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Piero Sraffa: The Forgotten Brilliance

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Abstract:
Production of Commodities by Means of Commodities: Prelude to a Critique of Economic Theory (1960) is a brilliant exposure of Piero Sraffa, not only for that it exposes perplexities of the marginal fundamentals in deriving the supply curve as a combination of laws of returns as dark spot which disturbs the harmony of the whole, nor him who tries to resolve the inconsistencies of transmission channel in transforming value into prices of production, but precisely above all, it is his genius which paradigms a new dimension in economic science by reappraising the critical balance between production and consumption and able to tackle Ricardo's worries of invariable measure of value by elucidating significant features of his own, a new look which is far from marginalist mechanisms of solicitation – undoubtedly the founder of alternative paradigm. Arguments still online on his ostensible obscurity, however, it is his bright contributions which substantiate that the distribution of income cannot be determined by production scheme alone, rather it depends on other socio-economic parameters as relevant rejoinders. In that way, Marxian outline of direct political class conflict is absent in his canonical deliberation, but silent espousal of long tenured battle regarding the sharing of economic harvest in competitive capitalism is present. The present paper tries to scrutinize the whole deliberation of his celebrated research agenda where he really stands as a *solitary reaper* amongst the contemporary assembly of prodigies.
Keywords: Value, Surplus, Prices of production, Standard Commodity, Re-switching in Production Technique.

THE PRELUDE: AN INQUIRY INTO THE CONCEPT OF VALUE - A PHILOSOPHICAL AND ECONOMIC DISSECTION

The most frequently used word in our daily language, value, measure of worth, has a profound conjectural equivalence with the usefulness that presumably satisfies, on a moderate scale, the principles of production through which conventional consequences of production are partly reflected, but the residual part is still an enigma. The dynamics of capitalist system of production and distribution including the capitalist crisis appears to be conditioned on the market price, because it signals of relative scarcity of resources along the line of harmonized set of preferences. As a result, many economists tried to reevaluate the tenets of price theory which led to major contentious arguments about whether the channel via which value is transformed into price is more fundamental than the price theory itself. The opposite assembly holds the contrary view that the investigation of the channel through which value is transformed into price is superfluous because the latter can be established in a more straightforward and consistent manner by examining the production and distribution conditions of net product to pay to the productive factors in the form of wages and profits. These ostensibly straightforward lines of reasoning, however, are deeply embedded on the concepts of price (or measure of worth) and the origin of profit. The resulting fallout would persuade a significant portion of academicians in economic science to revisit the traditional political economic ideas through the new lens in order to reexamine the fundamentals again. Despite the wide range of opinions, interpretations, and analytical inferences, the labour theory of value—which outlines the factors that determine value and the techniques for assessing it throughout the production process—forms the general basis of classical political philosophy. Nonetheless, the main obstacle to explaining the underlying basis of the long-term relationship between wage-profit distribution and economic advancement is the lack of clear expressions of value conversion and the measure of capital including the sources of profit. Smith, without having faith on any political arithmetic (1776, IV.v.69), albeit obliquely, tries to demonstrate the close equivalency between value and the natural price (long run normal price, à la Marshall), and defines later as the price that is determined by the systematic and comprehensible modifications of the output vector caused by the competitive behaviour (perfect liberty) with respect to demand side alignments in the competitive market structure. This price may be sufficient to supply, and no more than supply, that demand, à la Smith. He applies the same methodologies to determine the prices of labour and land (wages and rent at natural rates), where it was assumed that the value of capital invested would yield a uniform profit rate due to free and open competition between producing units, allowing the economy to reproduce indefinitely, and, in the process, the actual market price may fluctuate around its natural price, '…the natural price, therefore, is, as it were, the central price, to which the prices of all commodities are continually gravitating'—a close connotation to the standard measure of value. While acknowledging that Smith so accurately defined the original source of exchangeable value, Ricardo holds a different opinion, especially when it comes to the standard measure of value. He claims that "the quantity any object can command in the market is more important than the amount of labour that goes into its production, as if these were equivalent expressions."In this context, prices of production are another imperative thespian agent which appear as long run prices that contingent upon the propensity to achieve a uniform profit margin (by rearranging the capital intensity), given the level of output, for all industries in an economy, à la Marx (comparable to Smith's natural price), in a competitive environment with free factor mobility. According to him, the value of a good is the "socially necessary abstract labour" that appears to be embodied in the good, and prices of production are thus the sum of cost prices and gross profit margins or surplus value with the propensity to be uniform. Marx's analysis uses it as the center of gravity. In his seminal work of 1960, Sraffa posited that "value and price... less one-sided... than cost of production." Rather than emphasizing the possibility of a relationship between prices of production and market prices, he endorsed it with an insightful manner, pointing out that production prices are determined without any frame of alignment of supply and demand schedules. Marx attempts to systematically determine value and its distribution in a unified manner, but wages are independently and exogenously determined, despite the fact that they are supposed to be uniform under free behaviour. In terms of institutional structure and technology, especially in the setting of joint production, Sraffa's disposition differs from Marx. However, an important connection between Marx and Sraffa may be seen in the perspective of the transit of exchange relations and relative prices as the causes of value. In summary, taking into account the whole tour, Ricardo's (and other classists') worry for an invariable measure of value come to an end with Sraffa's standard commodity which the present study will look at in the subsequent part. Two years after Sraffa's Production of Commodities by Means of Commodities (1960) was published, Joan Robinson wrote a lengthy argument about value in her Economic Philosophy (1962). She argues that the notion of value has two different meanings, sometimes expressed as the object's utility, again, sometimes, the power of purchasing other good which the possession of that object conveys. She meaningfully contends that value is the mysterious emanation somehow hidden in the relative prices, and frustratingly concludes, "Value will not help. There is no operational content to it." Her argument makes one thing very evident: controversial shifts in the meaning of the term, value, make the entire set of analysis much more puzzling.

Professor Sen's view (December 2003) is relevant here since it is a meaningful encounter in relation to substantiate the usefulness of the analysis by stating that "the philosophical issues raised by Gramsci and Sraffa, and of course by Wittgenstein, have considerable bearing on this question."

According to neoclassical theory, value in use (usefulness) is thought to have intrinsic value or utility, but value in exchange (nominal price) is mostly generated through the act of exchange that generates relative prices. The foundation of neo-classicism does not adequately bank on the standing of value in use. Instead, according to them, value in exchange, or nominal price, is the key concern in the exchange-led market economy since it is affected by the interaction between supply and demand and can thus fluctuate in response to transitory changes in supply or demand conditions. One point is to be noted here that demand and supply schedules are presumed to be independent of one another. Neo-classical theory assumes that the marginal cost curve, which is the supply curve, responds to constant, decreasing and increasing returns for both firm and industry . Therefore, if we were to adhere to the neo-classical convention, the price of a given good or service, as well as the price of a factor input, would result from the interaction between preferences and relative scarcity under a distinct set of principles as well as from the assumption that factor demands depend on relative prices. In the partial equilibrium framework, the price of any good or service is thus determined independently of the prices of other goods, under the ceteris paribus condition.

By restoring societal synchronization in the behaviour of the economic agents in a new set of endowments, the Walrasian theory of the exchange mechanism is supposed to have a prudent outcome that creates an automatic and inherent tendency towards full employment equilibrium under the price taker condition. Consequently, the entire landscape of neoclassical construct leads to a paradigm shift in which price is determined by exchange instead of being rooted in the production process. This indicates that in the neoclassical tradition of self-interest optimization scheme, especially by Jevons, Walras, Marshall, and Menger, which primarily depends upon the fundamental rule of marginal principle, the value as the consequence of production process in a social matrix is ultimately marginalized. Sraffa's critique vehemently disagreed with the assertion that the distribution is justified by the aggregate production function; furthermore, he sharply disagreed on the neoclassical marginal principle. In this context, Sraffa's view is, "……. the marginal product of a factor (or alternatively the marginal cost of a product) would not merely be hard to find—it just would not be there to be found".

Classists like Ricardo define surplus in terms of product in the sense that it is the additional quantity of output over the cost through which the overall economy would reproduce to preserve the society's initial state of a productive system and would support economic expansion. According to Marx, the concept of (social) surplus refers to the additional material manifestation of value that results from unpaid labour time through the skewed distribution as a hallmark of exploitation. Marx contends that the surplus value (as profit) is the difference between the value of labour-power and the value created by it. His entire body of work moves from abstract labour to cost of production before arriving at the equalization of profits. The abstract labour (abstract human labour that creates the form and value of commodities) is employed to mend and reconcile the concept of commodity and its value and, thereby explaining the social relation within the broader context of the production system, à la Marx. In this approach, the solitary source of value in production is labour. Sraffa gently highlights the expansive wisdom of the surplus approach, which holds that surplus is the outcome of the consequences of unintended impacts of social productive process and their interactions with the institutional foundations in that process.

Profit as a part of surplus value is the margin per unit of capital advanced that exceeds the needs for reproduction. It is crucial aspect of the capitalist system and the rate of it depends on the time period over which it is expended and computed than it is on the production plan itself. In general, it has two-sided constituents: on the one hand, it serves as the economic goal of the production process, and on the other, it serves as a source of investable funds to support continued production. It seems sense that a capitalist would be motivated to invest if, at the very least, the profit rate is equivalent to the interest rate. From this correspondence, rate of profit and rate of interest are sometimes assumed identically. The production techniques cannot fully establish the distribution of net output as it depends on prices in proportion to the value of capital advanced. As a result, prices and profit appear to be determined simultaneously. This is where the capital controversy began as the measurement issue of capital in aggregate production function and whether capital may be viewed as an entirely movable factor of production that can be transferred from one production technique to another under the set of rules of a competitive market, with an assembly of old Cambridge economists, including Joan Robinson and Sraffa, bringing up the matter. The marginalist convention states that the rate of profit is equal to the marginal contribution of capital without any specific physical measurement of capital. Piero Sraffa points out that capital is an ensemble of heterogeneously produced goods that must be added in a way that allows for a cost-minimizing choice of techniques, in contrast to labour or land. The old Cambridge also points out that the estimation of capital value necessitates previous knowledge of equilibrium prices, which in turn demands an equilibrium rate of profit, which is only achievable after the value of capital has been determined and hence there is a problem of circularity appears. Paul Samuelson, the mainstay of New Cambridge, Massachusetts, predicated on the heroic supposition that capital-intensity is consistent throughout sectors—essentially, a world with a single product. In such an economy, when the distribution of income changes, the revaluation of capital that follows produces outcomes that are perfectly in line with the demands of neoclassical theory. A well-behaved demand-for-capital schedule resulted from Samuelson's derivation of a straight-line wage–profit rate frontier, which is the opposite of the typical convex isoquant curves and represents a cost-minimizing strategy. Samuelson criticized Marxian value theory parenthetically, claiming that it was unable to account for relative pricing. All of Samuelson's critiques of Marx, however, lose significance when one applies Marx's labour theory of value to his heroic assumption of an equal capital intensity across all industries. In contrast, Sraffa sets aside the other factor inputs and associated distributions as exogenous in order to attempt to address the problem within the framework of distribution (wages and profits for labour and capital). This calls for a unique approach to the system as a whole, which Sraffa provides with one of his most famous innovations, the standard commodity, which he ingeniously builds and in which wages are not necessary to be paid in real terms. Sraffa uses this as the numeraire of the pricing system. As such, Sraffa's assertion that "the rate of profit... must be uniform in all industries" shares some resemblances with the classists' viewpoints; nevertheless, his ultimate goal and some of the constituents are completely different, as the next section will demonstrate. The functional causality in relation to changes occurring is not emphasized in the dissemination of his canonical classic in Commodities, and nor the time dimension is expressly included, but it is implied in the form of a sequence of changed shape of modified objects. He does not also assume laws of returns or returns to scale in his entire analysis. The subtitle of this book Prelude to a Critique of Economic Theory largely supports this claim. His approach is wholly unrestricted by a mechanically agreed set of relations, including their incremental changes as marginal.

The motivational take of the present study, prima facie, seek to trace the complex journey of value, tracing its merging with price, whilst also exhuming the profound and far-reaching consequences of these theoretical nodes. In this pursuit, it stands in the shadow of Piero Sraffa's scrupulous craft, who has fashioned an alternative paradigm in economic science, that challenging the conventional orthodoxy in its foundational dynamics, with rigor and reverence, within the capitalist system. Though it is impossible to summarize his critique in a single sweep, the present study endeavours to undertake this monumental task, with the intent to unravel the brilliance of the architect—he who has constructed an alternative paradigm. Yet, the question remains, although sounds sad, why has his genius been consigned to the margins of mainstream economic thought and delineated to the obscurity of forgotten memory, thus eclipsed by the pervasive embrace of neo-classical doctrines? The focal point of Sraffa's investigation rotates around the intellectual frontline between competing economic theories, each offering a distinct understanding of how value transforms into price and how such transformations are tied to the broader mechanisms of production, distribution, and societal edifice, thus revolves around the contested intellectual terrain between classical and neoclassical economic theories, each offering fundamentally different conceptions of value, price, and the structure of production and distribution. At the heart of this issue lies the labour theory of value, a cornerstone of classical political economy, which proclaims that the worth of a good is determined by the labour embodied within it. From this foundation, the relationship between wages, profits, and the distribution of net economic worth forms the essential roots and twigs of his discussion. Sraffa's ingenious proposal of the standard commodity is the ground-breaking alternative for measuring value, and through this measure, he stanches the rejection of circular reasoning that plagues marginalist analysis. His work offers penetrating insights into the intricacies of distribution and the methods of production within a capitalist economy, unravelling the complexities that neo-classical models overlook and the very foundations of price theory itself.

Thus, given the backdrop, the central purpose of this paper is to re-examine and rehabilitate the intellectual legacy of Piero Sraffa by situating his contributions within the broader philosophical, theoretical, and institutional dimensions of economic thought. While Production of Commodities by Means of Commodities (1960) has been acknowledged for its technical dismantling of marginalist price theory, its deeper epistemological implications and socio-political resonances remain underexplored in mainstream economic discourse. This paper argues that Sraffa's work constitutes more than a critique—it represents the construction of an alternative paradigm rooted in classical political economy but advancing a distinct vision of value, distribution, and economic structure. The study thus seeks to go beyond summarizing his formal model and instead bring to light the full richness and relevance of his contribution in confronting enduring theoretical crises and distributional inequalities that characterize capitalist systems today. This inquiry represents but a miniscule endeavour, an infinitesimal drop in the vast ocean of economic science, undertaken to reclaim and celebrate the enduring genius of Piero Sraffa, to rescue his acumens from historical obscurity, and to irradiate the continued relevance of his ideas in addressing the contradictions that beset contemporary economic thought.

In doing so, the paper also aims to address why Sraffa's work has remained at the margins of economic orthodoxy, despite its transformative potential. Consequently, this paper is driven by three core research objectives to answer the queries pertaining to --- first, the clarification and rearticulation the core of Sraffa's critique of marginalist economics, particularly its treatment of value, price, and distribution. By dissecting how Sraffa replaces the subjective utility-based foundations of neoclassical theory with a surplus-oriented, production-based approach, the paper demonstrates how his work restores logical consistency and conceptual clarity to economic theory; second, connection the gap between Sraffa's technical framework and its broader philosophical and institutional implications. While existing summaries often isolate Sraffa's model from its critical subtext, this study seeks to recover the suppressed dimensions of his work—its silent engagement with class conflict, its subtle critique of capitalist production relations, and its implicit call for a foundational rethinking of the discipline's axioms; third, address the reasons for Sraffa's marginalization and explore the continuing relevance of his paradigm in contemporary economic debates. This includes investigating the historical context in which Sraffa's work was received and rejected, and understanding how ideological commitments within the profession have shaped the boundaries of acceptable theory.

For the above reasons, the inclusion of this summary of Sraffa's critique in the present paper is necessary because it performs a dual task: first, it elucidates a profoundly misunderstood and often misrepresented theoretical contribution; second, it repositions that contribution within the broader intellectual and institutional landscape of economic thought. While Production of Commodities by Means of Commodities (1960) has received extensive technical engagement, most existing summaries tend to isolate its analytical framework from the philosophical, historical, and epistemological concerns that animate Sraffa's project. This paper, however, aims to reintegrate those layers, offering a more holistic reading that treats Sraffa's work not merely as a technical correction to marginalism, but as the foundation of a radically alternative paradigm.

The necessity of this reappraisal lies in the persisting gaps in understanding Sraffa's intellectual intervention. The standard narrative often either reduces Sraffa's work to a refinement of Ricardian political economy or confines it to an abstract algebraic exercise disconnected from contemporary relevance. These accounts fail to grasp how Sraffa reconfigures the very architecture of economic reasoning—challenging the marginalist reliance on subjective utility, contesting the neoclassical treatment of distribution as derivative of choice, and instead restoring production and surplus distribution to the centre of analysis. His critique offers not only a methodological shift but also a substantive challenge to the legitimacy of dominant economic discourse.

This paper differs from existing summaries by attempting to capture the philosophical and institutional significance of Sraffa's alternative framework. It does not treat his theory as a relic of the classical tradition, but rather as an enduring challenge to the epistemological underpinnings of modern economic thought. By tracing the journey of value—its transmutation into price, and the socio-economic relations it conceals—this study sheds light on the residual elements that mainstream models overlook, such as the political nature of income distribution and the structural conditions of production.

Moreover, unlike conventional readings that often side-line the broader implications of Sraffa's work, this summary foregrounds the latent socio-political critique embedded in his formulation. Though Sraffa is often viewed as silent on class struggle in the Marxian sense, this paper argues that his work is anything but apolitical; it contains a silent yet profound engagement with the long-standing contest over the distribution of the economic surplus. In doing so, this account reinstates Sraffa not only as a theorist of prices and commodities but as a foundational thinker in the reconfiguration of economic science itself. Thus, the present summary is not a reiteration of past interpretations; it is an attempt to resituate Sraffa's brilliance within the evolving debate over the nature of value, the legitimacy of economic orthodoxy, and the ethical stakes of economic theory.The résumé of the present study portrays the entire dialogue through the passage of following Sections by bearing in mind the aforesaid conversation relating to the agenda, motivation and debates. To start with, *Few Notions Reconsidered before arrive at Sraffa's Critique* are deliberated, then the study moves to *Foundations of Sraffa's Critique* in next Section which is subdivided into subsections like *(A) Inconsistencies in the construct of neo-classical foundations; (B) Critical Construal of Price; (C) Standard Commodity; (D) Switch in the Methods of Production.* The subsequent Section occupies the discussion on *Beyond the Methodological: Sraffa's Hits, Misses and Silence* and, lastly, the paper ends up with *Concluding Remarks*.

FEW NOTIONS RECONSIDERED BEFORE ARRIVE AT SRAFFA'S CRITIQUE

Let's start with the issue of economic reproduction before moving on to the critique. Economic reproduction is the recurrent process of regenerating (rejuvenating) the initial state of the economy in both social and physical conditions. This involves the production and consumption of goods (all of the intermediate and final stages of production), the distribution of the value added, and the exchange and trade of all kinds of involuntary and voluntary social relations (including class hierarchies à la Marx), including competition and cooperation. The 18th century French Philosopher, Francois Quesnay was one of the first to introduce the concept of economic reproduction in his best-known work, Tableau Economique; Jacques Turgot, Pierre Samuel du Pont de Nemours, Marquis de Mirabeau, and other adherents of a similar philosophy to that of Quesnay are examples of Physiocrats, a term derived from the Greek word Physiocracy, which means government of nature. They believed that agriculture was the only productive sector capable of producing surplus, and that it was the main driving force of reproduction. Quesnay's net product is the social surplus which is the mark of value added (or net generated productivity), which appears to be related with the mode of production. Marx's conception of reproduction was extended by dividing it into two categories: simple reproduction and expanded reproduction. The former is without economic expansion and is characterized by subsistence-level living and cyclical regeneration, with landlords spending the surplus value earned by wage labour on consumption and hoarding. However, in the expanded reproduction, the part of surplus value is reinvested in production that ensues economic expansion. Hence, in that process, prices of production are that set of prices in which commodities are to be produced and reproduced in the expanded reproduction under capitalism, à la Marx. To be more precise, prices of production are derived by the technical characteristics of production under capitalism in the expanded reproduction to express the value of a commodity, '…it is values that stand behind the prices of production and ultimately determine them' (1981, p. 311). Because it essentially involves the surplus generation (claimed and used by capitalists) to augment the exchangeable worth of capital inputs, including increases in the capitalists' command in production and exchange relating to both volume of inputs and outputs, prices of production would therefore be crucial in accelerating increased reproduction and the dynamics of the capitalist system. Next is the neoclassical market design under liberal economy, that expending a rudimentary device to comprehend the economic endeavour at the provisional scale is based on the circular method of production by optimizing the behaviour of economic agents. This raises a number of consequences for the aforementioned issue. The organizational form of the entire production scheme under neo-classical design involves with the forces of production or technology, and, thus, the provisions of production relation between the means and owners of the means defines a specific political-social system of an economy. The appropriation of profit by private proprietors, which appears to be the sources of capital accumulation and accompanying economic growth, preserves a productive efficiency of the capitalist political organization as a whole. This is accomplished by the neo-classical assumption of constant return to scale in a price-taker situation, which leads to a stable (and sometimes unique) equilibrium solution. However, along with the condition of price taker, there is also the possibility that the conditions of market clearing might not guarantee full employment. The reason is that the epitome of neoclassical foundation of a single institution, the market, disappoints the norms of a sizable collection of social institutions. Due to his belief that any idealistic argument that is obscure should not be accepted, and that it is a disturbing element in the analytical construct to come out with a reasonable set of consequences, Sraffa does not consider these perspectives into account throughout the follow-through of his celebrated study due to its circularity and pointed out that as the value measurement of capital requires prior knowledge of equilibrium prices, which in turn requires an equilibrium rate of profit that cannot be obtained unless the estimated the value of capital, the neo-classical model of income distribution has an inherent measurement problem. His methodological construct argues that exchange values (relative prices) cannot be determined just by taking into account the cost of production in isolation of distribution (wages and profits), and in this way, his radical and destructive critique gives utmost importance to determining balance (equilibrium) through the distribution channel.

In encounter, Paul Samuelson designed a model of a world of single commodity with the assumption of uniform capital-intensity throughout sectors. In that scenario, when the distribution of income shifts, a well-behaved reappraisal of capital that follows a cost-minimizing strategy yields outcomes that are similar to those of neoclassical theory. This includes a straight-line wage-profit rate frontier and a well-behaved demand for capital that is not explicitly measured. However, reality does not follow Samuelson's venture; rather, if variable capital intensities across industries with the conformity of reality are assumed, then it is challenging to construct Samuelson's straight-line wage–profit rate frontier (by Garegnani, Pasinetti, and Amartya Sen), which produce well-behaved demand-for-capital schedules and are compatible with the cost-minimizing choice of approach. The aforesaid argument compels us to recall Smith, Ricardo and Marx in a spacious room, where the arguments about a harmonious design of the capitalist distribution system must centre on an effective configuration that incorporates a distinct arrangement of mode of production plan involving labour and capital. In his travel, Sraffa does this brilliantly and distinctively using his new invention of the standard commodity, a unique measure of value that that sufficiently validates a qualified solution to the transformation problem of labour values into production prices problem and corresponds to suit all three key forms of technical progress, presumably resolves the worries of Ricardo. This is the primary feature of Sraffa's approach, which enables him to resolve the the problem of the relationship between relative prices and the distribution of income. The whole panorama of his critique starts with single product industries with circulating capital (Part I), and then expends his discussion to multiple product industries with fixed capital (Part II) and ends up with switch in methods of production (Part III). In its way, he divides the whole assembly of produces in an economy into basic (commodities that enter directly or indirectly as means in every and each process of production) and non-basic products (commodities which do not serve as means of production or which are used, directly or indirectly, only in a limited number of processes) to separate the ways to determine wage rate and rate of profit. His prelude to a critique of economic theory is an intense search as a prologue relating to the problems those have been cropped up in economic analysis in linking relative prices with distribution, where classists are unable to resolve and marginalist approach is subject to analytical inconsistencies. His entire analytical framework is elucidated by considering simple reproduction scheme and expanded reproduction scheme with surplus generation. In consequence, Sraffa starts with "commodities are produced by separate industries and are exchanged for one another" and endures his deliberation with ".... a unique set of exchange values which if adopted by the market restores the original distribution of the products and makes it possible for the process to be repeated".

FOUNDATIONS OF SRAFFA'S CRITIQUE

A. Inconsistencies in the construct of neo-classical foundations

Sraffa's analysis assumes that profit rates are uniform across industries, based on capitalist production and free competition. Sraffa's critique defies neo-classical analytical constructs based on returns to scale and also differs from Marshall and others in not using demand-supply-based equilibrium price for its circularity due to measurement problem. He argues that all returns cannot be restored on the same plane, leading to conceptual inconsistencies. Sraffa contends that the law of increasing returns to scale is derived from Smith's impression of the division of labour in a manner consistent with the dynamics of technological progress, whereas decreasing returns to scale are linked to the Ricardian theory of rent in the context of changes in the proportions of factors of production as a result of scarcity of factors. As a result, Sraffa points out that the neoclassical behaviours of industry and firms are likewise addressed on the same plane. The ceteris paribus clause would no longer be consistent in the event of increasing or decreasing returns to scale if all firms continued to expand or limit within a single industry, or if different industries continued to expand or limit in response to the increasing or decreasing returns. In either scenario, the leaps in competition would not match the scale changes. The internal and external economies—or diseconomies—of businesses and industries have been disconnectedly canned in the neoclassical paradigm, à la Sraffa, in order to fit the entire system into the partial equilibrium framework.Again, if all firms in a certain industry use the same scarce factor and industry output increase causes average costs to change, it is possible that changes in other industries that utilize the same scarce component also contributed to the average cost change. The demand curve for any commodity is hence dependent on the corresponding supply curve, rendering the ceteris paribus clause null and void. Nonetheless, the marginal framework makes an attempt to use improbable assumptions to predict the cost and supply curves using the same analytical design. Therefore, the transformed supply curve (which follows non-proportional returns to scale on the same plane) interacts with the equivalent demand curve in the Marshallian partial equilibrium setting to establish the equilibrium price. Here, it is important to note another essential point. The precondition of independency of demand curve with the supply curve would also imply that marketing and selling outlays ought not to be included in the costs of production, which is not correct in practice. Consequently, in relation to the fragile conceptual underpinnings of neo-classical partial equilibrium framework (inconsistency of competitive equilibrium with variable returns to scale under the presumption of convex production set lending general equilibrium), Sraffa draws inference…"Marshall's theory […] cannot be interpreted in a way which makes it logically self-consistent and, at the same time, reconciles it with the facts it sets out to explain'; thus 'I think […] that [it] should be discarded' (Sraffa 1930: 93).

B. Critical Construal of Price

Unlike the classical foundation, the neo-classical basis of distribution is built using a parallel and identical technique of analysis, with symmetric dissemination of distributive variables. According to the marginal theory, the prices paid as wages, profits, and rents indicate the real cost of production for the provided efforts and sacrifices in the form of utility losses tolerated respectively by the workers, capitalists, and landlords as the incentives to generate final output. In a way, this uniformity involves with the sharing of final value addition into wages, profits and rents as per marginal contributions. Sraffa points out that the marginalist view aims to determine the prices of factor inputs via the law of non-proportional costs, by which the supply curve is constructed symmetrically to the corresponding demand curve to determine price, based on the ceteris paribus clause. In contrast, classists are interested in determining the (just) distribution of the social output among workers, capitalists, and landlords, based on the law of diminishing returns for factors and increasing returns in production. Thus, price determination without proper reference to a definitive standard of value in terms of utility or cost is invalid and illegitimate because, in that case, the partial approach results in the circular reasoning fallacy between two standards in terms of demand price and costs of production. So, the backdrop of Sraffa's thrust was twofold in relation to critical construal of price; first is to determine exchanges in terms of physical costs under the tutelage of methods of production, and second is to express the physical cost in terms of produced necessary commodities (having variabilities in substitutability amongst them) or composite commodity that is required to support the sustenance of labourer (on average) for a working day. Sraffa's standard price measure -- the standard commodity -- satisfies the critical mathematical condition of invariability when it comes to the distribution of wage and profit into physical quantities. To put it another way, it solves the problem of transformation of embodied labour values into prices of production in a consistent way.Sraffa's construction of commodity-based price disregards any unwarranted assumptions and, in that sense, it is a more sophisticated description than classical in general and Marxist in particular. According to Marx, social production and exchange are closely intertwined, and through a series of price signals, the entire process reiterates reproduction. Marx, thus, argues that the surplus value in the process of reproduction is an important reference indicator for pricing in order to fit the complete production scheme compatible with the labour theory of value by equating net income to labour expended during the production period. In this context, Sraffa's view seems to align with Marx's view of exchange, which posits that price is the exchange value of a commodity in terms of other commodities it commands to continue the reproduction. Marx's view of prices is more closely related to reproduction prices (that is, prices of production).

In contrast to classical theories , Sraffa's view is that association between commodity prices and cost of production is mutually reinforcing and not one-sided in the production scheme. Sraffa divided the entire set of produced into basic and non-basic goods after assuming two distinct systems, each with its own price determination process. These systems were production for subsistence with no surplus and production with surplus, where output is in excess of what is required to replace the inputs. The production of basic goods includes both the production of such things on their own as well as the production of other basic commodities. The non-basic goods are not entered in production process as the means of production and their prices depends on the prices of the used means of production in producing them. In this context, Sraffa adds, 'The criterion is whether a commodity enters (no matter whether directly or indirectly) into the production of all commodities…we shall call basic, and those that do not, non-basis products…. any system contains at least one basic product' (Sraffa, 1960).

The whole setup of wage and wage goods are important considerations in Sraffa's critique, but in a different way with greater precision in terms of representativeness and sense. Sraffa argues that the Ricardian, or broadly classical, view of variation of goods is inappropriate in a capitalist economy, as labourers also use luxury goods. Wage goods and basic goods may be considered the same when real wage is fixed at subsistence level. Labour is assumed to receive a part of surplus and paid wages post factum, à la Sraffa. Hence, market wage is a summation of basic goods and a part of surplus in real physical units which and a change in production due to a technological advancement in basic goods (or strictly wage goods) changes the variable surplus portion that would inevitably change the relative prices and the capitalists' share of profits. If the wage rate has been exogenous and determined outside of the production system, then it has to be '…in terms of a more or less abstract standard, and [would] not acquire a definite meaning until the prices of commodities are determined' (Sraffa, 1960). Therefore, Sraffa takes into account the potential effects of relative pricing on workers' consumption of commodities. Hence, in contrast to Ricardo or Marx, Sraffa's analytical framework demonstrates the possibility of tracing the relationship between distributive variables without taking the burden of restrictive assumptions. He also makes the conjecture that if wage increases, profit rate will decrease. Sraffa views input sharing industries as joint product industries, where the rate of profit depends on the sum of expenses on all inputs required to produce the joint products. the technologically given joint product industries, decision relating to cost of individual commodity is, thus, somehow fuzzy. The movements of inputs in the Sraffa's framework are restricted only within group for which the rate of profits is equalized, but there is no contrivance to modify the glut or shortages in the individual commodity production within the joint product industries.

In consequence, Sraffa replaces the amount of basic goods consumed by labour in ongoing production, rather than the direct implementation of labour time. Sraffa argues that the unit of labour time spent in production is not the basis for measuring the magnitude of relative prices because the unit of labour time is different from the cost associated with the unit of labour time. In doing so, he rejects both Ricardo's value proposition and Marx's theory of social system of production as fundamental errors in the context of value measurement, since value as worth and value as exchange are different. Sraffa argues that if the produced goods are used as both for consumables and inputs, then relative prices cannot be determined in isolation of the distribution. Given the conjecture, the set of prices of a given number of commodities is determined through the process of reproduction scheme where the number of commodities equals the number of production processes. His unique inference is that factor prices cannot be determined as commodity prices and the whole process of price determination needs a weighing scale between consumption and production. In that way, however, the complete decomposition of price into profits, wages, and rents is impossible if a basic commodity is used in an industry that solely uses its own outputs and is either directly or indirectly needed as a means of production in all other industries, for any limiting value of maximum profit rate to be finite, the corresponding wage would have to be zero.

In this context, some economists argue, such as Garegnani (1992), that Sraffa's scheme of price determination appears to have taken general equilibrium into consideration, and the calculated prices are equilibrium prices. On the other hand, a large number of economists disagree, claiming that Sraffa's entire discussion is only a static image of the production structure of an economy. Nonetheless, Sinha and Dupertuis (2009) assert that it serves as the system's Centre of Gravitation, akin to a state of equilibrium when capitalists would have no incentive to alter production plan. In this context, Sinha (2007) argues, '... data of inputs and outputs from factories (that) will not necessarily find the economy in equilibrium, and in a separate note he (Sraffa) went on to explain his equations do not assume any equilibrating forces behind them.'

C. Standard Commodity

Who will receive comparatively (just) bigger share of pie (net product) and how will that be decided and allocated? The second part is perhaps the ever-debated question in economics for long, which has been sufficiently contested across space and time as it has a long hold in both politics and economics, and also takes over a significant length in philosophically stirred political-economic thoughts. The capitalists and the workers are two of the main harbingers whose privileges appear to be leading in the production scheme and each of them claims profits and wages for their individual contributions to net product (net value addition). This leads to the departure of two opposing ideologies which are predominantly tried to dominate the other on the raised issue. The first involves determining an invariant measure of value and then to resolve

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the exact contribution component of net value addition. Rather of focusing on determining an invariant measure of value, the second vertical approach looks at measuring each contribution part in an all-inclusive manner through ceteris paribus clause and marginal contributions. The second vertical ostensibly appears appealing, but the entire architecture is seriously plagued by the adding up problem as the contributions are overlapped. The change in demand and supply of capital would induce the supply and demand of labour, thus violating ceteris paribus clause, that is to say, demand and supply schedules are not independent. In addition, corresponding factor demand and supply schedules are also dependent on the corresponding commodity framework schedules. Classists like Smith, Ricardo and Marx are essentially the heirs of the first vertical, although with different approaches, and tried to resolve the issue using labour theory of value (in wide sense). Sraffa's deliberation in Production of Commodities by Means of Commodities adequately quests the same following the broad path of first vertical, but with a different form of mechanism. It is in the process that Sraffa's construal of critical prices set the distribution variables at the centre after long years of Ricardo and Marx, in a most exceptional and intelligible manner, by including socio-economic parameters as pertinent rejoinders. In that way, he discards the Marxian outline of direct class conflict while tacitly acknowledging the presence of economic battle regarding the sharing of economic harvest in competitive capitalism.

The basic problem starts from the point of determining a general measure of capital. The net produce or surplus is a summation of net value of all goods being produced in all sectors over used capital and labour, which are typically heterogeneous (net value cannot be depicted in terms of corn as Ricardo did). To start with, the simple elaboration may be considered without having intervention (as tax, subsidies, etc.) and foreign sector.

Let $\mathbb{N}$ is gross domestic product and $\boldsymbol{\omega}$ is real wage rate in terms of a single product $(\boldsymbol{\chi})$ in a single-product producing economy. The production scheme is that

$\boldsymbol{\varphi}$ units of $\boldsymbol{\chi} + \boldsymbol{\mathcal{L}}$ units of labour $\rightarrow$ 1 unit of $\boldsymbol{\chi}$

Thus, total amount of capital expanded in production in terms of the product is $\mathbb{N}\boldsymbol{\chi}$, it is by means of the product as it is used as capital in production, total wage bill is $\mathbb{N}\boldsymbol{\mathcal{L}\omega}$ which Sraffa assumes it is to be paid at the end of production scheme (of year), that is, paid *post factum*, and capitalists earning in net domestic product (that is, $\mathbb{N} - \varphi\mathbb{N} = \mathbb{N}(\mathbf{1}- \varphi)$) and the share is $\mathbb{N}(\mathbf{1}- \varphi) - \mathbb{N}\boldsymbol{\mathcal{L}\omega}$. Thus, the rate of profit ($\mathbf{r}$) is,

$$\mathbf{r} = \frac{\text{Capitalist's share in net product}}{\text{Total Capital Expanded in production}} = \frac{\mathbb{N}(\mathbf{1}-\boldsymbol{\varphi}) - \mathbb{N}\boldsymbol{\mathcal{L}\omega}}{\mathbb{N}\chi} = \frac{(\mathbf{1}-\boldsymbol{\varphi}) - \boldsymbol{\mathcal{L}\omega}}{\chi}$$

The explication above makes it evident that the wage-profit relationship is inverse. Now, if we were to believe that an increase in profit would lead to a fall in wages for a specific produce, a crucial question would be raised regarding whether or not the same would hold true for other produce. To get the answer, one commodity must be taken as *numeraire* as a standard of measure. Which one, though, and why? Furthermore, it is a problem of how to *measure surplus* as it is also aggregate of heterogeneous products. In his *labour commanded measure* (as standard), Smith's view of capital or surplus is measured in terms of new employment of workers if it is fully invested to hire useful workers, depending on relative prices and wages. Ricardo was against of *labour commanded measure*, rather his view of surplus or capital is the difference between labour required to produce national output and to produce means, and thus profit rate is also expressed in terms of labour used in production without taking into consideration of technical progress.

Ricardo's worry relating to determine a single standard of value is related to a problem in that relative prices are highly susceptible to technology advancements and also shifts to the changes in allocation between wages and profits. Besides these, one thing is very clear that surplus or capital as well as profit rate should be measured in terms of value of quantities which should be independent of distribution (Garegnani, 1960), indicating the need for a standard measure of value, given the technology. In this perspective, history of economics viewed a great debate between two Cambridges, as *Capital Controversy*, in the context of measuring capital. Now, if the rate of profit is considered as the ratio between value of the surplus (as part of net product) and the aggregate value of capital expanded in the entire production system, again the *aggregated values* of them are required to determine the profit rate. This is the point of departure of another kind of disagreement by Sraffa over how to measure *value* (not price commanded) for measuring the respective factor contributions.

It is assumed, however, in all classical deliberations including Sraffa that profit rate is same for all industries, for a given set of prices of the produced goods, in competitive capitalism. Now for any change in wage, demands for wage goods and non-wage goods will change, causing a capital flight to more profit generating sector. This change in profit rate, as is evident from the above wage-profit relation, will result in changes in prices as well as of value of net product. It also has to do with how the price vector changes. This implies that both the initial combinations of produced goods and profit rate are altered. It seems to be that the entire system will be restored to a new equilibrium with an equal profit rate in each industry after capital mobilities have been shuffled, but with a different configuration of wage and non-wage commodities than its initial composition. The scale of output generally determines how profits are distributed among various sectors. The fundamental problem is from where to start. In other words, whether a certain set of prices and the value of the net product are known first, followed by the calculation of the profit rate, or whether prices are settled as the profit rate changes, followed by the value of the net product. For this kind of problem of circularity, however, Sraffa neglects altogether the scale issue in the elaboration of his seminal study. The determination of an *invariant measure of value* would become impossible unless and until the entire system would be simultaneously solved through the passage of standardized measurable content, because the *aggregated values of net product*, including value of the surplus, and the aggregate value of capital expanded in whole production system, is changing at each point of time. That is to say, invariant measure of value determination is profoundly *distribution-centric which involves simultaneity*, what Sraffa brilliantly explored with standard commodity. Marx was unsuccessful as he used the value of rate of profit based on the *weights of labour embodied* rather than the price.

This is the basic perception underlying Sraffa's *standard commodity* as the *invariant measure of value* which is his deliberate expediency that made up of all the basic goods in standard proportion and appears without any need to show it in aggregate units of numerous produces or to employ any numeraire. Given the technique, it is invariant to the changes in prices resulting from the variations in the distribution (of wages and profits) in physical units as composites of commodities and hence the necessity of other numeraire as a standard of measure is invalidated; but one point is important that it changes with changes with the production techniques. This is the point where Ricardo made a mistake by attempting to solve the dual function simultaneously in order to arrive at a singular, invariant measure of value. The overall picture reveals a crucial fact: Sraffa is, in general, similar to the first vertical who attempts to solve the distribution problem through the application of surplus theory, but differs from that assembly in that he finds a solution without explicitly considering the labour theory of value.

In Chapter IV of *Production of Commodities by Means of Commodities*, Sraffa clarifies in detail about Standard Commodity where he writes '…*It is impossible to tell of any particular price fluctuation whether it arises from the peculiarities of the commodity which is being measured or from those of the measuring standard. …The 'balanced' commodity …would represent no peculiarities of this type, since the same proportion would be found in all 'layers'…if we could discover such a commodity, we should therefore be in a position of a standard capable of isolating the price movements of any other product so that they could be observed as in a vacuum*' (Sraffa, 1960). The wages in terms of the Standard Commodity are essentially the nominal wage since the Standard Commodity is determined in order to standardize the systems of equations and considers profit rates as exogenously given. In the Sraffaian framework, the wage is considered to be paid *post factum*. As a result, standard

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commodity, refers to (composite) commodity which has the potency to be insulated by the price movements being accompanied by the changes in distribution, is a valuable indicator for accounting for variations in *wages in standard form*, given the production technique. Sraffa doesn't presuppose saving behaviour of the economy or returns to scale in the spread of his framework, and he also doesn't take the initial endowment of the means of production as given.

In that course, Sraffa includes the impacts of relative prices on basic commodities and assumes the profit rate as independent, because, '*as a ratio, [it] has a significance which is independent of any prices, and can well be "given" before the prices are fixed*'. Sraffa considers a holistic system of equations in a joint production scheme of different processes, '*considering that the proportions in which the two commodities are produced…the existence of two methods of producing them in different proportions…that the number of independent processes in the system [is] equal to the number of commodities produced*' (Sraffa, 1960). A *standard system* that provides a linear link between wage and profit rate would be one in which the standard measure of wage is substantiated by the standard commodity. In Sraffa's words '*particular proportions, such as the standard ones, may give transparency to a system and render visible what was hidden, but they cannot alter its mathematical properties*'. One crucial point that needs to be made is that the balance between production and consumption, one of the core tenets of Sraffa's system, is evident by means of expressions of standard commodity in a way that stems from the means of production to consumption goods, but not by the circular relationship between consumption and production. After expending the needs for reproduction, the surplus is distributed in terms of invariant measure of value (standard commodity) among workers and capitalists for various productive sectors and then may be invested or consumed (which defines exchange ratios in terms of values for the commodities). His entire setup implicitly illustrates the dynamics and relative strengths of class preferences among workers and capitalists in a capitalist system (inverse relation between wage and profit rate), although overtly direct class struggle and conflict are absent, but a tacit endorsement of the expanded struggle over the distribution of economic harvests in a market driven by competition is present.

Now, another important context in this respect is the production technique for n commodities, which is generally shown by input-output matrix, say, $\mathbb{M}$ (n X n order) including the vector of labour coefficients $\boldsymbol{\mathcal{L}}$ (n X 1 order) such that the price vector of the outputs produced by different industries in an economy (in matrix form) is $\boldsymbol{\mathcal{P}}\mathbb{M}\mathbf{(1+r)} + \boldsymbol{\omega\mathcal{L}}$, where $\mathbf{r}$ is the profit rate that is determined by the ratio of net of factor payments and total factor payments. Hence, we have, $\boldsymbol{\mathcal{P}} = \boldsymbol{\mathcal{P}}\mathbb{M}\mathbf{(1+r)} + \boldsymbol{\omega\mathcal{L}}$, and, in Sraffa's scheme, standard commodity is meant by the non-negative eigen vector of $\mathbb{M}$. Eigenvalues are the set of scalar values those associated with the set of linear equations and when the relations are shown in a square matrix form in relation to eigenvalues then it is called eigenvector (also known as latent vector or characteristic root). The array of elements (coefficients relating to a variable like a_{ij}) of any matrix may not show the information about the dependence or functional properties between variables, and that can be done by decomposing the matrix by eigen-decomposition with the help of eigenvectors and eigenvalues. If now the input-output matrix is assumed to be non-negative (the scalar elements or eigenvalues of it are non-negative), and if it is decomposed with the help of eigen vector, then we have, $\mathbb{M}\boldsymbol{\vartheta} = \boldsymbol{\vartheta\varepsilon}$, where $\boldsymbol{\vartheta}$ implies the corresponding eigenvector and $\boldsymbol{\varepsilon}$ symbolizes for eigenvalues. Now any of the eigenvector is arbitrarily chosen as standard commodity $\boldsymbol{\vartheta}$ such that $\boldsymbol{\mathcal{P}\vartheta} = 1$, then we have,

$$\boldsymbol{\mathcal{P}\vartheta} = \boldsymbol{\mathcal{P}}\mathbb{M}\boldsymbol{\vartheta}\mathbf{(1+r)} + \boldsymbol{\omega\mathcal{L}\vartheta} \rightarrow \boldsymbol{\mathcal{P}\vartheta} = \boldsymbol{\mathcal{P}\vartheta\varepsilon}\mathbf{(1+r)} + \boldsymbol{\omega\mathcal{L}\vartheta}$$

Thus, $1 = \boldsymbol{\varepsilon}\mathbf{(1+r)} + \boldsymbol{\omega\mathcal{L}\vartheta}$

Or, $1 - \boldsymbol{\omega\mathcal{L}\vartheta} = \boldsymbol{\varepsilon}\mathbf{(1+r)}$

Or, $(1 + \mathbf{r}) = \frac{1-\omega\mathcal{L}\vartheta}{\varepsilon}$

Therefore, $\mathbf{r} = \frac{1-\omega\mathcal{L}\vartheta}{\varepsilon} - 1 = \frac{1-\varepsilon-\omega\mathcal{L}\vartheta}{\varepsilon}$

Now, if we compare the single-commodity economy with economy with n-commodities that includes the changes in production technique and the resultant changes in distribution, then the same inverse relation between wage and rate of profit is obtained, if the standard commodity is assumed as *numeraire*. Thus, the impact of distribution is nullified from the determination of price relatives if standard commodity is taken as *numeraire*; the result simultaneously solves both the worries of Ricardo and dilemma in Marx's proposition in relation to exactness of weight for labour embodied. Hence, in case standard commodity, the production scheme will be as follows.

$\boldsymbol{\varepsilon}$ units of standard commodity + $\boldsymbol{\mathcal{L}\vartheta}$ units of labour → 1 unit of standard commodity.

Few important points are to be considered in the context of above deliberation. First, standard commodity is simply a *mathematical expediency*, however it provides an alternate paradigm that allows for precise observation of the measure of value and addresses a long-standing distribution problem by illuminating the exact ratio of distributive variables through the invariant measure of value. Second, when a capitalist invests units of a standard commodity as capital, the numerator of the ratio implies the capitalist's share of the net production expressed in terms of the standard commodity. Third, it implies that if wage increases, profit rate decreases and it is for each and every commodity those are produced in the economy in consideration. Implicitly it means an inherent struggle is always operative between two harbingers, labour and capital, in the production relation of competitive capitalism. Thus, standard commodity helps to detect the distribution in exact value of net product, but the distribution itself does not impact the relative prices, only the initial composition of vector of commodities may be changed. Fourth, any physical analogy used to describe the distributional relations of a complex system must include all the appropriate commodities used as inputs and appearing as outputs when an economy uses and produces a variety of commodities (not just corn as the only product that enters into all other production schemes).

D. Switch in the Methods of Production

The scholars of economics are very much familiar with the term 'aggregate capital' of an economy, but in many cases, it is used without providing a transparent impression of what it means indeed. However, it addresses a great deal of scholarly matters because it is regarded as economy's overall demand for capital resources. Sraffa raised the issue implicitly in his canonical book through the switch in the methods of production by means of capital intensity and choice of techniques. In this context, the stand of Joan Robinson (1975) is quite pertinent on the issue, '*The discussion has been involved, over the last twenty years, with the problem of "'measuring capital"* … Professor Samuelson is kind enough to make me a number of compliments in his comment. I would be more gratified if he would answer my point'.

What is Sraffa's take in this case? He contends that there is no underlying well-designed association between the profit rates and capital intensity or capital deepening. The fundamental point of his argument is that the same initial technique as a method of production may be reoccurred as a beneficial one for a continuous change in the profit rates if there is convenience in the choices of techniques. The argument of Sraffa seems to be reasonable from the point of view of larger landscape of his political-economic deliberation for the following reasons. First, his framework is based entirely on the factual information of production relation and much less dependent on virtuously endogenous variables of the production scheme alone. That is to say, it is rather more dependent on the dominant political constituents of distribution in the perspective of joint determination of value and distribution through the passage of standard commodity without entrancing any scale of production. In Sraffa's view, "… no changes in the proportions in which different means of production are used by an industry are considered, so that no question arises as to the variation or constancy of returns". (Sraffa, 1960) Second, Sraffa's theory can accommodate multiplicity of profit rates (rates of returns to investment) across industries and, for that, there is no need to assume aggregate demand function. This is the basic route of reswitching phenomenon of Sraffa. Third, on the assumption that all industries earn profits at the same rates, the prices of heterogeneous capital goods have no impact on Sraffa's standard system generated rate of profit. This is because Sraffa's critique is more general than that developed (on at least partly parallel lines) by Joan Robinson (1953), who directly refers to the aggregate notion of capital used in the so-called aggregate production function. In that consequence, for any change in the set of wages, prices would be changed in such way that it will confirm the uniform rate of profit for all industries because capital-labour ratio is different in the industries. This is the passage through which Sraffa's system obtains an implicit adoption of long tenured economic battle regarding the sharing of economic harvest in competitive capitalism. This is such that $r = R (1-w)$, where R is maximum profit rate, r is uniform rate of profit and w is wage measured in terms of standard commodity.

One essential point connected with the issue is the methods of production, which Sraffa does not define explicitly. According to Neri Salvadori (1985), if all methods of production are single product methods and k is the number of commodities involved in production, then at least k methods must be operated; and k methods determine k constraints among the $(k – 1)$ relative prices, the wage rate, and the profit rate.

Therefore, prices and the wage rate (or profit rate) can be determined as functions of the profit rate (or wage rate). In the joint production system, number of commodities is lesser than the methods, in that case, Sraffa argues, 'The conditions would no longer be sufficient to determine the prices. There would be more prices to be ascertained than there are processes, and therefore equations, to determine them' and assumes that 'the number of processes should be equal to the number of commodities.'

The need of the assumption is not straight forward as it seems to be. The point was already discussed in the preceding section. The underlying connotation is that production technique would also induce the price as later is connected with distribution. Sraffa contends that because capitals, as a set of produced means of production, differ with respect to their vintages and, as a result, changes in the income distribution (between wages and profits) would have ambiguous effects on changes in the relative prices of capitals, hence it is incorrect to assume that as wages rise, labour is replaced by capital. In that case, it is unjustified to comment a priori on the direction of movement of capital–labour ratio for any change in real wage, à la Sraffa. According to Sraffa, it is improper to assume that, as wages increase, labour is substituted by capital. In consequence, Sraffa adds, '…we seem to lack a common ground on which the comparison between the two methods can be carried out…a comparison of the prices by the two methods becomes meaningless since its result appears to depend on which commodity is chosen as standard of prices'. The ensuing outcome would force to change the production technique because the cost of capital per hour of labour employed for the new capital goods will be changed than the older ones .

Krishna Bharadwaj's (1970) work addresses the maximum number of switches between two production systems, focusing on the basic commodities that enter into the two alternative methods. She uses Piero Sraffa's classification of commodities into basics and non-basics, stating that the two systems may differ in production techniques for more than one common commodity. This leads to discussions about switching possibilities between the systems, as a collection of polynomial functions must have at least one common root when more than one fundamental is generated by different techniques. But she refuted the issue that such a condition would only be met by accident. She resolved that the maximum number of switches in a system with two basics and one non-basic would be three if: (i) there are three distinct basics in the two production systems combined; (a) the two systems use different methods for a basic that they have in common; or (b) the two systems only differ in the method for the non-basic that they have in common and neither method uses the non-basic. The categorization of commodities into basics and non-basics uses more information about a system than decomposable or indecomposable classification, with the maximum number of switching possibilities independent of value unit selection.

So, what is the fundamental take of Sraffa? The primal of his critique throws challenges against the very basic foundational marginalist (as well as classical) proposition that a free market economy with competitive capitalism moves automatically towards full employment equilibrium through the passage of increase in labour per unit capital as a result of decline in real wages (due to unemployment). The dual of his critique raises the issue of reswitching of technique which undermines the basic tenet of marginalist foundation in the form of recurrence of production techniques for monotonic changes in profit rates, which means reswitching advocates a paradoxical situation that would be evolved in the marginalist theory of returns to a factor. By altering the production methods, Sraffa shown that the same method of production can emerge as the most profitable one at different levels of the wage-profit ratio distribution curve. This defies the fundamental tenet of neoclassicism, which holds that capital and its price (the rate of profit) have a monotonic inverse relationship. After a prodigious contest, Samuelson (1966) also admitted it, "…re-switching is a logical possibility in any technology, indecomposable or decomposable…." His accepted that the conventional paradigm caused perplexity and the single most surprising revelation from the reswitching debate was the directional change of the relation between profit rate and net output. In the way, Amartya Sen (2004) added, "…. It would be, I believe, a mistake to see (as has been sometimes suggested) in Sraffa's analysis a causal system rival to the standard neoclassical model of the determination of prices, quantities, and the distribution of incomes. Sraffa was changing the nature of the inquiry—toward an important but neglected theme—rather than providing a different answer to a given question already in vogue in contemporary economics."

BEYOND THE METHODOLOGICAL: SRAFFA'S HITS, MISSES AND SILENCE

The Capital Controversy spans a wide range of uncertain, but legitimate, contemplations regarding the term equilibrium along with apprehensions for the definitional connotation and measure of capital in terms of unit technical unit (independent of prices and distribution) as far as it is utilized in conventional analysis. Specifically, it concerns the neo-classical claim about a generic, well-behaved production function, wherein the price of the factors and their corresponding marginal productivities are equalized through competitive equilibrium. But both sides of the argument held onto their beliefs without attempting to persuade the other side of their points of view. In his critical assessment of the aforementioned problems, Sraffa (1960) contends that the neo-classical all-fit-to- model approach is incapable of determining the unit measure of capital (that independent of prices and distribution). Through the application of strict assumptions based on Clark's parable of the single production function, Paul Samuelson's surrogate production function (1962) attempted to capture the issue of capital heterogeneity. These attempts thematically attempted to confirm that the economic consequences of both the single production function and of the general equilibrium would have agreeable with the broad neo-classical outcomes. Sraffa explicitly rejected the topics like consistency or variability of returns in his cyclical commodity production technique and the aggregate production function, and nor he used the interest rate associated with it as cost. According to Sraffa, the only elements affecting relative prices are the wage-profit divide as the distributive shares and the physical units of production.David Levhari (1965) tried to expand Samuelson's assertion of a "well-behaved" production function and related hypothesis into a complete non-switching theorem by refuting Sraffa's results. However, Pasinetti (1965) disproved the claim of Levhari–Samuelson non-switching theorem by showing the fundamental flaw in it. However, Samuelson's claim (1966) was startling; his parable concluded with "…. There often turns out to be no unambiguous way of characterizing different processes as more "capital intensive", more "mechanized", more "roundabout" . . . Such. . . labelling is shown, in the case of re-switching, to lead to inconsistent ranking between pairs of unchanged technologies, depending upon which interest rate happens to prevail in the market." Samuelson attempted to fill in a lot of blanks in Sraffa's seminal classic (1960), such as the lack of continuous returns to scale and the trivialities of the standard commodity. According to Samuelson, the fundamental component of the theoretical framework is needed to identify the non-wage earnings as a difference or "residual" that explains the significance of both the standard commodity and Ricardo's invariable measure of value. Additionally, he stated that while Sraffa is correct that finding marginal products in steady-state equilibrium is impossible when maintaining a single set of input proportions, it cannot be a compelling analysis because it makes no mention of when such products exist or do not. He also claimed that the mundane observations must be reiterated to emphasize that regrettably, the Sraffian literature since 1959 has overly focused on long-term equilibrium relationships. More interestingly, after everything, Samuelson presented a contrasting parable in which he called the 1960 book "a classic" and claimed to have devoted "a third of a century of exploration and reflection" to it (Samuelson 2000). He commented, " if I need to scold Sraffians for taking Production of Commodities by Means of Commodities too seriously, I must scold mainstream economists for not taking it seriously enough", and added more, “It is a beautiful work for all its idiosyncrasies.”

To hold the full implication of Piero Sraffa’s PCMC (1960), one must move beyond its mathematical and logical architecture into the philosophical and political terrain it quietly navigates. Now, the discussion seeks to expose the resonant deposits of Sraffa’s intervention, particularly its silent but profound engagement with the epistemic foundations of economic theory and the ideological structures underpinning its institutional acceptance. The theme of silence— Sraffa’s own —serves as both method and metaphor, embodying a larger critique of power, method, and precept in the economic science.At a shallow level, Sraffa’s framework is often wrongfully labelled for a technical refinement of Ricardian economics—a purely formal reconstruction of value and distribution. But this view misses the forest for the trees. What Sraffa actually accomplishes is the reconstruction of the classical surplus approach as a rigorous alternative to marginalist reasoning, rejecting subjective utility, marginal productivity, and capital as a measurable aggregate. The implications are not merely algebraic but philosophical: Sraffa’s call is to rethink the very ontology of economics—what constitutes value, how prices emerge, and who determines distribution. His framework is grounded in physical realities of production and social relations, not abstract preferences or individual optimizations.

Philosophically, this marks a decisive departure from the epistemological assumptions of neoclassical theory. Where marginalism assumes a world of atomistic agents whose preferences and endowments determine equilibrium outcomes, Sraffa suggests a system governed by material conditions and social structures. His reliance on given physical quantities and technology in production not only bypasses utility theory but also denies the neoclassical notion that prices emerge from subjective assessments. In doing so, Sraffa challenges the idea of economic theory as a neutral, value-free science. He reorientates it toward political economy, where distributional outcomes are not the outcome of natural laws but contingent upon institutional and class dynamics.

Politically, this silent critique is even more all-pervading. Sraffa’s analysis restores the pre-eminence of surplus and class structure to the centre of economic analysis. By linking wages and profits to physical production conditions rather than marginal utilities or supply and demand curves, he indirectly revives the classical concern of distributive justice. This has far-reaching implications: it means economic outcomes are shaped not by choice but by economic power, not by individual preferences but by institutional structures. Though Sraffa avoids overt references to class conflict or capitalist exploitation, his framework provides a conceptual arsenal for such critiques. It opens the door to a re-politicized understanding of economics—one attuned to inequality, exploitation, and systemic power.

And yet, interestingly, Sraffa keeps on silence. He offers no sweeping strategies, no polemic engagements, no overt political pronouncements. Even in the face of critiques—such as Samuelson’s parable—Sraffa chooses not to respond. The interaction between Paul Samuelson’s 1962 response to Production of Commodities by Means of Commodities and Piero Sraffa’s enduring silence marks a pivotal moment in the historiography of economic thought—one that encapsulates the deeper intellectual and institutional tensions the present paper seeks to explore. Far from being a neutral exchange between two economists, this episode illustrates how dominant economic paradigms absorb or neutralize theoretical threats through selective engagement, strategic reframing, and institutional insulation. Samuelson’s so-called “parable” is not merely a scholarly critique but a representative instance of how mainstream economics disciplines its margins. Samuelson, in his characteristic style, appeared to acknowledge the logical consistency of Sraffa’s framework but did so by enclosing it within the neoclassical matrix. In this reframing, Samuelson missed the essential thrust of Sraffa’s critique—that the marginalist theory of value and distribution is internally inconsistent when capital is treated as a produced means of production, not a primary factor with a well-defined quantity independent of distribution. Sraffa’s silence has often been misread as detachment, scholarly aloofness, or a purely academic temperament. But such readings are insufficient. Sraffa’s silence was strategic and philosophical. It reflects not an absence of politics, but a rejection of the discursive terms within which politics in economics is often conducted. To engage with marginalist theorists on their terms would have been to validate a conceptual language he had already shown to be internally inconsistent. His silence, then, becomes a refusal to legitimize a flawed discourse—a performative repudiation of an intellectual framework he had fundamentally undermined.

Moreover, this silence mirrors the institutional silence that greeted Sraffa’s work. Despite the rigour and elegance of PCMC, and despite its capacity to expose the circular reasoning and metaphysical assumptions of neoclassical capital theory, it was largely ignored or sidestepped in mainstream economics. This was not due to lack of comprehension but due to disciplinary closure. The economics profession, particularly in the post-war period, was deeply invested in formalism, equilibrium theory, and a vision of science modelled after physics. Sraffa’s return to classical political economy—with its historical consciousness, materialist ontology, and implicit social critique—stood outside this frame. It could not be absorbed without threatening the edifice of mainstream theory. Thus, the profession’s non-acceptance of Sraffa was not passive neglect but active exclusion. Silence, in this sense, became a mechanism of institutional boundary maintenance.This mutual silence—Sraffa’s refusal to conform and the discipline’s refusal to engage—constitutes a philosophical and political moment. It reveals the limits of coherent debate within structures of epistemic authority. It shows how paradigmatic alternatives are not defeated by argument but often by omission. And it underscores the political nature of methodological choices: what is seen as legitimate knowledge, and who gets to decide. So, Sraffa’s silence should not be read as a void, but as a space charged with critique. It is the silence of a thinker who chose not to shout, but to construct an intellectual edifice so logically airtight that its implications would speak for themselves—eventually, if not immediately.This encounter, when viewed within the broader structure of the present paper, does more than provide a historical anecdote—it becomes an allegory for the marginalization of heterodox thought itself. It reveals the mechanisms by which critical alternatives are acknowledged only to be domesticated, and how silence, often seen as weakness, can function as a powerful strategy of dissent. More importantly, it reinforces the paper’s core argument: that Sraffa’s work is not a relic of classical economics but a living, radical critique of economic orthodoxy. In reanimating this episode, the present analysis brings to light not only the philosophical depth of Sraffa’s intervention but also the ideological contours of the profession that rendered it obscure. This, ultimately, is the enduring relevance of Samuelson’s parable—it dramatizes the very crisis of economic knowledge that Sraffa sought to expose and that the present paper aims to confront.

CONCLUDING REMARKS: RELEVANCE AND REHABILITATION

In light of the philosophical, political, and epistemological layers explored throughout this study, it becomes clear that Piero Sraffa’s contribution is not merely a historical curiosity or an elegant technical model but a foundational challenge to the very architecture of mainstream economic thought. The urgency of rehabilitating Sraffa’s intellectual legacy stems not from nostalgia but from the contemporary relevance of his critique—especially as global capitalism confronts worsening inequality, ecological constraints, and theoretical stagnation in economics. In this context, Sraffa's silent yet radical intervention offers a conceptual pathway for rethinking the discipline’s core assumptions and reinvigorating its social purpose. What then is Sraffa's achievement? Simply, it is creation of alternative paradigm that compel us to think the perspectives of economics beyond conventional solicitation.

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