative mental contribution; she still requires 10 hours' **PL** to catch 2 impala or, alternatively 8 rabbits. Equal quantities of labor time expended are valid for both hunters, and therefore, 1 impala should exchange for 4 rabbits instead of 2, in order to maintain the equality of the

exchange when considering the labor-time expended. As a result, at the end of the day, Rosa would be expected to give up 4 rabbits which are equal to 5 hours' **PL** in return for 1 impala, which equals Maria's 5 hours of **PL** a day.

This means that:

$$\text{Rosa's consumption} = 1 \text{ impala} + 4 \text{ rabbits} = 10 \text{ hours' PL} \quad (8)$$

$$\text{Maria's consumption} = 1 \text{ impala} + 4 \text{ rabbits} = 10 \text{ hours' PL} \quad (9)$$

But compared to 'initial values', each consumes products now worth 15 hours' **PL** instead of 10. Maria's 5 hours' physical labor a day could purchase 2 rabbits, initially. Now, she can get 4 rabbits; double the amount without any contribution on her part to the total wealth of the community. Maria and Rosa together are richer now.

But....and there is a 'but'.....

Is this a 'fair' and/or 'rational' exchange?

If one ignores the 'productivity increasing' creative contribution of Rosa, **CML**, exchanging 1 impala for 4 rabbits would, at first, seem like an egalitarian exchange. But as yet Rosa has not been rewarded for her creative mental contribution which doubled her productivity and contribution to the common wealth. Instead of a combined value worth 20 hours' **PL**, there is now a total value which is worth 30 hours' **PL**. Maria, the impala hunter, who made no mental contribution to the common wealth would be the beneficiary of the new exchange relations based on the 'physical labor-time expended' approach. She works only 10 hours but consumes an output value worth 15 hours in terms of the physical labor-time employed. Meanwhile, Rosa who produces 20 hours value in terms physical labor-time only enjoys 15 hours' output.

Such an exchange relationship would not encourage the further development of new ideas, e.g., new methods of hunting, since the system rewards the unproductive person, rather than the one who enhances the common wealth..

UNEQUAL EXCHANGE

Case:1-B:

Initially, Maria and Rosa were exchanging 1 impala for 2 rabbits. Assume that after the introduction of the new method developed by Rosa, the initial exchange relationships are maintained. In other words, Maria and Rosa still exchange and consume 1 impala and 2 rabbits each.

But now, Rosa has access to an additional 4 rabbits which are worth 10 hours' **PL**, which she can exchange for another product she wants, say for 2 sheep worth 10 hours' **PL** in another community. Maria still consumes 1 impala and 2 rabbits (equivalent to 10 hours' **PL**) while Rosa now has 1 impala, 2 rabbits and additional 2 sheep at her disposal for daily

consumption. Rosa's creative mental contribution entitles her, given the demand, to a higher consumption level while Maria's consumption is unchanged. Now the community as a whole is more prosperous.

$$\text{Rosa's consumption} = 1 \text{ impala} + 2 \text{ rabbits} + 2 \text{ sheep} = \text{worth } 20 \text{ hours' PL} \quad (10)$$

$$\text{Maria's consumption} = 1 \text{ impala} + 2 \text{ rabbits} = \text{worth } 10 \text{ hours' PL} \quad (11)$$

In this case, there is no egalitarian exchange in the Classical tradition of 'equal quantities of labor-time' expended. But now this outcome seems to be economically more rational, than the foregoing Case:1-A.

A MORE LIKELY AND REALISTIC OUTCOME

Case:1-C:

If there is an 'insufficient' demand for Rosa's additional 4 rabbits by a third person outside her community, then even Maria might benefit from the new exchange relationship and enjoy more consumption. Our initial community consisted only of Maria and Rosa. Rosa can now exchange only 2 rabbits for 1 sheep outside her community leaving 6 rabbits at her disposal before entering the exchange relations with Maria. If the market is to be cleared, Rosa will have to accept a new exchange relationship where 1 impala is exchanged for 3 rabbits. Now, it is not only Rosa who is better off but also Maria who actually made no contribution to the increased total supply.

$$\text{Rosa's consumption} = 1 \text{ impala} + 3 \text{ rabbits} + 1 \text{ sheep} \quad (12)$$

$$\text{Maria's consumption} = 1 \text{ impala} + 3 \text{ rabbits} \quad (13)$$

This outcome appears to be closer to reality than the two prior cases, because it allows even the non-creative partner to benefit from the overall development originating from others' 'creative' contribution.

To put it differently, with regard to actual economies, it is not only the inherently more dynamic industrial sector which benefits from 'creative' mental contributions; but also the service sector benefits, which is inherently prone to a relatively lower productivity growth.

VALUE-PRICE RELATION

How are values transformed into prices? That was one the central issues troubling the minds of the Classical economists. Ricardo had searched for an 'invariable measure' of value to but could not find one, which satisfied him. He claimed that;

"... there is no commodity which is not itself exposed to the same variations as the things, the value of which is to be ascertained; that is, there is none which is not subject to require more or less labor for its production." (Ricardo, 1990,44-45)

For Marx, using the same exchange-value relations developed by Ricardo, the answer was obvious but Ricardo was unaware of his own discovery. The invariable measure Ricardo was looking for was the labor-power, which Marx defined as;

"... the aggregate of those mental and physical capabilities existing in the physical form, the living personality." (Marx, Vol. I, 270)

Marx had attempted to measure the value of what he called 'socially necessary labor' in terms of the hours expended. There was no reference made that would enable one to distinguish between the 'creative' mental labor producing 'new ideas' and 'mental labor' or human capital necessary for the efficient use of the 'new ideas', (new technology). As a result, the exchange relations as in **Case:1** above, where equal quantities of labor time consumed were exchanged, seemed to be an egalitarian solution.

However, as we have seen in the previous sections, given nature's gifts and their indispensable role in supplying any product, 'creative' mental labor with its distinctive ability to create 'new' ideas, appeared as the only source of long-run growth and wealth. Therefore, the exchange relations have to be based on a labor expended approach with all three properties of laborer; the creative, mental and physical aspects. Estimation of the actual amount of physical labor consumed is relatively easy to quantify. But, where one can find a proper unit of measurement capable of accounting for the contribution of the 'mental' abilities, especially of 'creative' mental abilities is a much more complicated task.

If the introduction of new ideas by 'creative' mental labor is a continuous process, how can we successfully transform values into prices in an economy that is dynamic?

RELATIVE PRICES

Value of a product is the 'value transmitted' to the product, cet. par. In our simple model in **Case:1-A**, the relative values were determined by the physical-labor expended. But external demand as in **Case:1-B** and the external-internal demand relationships as in **Case:1-C**, showed that the magnitude of the demand is an important element in the determination of relative values. Bearing in mind that the accurate measurement of the value transmitted by mental labor is highly unlikely, the relative market prices will be 'assumed' to reflect both the values transmitted and the magnitude of the demand. Though relative price ratios do not reflect actual transactions in a monetary economy but they can be used as a tool to demonstrate the crucial role of the 'creative' mental contribution, in the form of a 'new' idea or technology, in the formation of the relative price, given the demand.

Case: 2-A (as presented above)

Let us start by reconsidering our simple economy with two hunters and introduce money as the sole medium of exchange in their transactions. Ignoring for the sake of simplicity aspects like risk and profit, let's assume that one impala is worth 30 \$ and one rabbit 15 \$. Initial exchange relations based on 10 hours' physical labor a day can be expressed as follows:

$$2 \text{ (impalas)} * 30 \$ = 4 \text{ (rabbits)} * 15 \$ \quad (14)$$

Where;

$$1 \text{ impala} = 2 \text{ rabbits} \quad (15)$$

Or

$$30 \$ = 2 * 15 \$ \quad (16)$$

Now, let us assume once again that Rosa, the rabbit hunter, utilizing her mental faculties, develops a new hunting method which doubles her productivity from 4 to 8 rabbits within the same time-span of 10-hours. Disregarding any reward for Rosa for her productive contribution, and estimating the value created in terms of the labor-time-units expended, the new exchange relation between Maria and Rosa would be as follows:

$$2 \text{ (impalas)} * 30 \$ = 8 \text{ (rabbits)} * 7.5 \$ \quad (17)$$

Where;

$$1 \text{ impala} = 4 \text{ rabbits} \quad (18)$$

Or;

$$30 \$ = 4 * 7.5 \$ \quad (19)$$

In terms of initial prices, Maria's total labor valued at 30 \$ now commands a 4 rabbit value of 60 \$. **Is this a 'fair' and/or 'rational' exchange relationship?**

The equal labor-time approach rewards the less productive hunter, Maria, while not properly (fairly?) rewarding the more productive hunter Rosa. Under these circumstances, there would be no incentive for Rosa to make any effort to further improve her productivity.

Case: 2-B

Given the initial price and demand where 1 impala is exchanged for 2 rabbits, Rosa, the more productive hunter, could be in a better-off position if she can sell the additional 4 rabbits in other markets. Given a demand by a third party consumer at the initial price of the rabbits (15 \$ each), Rosa's total income could increase from 60 \$ to 120 \$ a day, while that of Maria, the less productive one, remains at 60 \$ a day.

$$\text{Rosa's income} = 1 \text{ impala} (30 \$) + 6 \text{ rabbits} (6 * 15 \$) = 120 \$ \quad (20)$$

$$\text{Maria's income} = 1 \text{ impala} (30 \$) + 2 \text{ rabbits} (2 * 15 \$) = 60 \$ \quad (21)$$

Meanwhile, the total income of both, Maria and Rosa, increased from 120 \$ to 180 \$ thanks to the contribution of Rosa's creative mental contribution. Rosa's greater income is the result of and a justified reward for her 'creative' contribution, that is, her increase in productivity.

$$\text{New total income/per day} = 8 \text{ rabbits} * 15 \$ + 2 \text{ impalas} * 30 \$ = 180 \$ \quad (22)$$

The prices have remained unchanged i.e., at the initial level due to a sustained demand from third party sources outside the original community.

Case: 2-C (flexible price)

Suppose that the external demand is such that it causes the price of one rabbit to decline from 15 \$ to 10 \$. As a result, and in order to clear the markets, one impala will have to be exchanged for 3 rabbits in our original community. The new but somewhat deteriorated exchange ratio for Rosa would be as follows;

$$1 \text{ (impala)} * 30 \$ = 3 \text{ (rabbits)} * 10 \$ \quad (23)$$

Plus two rabbits worth 20 \$ sold at external markets.

$$\text{Rosa's new income} = 6 * 10 \$ + 2 * 10 \$ = 80 \$ \quad (24)$$

$$\text{Total income} = \text{Rosa's income } 80 \$ + \text{Maria's income } 60 \$ = 140 \$ \quad (25)$$

Maria now consumes 3 rabbits instead of 2, a 50 percent improvement in her consumption. Maria and Rosa's joint total income is now 140 \$. As a result, Maria benefits from Rosa's creative mental contribution and Rosa ends up with deteriorated terms of trade. On the other hand, both Rosa and Maria are now better off.

RELATIVE PRICES IN THE SERVICE SECTOR

In the view of many Classical economists, the output of the service sector was considered as 'unproductive'. But, in contemporary economies, it is an acknowledged and quantitatively proven fact that the service sector output is not only productive in terms of added-value but also constitutes the largest share of GDP. The service sector produces nothing tangible or storable like the industrial sectors. Thus, there are no physical quantities to exchange as in the simple model above. In commodity production, there is a close relationship between the 'tangible' input and 'tangible' output, which normally moves in the same direction. In contrast, the service sector output is characterized by a higher intensity in labor-expended. Unit costs are closely related to labor costs as a function of the time expended, given the initial fixed costs. For instance, a teacher, a hairdresser, a business consultant or a musician can increase the total amount of the service they supply by working longer hours per day, week or month given the initial combination of the inputs which they employ.

Using labor-time expended as a standard unit of measurement might appear to be an appropriate method by which to analyze the relative values or the prices used in the service sector. However, if we take into consideration the different qualities of mental labor required in producing the different kinds of the services, such comparisons lose all their credibility. The value or price of the variable quality of the labor services will of course be different for each type of service demanded. Thus, the value or price of each specific labor service would be different, even if the 'equal labor time-expended' unit was used in calculating the price or value of the supply for each individual service.

Despite its significance for all domestic and global economies, a separate value/price analysis in the service sector will not be undertaken at present, due to the limited scope of this

article.

COMMODITY SECTOR PRICE FORMATION & PROFIT

So far, the analysis has focused on the creation and exchange of **relative-values or prices** in the commodity producing (tangible) sector. But, the analysis fails to reflect the real situation adequately; because the role of profit involved in the production process, in price formation and in exchange relationship has been neglected. In this section, profit will be introduced into the price formation analysis as it would occur in an actual economy. Introducing profits would inevitably lead to the simultaneous study of functional income distribution as well as the formation of new prices for new products, after the introduction of a new technology.

TRANSFORMATION OF VALUES INTO PRICES

A Case of 'Barter-Exchange'

In barter exchange relations as in the simple model previously presented, the exchange-value of each product was determined by;

- the mental and physical labor embodied in it/ (**LE**),
- the objective value (**OV**),
- the magnitude of demand for the product (**D**),
- the subjective value (**SV**), which was previously assumed to be a 'given'.

The last (**SV**) reflected the value that the end-users are willing to give up in exchange for a desired product, while the objective value, **OV**, reflected the value of the past (**LE_{t-1}**) and the present (**LE_t**) mental and physical labor embodied in the product (**LE**), excluding any or all profits.

Initially, one impala was exchanged for two rabbits. But after a mental contribution, Rosa's acquisitions had doubled and in order to clear the market, one impala had to be exchanged for four rabbits, as in Case:1-A and Case:2-A.

In Case:1-B and Case:2-B, there was a demand for an additional four rabbits which originated outside the community and as a result, Rosa's income doubled. From a more realistic and rational 'exchange relation' perspective, which is found in Case: 1-C and Case: 2-C, both members of the community benefited from Rosa's mental contribution, but Rosa's profit was higher than Maria's. All these factors indicated that the market exchange-value (**MV**) of a product is determined by the **LE** and **D**.

In the absence of profit, the **MV** equation can be shown as:

$$\mathbf{MV} = f(\mathbf{OV} ; \mathbf{SV}) \quad (26)$$

Or, alternatively

$$\mathbf{MV} = f(\mathbf{LE} ; \mathbf{D}) \quad (27)$$

implying that **LE** is the sole source of any value generation, while **D** gives the final shape to the exchange relationships by means of ‘haggling and bargaining’. There were no profits involved and exchange was based on equal quantities of **MVs**, as in Case:1-C.

$$1 \text{ MV}_i = 3 \text{ MV}_r \quad (28)$$

Instead of the initial

$$1 \text{ MV}_i = 2 \text{ MV}_r \quad (29)$$

MV_i and **MV_r** denote the market values of impala and rabbit, respectively. The critical question in these relative exchange relationships is:

How to transform these values into market prices (**MPs**) in the ‘barter’ exchange?

To obtain the **MP** we simply have to add any profits (π) to both sides of the equation used in the exchange relationships. Since profit rates are expected to be equal as a result of competition, new exchange relationships would not affect the essential exchange and be based upon, in a sense, the original **MVs** of impala and rabbit respectively.

$$\text{MP}_i = \text{MV}_i + \pi_i \quad \text{one impala's market price} \quad (30)$$

$$\text{MP}_r = \text{MV}_r + \pi_r \quad \text{one rabbit's market price} \quad (31)$$

$$\pi = f(\text{SV}) \quad \text{or} \quad \pi = f(\text{D}) \quad (32\text{-a})$$

$$r = f(\text{SV}) \quad \text{or} \quad r = f(\text{D}) \quad (32\text{-b})$$

And, given Case:1-C;

$$1 \text{ MV}_i + \pi_i = 3 \text{ MV}_r + \pi_r \quad (33)$$

By assumption;

$$\pi_i = \pi_r \quad (34)$$

And;

$$1 \text{ MP}_i = 3 \text{ MP}_r \quad (35)$$

In other words, in a ‘barter’ exchange model **MPs** deviate from **MVs** only to the extent of the size or rate of the profits. Since profit rates are assumed to be uniform, **MPs** would reflect actual **MVs**.

But, as we all know, barter exchange is a rare exception in modern economies.

PRICE FORMATION IN A MONETARY ECONOMY

In monetary economies, given a fair competitive environment and the appropriate institutional and cultural settings, prices are determined by each firm in every sector on the initial costs plus a profit basis in accordance with long term profit maximization goals, given the level of demand. Costs include the prices of all the inputs of production, both past and present, including any profits together with the present wage level. There are no homogeneous

products and thus no uniform price, even within the same sectors or sub-sectors. Accordingly, there are no homogeneous production methods, either. Each product can be produced by a different production method and displays unique product-specific features. In other words, each firm may require labor-power services as well as financial, organizational and technological settings in different qualities and quantities. Given these features, firms would have different break-even points and different optimum plant capacities. As distinct from the simple model above, we have to bear in mind that there may be at least one additional input of production other than the services of labor.

Although labor is the sole source of all value generation, the market price (**MP**) paid by end-users normally exceeds the costs, e.g., value transmitted to the product, by a certain margin. The difference is the **profit** (π) paid to the entrepreneur for the **risk** he/she assumed. This is not a payment for a value transmitted to the product by capital. In fact, it is a payment ‘in excess’ of the costs. In a sense, it may be called a **surplus value** or an **extra cost**. This additional payment or **surplus value** / **extra cost** is a necessary and sine qua none income so that the capitalist system can keep functioning. Thus, the **MP** can be defined as **the monetary expression of a product regulated by CP plus π which is shaped by D**.

1- Output with ‘one input only’

Assume an economy where labor is the only input of production of Commodity-X. Given the demand (**D**), the cost of production (**CP**) of **X** would be;

$$\mathbf{CP}_x = \mathbf{wL} \quad (36)$$

And the market price;

$$\mathbf{MP}_x = \mathbf{CP}_x + \pi_x \quad (37)$$

In this initial stage of production with ‘labor input only’, the market value (**MV**) of a product equals the **CP**, while the **MP** is greater than the **MV** ($\mathbf{MP} > \mathbf{MV}$) by virtue of the size of the ‘profit’. In other words, when profits are introduced, neither **CP** nor **MV** would no longer reflect the **MP** of the product.

2- A case with ‘multiple inputs’

Assume that Commodity-X produced yesterday is used as an input in the supply of Commodity-Y today. The **CP** of **Y** would comprise of past and present $\mathbf{w}^* \mathbf{L}$ plus the past π acquired;

$$\mathbf{CP}_y = \mathbf{w}_x \mathbf{L}_x + \pi_x + \mathbf{w}_y \mathbf{L}_y \quad (38)$$

And, bearing in mind that **D** affects both π and the relative exchange ratios as in the simple model;

$$\mathbf{MP}_y = \mathbf{w}_x \mathbf{L}_x + \pi_x + \mathbf{w}_y \mathbf{L}_y + \pi_y \quad (39)$$

To put it differently;

$$\mathbf{MP}_y = \mathbf{CP}_y + \pi_y \quad (40)$$

Where,

$$\mathbf{MP}_y > \mathbf{MV}_y \quad \text{by the amount of} \quad \pi_x + \pi_y \quad (41)$$

Alternatively;

$$\mathbf{MP}_t = wL_{t-1} + \pi_{t-1} + wL_t + \pi_t \quad (42)$$

Where \mathbf{t} denotes the time.

In regard to a product with ‘ \mathbf{n} ’ inputs, the \mathbf{MV} and \mathbf{MP} would be:

$$\mathbf{MV}_n = \Sigma \mathbf{LE}_n \quad (43)$$

$$\mathbf{MP}_n = \Sigma \mathbf{LE}_n + \Sigma \pi_n \quad (44)$$

It is interesting to note that although \mathbf{MP} always includes payment in excess of the \mathbf{MV} of a product by a margin of π , under normal conditions, the exchange relation of two producer-consumers like Rosa and Maria would present an interesting result. They would be exchanging equal quantities of \mathbf{MV} s among themselves in a **barter-like** manner.

In other words;

$$\text{Since } \pi^R = \pi^M \quad \text{then} \quad \mathbf{CP}^R = \mathbf{CP}^M \quad \text{and accordingly,} \quad \mathbf{MP}^R = \mathbf{MP}^M$$

where \mathbf{R} and \mathbf{M} represent Rosa and Maria, respectively.

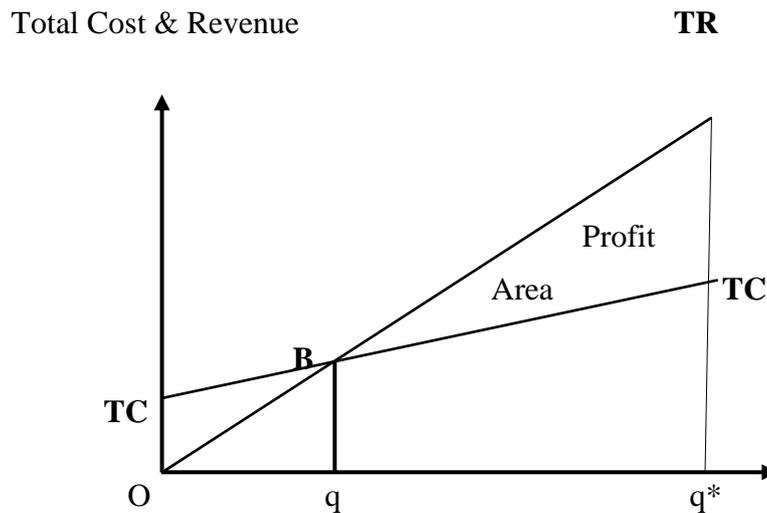
A ‘GIVEN’ PRODUCT, A ‘GIVEN PRODUCTION METHOD & PROFIT

Let us first consider a case with a **given** product and a **given** production method. Given a certain plant capacity, the rate of profit (\mathbf{r}) would be determined by \mathbf{MP} set on a $(\mathbf{CP}+\pi)$ basis where π would be subject to the magnitude of demand (\mathbf{D}). Or, the projected size or rate of profit by the firm would determine the \mathbf{MP} and the quantity demanded or supplied (\mathbf{q}), given the \mathbf{PC} and the \mathbf{CP} -schedule.

Break-even point and profit

Figure-1 shows the relationship between the quantities supplied and profits for a given product, a given production method and a given plant capacity. \mathbf{B} denotes the break-even point of production where the average unit costs equal the average unit returns, resulting in no profits. However, producers guided by the profit motive would be reluctant to produce at or below \mathbf{B} , at least, not in the long term. The size as well as the rate of the profit per unit output would increase as the total quantity supplied moves to the right of \mathbf{q} towards \mathbf{q}^* . Given \mathbf{D} , at the maximum output level (\mathbf{q}^*) determined by the plant capacity, the size and rate of profit would be at the highest possible level.

Figure: 1

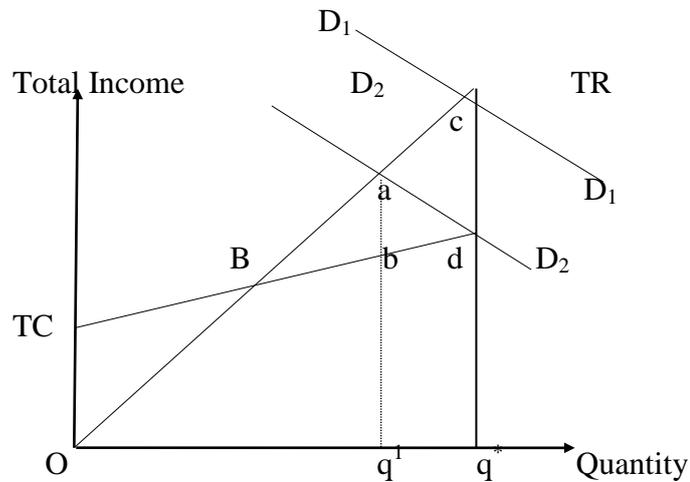


Profit rate for each firm might differ from the average profit rate in the sector as the quantities demanded or supplied vary from firm to firm, *cet. par.* In other words, similar products produced by different types of technologies would naturally produce different unit production costs, optimum plant sizes, break-even points and size or rate of profits. Differing levels of the quantities produced would also influence the size and rate of profits.

How Influential is Variations in Demand?

Assume that the **MP** is initially set at a level, which assured a sufficient demand for full plant capacity utilization. But, then, for some reason, the demand curve shifts towards the origin, from D_1D_1 to D_2D_2 . Given the **MP** and full plant output capacity by q^* , as in Figure-2, the shift in the demand curve would cause alterations not only in the quantities produced but also in the size and rate of the profits. The profit would follow a decline in **D** and drop from the area of the quadrilateral 'abcd', to the area of 'abB', also causing a decline in the quantity produced by the gap of q^1q^x , e.g., $Oq^x - Oq^1$. The new but inefficient capacity utilization level is denoted by the dashed line aq^1 . At that level, both the size as well as the rate of profit would be lower.

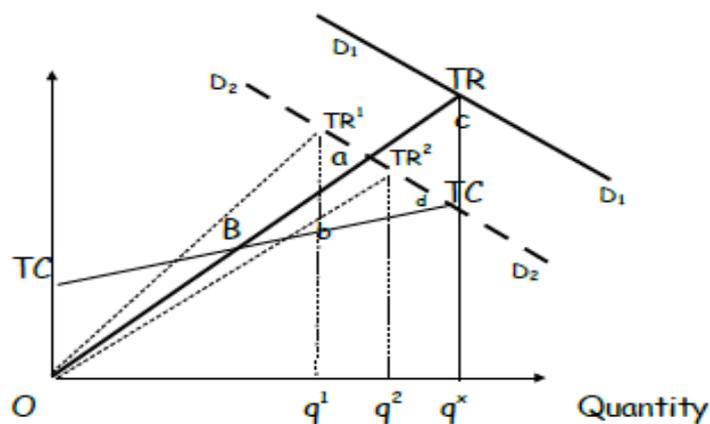
Figure: 2 Total Cost & Income



Variations in total income and profit

Following the decline in demand and the ensuing excess plant capacity, the firm may respond by changing its price. If the **MP** is increased, the revenue line **OTR** would become steeper, **OTR¹**, but it would be unlikely to restore the initial profit size and full plant capacity level (Figure: 3). If the **MP** is reduced in response to a fall in the demand curve, the **OTR** revenue line would become flatter; **OTR²**, and the plant capacity utilization would increase if the end-users respond by increasing their demand. But the restoration of the initial profit level would be impossible.

Figure: 3 Total Cost & Income



To conclude; the labor-expended (**LE**) argument alone falls short of explaining market prices, especially in the case of a supply-demand imbalance. **CP**, which reflects (past and present) **LE** and past ' π ' seems to regulate the minimum **MP**- level, which, in the final stage, is adjusted by 'haggling and bargaining' in the market. Thus, fluctuations in demand causing

imbalance in supply-demand conditions have an influential impact on the determination of the short term **MP**. With a ‘given’ technology and a supply-demand balance, the long term **MP** is more likely to reflect the **LE** and past π , plus the present π shaped by present **D**-schedule.

However, there is an essential reality; technology (‘creative’ mental contribution) is not a static ‘given’, on the contrary, it is a dynamic progress which influences the price and profit expectations by continuously introducing **new products and new methods of production**.

TECHNOLOGICAL PROGRESS, PRICE & PROFIT

The major difference in the following analysis is the introduction of ‘new’ technologies, which originate from creative mental labor. For the purpose of this analysis there are two assumptions: demand is a ‘given’ and there is no excess plant capacity.

In the light of our proposition, the critical question is; where to set the **MP** in a competitive market with regard to the ‘creative’ mental contribution, e.g., the technological innovation? Below, we will examine two cases related to price formation.

- 1- **A Given** product but a **new** production method resulting from ‘creative’ mental labor:
- 2- **New** products brought about by ‘creative’ mental labor.

1- A ‘Given’ product but ‘new’ production method and price

‘Creative’ mental labor constantly introduces new ideas or new technologies from which the economically efficient (profitable) ones are chosen and implemented as ‘new’ products and/or ‘new’ production methods.

There are the two basic reasons to implement a ‘new’ technology for a ‘given’ product;

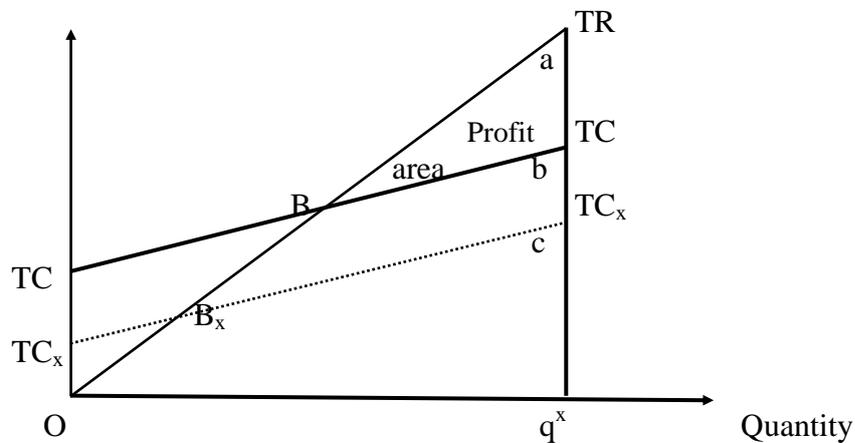
- 1- To make higher profits by reducing the unit **CP**, or given price;
- 2- To become more price-competitive by reducing price.

If there is a sustained demand at the initial price level, there would be no need to change the price after the introduction of new method of production which reduces per unit **CP**. The **expected** and normally **realized** rate of profit should be higher than before, at least until the others catch up. Figure: 4 shows a hypothetical case of declining costs and increasing profits in relation to a cost-saving technological change with a given output.

TC_x - TC_x line indicates the new cost curve, which is now closer to the origin as a result of the new method, indicating lower production costs, thus higher profits. The new profit area is **acB_x** where **acB_x > abB**. The profit area before the introduction of the new technology is indicated by the triangle **abB**.

Figure: 4

Total Cost & Income

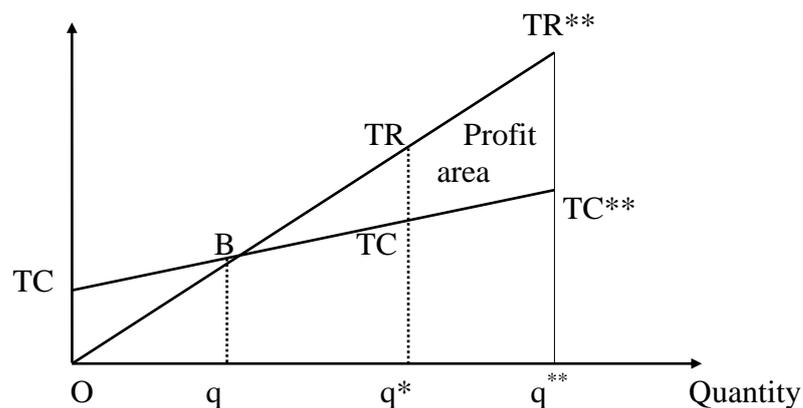


Let's assume that a 'new' technology reduces the unit cost. Reduced unit cost facilitates a price reduction that would make the product more competitive. If the firm wants to improve its position, then it would have to lower the price. Given the facility to expand production capacity to meet the increased demand, the size of the profit' would increase with increased supply, *cet. par.* (see Figure:5).

The new plant capacity is denoted by Oq^{**} while $B-TR^{**}-TC^{**}$ denotes the new profit area, which is larger than $B-TR-TC$, the initial profit area.

Figure: 5

Total Cost & Income



So the conclusion reached is; as a result of the 'creative' mental labor's contribution which reduces unit production cost, then either the rate of profit increases or the product becomes more competitive by reducing its price thus increasing the total size of profits, in accordance with firm's short and long term targets.

‘New’ products, prices and profit

The distinctive feature of economies is the continuous introduction of ‘new’ ideas (products) by the ‘creative’ abilities of mental labor. Since the product is **new**; there would be no comparable unit cost or price level. One may immediately assert that, the **expected**, and the **realized**, profit rate would be higher than the prevailing average market rate, because the owner of the new technology would enjoy a monopolistic power of that new idea (new technology) in the market, until the competitors catch up.

CONCLUDING REMARKS

The purpose of this paper was to display the genesis of and the ever changing source of ‘added value’. The analysis so far has indicated that, given natural resources and physical labor, **the creative knowledge of labor-power is the sole source of all the exchange-values created and all the wealth which is accumulated.**

In the analysis presented above, the increase in total wealth was the result of Rosa’s ‘creative’ contribution that can be advanced with formal and/or informal education, training and experience. It is only the creativity of the human mind that helps change and controls our environment by creating ‘new’ technologies. Rosa's creative mental contribution and the contributions of countless others that has been generated and accumulated over millennia, constitutes an immense reservoir of knowledge, which is presently at the service of mankind.

Nobody, no matter how brilliant his/her mental abilities are, acquires knowledge in the form of ‘manna from heaven’. In this day and age, knowledge is normally acquired through long years of formal or informal education, in-service training and can be enhanced by innate talent and acquired experience such as learning-by-doing. Personal abilities, appropriate socio-economic conditions and opportunities naturally play a significant, if not a determining, role in the final quality of these abilities.

Persons who live in developed countries are more fortunate in acquiring opportunities than those who live in less developed countries. They naturally acquire a higher degree of qualification than those less fortunate, influenced by the surrounding socio-economic conditions.

In a capitalist market economy where money is used as the medium of exchange, the producers obtain a part of the sale-price referred to as ‘profit’. This profit is not a value added by capital or the entrepreneur but some kind of ‘compensation’ or a ‘reward’ for the risks assumed by supplying these products in competitive markets. For some economists, this is considered as a ‘surplus-value’ or ‘unpaid wage’. Regardless of how you look at it, some kind of compensation is necessary to secure future investments.

The rate of profit is always directly associated with the sale price. On the other hand, the magnitude of demand may influence the sale-price. In other words, the sale-price influences the magnitude of demand and the magnitude of demand influences the sale-price; there is a

reciprocal interaction.

All commodities originally stem from nature and are transformed or re-shaped by mental and physical labor-services. Given the limited impact of physical labor, the 'creative' mental faculty of the labor force continually introduces new ideas in order to change and control our environment, which in its turn changes our entire way of life. In the meantime, 'qualified mental labor' (human capital) is required to secure the efficient use of these new ideas (technologies). Assuming the presence of an optimum efficiency in production, 'new' technology influences the price-level by introducing either;

- 1- a cost-saving 'new' method of production, for a 'given' the product; or
- 2- 'new' products with 'new' sets of values and prices.

In both cases, the profits are expected to be higher than average.

The unequal distribution of income has always been one of the major issues and an embarrassment for both economic science and economists. In a society where everybody receives a share of the profits, income distribution is likely to be fairer than it is now.

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