

# Vulgar Economy in Marxian Garb: A Critique of Temporal Single System Marxism

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**Abstract:** This paper presents a critique of recent efforts, under the rubric of Temporal Single System Marxism, to defend Marx's value theory against the claim that his transformation algorithm is flawed. Although Marx did make a number of errors in elaborating his theory of value and the profit rate, these missteps do not undermine his larger scientific project. Far greater damage has been inflicted by his would-be Temporal Single System defenders, who camouflage Marx's errors by detaching him from his Ricardian roots; in the process they redefine value in a way that trivializes its function in Marx's system. Far from "vindicating" Marx's theory, Temporal Single System Marxism is an exercise in vulgar economy – the confusion of superficial appearances for underlying social reality.

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“[A]ll science would be superfluous if the outward appearance and the essence of things directly coincided” (Marx 1894: 817).

“Although Marx's attempt to recalculate values into prices must be regarded as a failure, yet the idea of such a double-calculation should not be dismissed off-hand. A correct solution of the theoretical problem which Marx had set himself, is very apt to strengthen an insight into important economic relationships” (Bortkiewicz 1907: 13).

## 1. Introduction

Since the publication of Ladislau von Bortkiewicz's assessment of Marx's transformation of labor values into prices, economists have generally acknowledged that Marx's treatment of the problem was deficient, and that prices of production can be explained without reference to labor values. The critique put forth by Bortkiewicz (1907) and subsequently reaffirmed and elaborated by, among others, Seton (1956–57), Morishima (1973) and Steedman (1977),

attributes three interrelated errors to Marx. First, in formulating the price equations laid out in *Capital*, Vol. III (1894: 154–172) Marx neglected to weight the inputs of each production process by their prices of production. Second, the profit rate Marx uses to calculate prices is defined as a ratio of quantities of labor time. But since prices of production do not in general coincide with labor-values, there is no reason to suppose that the economy's long-period normal rate of profit will coincide with the ratio of aggregate surplus-value to the aggregate quantity of labor embodied in constant and variable capital. Hence, Marx's price calculation, which is based upon the latter ratio, is incorrect. Finally, Marx asserted that (i) the aggregate amount of surplus-value generated by production will equal the mass of profits; and (ii) the quantity-weighted sum of prices will equal the quantity-weighted sum of labor-values. We now know however that, except in the special circumstances in which relative prices are proportional to labor-values, both of these so-called invariance postulates cannot hold simultaneously.

How damaging these results are to Marx's larger scientific project is a matter of some debate, and depends upon what one understands that project to have been. It is hardly surprising that orthodox economists have tended to interpret Marx's technical missteps as fatal to his entire theoretical program (Blaug 1980; Samuelson 1971). What is puzzling is the apparent willingness of modern-day *Marxists* to accept precisely the same view – that if Marx's transformation algorithm is defective, his account of capitalism collapses. Indeed, the vast oceans of ink that have been spilt in various campaigns to “vindicate” Marx on this point reflect a curiously narrow conception of his analytical achievement, a conception in which everything essential emanates from, and hence hinges upon the soundness of, his value theory. A neat statement of this position can be found in the opening paragraphs of a recent paper by Andrew Kliman and Ted McGlone (1999), who remark that if Marx's critics are correct, if his theories “suffer from

insuperable internal inconsistencies” and “are untenable even in their own terms”, then his analysis must be discarded or revised. Kliman and McGlone go so far as to endorse Anthony Brewer’s assertion (1995: 140) that if Marx’s value theory and his law of the tendency of the profit rate to fall “both fail ... not much is left.”

In fact quite a lot may be left. The point made by Kliman and McGlone seems incontrovertible on its face: how can a theory that suffers from “insuperable internal inconsistencies” and is “untenable even in its own terms” be defended? But posing the problem in this way begs a more elementary issue, that is, to what extent is Marx’s value analysis, *in its particulars*, indispensable to his account of how capitalism functions? This question is at the heart of recent efforts to refute Bortkiewicz’s critique from a perspective that may be described either as the Temporal Single System approach or as Non-equilibrium Marxism.

This essay argues that the Temporal Single System approach misinterprets Marx; that its analytics and methodological outlook are unsound; and that far from providing a defense of Marx, it amounts to an exercise in what he called vulgar economy, in which surface appearances are mistaken for underlying social reality. Marx’s *value analysis* does indeed contain errors that render it untenable. In view of the complexity of the problems the theory was meant to solve, and the relatively unsophisticated character of the tools Marx had at his disposal, these errors would have been difficult to avoid, even for an intellect of his caliber. But his basic theoretical framework, in support of which he developed the value analysis, is untouched by Bortkiewicz’s critique.

That framework conceives of prices as long-period centers of gravitation regulated, together with the rate of return on capital, by the technical conditions of production and the real wage. Profit emerges as a residual, or surplus, whose magnitude depends upon the degree to

which workers can be made to produce more output than they and the production process consume. This surplus approach can be developed without reference to Marx's problematic value categories, as in Sraffa's *Production of Commodities by Means of Commodities* (1960). Such formulations not only capture Marx's principal claims about how the profit rate, wages and prices are connected to one another, but also demonstrate that these claims are fundamentally correct.

Marx's errors are, in the end, minor; for they can be eliminated by a slight revision of the form in which his theory of value and distribution is presented, without undermining any of his basic propositions about how capitalism functions and how it develops through history. By contrast, as we shall see, the Temporal Single System "defense" of Marx, aside from being textually ungrounded, interprets his theory in a way that deprives it of its scientific content.

## **2. The Surplus Approach to the Theory of Value and Distribution**

Temporal Single System Marxism is by no means a homogeneous body of doctrine; but common to all of its adherents is a strong antipathy to interpretations of Marx that derive from Piero Sraffa's (1951, 1960) conceptualization of classical political economy, or that, as with Bortkiewicz, anticipate insights associated with Sraffa's work. Bortkiewicz's critique is said to be directed at a caricature of Marx's argument, in which Marx is wrongly viewed as carrying forward a theoretical project that was initiated by Adam Smith and David Ricardo, and then clarified and refined by Sraffa in the twentieth century.<sup>1</sup> It would not be inaccurate to say that Sraffa is the real target of Non-equilibrium Marxism, with Bortkiewicz being identified as a

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<sup>1</sup> See Freeman and Carchedi (1996b: x): "What has been understood as Marx's economics is in fact something else. Academic economics has assimilated Marx to Neoclassical General Equilibrium theory. His alleged inconsistencies are the crop of an unviable hybrid. This is not a maturation but a sickness of the theory, a perversion induced by its absorption into an alien system."

proto-Sraffian. Let's begin then with a summary of the Sraffian interpretation of the classicals and Marx.<sup>2</sup>

The interest of the classical economists in understanding the forces that regulate the profit rate stemmed from their belief that its magnitude determines the rate of capital accumulation. Classical political economy saw competition as the central coordinating mechanism within capitalism. In the absence of impediments to the mobility of resources, intersectoral capital flows push outputs and market prices toward their long-period normal levels, so that the profit rate will tend to equalize across all lines of enterprise. The constellation of prices, outputs and the real wage consistent with the establishment of a uniform profit rate reflects the dominant and systematic forces operating on prices and distribution; these forces were regarded by the classicals as the proper object of scientific inquiry. Deviations between the actual position of the economy and the long-period position were viewed as the result of random and unsystematic causes which, precisely because of their accidental character, are of negligible scientific interest.

A distinctive feature of the classical analysis of distribution is the central role it assigns to the opposition of class interests – in particular between workers and capitalists, but also, as in Ricardo's writings, between capitalists and landowners. Within this framework, the share of aggregate income received by the owners of capital and land represents a surplus obtained after deducting from the social product the consumption goods necessary for the sustenance and reproduction of the working class, and the commodities used up in the production process (including depreciated capital). The profit rate depends upon the magnitude of this surplus – or at any rate the part of it that goes to capitalists – relative to the quantity of capital utilized in production.

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<sup>2</sup> The principal references for this interpretation are Sraffa (1951, 1960), Dobb (1973) and Garegnani (1984).

Here a complication arises. To see the difficulty, let us leave rents out of consideration.<sup>3</sup> The social product, the consumption of workers, and the fixed and circulating capital that enter into production are not scalars: they are vectors comprised of numerous different types of commodities. Before the profit rate can be established as a ratio of the surplus to the quantity of capital utilized in production, these vectors must be made commensurable. An obvious way to proceed would be to weight the components of the vectors by their long-period prices of production, so that the numerator and denominator of the ratio appear as magnitudes of monetary value. But since a normal return on capital is an element of cost, prices themselves depend upon the profit rate and therefore cannot be treated as known prior to the determination of the latter.<sup>4</sup> The solution to this puzzle, as is now well known, requires that relative prices and the profit rate be determined simultaneously (see Sraffa 1960: 6). Simultaneous equation systems and the tools of linear algebra were not available to Ricardo or Marx, however, and they had to look elsewhere for a solution.

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<sup>3</sup> Ricardo got rent out of the way by showing that the price of corn is regulated by the conditions of production on the least fertile parcel of land brought into cultivation, that is, on the marginal parcel of land, which pays no rent. Though Marx's analysis of rent differs from Ricardo's in some respects, he appears not to have had any serious reservations about the proposition that prices depend upon the conditions of production on the marginal land (see Marx's letter to Adolf Cluss, October 5, 1853, in Marx and Engels 1852–55: 382–383). In any case, Temporal Single System Marxism has had little to say about rent, and generally ignores it. Nothing in what follows is contingent on the exclusion of rents from discussion.

<sup>4</sup> This complication did not arise in Ricardo's earliest formulation of his theory of the profit rate, in which he contended that "the profits of the farmer ... regulate the profits of all other trades" (Ricardo 1951–73, Vol. IV: 104). Prior to 1815, Ricardo surmised that in agriculture the output, wages and material inputs all consist primarily of a single commodity, corn, so that the profit rate in that sector could be calculated as a ratio of quantities of grain (Sraffa 1951). Intersectoral capital flows would then cause the rates of return in other sectors to adjust toward the agricultural profit rate. He soon abandoned this approach, conceding Malthus's point that, even in agriculture, wages and material inputs are not comprised mainly of a single commodity which is homogeneous with the output. In modern terminology, Ricardo's pre-1815 formulation supposes that corn is the sole basic commodity, that is, the only commodity that enters directly or indirectly into the production of every commodity in the system (Sraffa 1960: 8). In attempting to generalize the argument to cases of more than one basic commodity, Ricardo encountered the problem posed by the interdependence of prices and distribution.

In the *Principles* (1821), Ricardo supposed that commodities exchange approximately in proportion to the quantities of labor that enter into their production. On this assumption the profit rate can be determined as a ratio of quantities of labor-time. Ricardo realized that this solution was imperfect since, owing to sectoral differences in capital structure, commodities do not generally exchange in proportion to the quantities of labor embodied in them. His unsuccessful search, almost to the moment of his death, for an invariable measure of value was an attempt to overcome the limitations of the labor-embodied approach. Still, despite its limitations, that approach enabled him to establish important results that are now known to be correct. Ricardo was the first theorist clearly to grasp: (i) that the profit rate and the real wage are related to one another in a systematic way, and that the properties of the trade-off between them depend upon the technical conditions of production; (ii) that a commodity's price varies not only with the quantity of labor required to produce it, but also with changes in distribution; and (iii) that the direction and magnitude of the variations in a particular commodity's price, consequent upon a change in distribution, depends upon the proportions in which labor and produced inputs enter into the production of that commodity relative to the proportions in which they enter into the production of the *numéraire*.<sup>5</sup>

Ricardo, then, developed his labor-embodied approach in order to address a technical problem, relating to the measurement of capital, that arises from the interdependence of prices and the profit rate. Marx could hardly avoid confronting the same problem in his effort to provide an account of capitalist production relations. As with Ricardo, his labor-value analysis is a technical device designed to isolate an objective relationship, between wages and the profit rate, that could not at the time have been exposed by other means.

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<sup>5</sup> But the relation is more complex than Ricardo, or Marx for that matter, imagined (see Sraffa 1960).

Marx hints at this technical function of the value analysis in *Capital*, Vol. I, when he remarks that “the rate of profit is no mystery, so soon as we know the laws of surplus-value. If we reverse the process, we cannot comprehend either one or the other” (1883: 216). Another hint can be found a few pages further on:

To split up ... the product into different parts, of which one represents only the labour previously spent on the means of production, or the constant capital, another, only the necessary labour spent during the process of production, or the variable capital, and another, the last part, only the surplus-labour expended during the same process, or the surplus-value; to do this, is, as will be seen later on from its application to complicated and hitherto unsolved problems, no less important than it is simple (1883: 223).

The “complicated and hitherto unsolved problems” to which Marx here refers appear to have been those relating to the interdependence of prices and the profit rate – the “mystery” that only the laws of surplus-value can unfold.

Marx’s approach to the puzzle is not identical to Ricardo’s, though. Ricardo supposes that commodities exchange roughly in proportion to their labor-values; if one can find the right standard of value, then distribution-induced price changes will counterbalance each other in the aggregate, so that variations in the profit rate could be attributed to changes in the amounts of labor required to produce wage goods and capital goods.<sup>6</sup> Ricardo drew no distinction between value and price: he generally used the word value to mean a commodity’s long-period price, that is, its cost of production, defined to include a normal rate of return for the owners of capital. But a unique aspect of Marx’s theoretical system is his assertion that something called value exists which is different from and analytically prior to price. (This is precisely the view

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<sup>6</sup> Ricardo realized that no such ideal standard of value exists; his aim was to discover a standard that would most closely exhibit the properties of the ideal.

disputed by the Temporal Single System school.) Marx in effect *defined* value as the amount of socially necessary labor directly and indirectly embodied in a commodity. Exchange value, or price, is the form in which value manifests itself; but the two are not the same thing, and value is the more fundamental category.

Marx appears to have adopted labor-values as the units of an accounting system designed to reveal certain essential aspects of capitalist reality, presumably aspects that could not have been uncovered by other means. The labor-value analysis was not necessary to demonstrate that capitalist production relations generate profits through exploitation. Exploitation, simply put, occurs when capitalists appropriate part of the net output that workers produce. That this is a feature of capitalism is evident, and there is no need for a special analytical device to establish the presence of the phenomenon.<sup>7</sup> Nor does one need to express one's accounts in units of labor-time in order to show that capitalist exploitation is sociologically complex or that it inflicts upon workers a historically specific form of alienation.<sup>8</sup>

As noted above, Marx did not have at his disposal the mathematical tools that would have enabled him rigorously to expose the existence of a necessary relationship between the wage and the profit rate. It seems probable, then, that, like Ricardo, he introduced his value analysis to address this problem. Marx's procedure, however, does not rely upon the supposition that commodities exchange in proportion to their labor-values, though of course in Volume I of *Capital* he does make this assumption to simplify his account of how "the laws of surplus-value"

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<sup>7</sup> A necessary and sufficient condition for the emergence of a positive profit rate in the system as a whole is that the amount of abstract labor-time extracted from workers exceeds the labor-time embodied in the commodities they consume. But the validity of this so-called Fundamental Marxian Theorem (Morishima 1973: 53–54) is trivially evident, and there is little reason to think that the principal aim of Marx's value analysis was to establish this obvious proposition. It is more plausible that the Fundamental Theorem surfaced as a by-product of Marx's attempt to solve a less transparent problem

<sup>8</sup> Jossa (1991) and Sinha (2000) are representative of the view I am disputing here.

regulate the profit rate.<sup>9</sup> Instead, Marx contends that the total mass of profits coincides with the total mass of surplus-value, and that the ratio of the latter to the aggregate quantity of constant and variable capital, reckoned in labor-value terms, determines the general rate of profit. In Volume III he then uses the profit rate, so determined, to transform values into prices of production.

Neither Marx nor Ricardo put forth any doctrine that can properly be called a “labor theory of value”; it is no accident that the term cannot be found in their writings. Ricardo had a *cost of production theory of price* (in which, to be sure, he regarded labor as the principal influence on cost). Marx had a *labor definition of value*. But they both understood the profit rate to depend upon the technical conditions of production and the real wages of labor. Labor plays somewhat different roles in their theories of the profit rate; but for both the role was largely technical: by conceiving the magnitudes that comprise the profit rate as quantities of labor-time, Marx and Ricardo were able to avoid then-unresolvable problems posed by the interdependence of prices and distribution.

### **3. Marx’s Economics and the Equilibrium Method**

Temporal Single System Marxism argues that Marx’s value theory must be understood as sequential (or temporal) and non-dualistic (or single-system). Sequentialism entails that variables must be determined in succession over time, not simultaneously. Marx’s theory is said

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<sup>9</sup> The argument is well known. Within the capitalist mode of production, workers’ labor-power – their capacity to work – is a commodity and therefore has value. As with all commodities, the value of labor-power is the amount of abstract labor required for its production. If the wage is some biologically and socially determined norm, then the value of labor-power is the amount of socially necessary labor-time embodied in the typical wage basket. The capitalist purchases a worker’s labor-power for a certain amount of time, say a ten-hour working day. If the value of a day’s wages is equal to five hours of labor, then after five hours’ labor the worker has generated an amount of value just equal to the value

to be non-dualistic in the sense that “values and prices reciprocally determine one another”; hence they cannot be explained separately via distinct analytical systems (Freeman and Carchedi 1996b: x). The foundational premises for these claims are:

- (i) that Marx measures constant and variable capital not as labor-values values but in terms of money-prices; that is,  $c$  and  $v$  in the usual notation represent not quantities of labor-time, but sums of money advanced for the purchase of means of production and wage goods; and,
- (ii) that Marx treated these sums of money as parametric in the transformation algorithm of Volume III of *Capital*.

Within this framework, it is alleged, both of Marx’s invariance postulates can be imposed simultaneously; the transformation algorithm is sound; and the Okishio Theorem, which calls into question Marx’s law of the tendency of the profit rate to fall, does not hold.<sup>10</sup>

These claims are in part grounded in a muddling of the distinction between theory and method. The long-period *method* described in Section 2 above was utilized by the classical economists and, *pace* the Temporal Single System view, by Marx, as well as by the first generations of the marginalists up to at least the 1930s. This method has been deployed within two mutually incompatible approaches to the *theory* of value and distribution – the surplus theories of the classical economists and Marx; and the altogether different supply-and-demand framework of marginalist theory.

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of his labor-power. Any additional work he performs creates value in excess of what is required to reproduce his capacity to work. This surplus-value is the basis of profits.

<sup>10</sup> The focus of this paper is on Marx’s value theory; the Temporal Single System effort to rehabilitate Marx’s law of the tendency of the profit rate is not discussed.

Temporal Single System Marxists misleadingly equate the approach of Ricardo, Sraffa and Bortkiewicz with orthodox neoclassical theory on the basis of their common use of simultaneous equation models and the equilibrium method. Freeman and Carchedi (1996b: xiii), for example, write that

The formalisation of Marx's theory of value which descends from Bortkiewicz is a dead end which has served primarily to assimilate Marx to General Competitive Equilibrium. Bortkiewicz himself did not disguise his aim. A lifelong admirer of Walras ..., he openly acknowledged this debt and his avowed aim was to formulate Marx's transformation procedure in Walrasian terms. He criticised Marx ... for determining prices and values through a succession of phases of the circuit of reproduction, and substituted Walras' approach which simultaneously determines prices and/or values once for all.

Naples argues along similar lines: "The equilibrium methodology does not provide a neutral analytical tool, but directs economic investigations towards neoclassical results" (1996: 100).

Leaving aside for now the question of the extent to which Marx's methodological outlook overlaps with that of Ricardo or Sraffa, the suggestion that orthodoxy can be defined by its method is highly problematic. Theories that explain wages and profits in terms of the opposition of class interests in a historically contingent institutional context are radically different analytical engines from a theory in which income distribution is determined by substitution mechanisms grounded in price-elastic factor demand functions. Furthermore, Sraffa's work, far from being a variation on Walrasian orthodoxy, undermines the substitution mechanisms upon which the latter rests

The non-equilibrium Marxist literature crudely and misleadingly links the equilibrium method to the use of simultaneous equation models. "Bortkiewicz's equilibrium methodology,"

Naples claims, “followed neoclassical General Equilibrium theory by employing the logical construct of simultaneous time – a moment in which all economic behaviour transpires at once” (1996: 90). Naples is off-target here. A simultaneous equation approach does not imply that “everything occurs at once”; it reflects the judgement that certain variables cannot be explained independently of one another. As we have seen, Bortkiewicz and Sraffa deployed their equation systems to deal with the problem posed by the interdependence of prices and distribution – a phenomenon that was well understood by Ricardo and Marx. There is nothing Walrasian or neoclassical about this particular use of simultaneous equations. Walras and Pareto insisted on a simultaneous determination approach for the altogether different reason that, within marginalist theory, the relative factor scarcities that regulate distribution not only depend upon but also influence the pattern of demand. Nor is there anything either in Sraffa’s equations or in the Walrasian system that denies the temporal character of economic processes. On the contrary, a sizable body of Sraffian and marginalist literature on stability exists precisely because everything *doesn’t* happen at once, and theorists therefore need to ascertain the conditions under which the solutions to their equations will function as centers of gravitation for the actual variables of the economy.

Similar misrepresentations are perpetrated by Freeman and Carchedi, who assert that “The most essential phenomena of a market economy cannot be understood in an equilibrium framework, and are therefore impenetrable to neoclassical economics and to equilibrium Marxism” (1996b: xviii). For,

[i]n a world out of balance the principle of equilibrium is neither a valid foundation nor a real result. Practising economists are driven to study change, time and disequilibrium. Cyclic crises, unemployment, debt, underdevelopment, and financial chaos are the real

phenomena which command attention, but they receive no attention. Orthodoxy either defines them out of existence or labels them exceptions. Official economics [applies] to an unstable world concepts derived from the assumption of stability.

This presents a striking contrast with the theory which saw capitalism ... as *inherently* contradictory and self-disequilibrating, that of Karl Marx; a theory rooted in the understanding that economic movement ... is driven by continual change and evolution, racked by violent storms and catastrophes, that inequality and uneven development are its very life force, and above all that these phenomena are not external to the market but generated by it, the external expression of its internal law of motion (1996b: viii).

The assertion that neoclassical economics pays no attention to trade cycles, unemployment or monetary and financial dysfunctions is obviously untrue and requires no comment.<sup>11</sup> The orthodox treatment of these issues may very well be unsatisfactory. But the theory's defects won't be exposed by an unreflective dismissal of a straw-man parody of it.

What matters for the present discussion is that the parody is intended to encompass what Freeman and Carchedi regard as the distortions of "equilibrium Marxism" – in their view a variant of orthodoxy. One difficulty with this criterion of a theory's Marxian pedigree is that there is nothing uniquely Marxian about the conceptualization of capitalism as "inherently self-disequilibrating, driven by continual change and evolution, [and] racked by violent storms and catastrophes." Joseph Schumpeter (1942) described capitalism in almost identical terms; and Keynes, who had a notorious aversion to Marx, would not have quarreled much with this description.

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<sup>11</sup> In analyzing a particular problem orthodox theorists might abstract from these phenomena, as indeed might Marxists. But abstraction from certain phenomena in one context does not preclude consideration of these same phenomena in other contexts.

More to the point, the characterization of capitalism offered by Freeman and Carchedi is incomplete. What it leaves out is the coordinating mechanism discovered by the classical political economists and adopted by Marx. Capitalism is indeed crisis-prone; workers often experience the market as an invisible fist rather than as a benign instrument of material progress. But the system is not wildly chaotic; if it were, it could not have lasted these four hundred years. Market forces do coordinate the decisions of economic agents. The process is not seamless; it can be messy and unpleasant. Yet somehow commodities get produced, not in random quantities but in amounts that are close to what can be sold. Resources are directed to the sectors that require them, more or less in accordance with the amounts wanted.<sup>12</sup> Incomes are generated and paid, and are in good measure channeled back into expenditure. In short, the system reproduces itself. How it manages to do this is something that needs to be explained, as Marx well understood. He also appears to have recognized, along with his classical predecessors, that the principal coordinating mechanism is “the competition of capitals, which first brings out the price of production equalising the rates of profits in different spheres” (Marx 1894: 180).

In line with the methodological outlook of the classicals, Marx conceived of prices of production as long-period centers of gravitation, around which market prices fluctuate (1894: 178, 181). Non-equilibrium Marxism, however, dismisses the analysis of long-period coordinating tendencies as an ideological exercise, on the ground that what we observe are discoordination, structural change and crisis, rather than static positions of central gravitation. The conception of theory that underlies this view is astonishingly naïve.

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<sup>12</sup> There is no presumption here that the amount of labor demanded will be sufficient in general to establish full employment.

Theory aims to expose the regularities that underlie observed reality. It does this by abstracting from the countless random and transitory impulses that affect the actual values of the variables we wish to explain. Owing to such accidental causes, the magnitudes determined by a theory cannot be expected to coincide exactly with the actual magnitudes observed in the market. If a theory is sound, the deviations between actual and theoretical magnitudes will tend to counterbalance one another over time, so that the averages of the observed magnitudes will be close to those established by the theory: a theory's usefulness is gauged by how accurately it depicts the tendential mechanisms that operate on the phenomena we observe (see Garegnani 1990: 45–49, for a more thorough discussion of this point).

This methodological principle is evident throughout Marx's discussion of the equalization of profit rates in *Capital*, Vol. III:

If prices of commodities in one sphere are below or above price of production (*wherein we deliberately leave aside the fluctuations attendant upon the various phases of the industrial cycle in each and every enterprise*) the balance is effected through the expansion or curtailment of production ... caused by inflow or outflow of capital to and from individual spheres of production. It is by this equalisation of the average market-prices of commodities to prices of production that deviations of specific rates of profit from the general, or average, rate of profit are corrected.... If perceptible at all, this process is so only in the fluctuations and equalisations of market-prices of commodities to prices of production, not as a direct fixation of the average profit (1894: 367; emphasis added).

[Deviations of market-prices from prices of production] mutually balance one another, so that in the course of certain longer periods the average market-prices equal the prices of production (1894: 356).

Thus for Marx the divergence of actual magnitudes from neat formal results does not invalidate those results, since a theoretical proposition manifests itself “in reality only in approximation and with a thousand modifications” (1894: 184).<sup>13</sup> Naples (1996: 96), perhaps inadvertently, supports this interpretation when she observes that “In Volume III of *Capital*, Marx ... abstracted from the actual absence of a uniform profit rate, and ... from those real conditions he considered inessential in order to throw into relief the underlying structure of capitalism.” She neglects to explain, why Marx is entitled to engage in abstractions, while Sraffa is not – even when they utilize the same abstraction!

Non-equilibrium Marxism appears, in the light of what has just been said, to be a peculiar variant of what Marx called vulgar economy – a body of propositions that mistakes superficial appearances for the fundamental social relations that underpin capitalism. In stark contrast to classical political economy, which “since the time of W. Petty has investigated the real relations of production in bourgeois society, ... vulgar economy ... deals with appearances only, ruminates without ceasing on the materials long since provided by scientific economy, and there seeks plausible explanations of the most obtrusive phenomena...” (Marx 1883: 81). As Marx remarked to Ludwig Kugelmann in a letter of July 11, 1868,

The vulgar economist has not the slightest idea that the actual, everyday exchange relations and the value magnitudes cannot be directly identical.... What is reasonable and necessary by nature asserts itself only as a blindly operating average. The vulgar economist thinks he has made a great discovery when, faced with the disclosure of the intrinsic interconnection, he insists that things look different in appearance. In fact, he prides himself in his clinging to appearances and believing them to be the ultimate. Why then have science at all? (Marx and Engels 1868–70: 69).

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<sup>13</sup> See also Marx (1894: 161): “Under capitalist production, the general law acts as the prevailing tendency only in a very complicated and approximate manner, as a never ascertainable average of

Marx regarded classical political economy as a scientific project (albeit one that was flawed in important respects); vulgar economy he dismissed as ideology masquerading as science. As the passages reproduced above suggest, he believed that classical political economy was able to penetrate surface appearances because, among other things, it utilized the long-period method. His method was incompatible with the simplistic literalism of the view that theories of long-period gravitation cannot tell us anything about actual economic processes because the economy never settles into an equilibrium.

Freeman (1996: 17–19) attributes a set of absurd “presuppositions” to equilibrium theory in all its variations. He seriously misrepresents the positions he opposes, and demonstrates a startling incapacity to distinguish identities, equilibrium conditions and tendencies from one another. According to Freeman, the Sraffa-Bortkiewicz framework presumes that “Commodities are sold for the price at which they were purchased. This is the secret, ideological form of the basic Equilibrium postulate, which has the most profound impact on the internal logical structure of every variant of it.” He maintains also that the equilibrium framework comprises “a Ptolemaic System [whose] job is to sustain an ideology” (1996: 21) in which “All profit rates are equal”, and in which “Prices can never change”.

These attributions are simply wrong. Equilibrium theories do not presume that actual profit rates are equal across sectors, or that prices are constant and uniform for each commodity. The presumption is that there exist within capitalism mechanisms that, under given conditions of production and given distributional arrangements, (i) cause the prices of all units of each type of commodity to gravitate toward a unique value, that is, toward the commodity’s long-period normal price; and (ii) cause sectoral profit rates to converge if there are no impediments to the movement of capital. Marx affirmed the centrality of these tendencies, as we have seen.

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ceaseless fluctuations.”

None of this is intended to deny what is indisputable, that Marx devoted ample attention to crisis and structural change. But there is no evidence that he regarded these phenomena, in themselves, as destructive of the results obtained through the application of the long-period method. The evidence, as reflected in his remarks on the tendency of sectoral profit rates to equalize, lies entirely on the other side. Trade cycles, growth, technical change and the socio-political dynamics of class conflict coexist with equilibrating processes such as those described by Smith and Ricardo. Non-equilibrium Marxists maintain that the long-period method is incompatible with a reality characterized by disequilibrium and historical change. On the contrary, the method not only acknowledges the existence of crises, coordination failures and evolutionary change – it contends that they can best be understood against the background of the gravitational mechanisms they disrupt.

#### **4. Analytical Features of the Temporal Single System Approach**

The essential elements of the Temporal Single System Approach are captured in a model developed by Kliman and McGlone (1999).<sup>14</sup> They begin by defining a unit of labor-time as the amount of labor that exchanges for one unit of money, say a dollar, so that all of the value and price magnitudes in the model can be read either as quantities of money or as quantities of labor-time. All parameters and variables are measured per unit of output. Constant capital  $c_i$  and variable capital  $v_i$  represent the sums of money advanced by capitalists in sector  $i$  to purchase means of production and to pay the wages of workers. These sums of money need not correspond to the quantities of labor actually embodied in the material inputs utilized or in the wage goods consumed by workers. Surplus-value  $s_i$  represents the amount of labor-time,

again measured in money, that employers compel workers to perform in excess of  $v_i$ . Thus  $l_i = s_i + v_i$  is the total amount of direct labor, measured in money, devoted to the production of a unit of commodity  $i$ . Values  $\lambda_1, \lambda_2 \dots \lambda_n$  are therefore given by the expression

$$\lambda = \mathbf{c} + \mathbf{v} + \mathbf{s} = \mathbf{c} + \mathbf{l},$$

(1)

where  $\lambda, \mathbf{c}, \mathbf{v}, \mathbf{s}$  and  $\mathbf{l}$  are row vectors of the sectoral magnitudes  $\lambda_i, c_i, v_i, s_i$  and  $l_i$ .

Market prices may deviate from values owing to the gain or loss of value in exchange.

Denoting this gain or loss in sector  $i$  by  $g_i$ , we have:

$$\mathbf{p} = \mathbf{c} + \mathbf{v} + \mathbf{s} + \mathbf{g},$$

(2)

where  $\mathbf{p}$  is the vector of market prices and  $\mathbf{g}$  is the vector of the sectoral gains and losses of value in the course of exchange. Profits are given by the difference between price and costs:

$$\boldsymbol{\pi} = \mathbf{p} - (\mathbf{c} + \mathbf{v}) = \mathbf{s} + \mathbf{g}.$$

(3)

Sectoral profit rates are given in value terms by  $\rho_i = \frac{s_i}{c_i + v_i}$ , and in price terms by  $r_i = \frac{s_i + g_i}{c_i + v_i}$ .

The differentials that comprise  $\mathbf{g}$  are determined by the mechanism that equalizes sectoral profit rates: the elements of  $\mathbf{g}$  adjust to ensure that the profit ratios  $r_i = \frac{s_i + g_i}{c_i + v_i}$  are identical.<sup>15</sup>

Kliman and McGlone take Marx's assertion that value cannot be created in exchange to mean

<sup>14</sup> Analogous formulations can be found in Freeman (1996), McGlone and Kliman (1996) and Naples (1996).

<sup>15</sup> This point becomes clear only in the numerical illustration presented in the Appendix to Kliman and McGlone (1999). The initial impression is that the elements of  $\mathbf{g}$  are parametric and arbitrary, that is to say, unexplained. The supposition that profit rates equalize is problematic within the Temporal Single System framework; see below.

that the sum of the elements of  $\mathbf{g}$ , weighted by the outputs of the sectors to which they correspond, must be zero:  $\mathbf{g}\mathbf{x} = 0$ , where  $\mathbf{x}$  is the column vector of gross outputs, taken as parametric. From the supposition that  $\mathbf{g}\mathbf{x} = 0$  it follows trivially (since  $\boldsymbol{\pi}$  is defined to equal  $\mathbf{s} + \mathbf{g}$ ) that  $\boldsymbol{\pi}\mathbf{x} = \mathbf{s}\mathbf{x}$ : the sum of profits equals the sum of surplus-values.

Let  $\mathbf{A} = [a_{ij}]$  be an  $n$ -dimensional square matrix of unit input coefficients. In standard formulations the vector of labor-values is given by the solution to the system  $\boldsymbol{\lambda} = \boldsymbol{\lambda}\mathbf{A} + \mathbf{l}$ ; that is,  $\boldsymbol{\lambda} = \mathbf{l}[\mathbf{I} - \mathbf{A}]^{-1}$ . However, in line with the Temporal Single System view that prices and values determine one another sequentially over time, Kliman and McGlone make values in period  $t+1$  depend upon input prices of the preceding period:

$$\boldsymbol{\lambda}_{t+1} = \mathbf{p}_t \mathbf{A} + \mathbf{l}, \quad (4)$$

where the elements of  $\mathbf{p}_t \mathbf{A}$  correspond to the per-unit amounts of constant capital advanced to each sector; in Marxian notation we may write  $\mathbf{p}_t \mathbf{A} = \mathbf{c}_t = [c_{it}]$ . Similarly, prices in period  $t+1$  are determined by period- $t$  costs, adjusted by the monetary value gained or lost in exchange during period  $t$ :

$$\mathbf{p}_{t+1} = \mathbf{p}_t \mathbf{A} + \mathbf{l} + \mathbf{g}_t. \quad (5)$$

Multiplying the latter expression by the output vector, and recalling that  $\mathbf{g}\mathbf{x} = 0$  by assumption in each time period, we have  $\mathbf{p}_{t+1} \mathbf{A}\mathbf{x} - \mathbf{p}_t \mathbf{A}\mathbf{x} = \mathbf{l}\mathbf{x}$ . Kliman and McGlone interpret this last result as a demonstration that “Marx’s argument implies that ... the sole source of value added in price terms in any period is ... the living labor performed in the capitalist production process” (1999: 38); that is, prices depend upon values.

Within the Temporal Single System framework the price equations may also be written as:

$$\mathbf{p}_{t+1} = \mathbf{p}_t (\mathbf{A} + \mathbf{bl})(1 + r_t), \quad (6)$$

where the column vector  $\mathbf{b}$  gives the standard wage-basket, or the amount of each commodity consumed per unit of labor performed. Thus, the elements of  $\mathbf{p}_t \mathbf{bl} = \mathbf{v}_t$  represent the per-unit amounts of variable capital advanced to each sector. Period- $t$  prices are parametric: they are “the output prices of the preceding period” and hence constitute the given “initial conditions” of the price determination problem (Kliman and McGlone 1999: 50-51).<sup>16</sup> Kliman and McGlone close the system by fixing the profit rate, uniform across sectors owing to competition, as follows:

$$r_t = \frac{\mathbf{s}_t \mathbf{x}}{\mathbf{c}_t \mathbf{x} + \mathbf{v}_t \mathbf{x}} = \frac{\mathbf{lx} - \mathbf{p}_t \mathbf{blx}}{\mathbf{p}_t (\mathbf{A} + \mathbf{bl}) \mathbf{x}}.$$

(7)

Thus, in accordance with Marx’s claims, “The level of the profit rate depends only on the degree to which capital succeeds in pumping out surplus labor. It is therefore determinable upon the completion of the production process, before commodities go to market. Competition merely effects the equalization of profit rates at this previously determined level” (McGlone and Kliman 1996: 37). Kliman and McGlone conclude that Marx’s value theory, if interpreted in terms of Equations (1)–(7), is immune to the criticisms that have been leveled against it.

What are we to make of all this? The model we have just sketched hardly provides the basis for a persuasive defense of Marx’s value theory, as Kliman and McGlone contend. The problems begin with their definitions of Marx’s  $c$  and  $v$  as quantities of money advanced. Their observation that Marx reckoned his value magnitudes in money terms is unobjectionable. What

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<sup>16</sup> The Temporal Single System framework treats value in the price equations (6) as equivalent to market price. It is what an accountant would place under the heading of costs when calculating net revenues; so it is passed along into the value – read market price – of the commodity whose production is under consideration.

is problematic is the assertion that the money values that measure  $c$  and  $v$  do not coincide with the labor-values of the means of production and the wage goods consumed by workers.

There is a difficulty, first of all, in determining the magnitude of surplus-value and distinguishing it from paid labor. According to the Temporal Single System interpretation,  $v$  is the sum of *money* advanced to pay wages; it need not, and generally will not, match the amount of socially necessary abstract labor embodied in the wage goods required to support the workers who collaborated in the production process. The question arises: how then is the amount of surplus-labor  $s$  to be established? In the traditional interpretation the distinction between  $v$  and  $s$  is clear because, though both may be measured in money terms, each represents a quantity of actual labor-time. Thus, assuming that one dollar is equivalent to one hour of labor-time,  $v = \$30.00$  would mean that 30 hours of abstract labor are embodied in the wage goods consumed by a worker and his family in a typical week. If the work-week is 40 hours, the amount of surplus-value generated per worker per week would be 10 hours, or in money terms \$10.00, and the rate of surplus-value would be  $s/v = 10/30$ , or 0.333.

The schema described by Kliman and McGlone conceives variable capital simply as the wage bill. Since this sum need not be equivalent to the amount of labor, reckoned in money, contained in workers' wage goods, we have no criterion for decomposing the work-week into necessary labor and surplus labor. In their numerical examples, Kliman and McGlone assign arbitrary magnitudes to the  $s_i$ , on the presumption that the rate of surplus-value is given and equal across sectors, though subject to change from one period to the next. But taking the rate of surplus-value as parametric makes sense only if it is conceived as a ratio of quantities of labor-time. For otherwise the sum of money  $v$  would be the only observable component of the ratio and there would be no way objectively to establish the magnitude of the numerator  $s$ .

The problem may be approached from a different angle. Kliman and McGlone define the labor input vector  $\mathbf{l}$  to be equal to the sum of  $\mathbf{v}$  and  $\mathbf{s}$ . But in Equation System (6),  $\mathbf{l}$  measures physical quantities of direct labor actually expended in production.<sup>17</sup> A Temporal Single System theorist might want to reason that when the money value of a unit of labor is fixed at one dollar = one hour of abstract labor, the relation  $l_i = v_i + s_i$  permits us objectively to determine  $s_i$ , since both the sum of money  $v_i$  and the labor coefficient  $l_i$  are observable. This reasoning doesn't help, because within the Temporal Single System framework  $v_i$  represents the wage cost per unit of output, but does *not* correspond to any *observable* amount of labor-time. Since  $l_i$  is observable only as a quantity of labor-time,  $s_i$  can be derived from it only if  $v_i$  also represents a quantity of observable labor; for there is no sense in subtracting a sum of money from a quantity of labor. By the same reasoning, if  $v_i$  is observable as a sum of money,  $s_i$  can be derived from it only if  $l_i$  were also observable as a sum of money, which it is not.

To establish Marx's two invariance postulates – the sum of profits equals the sum of surplus-value; and, the sum of prices equals the sum of values – Temporal Single System theorists resort to a clumsy sleight of hand. Their argument, as developed in various laborious numerical illustrations (McGlone and Kliman 1996; Kliman and McGlone 1999; Ramos-Martínez and Rodríguez-Herrera 1996) amounts to this. Consider an economy comprised of two sectors. Using upper-case letters to denote total, as distinct from per unit, magnitudes, let  $K^* = K_1 + K_2$  and  $S^* = S_1 + S_2$  be the aggregate capital advanced and

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<sup>17</sup> Otherwise there would be an ambiguity concerning the dimensionality of **pbl**: if the elements of  $\mathbf{l}$  were here interpreted as quantities of money, the elements of **pbl** would be measured in meaningless units of money  $\mathbf{X}$  money. Ambiguities of this sort run through all attempts to formalize the Temporal Single

surplus-value for the economy as a whole. If the “profit rate” is defined as  $S^*/K^*$ , it follows trivially that the total profits – the “profit rate” multiplied by the aggregate capital advanced – will equal the sum of surplus-value:  $\frac{S^*}{K^*} = (K_1 + K_2) = S^*$ . Since prices are equal to cost of production, including normal profits, we have:

$$\begin{array}{rcccl} \left[1 + \frac{S^*}{K^*}\right] \cdot K_1 & = & C_1 + V_1 + S_1 & & \\ + & & + & & \\ \left[1 + \frac{S^*}{K^*}\right] \cdot K_2 & = & C_2 + V_2 + S_2, & \text{and therefore,} & \\ \hline \text{Total Price} & = & \text{Total Value} & & \end{array}$$

Far from clarifying the laws of surplus-value, this argument merely demonstrates that Kliman and McGlone know how to apply the laws of arithmetic. The Temporal Single System “vindication” of Marx is obtained by labeling price magnitudes “values”, calling the arbitrary and ill-defined ratio  $S^*/K^*$  the “profit rate”, and then laying out the accounting relations that follow from this idiosyncratic terminology.<sup>18</sup> To borrow a metaphor from Joan Robinson, they have put the rabbit inside the hat in full view of the audience!

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System argument. To insist that “Price and value are the same thing in different phases of the existence of capital” (Freeman 1996: 17) does not make clear how sense is to be made of the equations.

<sup>18</sup> In an early contribution along related lines, Alan Lipietz makes the following observation about how his own New Solution reading – which treats variable capital as the sum of money wages– validates Marx’s transformation: “The simple point is that [in my system the rate of exploitation] and [variable capital] do not have the same meaning, nor the same quantitative measure [as they do in Marx’s], though they serve as indices to represent the same theoretical concepts” (1982: 81). And Foley, an independent originator of this same approach, has recently remarked that it is not so much a solution as a New Interpretation, “since it proposes a particular definitional ordering of the key abstractions of the labor theory of value” (2000: 22–23). Temporal Single System Marxists extend this definitional reordering far beyond the New Solution, and add an idiosyncratic conception of Marx’s method. Unlike Lipietz, who is cautious not to attribute his definitions to Marx, and Foley, who hedges a bit, Temporal Single System Marxists do claim that their definitions coincide with Marx’s.

The Temporal Single System framework preserves Marx's invariance postulates by interpreting his value magnitudes as prices, while still calling them values. To justify this reasoning, its adherents appeal to the dialectical method:

Value and price are dialectically linked and form the contradictory unity of value and its form. The dualistic method used by Bortkiewicz, supposedly to correct the transformation, is based on an understanding of value different from Marx's... (Ramos-Martínez and Rodríguez-Herrera 1996:59).

[T]he persistence and dominance of the dual-system interpretation [is explained in part by] the tendency to read *Capital* linearly rather than dialectically. Initial statements that commodities' values are determined by the labor-time they contain ... are read as transparent definitions requiring no enrichment of meaning, so that Marx's subsequent development of the concept of value is forced to conform equally transparently to the definitions of be judged self-contradictory (Kliman and McGlone 1999: 40).

Because *Capital's* projects and concepts ... are inherently critical, Marx's work becomes subject to distortion when forced into the mould of economic theory.... The dialectical meaning of the term "transformation" ... differs from its use as a synonym for a mathematical mapping. Many ... of Marx's critics view his transformation procedure precisely as a failed attempt to map a self-contained set of values onto another self-contained set of prices of production.... [W]hat goes unrecognized is that this transformation is but one of many transformations into opposite discussed throughout the three volumes of *Capital*, none of which are mappings (McGlone and Kliman 1996: 29, 34).

This stance, if accepted as a guiding principle of exegesis, would completely insulate Marx from criticism on matters of economic theory; for almost any theoretical error attributed to him could be explained away by arguing that the critic had projected the categories of bourgeois economic discourse onto Marx's more philosophically nuanced dialectics.

I do not dispute the importance of the dialectical method in Marx’s work. But beginning in the 1840s he had sought to demystify the dialectic by turning Hegelianism on its head, that is, by grounding the dialectic in historical materialism (see Marx’s letter to Kugelmann of March 6, 1868, Marx and Engels 1864–68: 544; and his Afterword to the Second German Edition of *Capital*, Vol. I, 1883: 29). The fluid Temporal Single System use of terminology – in which “value” somehow represents labor-time but is nevertheless conceptually indistinguishable from the word “price” – is more characteristic of Hegel’s dialectic than of Marx’s, and is difficult to reconcile with Marx’s aim of making his critique of capitalism accessible to working-class readers.<sup>19</sup>

In any case, the debate is at bottom about Marx’s economics, not his dialectics. The models found in the Temporal Single System literature aim to establish the coherence of Marx’s account of how values, prices and distribution are interrelated. If the issues at stake were not at some essential level the same as those addressed by Ricardo and Bortkiewicz, there would be no sense in setting out the problem in the form of equation systems that are structurally analogous to those of Sraffa.

But the Temporal Single System equations don’t clarify the economic issues. Kliman and McGlone insist that Equation System (6) –  $\mathbf{p}_{t+1} = \mathbf{p}_t(\mathbf{A} + \mathbf{bl})(1 + r_t)$  – is an accurate

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<sup>19</sup> Marx concedes that in elaborating his theory of value he “coquetted with the modes of expression peculiar to [Hegel]” (1883: 29), mainly to deliver a poke in the eye to contemporary mediocrities who had been dismissive of Hegel. In his student days, Marx ridiculed the obscurities of Hegel’s dialectic in a withering free-verse poem:

Words I teach all mixed up into a devilish muddle,  
 Thus, anyone may think just what he chooses to think;  
 Never, at least, is he hemmed in by strict limitations.  
 Bubbling out of the flood, plummeting down from the cliff,  
 So are his beloved words and thoughts that the poet devises;  
*He* understands what he thinks, freely invents what he feels.  
 Thus, each may for himself suck wisdom’s nourishing nectar;

representation of Marx's transformation procedure, with  $\mathbf{p}_t \mathbf{A}$  and  $\mathbf{p}_t \mathbf{b}$  equivalent to Marx's value categories  $c$  and  $v$ . The profit rate is determined by the ratio of surplus-value to the capital advanced, as in Equation (7). Until input prices are established the system has  $n$  degrees of freedom. Thus we should not be surprised that both of Marx's invariance postulates can hold within it: no mathematical contradictions can arise because the model is spectacularly underdetermined. To this criticism – first raised in 1995 by Gil Skillman in an unpublished note – Kliman and McGlone respond that the input prices  $\mathbf{p}_t$  are parameters, not unknowns, and that once they are specified the system is fully determined. Here, though, the “invariance postulates” don't operate as constraints on the price solution – as Marx surely intended them to do – and hence don't overdetermine the system. Since, in this peculiar shell-game, the elements on the right hand side of Equation System (6) are labeled – or, rather, *mis*labeled – “values”, the “invariance postulates” will hold as accounting identities. But precisely because they hold as accounting identities rather than as constraints on the price solution, the Temporal Single System conceptualizations of the invariance postulates cannot be regarded as equivalent to Marx's.

In fact, Equation System (6) is not even a mathematical system, strictly speaking. With  $\mathbf{p}_t$  and  $r_t$  given as initial conditions, each price equation is self-contained and can determine the  $t+1$  price to which it corresponds, *without any reference whatsoever to the other equations!* Thus, Marx's Temporal Single System defenders have “vindicated” him by reducing his value analysis to a problem of elementary arithmetic that even the dullest schoolchild could solve. One must wonder whether he is well-served by such a vindication.

As if all this weren't enough, the determination of the profit rate in Equation (7) is a question-begging fudge. Kliman and McGlone provide no justification for their implicit

supposition that the profit rate given by Equation (7) corresponds to the rate that competition will tend to establish in the actual economy. Their model contains enough degrees of freedom to permit them to fix the variable  $r_t$  in this way without giving rise to a contradiction. But this does not mean that they have explained the profit rate. Any number pulled out of a hat would meet their criterion of avoiding a mathematical inconsistency.<sup>20</sup> Their rationale for Equation (7) is that it aligns with Marx's claim that the profit rate depends on the proportion of surplus-value to the constant and variable capital advanced. This claim, though, is one of the propositions that Bortkiewicz's critique called into question: Kliman and McGlone assume what they need to prove.

Kliman and McGlone further confuse matters by adopting the traditional uniform profit rate condition, without stopping to realize that the average profit rate is a conceptual center of gravitation that – flukes aside – can prevail only when market prices coincide with long-period prices of production. The intersectoral capital flows that cause profit rates to equalize in Marx's theory are triggered by profit rate differentials associated with deviations between market prices and prices of production. The mechanism that equalizes profit rates simultaneously brings market prices into line with prices of production (Marx 1894: 178–181, quoted in Section 2 above). If market prices do not coincide with prices of production, there is no reason to think that the profit rate will be uniform across sectors. To assume a uniform profit rate in such circumstances amounts to imposing an arbitrary condition on the sectoral mark-ups. Kliman and McGlone maintain, as though it were a discovery of great consequence, that the uniform profit rate condition is compatible with virtually any set of prices (1996: 39–40). This is true only if (i) one enlarges the number of degrees of freedom of the model by removing all

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<sup>20</sup> Indeed, their model is so constructed that  $r_t$  is not even constrained to lie on the  $w-r$  trade-off

constraints on input prices; and (ii) one exhibits no curiosity about the mechanism that establishes the uniform profit rate. That is to say, it is true only if one subordinates the economics of the problem to the mathematics.

Freeman and Naples at least recognize that the uniform profit rate condition is linked to the way prices are conceptualized. As Freeman rightly observes,

The simplification [of assuming that input prices coincide with output prices] cannot be conveniently dropped.... It is of a piece with the equal profit rate assumption. Without it there would be  $n$  equations connecting  $2n$  unknown prices and  $n$  unknown profit rates. Of these,  $n$  are removed by fixing output prices to be identical to input prices. A further  $n-1$  are removed by the equal profit rate assumption, and the system is then determinate to within a ratio, the famous *numéraire*. No constant prices, no solution (1996: 19).

Apparently forgetting that Marx regarded the uniform profit rate condition as a useful analytical device, Freeman condemns it as an axiom generated entirely by the mathematical requirements of economic theory. But the claim that profit rates tend to equalize is not an axiom; nor is it devoid of scientific content. It is a proposition, grounded in reason and observation, about how capitalism functions. Whether capitalism does in fact function in accordance with that proposition – whether profit rates do tend to converge – is an empirical matter that lies beyond the scope of this essay. The point is that Freeman's complaint that the uniform profit rate condition "eliminates all indeterminacy by assuming away all external determinations of price" is simply incorrect; the proposition is not refuted by the mere fact that at any given moment profit rates are not equal.

Naples (1996) also rejects the uniform profit rate condition. Her  $n$ -sector model, by my reckoning, contains  $n$  degrees of freedom. The number of unknowns exceeds the number of equations to such an extent that no contradiction can possibly arise by imposing both of Marx's invariance postulates; the model assumes what it wants to prove. Closure – that is, determination of absolute prices in period  $t+1$ , given period- $t$  prices – requires that the rate of mark-up over costs be given for each sector, though she says nothing about what determines these mark-ups. One might think that since all of the prices in the model are market prices, the mark-ups could only be determined *post factum*, that is, only *after* the selling prices have been realized in the market. Be that as it may, Naples betrays no awareness that anything might be amiss when she remarks, by way of summarizing her model's results, that “more information on the historical structure of capitalist competition is necessary before relative prices can be known” (1996: 111). We are now a long way from Marx's project, a central aim of which was to explain the remuneration of capital in terms of the conditions of production of material inputs and labor power. Naples turns this question on its head: the remuneration of capital is treated as arbitrarily given by “the historical structure of capitalist competition” in order to validate Marx's invariance postulates. But Marx adopted the invariance postulates in the first place only to explain the remuneration of capital: like Kliman and McGlone, Naples assumes what needs to be demonstrated.

## 5. The Textual Evidence

Temporal Single System theorists acknowledge that Bortkiewicz's critique is sound as regards the traditional long-period interpretation of Marx's value analysis. What they claim is that the critique is directed at a misrepresentation of Marx's theory; when Marx is correctly

interpreted – as having sought to explain the sequential movement of actual market prices and values (defined as money costs) – the usual criticisms no longer apply.

Naples puts an interesting spin on this argument when she characterizes Bortkiewicz’s contribution as the “discovery of a contradiction between Marx and equilibrium.” Bortkiewicz’s mistake was to allow “his simplifying equilibrium assumptions to vitiate Marx’s most critical concept[s]: that the capitalists’ ownership of the means of production permits them to extract both necessary and surplus labour from workers, and that their labour productivity explains both prices and the profit rate” (Naples 1996: 97). How Bortkiewicz’s argument “vitiates” these concepts is unclear, since they both hold (though not exactly as Marx supposed them to) within the conventional interpretation. In any case, according to Naples, Bortkiewicz demonstrated that if a uniform profit rate condition is imposed on a

Simultaneous-time [*sic!*] model ... the system of equations becomes overdetermined. But Marx would argue that it is not he but capitalism which is internally inconsistent. Its tendency towards a uniform profit rate cannot be realized. He would agree with Walras that the promise of socialism hinges on demonstrating the irrationality of capitalism. And he would applaud the success of his labour theory of value in demonstrating precisely that (1996: 111–112).

In this deformed analogue of Samuelson’s eraser solution, the contradictions exposed by Bortkiewicz are resolved by a semantic waving of hands: the contradictions are not Marx’s but capitalism’s, and they become apparent only when we try to fit his theory into an equilibrium straightjacket and then “discover” what appear to be errors in it.<sup>21</sup> Naples argues that “the

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<sup>21</sup> “[W]hen you cut through the maze of algebra and come to understand what is going on, you discover that the ‘transformation algorithm’ is precisely of the following form: ‘Contemplate two alternative and discordant systems. Write down one. Now transform by taking an eraser and rubbing it out. Then fill in the other one. *Voilà!*’” (Samuelson 1971: 400). Freeman (1996: 11) blithely remarks that “One need

labour theory of value was Marx's 'hard core' [in the sense of Lakatos 1978] and therefore incapable of refutation from within his own paradigm.... He would have rejected equilibrium as an 'inappropriate abstraction' inconsistent with his core principles" (1996: 97).

I think it doubtful that the inventor of historical materialism would have defended his own theory by insisting that its premises are not subject to scientific scrutiny. Beyond that, however, Naples's reasoning reflects a central defect of Non-equilibrium Marxism –that the main argument adduced in support of its interpretive stance is that this interpretation, and the idiosyncratic terminology that goes with it, provide a rhetoric in which certain questionable propositions put forth by Marx can be made to *appear* correct. A cursory examination how Non-equilibrium Marxists handle the textual evidence reveals that careful attention to nuance and context is not characteristic of their approach.

The following passage occurs in *Capital*, Vol.I:

Magnitude of value expresses a relation of social production, it expresses the connection that necessarily exists between a certain article and the portion of total labour-time of society required to produce it. As soon as magnitude of value is converted into price, the above necessary relation takes the shape of a more or less accidental exchange-ratio between a single commodity and another, the money-commodity. But this exchange-ratio may express either the real magnitude of that commodity's value, or the quantity of gold deviating from that value, for which, according to circumstances, it may be parted with. The possibility, therefore, of quantitative incongruity between price and magnitude of value, or the deviation of the former from the latter, is inherent in the price-form itself (1883: 102).

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*only* assume that the value advanced by capitalists is represented by the money they pay instead of the value of what they buy, and [Marx's] theory becomes coherent." *Voilà!*, as Samuelson might say.

Working from a translation that writes “transformed” for “converted”, Freeman (1996: 10–11) offers this passage as evidence that Marx had no need to transform inputs in Volume III, “because the transformation is already given in Vol. I”. But the passage merely makes a routine point that no one disputes, that money-denominated prices can diverge from labor-values for both systematic and accidental reasons. In drawing a connection to Volume III, on the basis of nothing more than the presence of the word *transformed*, Freeman fails to notice that the passage provides no support at all for the Temporal Single System position.

Similarly, when Marx writes in Volume II (1893: 106) “that value functions as ... capital only in so far as it remains identical with itself and is compared with itself in the different phases of its circuit, which are not at all ‘contemporary’ but succeed one another,” Freeman (1996: 16) sees proof that Marx’s methodological views are incompatible with the simultaneous determination approach. But Freeman’s reading is a *non sequitur*. Neither Bortkiewicz nor Sraffa, nor anyone else, claims that Marx adopted a simultaneous determination approach in his discussion of value and price. What is at issue is whether he conceived of values and prices as long-period centers of gravitation, in which case some of the problems that arose in his analysis of value can be resolved only within a simultaneous determination framework. The quoted passage has no bearing on this point. Nor is the simultaneous determination method at all in conflict with Marx’s quite sensible observation that capital changes form over time as it passes through the various phases of its circuit.

In *Theories of Surplus Value* (1862–63, Vol. II: 167) Marx tells us that

Every commodity which enters into another commodity as constant capital emerges as the result, the product, of another production process. And so the commodity appears alternately as a pre-condition for the production of other commodities and as the result of

a process in which the existence of the other commodities is the pre-condition for its own production.

To Freeman (1996: 16) this statement can only be interpreted as supportive of a method of successive determination in chronological time. Readers less fixated on grinding the Temporal Single System axe might perceive that the statement is equally consistent with a view of production as a circular process in which commodities are produced by means of commodities – and that important aspects of an economic system so-conceived can be elucidated through simultaneous equation models of the sort developed by Bortkiewicz and Sraffa.

Kliman and McGlone focus on a different set of passages in Marx's work, but exhibit the same inclination to claim even the most open-ended statements as evidence in favor of the Temporal Single System interpretation. For example, they cite the following passage from *Capital*, Vol. I: "The means of production on the one hand, labour-power on the other, are merely the different modes of existence which the value of the original capital assumed when from being money it was transformed into the various factors of the labour-process" (Marx 1883: 20). From this statement Kliman and McGlone (1999: 38) conclude that for Marx "the value of capital ... is not synonymous with the values of inputs purchased with it," since "the capital value is the sum of value [that is the sum of money, G.M.] advanced to acquire inputs, which can clearly differ from the value [that is, the labor-value] of the inputs themselves." None of this however is implicit in Marx's statement, which says only that capital changes form over the course of its circuit. In as much as the passage appears in Volume I, throughout which Marx assumes that commodities exchange in proportion to their labor-values, the meaning Kliman and McGlone wish to assign to it is a considerable stretch. When Marx observes a few lines later that should the price of cotton double, it will transfer twice its value to goods for which it is an

input, Kliman and McGlone conclude that the value transferred is a price magnitude. Yet Marx attributes the cause of the doubling of the price of cotton to an increase in the amount of labor embodied in each pound of it, owing to a crop failure; and again, Kliman and McGlone forget the presumption throughout Volume I that price and value coincide.

Kliman and McGlone also mention the well-known passage in which Marx appears to have acknowledged the need to weight inputs by their prices of production:

Since the price of production may differ from the value of a commodity, it follows that the cost-price of a commodity containing this price of production of another commodity may also stand above or below that portion of its total value derived from the value of the means of production consumed by it. It is necessary to remember this modified significance of the cost-price, and to bear in mind that there is always the possibility of an error if the cost-price of a commodity ... is identified with the value of the means of production consumed by it (1894: 164–165).

According to Kliman and McGlone (1999: 39), Marx is not here acknowledging an error of his own, but is warning against the dualist “error” of supposing that the capital-value advanced is equivalent to the labor-time embodied in the material inputs and wage goods that enter into the production process.

But the point of the passage is to elaborate one of the various reasons that prices of production may deviate from values, and there is nothing in it which supports the Temporal Single System claim that the money cost of inputs passes into the value of outputs. On the contrary, immediately prior to the passage just reproduced Marx writes that “for the buyer the price of production of a specific commodity it is its cost-price, and this may pass as cost-price into the *prices* of other commodities” (emphasis added). I grant that the point Marx was trying to make in the longer passage is not transparent. But this last remark about cost-price passing

into prices suggests that if we are to assign any significance to the longer passage, we should favor the traditional reading (Marx realized that inputs need to be transformed) over the Temporal Single System interpretation (Marx's  $c$  and  $v$  are price magnitudes and therefore don't need to be transformed). This last quoted comment lends support to the dualist view that Marx regarded values and prices as components of two distinct (but not unconnected) systems.

To take a final example, McGlone and Kliman (1996: 35) refer to a letter of June 27, 1867, in which "Marx explicitly equates 'cost-price' with the 'price of the constant part of capital + wages' and notes that his transformation 'presupposes' that various value magnitudes appear as sums of money." An examination of the letter reveals however that Marx "presupposes" nothing of the sort. The rather obvious fact that constant and variable capital take the form of money magnitudes in a market economy is not contested by any interpreter of Marx; nor is there anything significant in his equating cost-price with the sum of material input costs plus wages: his definition of cost-price is not a matter of controversy. What is in contention is whether, in his discussion of the transformation, Marx conceived of  $c$  and  $v$  as price magnitudes or as quantities of labor-time. The letter offers no clear insight, one way or the other, on this question. Marx writes to Engels that explaining the transformation of value into price of production "presupposes" that the transformation of the value of labor-power into wages, of surplus-value into profits, and of profits into average profit have been explained – and this is the only thing that he presupposes in the letter. The exact meaning of all this is open to discussion, but his remarks do not give us any reason to think that he'd already transformed the input side, as McGlone, Kliman and the rest of the Temporal Single System school contend.

A central tenet of the Temporal Single System approach is that the interpretations associated with Bortkiewicz and Sraffa inappropriately project Ricardo's analytical framework

onto Marx. Non-equilibrium Marxist object, in other words, to what they regard as the misleading “transformation of Marx into Ricardo”, as Rodríguez-Herrera (1996) puts it in the title of his contribution to the Freeman and Carchedi collection. The view that Marx and Ricardo were working in the same theoretical tradition is not a uniquely Sraffian position, however. Schumpeter thought it an ‘obvious truth’

that, as far as pure theory is concerned, Marx must be considered a ‘classic’ economist and more specifically a member of the Ricardian group. Ricardo is the only economist whom Marx treated as a master. ... Marx used the Ricardian apparatus: he adopted Ricardo’s conceptual layout and his problems presented themselves to him in the forms that Ricardo had given to him. No doubt, he transformed these forms and he arrived in the end at widely different conclusions. But he always did so by way of starting from, and criticizing, Ricardo — *criticism of Ricardo was his method in his purely theoretical work* (Schumpeter 1954: 390).

But even if we leave aside Schumpeter, Sraffa and the rest of the literature published after Marx’s death, the difficulty with the Temporal Single System position is that Marx himself acknowledged his Ricardian roots.

In his 1873 Afterword to the second German edition of *Capital*, Vol. I, Marx refers approvingly to the assessment of a Russian professor, Nikolai Sieber, “of my theory of value, money and capital, as in its fundamentals a necessary sequel to the teaching of Smith and Ricardo.” He goes on to cite, also with approval, Sieber’s judgement that “In so far as it deals with actual theory, the method of Marx is the deductive method of the whole English school whose failings and virtues are common to the best theoretic economists” (Marx 1883: 16–17).

One finds in Marx numerous statements that depict classical political economy as a theory concerned with explaining how a capitalist economy generates and allocates a surplus to consumption and accumulation, and among social classes. *Theories of Surplus Values* contains an

intriguing – and sympathetic – passage on the Physiocrats which is strikingly evocative of the corn-ratio theory of profits that Sraffa attributes to Ricardo (see fn 4 above):

The difference between the *value* of labour-power and *the value created* by it — that is, the surplus-value which the purchase of labour-power secures for the user of labour-power — appears most palpably, most incontrovertibly, of all *branches of production*, in *agriculture*, the primary branch of production. The sum total of the means of subsistence which the labourer consumes from one year to another, or the mass of material substance which he consumes, is smaller than the sum total of the means of subsistence which he produces. In manufacture the workman is not generally seen directly producing either his means of subsistence or the surplus in excess of his means of subsistence. The process is mediated through purchase and sale, ... and the analysis of value is necessary for it to be understood. In agriculture it shows itself directly in the surplus of use-values produced over use-values consumed by the labourer, and can therefore be grasped without an analysis of value in general... (Marx 1862–63, Vol. I: 46).

And in Volume III of *Capital*, Marx (1894: 114) comes close to attributing this sort of argument to Ricardo (though not with specific reference to Ricardo’s pre-1816 writings): “It leaps to the eye, particularly in the case of agriculture, that the causes which raise or lower the price of a product, also raise or lower the value or capital, since the latter consists to a large degree of this product, whether as grain, cattle, etc. (Ricardo).”

These passages make clear that Marx recognized the structural similarity between his own conceptual apparatus and the profit theories of the Physiocrats and the classical political economists, particularly Ricardo, whose *Essay on Profits* (1815) appears to have been grounded in corn-ratio reasoning. Marx also grasps the limitations of the corn-ratio argument: its central premise – physical homogeneity of product, means of production and workers’ means of subsistence – does not carry over to manufacturing sectors, so that the general analysis of the

process by which a surplus is created and appropriated requires a theory of value. Here we have further evidence that Marx's labor-value analysis was intended to solve the technical problem of how to expose the relations connecting wages, the material conditions of production and the profit rate, given the interdependence of exchange values and distribution.

## 6. Conclusion

Temporal Single System theorists claim to have put forth “a defensible interpretation” in which Marx's value theory and transformation procedure are found to be “internally consistent”. They maintain further that, in the absence of compelling evidence to the contrary, Marx's work should be debated on the basis of an interpretation that attributes coherence to his arguments and makes sense of each of his analytical categories and propositions in relation to all of his other principal categories and propositions. Thus, “It is a matter of simple intellectual honesty that [Marx's critics] now either demonstrate that [the Temporal Single System argument] is internally inconsistent, or renounce claims to have refuted him on logical grounds” (Kliman and McGlone 1999: 44–45).

But as the preceding pages show, the case against the Temporal Single System interpretation *is* compelling. We saw in Section 4 that, on the Temporal Single System definitions of Marx's categories, there is no way to decompose the work-week into necessary labor and surplus labor. We saw also that Temporal Single System models avoid the appearance of inconsistency by introducing so many degrees of freedom that Marx's invariance postulates cannot possibly be violated: the models are so open-ended that they explain nothing at all, let alone the phenomena that Marx was trying to understand. The mere absence of arithmetical error does not render a model coherent, in the sense of providing a meaningful set of

propositions about what the world is like. If the Temporal Single System reading were correct, Marx's theory would still be vulnerable, on these grounds, and on the other points raised in Section 4.

According to the Temporal Single System criteria of textual exegesis, not only is the absence of arithmetical error sufficient to establish the "coherence" of a particular interpretation of Marx's value theory; but the presence of a technical error in his discussion of the relation between value and price would render his entire theoretical system *incoherent*. There is of course another possibility – that Marx's theory is sound in its fundamentals, though he lacked the technical apparatus to give it precise formal expression. On this reading, the labor-value analysis emerges as an ingenious device that enabled Marx, like Ricardo before him, to expose and clarify relationships that are central to how capitalism functions, in particular the relationships that connect the technical conditions of production, the profit rate and the real wage to one another. Likewise, his demonstration that prices deviate from labor-values in a systematic fashion, depending upon whether the organic composition of capital in any given sector is higher or lower than the average composition, is an impressive analytical achievement. Modern analytics have shown that these results are, in the main, correct, notwithstanding the blunt and imperfect character of the device – the labor-value theory – by which Marx arrived at them.

Textual support for the Temporal Single System defense is thin, as we have just seen in Section 5. The Marx of the Temporal Single System school is deracinated, severed from the Ricardian tradition that Marx himself acknowledged as the basis for his political economy. This deracination exacts a heavy cost. For the sake of rehabilitating an obsolescent and flawed tool,

Temporal Single System Marxists have redefined Marx's theoretical project in a way that deprives it of its scientific content.

Marx sought to identify and explain the tendential laws of motion that underlie capitalism's surface phenomena. Non-equilibrium Marxism identifies these same surface phenomena as the objects of its analysis: its models purport to explain the sequential movements of prices and "values" through every moment of time. In this respect, the Temporal Single System approach has less in common with Marx's economics than with modern intertemporal general equilibrium models that determine sequences of temporary positions. A model of this type is of limited applicability unless there are reasons to think that the actual magnitudes of the economy will coincide with those predicted by the model. For the economy begins to move away from such a predicted temporary position – that is, toward the next predicted position – the moment it is established. If actual and predicted magnitudes don't coincide, the scientific significance of the latter is minimal: for it is then neither observable itself, and, since it is not a center of gravitation, neither does it exert any influence on the variables that *are* observable. Observed magnitudes may diverge from the magnitudes predicted by Temporal Single System models for all the same accidental reasons that they can deviate from the magnitudes predicted by a long-period equilibrium model. But such deviation, routine and harmless in long-period analysis, have serious consequences for intertemporal models: as the system moves further in time from its initial position, the impact of small, and inevitable, errors in the calculation of the temporary positions is likely to be amplified, causing the deviations between predicted and observed magnitudes to widen significantly over time.<sup>22</sup>

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<sup>22</sup> This problem was identified more than six decades ago by John Hicks (1936: 241), one of the originators of the intertemporal method.

Freeman (1996: 20) describes the Sraffian reading of Marx as little more than “mathematically pure ideology”. Naples, as we noted in Section 2, asserts (wrongly) that the equilibrium method implies neoclassical results. McGlone and Kliman (1996: 29) characterize their defense of Marx “as an attempt to combat an ideological attack on his ... ideas.” It is not at all clear, though, in what sense the exposure of a technical error in Marx’s analytics constitutes “an ideological attack on his ideas” – especially when the explicit purpose of at least some critics of the transformation algorithm is to establish that on fundamental matters Marx was on the right track.

Ian Steedman’s conclusion to *Marx after Sraffa* (1977: 206) contains the following, usually overlooked, lines:

The Sraffa-based critique [has] significant implications for Marx’s work but it does not entail a sweeping rejection of the entire edifice.

... [T]hat critique is in no way destructive of the project of providing a materialist account of the capitalist mode of production; nore is it in the least inconsistent with the attempt to build a fully articulated social, political and economic account of particular capitalist social formations. More specifically, many aspects of Marx’s political economy, because they are independent of his reasoning in terms of value magnitudes, are unaffected by the Sraffa-based critique. For example, the concepts of labour, of labour-power and of surplus labour are quite untouched by that critique. So are Marx’s emphases on the labour process, on coercion therein, and on the everchanging nature of the labour process resulting from both workplace conflicts and the competitive struggle. Equally unquestioned is Marx’s stress on accumulation involving both quantitative expansion and qualitative development.

What the Temporal Single System argument lacks is a clear and persuasive statement of why Marx, after Sraffa, requires a labor-value analysis at all. Sraffa’s work shows that his rich account of capitalist production relations can be given robust foundations – without the

labor-value analysis, and at no cost to his materialist framework. Temporal Single System Marxism attempts to rescue the labor-value analysis by interpreting it in a way that renders it incapable of answering non-trivial questions. In this exchange of non-equivalents, Marx loses far more than he gains.

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