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Unproductive Labor and the Smile Curve

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Abstract

A production boundary consistent with Marx's theory of value may be drawn around labor that is quantitatively predicated by output at the point of exchange, as opposed to being merely causally predicated. The key difference between that production boundary and received Marxist doctrine on unproductive labor is that all other labor is excluded, rather than only such other labor that also falls to be treated as forming part of the "sphere of circulation." Alternatively put, both sides of the "smile curve" are unproductive of value, rather than just the right-hand side. This conclusion substantiates the analytical nexus as between material production and global inequality to be found in critical global value chain literature.

JEL Classification: B51, D43, D46, F66, O34

Keywords

global value chains, inequality, material production, intangible assets, value theory, unproductive labor

1. Introduction

This article seeks to make a contribution to the theoretical framework within which critical global value chain scholarship (and critical scholarship in related areas, e.g., global wealth chains; the global production network) takes place. Further, the principal intended readership of this article is scholars who (in common with the author of this article) work critically on global production and global value sequestration specifically from a position outside of formal economics (i.e., in such disciplines as economic geography, international political economy, critical accounting, critical legal studies, critical management studies, fiscal sociology, and so on). The fact that the intended readership of this article is one working from a position outside of formal economics is important: a guiding principle behind its argument is that, while it deploys a Marxian value-theoretical framework in order to develop its contribution, it is not intended to commit any scholar who makes use of its conclusions to the disciplinary siloing and methodological exigencies of Marxist economics, still less any specific branch of it.

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"Critical" scholarship for the purposes of identifying the readership of this article is scholarship that is critical specifically of the uninterrogated application of the concept of "value added" in discussion around global value chains. The section of this introduction immediately following elaborates briefly upon that definition and sets out in summary form what this article has to offer to scholars falling within it (the remainder of this introduction serves a subsidiary purpose which is explained subsequently).

Value added is an accounting artifact pertaining to business entities and it means accounting profits plus wages. It is an important concept in global value chain analysis because scholars and technocrats are alert to the fact that, when disaggregated globally along value chains, some business processes "add" more "value" than others. What this means is that those processes generate more accounting surplus at value chain nodes (prior to its allocation as between workers and owners) than other processes. In other words, some disaggregated business functions are associated with higher wages and/or profits than others. An uncritical perspective might accept that the value added accruing at a value chain node reflects the contribution made at that node to the market value of the ultimate product at the consumer end of the value chain. A "critical" perspective on global value chains is defined here as one which, by contrast, treats that capitalist accounting outcome with a degree of suspicion or circumspection, allowing for the possibility that high value added potentially reflects mere value *capture* at the node in question as opposed to value *creation*.

As further elaborated in section 2 of this article, that attitude of suspicion or circumspection as regards capitalist accounting outcomes in global value chains forms part of an analytical nexus as between material production and global inequality. In broad summary, value is often seen by scholars working in this area to be created by low-paid workers in low-margin value chain nodes performing material production in poor countries, while wealth accrues to the shareholding classes of rich countries by dint of value capture effected by means of intangible assets held by lead firms. The contribution of this article is to do with the ways in which that suspicion or circumspection, having that significance as regards structural global inequality, may be formalized as a foundational theoretical element for scholarship in this area.

In pursuit of that contribution, section 2 of this article goes on to briefly describe three possible approaches to formalizing that suspicion or circumspection, that is, (1) monopoly rent, (2) the distinction between productive and unproductive labor in Marxist economics, and (3) a more expansive definition of unproductive labor that accords more closely with that aforementioned analytical nexus as between material production and global inequality, but that Marx condemned as "crude materialism." In essence, this article advocates the use of "crude materialism," and shows how that theoretical framework may be deployed with some degree of fine-graining as regards the question whether a given kind of labor taking place at a value chain node under consideration is or is not value creating. And, in addition, as a core element of its contribution, this article roots "crude materialism" in a coherent and widely recognized value-theoretical framework. Paradoxically, however, that value-theoretical framework is Marx's. This article therefore places its understanding of the distinction between productive and unproductive labor in opposition to the received one in Marxist economics.

Setting out that oppositional stance is not, however, a primary purpose of this article. The purpose here is primarily to provide a *free-standing* distinction between productive and unproductive labor which will serve critical value chain scholars as a robustly theorized substitute for an otherwise merely implied "crude materialism." That being the case, the article is not presented or structured as a contribution to Marxist debates about the distinction between productive and unproductive labor, and it seeks to deploy as little as possible by way of Marxist analytical tools outside of core value-theoretical principles. Having in mind an additional potential readership of scholars doing theoretical work on the foundations of Marxist political economy, however, the core claims in the article, insofar as they constitute a stance within those debates, are therefore extracted here in the remainder of this introduction by way of signposting for that readership.

The starting point of that subsidiary contribution is that value is what it is, and labor either does or does not create it, irrespective of what Marx himself may have written about the distinction between productive and unproductive labor. Accordingly, it is an error to treat this question as being susceptible to determination on the basis of Marxian authority regarding that distinction. That said, one of Marx's core statements on the distinction between productive and unproductive labor, that is, the passage in *Capital*, volume 2, where he distinguishes the work of starting a fire with the role of the fire's fuel, is deployed here as a useful guiding analogy. The point typically drawn from that analogy is a distinction between the sphere of production and the sphere of circulation, but here the analogy is read as distinguishing labor which is a mere *cause* of a commodity undergoing exchange from labor that is *quantitatively* implicated by it (and therefore productive). That distinction is advanced here as the key to the productive/unproductive binary, flowing as it does from the fundamental theoretical starting point of abstract labor, and flowing into all the detail of how the distinction is to be applied in practice.

The reason that quantitative implication is necessary, and a merely causal relation is insufficient, is because value in the Marxian schema is not concretely created by labor but is, rather, projected back onto purely *notional* prior labor by the social mechanism of exchange. This can only be a quantitative effect of exchange in relation to prior labor that is quantitatively implicated by the commodity at that point, by reference to prevailing conditions of production. This should not be a controversial claim—it is simply how value in the Marxian value-theoretical schema works. But its implications for the distinction between productive and unproductive labor are nonetheless controversial, because those implications accord more closely with "crude materialism" than with received doctrine.

Value creation takes place in mines and on farms, on fishing and container vessels, in factories and at logistics hubs, in goods vehicles and at retail outlets; in all the processes that bring physical commodities from extraction to consumption along the commodity chains of which the global production network is composed. This much is recognized across the spectrum of Marxist and non-Marxist value-theoretical standpoints. But the implication of Marx's social theory of value is that more or less every other business function, however deeply implicated in capitalist profitability, however socially useful, however functional upon human creativity of various kinds, serves not to create value but (if profitable) to capture it merely, from that underlying essentially material dynamic. This assertion stands in contrast to received Marxist doctrine that (as pointed out in section three) generally treats all labor as productive if it is implicated in capitalist profitability, subject to certain questionably founded subtractions.

Sections 2, 3, and 4 of this article set out in detail the theoretical framework summarized in the foregoing introductory remarks. Section 5 contains the substantive contribution of the article, insofar as it extrapolates from Marx's conception of value a step-by-step guide to distinguishing productive from unproductive labor, with the "crudely materialist" implications for critical value chain scholarship flagged up as the discussion proceeds. Section 6 concludes.

2. The Value Problem in Critical Value Chain Scholarship

The phenomenon of varying value added as between disaggregated business functions is most readily encountered in the so-called "smile curve" or "smiling curve" (OECD 2013) originally described by Acer co-founder Stan Shih, and this article accordingly offers the smile curve as a lens through which to understand its contribution. The smile curve plots product life-cycle chronology (i.e., tracking the product from development through manufacture to sales) on the x-axis, and value added on the y-axis. The shape of the resulting curve is (schematically at least) a smile. This smile reflects the fact that (a) preproduction processes on the left of the curve like research and development, design, and so on and (b) sales-oriented processes on the right of the curve like branding, marketing, advertising, and so on all "add" a lot of "value." In the middle of the curve, by contrast, where raw materials extraction, agriculture, manufacture, bulk transportation, and so

on take place, there is a deepening dip reflecting the low value added (i.e., low wages and/or profits) associated with those functions.

The smile curve, while in and of itself susceptible to empirical demonstration (Meng, Ye, and Wei 2020), is therefore in essence a schematic representation of the more widely recognized general phenomenon whereby intangible assets are of increasing importance in the global economy as contrasted with material production (Haskel and Westlake 2018), given that the business functions up the sides of the smile curve all instrumentalize intangible assets of one kind or another in their realization of value added. To the extent this article is founded in empirical claims, therefore, those claims are uncontroversial ones about a broad and oft-noted trend in the global structure of capitalism.

That trend has long been associated with the tendency for firms in the Global North/global economic core to outsource production to lower-income, lower-wage economies (Klein 1999), and indeed the phenomenon whereby lower value added is associated with material production has a demonstrably uneven economic geography. The vast majority of the world's population lives in states with a gross domestic product (GDP) per capita very substantially below the GDP per capita enjoyed in the rich countries of the Global North. And those lower-income states are almost exclusively states that have a proportion of the workforce employed in raw materials extraction, agriculture, and manufacture, which is substantially *higher* than the kinds of proportion generally to be found in the higher-income states, notwithstanding that it is of course in those higher income states where the lion's share of the world's consumption of goods takes place (these uncontroversial claims may be readily substantiated with data from the World Bank, International Labor Organization, and so on).

Returning specifically to the disaggregated business functions depicted in the smile curve, the classic manifestation of that trend would take the form of product design functions and other technical functions relating to intangible assets on the left-hand side of the curve being located in a wealthy country, the production of the commodity in the middle of the smile curve being outsourced to a low-margin contract manufacturer in a low-wage economy in the Global South, and the marketing, advertising, and sales functions on the right-hand side of the smile curve achieving sales of the commodity in wealthy countries at prices out of all proportion to production costs. Of course, to flesh out the picture for the purposes of recent developments it should be recognized that the left and right sides of the smile curve also contain the technical functions that build and maintain web-based platforms of various kinds and the functions those platforms perform in creating and finding markets for commodities.

The advantage of viewing these kinds of dynamics through the lens of the smile curve is that the smile curve is agnostic as to whether any particular business function is under common ownership with any other in the value chain. Value chain analysis accommodates the entire gamut of business relationships capable of coordinating business functions (Gereffi, Humphrey, and Sturgeon 2005) and accordingly we are enabled to drop the firm as unit of analysis. We can instead treat as the unit of analysis the entire global chain of business functions bringing matter from extraction to consumption (or, for those who prefer to view the chains as immaterial, bringing the output of human creativity from initial conception to the satisfaction of subjective consumer desire). And accordingly, we can bring into view issues that might be obscured by conventional objects of analysis i.e., firms operating in national economies. A typical illustration of the kind of issue foregrounded would be the way in which global value chains shield profitability in the economic core from the costs associated with (for example) worker safety regulation.

Viewing such chains uncritically, it might appear that the higher value-added business functions within them are simply more important than the others from the point of view of creating and satisfying subjective consumer desires and are being rewarded accordingly in the form of higher wages and/or profit. It is on that basis that a mainstream "development" recommendation

to poorer countries is that they implement policies which foster "upgrading" on the part of value chain participants (i.e., doing more of the activities up the sides of the curve; Quentin and Campling 2018). The idea is that this would generate more "value added" domestically, which would in turn foster economic growth and all the benefits that economic growth is understood to entail.

A critical understanding, by contrast, might have regard to the power asymmetries that underpin economic outcomes. It might hold that "value"—value in some more fundamental, meaningful sense than surplus as measured by reference to accounting artifacts—is not "added" in increasing amounts up the sides of the curve but is, rather, *captured* by virtue of the activities taking place there, having been created elsewhere. So, for example, in an instance of a commodity designed and sold in a wealthy country but manufactured in a poorer one, the analysis would be that the value possessed by the commodity at the point of sale is created in material production in a greater quantity than is reflected in the export/wholesale value of the manufactured item.

The enhanced value added accruing to the business functions that design the product and effect the sale (and, accordingly, the suppressed value added of the physical manufacturer) is referable to the fact that those design/sale functions are exercised at "choke points" in the chain where the value produced in production cannot be realized in exchange except via those choke points, having the consequence that some of the value embodied by the commodity is realized at the choke point rather than where it is created. Those choke points are controlled by a combination of formal intellectual property and other less formal commercial advantages coming under the general rubric of "intangible assets" (Quentin and Campling 2018).

This kind of perspective is readily situated in the context of broader arguments to the effect that global value chains are an instrument of global economic domination, in which the intangible property regimes created and maintained up the sides of the smile curve serve to extract value from the global production network such that it accrues to the shareholding classes predominantly resident in wealthy countries despite being derived from the labor of workers predominantly in less wealthy countries (Starosta 2010; Smith 2016; Davis, Kaplinsky, and Morris 2018; Suwandi 2019; Durand and Milberg 2020; Baglioni, Campling, and Hanlon 2021; Hickel et al. 2022). And those arguments in turn inhabit a broad tradition of heterodox political economy that seeks to address global inequalities as a structural phenomenon, under a variety of rubrics: unequal exchange, world systems theory, dependency theory, and so on.

The question therefore arises of how to distinguish, on the one hand, the accounting surplus arising in the form of "value added" from, on the other, surplus value in that aforementioned more fundamental, meaningful sense. There are at least three approaches to consider.

(1) One such distinction would be the concept of economic rent as recognized by mainstream economics. Mainstream economics generally accords all apparent factors of production a role in value creation but accepts the possibility of enhanced returns—rent—to an actor or factor of production, at the expense of others, by reference to market imperfections of one kind or another. If intangible assets are understood as an instrument of monopoly power, which yields one of the recognized forms of rent, then even mainstream economics would allow that *some* of the accounting surplus accruing up the sides of the smile curve may be captured at the expense of other actors in the chain. And, in particular, it is widely understood that the so-called "digital economy" yields monopoly power to its participants through what is known as the "network effect." Mobilizing this analysis is the strategy adopted in Durand and Milberg (2020) (see also Davis, Kaplinsky, and Morris 2018).

There is a crucial shortcoming to this approach for the purposes of critical value chain scholarship, however. Since all apparent factors of production are accorded a role in value creation, the impact of market imperfections can only ever be a matter of degree. Creating and maintaining the

intangible instruments of monopoly power requires effort and skill, and mainstream economics will see that effort and skill as deserving of *some* reward, and perhaps quite a substantial reward, even if not quite as much reward as the market yields. This allows the effect of market imperfection to be squeezed to insignificance in the analysis. A practical illustration of this weakness in the "economic rent" narrative may be encountered in recent multilateral negotiations over the international tax norms that should apply to the taxation of profits in the "digital economy." In those negotiations, the possibility that economic rent may play a role in profitability was repeatedly raised by major institutional actors and was nonetheless ignored (see Quentin 2021).

(2) In the classical tradition of political economy, by contrast, the existence of "unproductive labor" is recognized. Unproductive labor is labor that is remunerated, and that may well be connected to capitalist profitability as a matter of causation, but which (crucially) does not create *value*, as value is understood in the value-theoretical schema in operation. Deploying such a concept could potentially deem entire value chain nodes up the side of the smile curve to be non-value creating. In traditional Marxist political economy, for example, while extraction, manufacture, logistics, and so on (i.e., activities at the bottom of the smile curve) are unequivocally productive, essentially all the business functions up the right-hand side of the smile curve (advertising, marketing, sales, and so on) are unproductive (Mohun 1996; Savran and Tonak 1999; Shaikh and Tonak 1994).

But this traditional Marxist perspective, so it turns out, is not as helpful in this context as it could be. This is because it commonly treats as productive certain labor up the left-hand side of the smile curve, for example, labor of a technical nature (Marx 1976: 643–44). And this is not merely a weakness from the point of view of diluting the analysis; it means that complicated technical issues necessarily come into play. Even before spatial unevenness is taken into account, Marxist economics suffers from the complexity that, in order to yield quantities that behave analogously to market prices, value must be adjusted in accordance with how capital intensive the sector is (this is the notorious "transformation problem" of which there are a number of vigorously contested and mutually incompatible solutions; see for example Potts and Kliman 2015). In addition, the fundamental Marxian value-theoretical step of treating labor as a fungible commodity means that the wide heterogeneity of labor actually taking place in the real world is reduced to a notional systemwide average (Heinrich 2012: 51–52). Once the possibility for geographical variation in these core parameters becomes a focus of analysis (i.e., dealing with circumstances where equivalent sectors have lower capital intensity and lower wages in poorer countries), the modeling complexities are hugely compounded (Hadjimichalis 1984). In addition, addressing these complexities generally means committing to one of the available solutions to the transformation problem, and they all have theoretical infelicities associated with them.

There are of course Marxist economists grappling with these difficulties (see, e.g., Amin 2010; Ricci 2021), but they are necessarily working at a perpetual frontier of Marxist economics rather than with core theory. Few critical value chain scholars working outside an economics paradigm are going to want to take a stance on the foregoing technicalities prior to addressing their substantive research concerns. It might be suggested that the transformation problem is an opportunity in this context as much as a problem, insofar as it places us in a theoretical space where we are already of necessity accommodating deviations between price and value (see, e.g., Foley 2013). But given the role of the transformation problem in immersing a Marxist approach to value in perpetual controversy (see, e.g., Steedman et al. 1981), taking that opportunity is likely to be too great a hostage to fortune for most. Indeed, today many Marxists avoid that controversy altogether by construing value qualitatively as a governing logic of capitalism rather than as having analytically useful quantitative content (see Pitts 2018 for an overview).

(3) An even more constrained boundary around value creation (alternatively put, one with an expanded conception of unproductive labor) is the "crude materialism" (Marx 1976: 683) that states that only material production creates value. This was one of two bases proffered by Adam Smith for the distinction between productive and unproductive labor, and it was the one that attracted extensive opprobrium from Marx in *Theories of Surplus Value*. This approach may nonetheless be found expressly adopted in critical global value chain scholarship today. This is because the "transformation of physical states" (or "reordering of physical matter," as Marx puts it; Marx 1976: 133) is an intuitively apt way to characterize value creation in production, as distinct from the various means by which that value is sequestered by asset owners (Seabrooke and Wigan 2022: 2[1]). Indeed, important structural phenomena seem to swing clearly into focus when something resembling crude materialism is adopted for these purposes, because the intangible assets that arise from labor up the sides of the smile curve are manifestly instruments of wealth sequestration, whether or not that labor is productive (Quentin 2022).

But by dint of being founded on a crude materialism that Marx expressly repudiated on a principled basis, this approach has the defect of seeming to stand at odds with both mainstream economics *and* heterodox political economy in the Marxist tradition. In sum, the purpose of this article is to address that defect by showing how the expanded conception of unproductive labor implied by the "crude materialism" approach may be regarded as consistent with Marxist value-theoretical principles after all. Its approach is to abandon the received doctrine and reconstruct the distinction between productive and unproductive labor from scratch.

The conclusion for the purposes of critical global value chain scholars is very simple. Material production, as classically understood, is where *all* the value creation in the global production network is taking place. That's all there is to it. All the other nodes in the chain you are looking at are engaged in value capture. There may be incredibly creative work going on at those other nodes that is deeply implicated in capitalist profitability, to a degree that renders negligible in comparison the value added that capitalist accounting attributes to material production nodes. But from the point of view of value as theorized here those other nodes associated with intangible business functions do no more than carve an unearned share of surplus value from the socially imposed need on the part of matter that has been sucked into circuits of capitalist production to get to the next point of exchange. From the perspective of the theoretical stance articulated here, it is as if those nodes were no more than bandits at a mountain pass.

How that banditry is effected in practice—whether it be by dint of having designed desirable objects, or marketed them cleverly, or by dint of directly or indirectly dominating global markets in other intangible ways, is outside the scope of this article to discuss—the theoretical foundation on offer here to critical value chain scholars is for such scholars to do with what they will.

3. The Unproductive Labor Problem in Marxist Political Economy

Before setting out its free-standing distinction between productive and unproductive labor based on core Marxian value-theoretical principles, it is necessary to acknowledge (as briefly as possible!) Marx's own attitude to that distinction, and the one to be found in received Marxist doctrine. And that discussion begins here with the concept of value as encountered in classical political economy generally.

[1]Interestingly, these authors have now resiled from the stance to the effect that value creation, as distinct from value capture, requires the "transformation of physical states," arguing in a more recent publication the contrary position that value creation and value capture are not susceptible to analytical disentanglement (Bair et al. 2023).

Value in classical political economy (including the Marxist variant) is an objective property of commodities themselves. The value question arises from positing the existence of a quantitative surplus notwithstanding that commodities that are inputs to production and commodities that are the outputs of production are not the same thing. In view of that heterogeneity between inputs and outputs, a shared quantifiable property "value" must be attributed to these different commodities to make them commensurable with each other, so that the former can be subtracted from the latter to yield a quantitative surplus. This surplus value corresponds in broad terms to both the physical surplus of commodities that is produced and to the cash surplus that accrues in the hands of asset owners.

The story of that conception of value is as follows. The French physiocrats traced the origin of wealth to agricultural labor, and Adam Smith extended the scope of the analysis to include any labor that is involved in the production of material commodities. David Ricardo sought to model that analysis systematically by adopting a single basic commodity as *numeraire* by reference to which to value all commodities but hit a roadblock because of the technical problem of varying ratios between capital and labor between different sectors. Marx's innovation was to use labor itself as the *numeraire* commodity—or at least a notional fungible form of labor referred to as "abstract labor"—and this led to a lot of important critique but also (this being the aforementioned "transformation problem") foundered on the same technical problem of varying capital intensity between sectors. That problem was solved in the twentieth century by Pierro Sraffa, his solution being to sidestep the very possibility of a varying ratio between capital and labor by treating wages as a distribution out of surplus rather than the cost of a production input (versions of and perspectives on this story can be found in Marx 1969; Dobb 1973; Mirowski 1989; Boss 1990; and Pitts 2021).

A key feature of this story is that it is to do with the surplus of commodities that generally arises when society produces fresh commodities by deploying labor and using up existing commodities (i.e., using them up both as means of production and as worker subsistence). It is only meaningful to speak of this kind of surplus in relation to some sectors and not others because the output of other sectors does not get "used up." It is meaningful to say of agricultural workers that they produce a surplus by producing more food than they themselves eat, but it is not meaningful to say of marketing creatives that they produce a surplus by writing more advertising copy than they themselves read. The distinction is sometimes misunderstood as being about the moral worth or utility or social need for the output. It is not. It is about whether consumption of the output increases its scarcity, such that it is meaningful to talk about a quantitative surplus of it when its use as means of production and means of subsistence is netted off against gross output. In the classical tradition labor which does not produce output of a kind where it is meaningful to speak of surplus is referred to as "unproductive."

In his work Marx expressly deploys the notion of "unproductive" labor. That being the case it might be thought that the "production boundary" subtended by his theory of value (i.e., the boundary around labor processes that create value as opposed to unproductive labor processes) is a classical one. Further, on a superficial reading, at least, Marx appears to be engaging with the classical economists on their analytical territory, essentially offering an improved answer to questions posed by Ricardo. Investigating where Marx's production boundary is situated by reference to his definition of unproductive labor, however, presents two major difficulties.

First, Marx is primarily concerned to debunk the more "superficial" (Marx 1969: 295) of the two distinctions between productive and unproductive labor that Adam Smith operates, that is, a distinction that rests on the materiality of the output, since this is an error of theoretical pathway if not necessarily of destination. It is not the content of the labor that matters nor the properties of the output but, rather, the fact that the labor is paid for out of capital and not revenue (Marx 1969: 152–74). In other words, productive labor is labor whose subsistence is to be netted off from gross to yield surplus, rather than labor to which that surplus is applied. This is effectively

nothing more than a restatement of the basic concept of value in classical political economy: if the purpose is to quantify the surplus of commodities that arises when society produces fresh commodities by deploying labor and using up existing commodities, you only want to subtract the subsistence of the labor deployed in the using up, and not such labor as may be deployed in other contexts. But the impulse on Marx's part to avoid falling into the trap Smith fell into of constraining that circuit arbitrarily by reference to the materiality of the output has the consequence that he is extremely keen to include the production of immaterial outputs within the scope of labor that is deemed productive. His counterexamples (i.e., contra Smith) are not fully thought through, however.

So, for example, he treats Milton's production of *Paradise Lost* as unproductive, even though Milton was paid, and the poem was published commercially, but is frustratingly vague about the putatively contrasting figure of the jobbing "literary proletarian of Leipzig" who is "pretty nearly a productive worker since his production is taken over by capital and only occurs in order to increase it" (Marx 1976: 1044). What does "pretty nearly" mean in this context? Is this an extension of the production boundary to immaterial production or not? Similarly vaguely, Marx treats a singer who performs live to an audience for the purposes of capitalist profit as *potentially* being productive from the point of view of the social relations governing the production of value, ultimately concluding that the question is just too trivial to be worth resolving (Marx 1976: 1044).

Secondly, in the context of drawing his own distinction (i.e., as opposed to attacking Smith's), Marx is focused on the production of value for the individual capitalist employing the labor, in the form of specifically monetary profits, rather than on the production of value in the form of quantities of abstract labor. Accordingly, he offers the example of a schoolteacher whose labor is productive by mere virtue of the labor being paid for out of capital and resulting in profit (Marx 1976: 644). What this leaves unexplained is the categories of labor that Marx himself treats as unproductive notwithstanding that the labor in question is posited as an input by capital and implicated in capitalist profitability. The paradigmatic instance of this is the labor required to bring sales about. Marx says that this labor:

> no more creates value than the labor that takes place in legal proceedings increases the value of the object in dispute. This labor—which is a necessary moment of the capitalist production process in its totality, and also includes circulation, or is included by it—behaves somewhat like the "work of combustion" involved in setting light to a material that is used to produce heat. This work does not itself produce any heat, although it is a necessary moment of the combustion process. (Marx 1978: 208)

This is a powerful image, beautifully apt for the task of explaining how labor can be linked to capitalist profitability on the level of causation but nonetheless fall outside a classical-style production boundary, but it directly contradicts the example of the schoolteacher. Consider a profitable firm of marketers, or advertisers, or lawyers. As with the case of the schoolteacher, their labor is paid for out of capital and makes a profit for the owner of the firm. Why is it not productive like the labor of the schoolteacher? What is the distinguishing feature of this labor that is mere combustion-causing rather than heat-producing? The answer given by those seeking to elaborate from Marx's writings on this topic a classical-style production boundary is to treat all labor that is implicated in capitalist profitability as productive unless it falls within the "sphere of circulation" or of "distribution" (Mohun 1996; Savran and Tonak 1999; Shaikh and Tonak 1994).

But this is not a satisfactory answer since distinguishing the "sphere of circulation" from the sphere of production seems to commit the aforementioned theoretical blunder of drawing the boundary by reference to the content of the labor, or the nature of the output (e.g., advertising as opposed to education). There are university lecturers who are primarily employed for the marketing impact of the recognition of their names among the public, and there is educational content

in the marketing blurb on the side of cereal boxes. Evaluating the social utility of these forms of activity or output and sitting in subjective judgment over whether they are value-creating or mere sales-causing on the basis of their content is precisely the kind of task that an objective theory of value—existing for the purpose of measuring gross capitalist outputs such that capitalist inputs can meaningfully be subtracted from them to yield a net quantity of surplus—should be carefully constituted to avoid.

A further difficulty is that these 1990s articulations of the concept of unproductive labor seem to posit a world in which most labor even within national economies is productive but certain subtractions need to be made (e.g., for the person operating a supermarket checkout at the end of a long chain of productive commodity workers). Accordingly these articulations do not seem to address the world (even then already well established but now dominant) of intangibles-driven globalized production where material chains bringing physical matter from extraction and production in the Global South/economic periphery to consumption in the Global North/economic core involve low margins, while vast amounts of capitalist profitability accrues at (or accrues in tax havens on account of) production nodes in the economic core where the business function is design, marketing, web platform maintenance, the algorithmical processing of consumer data, and so on. That being the case, these articulations of the distinction between productive and unproductive labor seem *prima facie* to be unrealistic, and seem to risk being politically unpalatable for left movements in the Global North/economic core insofar as they deem huge swathes of local workers to be unproductive (Quentin 2023).

If the received distinction between productive and unproductive labor was theoretically coherent and in accord with principle these aspects would not be a problem: Marxists would be holding the line and a departure from doctrine would be treated as heresy. But they are not. As well as the distinction being persuasively critiqued on a principled basis from within Marxist economics (see e.g., Laibman 1999), alternative (and avowedly non-economistic) traditions have emerged in which wholesale rejection of the distinction is effectively a foundational axiom, such as "autonomism" and the "value form" tradition (see, e.g.,, Harvie 2005; Pitts 2018). Formal Marxist economics of national economies continues to be conducted on the basis that the distinction is valid, and robust-seeming conclusions may be based on it, but only with the caveat that the underlying theory is questionable (see, e.g., Morrone, Marquetti, and Miebach 2022: fn. 1).

This then is the unproductive labor problem in Marxist political economy: some Marxist scholars think the Marxian articulation of the definition of unproductive labor is firmly established doctrine, and others think it so incoherent and contrary to principle that, in the form in which it is generally understood at least, it should be abandoned. The solution offered here is a composite of both positions: the received doctrine should be abandoned, but the category of unproductive labor is nonetheless to be retained, albeit that it should be derived from core Marxist value-theoretical principle, rather than from the questionable authority of Marx's internally inconsistent pronouncements on the topic. And if so derived (so this article argues) it broadly corresponds to the empirical story told by the smile curve. In other words, it places value creation solely at the central dip in the curve.

4. Marx's Social Conception of Value

The starting point for this analysis is the concept of "abstract labor," which is the "substance of value" in the Marxian schema. Abstract labor is perhaps best understood by reference to fungibility (or, as Marx puts it in the Fowkes translation, divisibility into "aliquot part[s]," 1976: 202). In a sense, at the maximum level of abstraction, all commodities are fungible since they exchange for money, and with money one can buy other commodities. To effect this fungibility it is necessary to have the correct quantities of each, such as would attract the same amount of money (Marx 1976: 127), but in principle, and assuming the correct quantities, any commodity can (via

the medium of money) exchange for any other commodity. Fungibility at this level of abstraction reflects back on the labor that went into making the commodities. The specific prior *concrete* labor embodied in each commodity (which is relevant to that specific commodity's utility or desirability, making it a "use value" in Marx's schema, 1976: 126) is irrelevant to its *quantifiable* equivalence with other commodities. For the purposes of exchange, the labor it embodies is not that specific prior concrete labor but the fraction the commodity represents of the totality of prior social labor.

This totality, insofar as it must be treated as divisible into fungible fractions (which treatment reflects the forcible equivalence imposed on commodities by the mechanism of exchange) is what is referred to by Marx as "abstract" labor (1976: 128). Abstract labor is the "substance" of value as Marx conceives of it (1976: 131), meaning that the value of a commodity is the quantity of abstract labor embodied in it.

Marx proposes that abstract labor as it is embodied in commodities is to be measured in units of "socially necessary labor time," which is "the labor required to produce any use value under the conditions of production normal for a given society and with the average degree of skill and intensity of labor prevalent in that society" (1976: 129). A key feature of this metric, which reflects the logic of abstract labor, is that it quantifies value by reference to a notional totality of social labor as at exchange. Whatever the prior *concrete* labor, the act of exchange is what brings into being a notional totality of fungible prior labor, a fraction of which being the labor that would have been necessary to bring the commodity to the point of exchange in the quantity in question. "The value of a commodity is determined not by the quantity of labor actually objectified in it," Marx explains, "but by the quantity of living labor necessary to produce it" (1976: 676–77). Abstract labor is therefore a social and not a physical substance (Marx 1976: 149); quantifiable, yes, and dependent for its existence on the prior concrete labor that went into the commodity, but brought into being by the exchange relations that exist under capitalism rather than by the physical process of production.

Abstract labor, the social substance of value, plays a central role in the Marxian analysis of capitalism, because it is abstract labor's property of wanting to create more of itself—value valorizing itself—that acts as the underlying motive force in the capitalist mode of production (Marx 1976: 255, 302).

The remainder of this article explains how a production boundary around the bottom of the value chain smile curve may be elaborated from the foregoing conception of value. The structural implication of this interpretation, when applied to actually existing capitalism today, is that value is not valorizing itself such that (subject to interest, rent, tax and so on) the owners of means of production reap the profit, as they would in a traditional Marxist analysis. Value is, rather, valorizing itself in low-wage, low-margin global value chain nodes (because that is where the productive labor is according to the arguments that follow) while the associated profit is (as the smile curve shows us) reaped by the lead firms that invest in creating and maintaining the intangible instruments of value *capture* that inhabit the upturned sides of the smile curve.

The argument in this article regarding that structural locus of value creation takes the form of a distinction between productive and unproductive labor (since value creation is, by definition, only occurring where productive labor is taking place), and it proceeds in four steps. It is steps 2 and 3 that are particularly relevant to the application of the distinction in the context of the smile curve. Steps 1 and 4 are there for completeness, in anticipation of the kind of definitional quibbles that were clearly already an irritating distraction when this topic was being considered by Marx himself. Importantly, the fact that the distinction is elaborated in four steps should not be understood to indicate that it comprises four elements, or that there are four categories of unproductive labor to exclude. The distinction between productive and unproductive labor is, on the level of principle, a binary one. These steps are in the nature of a heuristic toward applying it in practice that is cumulatively more granular as the steps proceed.

5. Four Steps to Distinguishing Productive and Unproductive Labor

Step 1: Does capital pay for the labor?

The first step is determining whether or not capital *pays* for the labor, in wages or some kind of wage equivalent, for example, a piece rate (or, exceptionally, in the case of unfree labor, in other less direct ways). That capital pays for the labor is a fundamental condition, since the discussion is here predicated on the presupposition that the purpose of the concept of "value" is to arrive at a quantitative account of surplus. If the labor is not actually an input that we are subtracting from output to find a net surplus, then it is not relevant to the question that the concept of value exists to answer. (There are scholars working in this area who characterize observing this condition as the "fetishization" of wage labor, Fuchs 2014: 109, but their objection is very hard to understand.) The condition in this first step, it should be noted, relates to capital paying for the input *qua* input; a wealthy person buying something as a consumer is not what is being referred to here.

Step 2: Is the output capable of bearing value?

The second step is to determine whether the output of the labor at the point of exchange is *capable* of bearing value. By "output of the labor" what is meant is not the results of the worker's labor necessarily, but the final result of the business process in which the worker participates, insofar as that result goes to market as a commodity. So, for example, an in-house information technology (IT) support worker produces IT support, but if the company for whom they work sells widgets, then the output of the labor of the IT support worker is widgets. If that output is not capable of bearing value, then the labor yielding that output was not "productive" of value. Step 2 is about which outputs are, and are not, so capable.

As noted above, abstract labor arises from the indelible fact of prior allocation of resources giving rise to the commodities being exchanged under capitalism—indelible because it has happened in the past. Abstract labor arises at the point of exchange because the specific quantities of commodities undergoing exchange force the prior heterogeneous concrete labor into fungibility. But there is a complication. The amount of prior labor predicated by each commodity undergoing exchange (and therefore entering the totality of labor in its fungible form) is not the *actual* prior labor, it is the prior labor predicated by the commodity in view of the prevailing conditions of production at the point of exchange (this, it can be recalled from the explanation above, is how "socially necessary labor time" is defined).

This feature of the social model of value means that, in order for something to bear value as a commodity, it is not enough that a specific quantity of concrete labor has gone into something that subsequently undergoes exchange as a commodity. What is necessary is that the thing undergoing exchange as a commodity predicates a specific quantity of prior labor by reference to prevailing conditions of production. In other words, you should in principle be able to count the number of units of the commodity undergoing exchange and determine from that number how much labor went into them, by reference not to their *actual* production but by reference to the units-produced-per-unit-of-labor achieved in the typical production process for that commodity. And it is certainly true of material commodities of the classical kind—"goods"—that they meet the condition that a quantity undergoing exchange predicates a quantity of prior labor by reference to prevailing conditions of production. This is uncontroversial. Nobody is out there arguing that the Marxian production boundary is narrower than the basic classical one of "crude materialism."

With "immaterial products," by contrast, "the quantity of labor required to achieve a particular result is as conjectural as the result itself" (Marx 1969: 268). This distinction, it is here

contended, is fundamental. "Immaterial products" may routinely behave as commodities, but even when they are behaving as such they do not predicate a specific quantity of prior labor by reference to prevailing conditions of production. The article that you are currently reading, for example, may be caused by its publisher to behave as a commodity—a pdf of it may be made available to purchasers for a unit price. But the number of unit sales of this article does not predicate an amount of authorship on the part of its author. Once written an article can be sold over and over again in pdf form, without any further authorship.

It may be objected that so-called "immaterial commodities" (like a pdf of an academic article) have a materiality. There exists a materiality to the data of which each instance of such an object is composed. Crucially, however, the quantitative constraint imposed by the prior allocation of resources that is reflected in that materiality is referable to the material storage and transmission mechanisms by means of which such putative "commodities" are distributed; not to the putative "commodities" themselves. If you have a copy of this article as a pdf on an electronic device, the labor predicated by that pdf took place in the factory where the device was made (and the mines and so on in the device's commodity chain), not at its author's desk. This is not a peculiarity of digital commodities, of course; it is true of printed books that extra copies require more work at the print shop but no increased quantity of authorship. Data is material, and it continues to be material even in the digital age, but the production of the data *as such* (i.e., as contrasted with some alternative bundle of information to be carried in the same transmission and/or storage mechanism) does not create value.

This is a key point and so it is worth dwelling on it for a moment. Marx wrote that "the product of mental labor—science—always stands far below its value, because the labor time needed to reproduce it has no relation at all to the labor time required for its original production. For example, a schoolboy can learn the binomial theorem in an hour" (Marx 1969: 353). He was, however, understating the matter. From the strict perspective of the social model of value the value of the product of "mental labor" in the sense Marx means it here (i.e., knowledge-creating labor) is zero.

That Marx himself did not go this far may be referable to a general ambiguity sometimes said to exist between conflicting models of value in his work (Mirowski 1989; Saad-Filho 1997; Heinrich 2004; Pitts 2021). If you permit an ambiguity to exist as between actual prior concrete labor in production as a source of value and the notional prior labor predicated socially by commodities and conditions of production at the point of exchange, you cannot go so far as to claim that the product of knowledge-creating labor is worth nothing—there may be some homeopathically reduced residue of actual prior concrete labor. Accordingly, there exists some debate over whether information commodities might be of a value that *tends towards* zero as opposed to being actually zero (Rigi 2015; Parkhurst 2019). Zero is the answer that adheres more closely to Marx's social model of value as strictly understood, however, and has been convincingly argued for in recent literature in this area (Rotta and Teixeria 2019).

It should be noted that the claim being made here is not in and of itself a novel one. Indeed, it forms the basis for the argument to be found in "postoperaist" literature that classical Marxian value theory has suffered a "crisis of measurability" (Marazzo 2008: 43). As Pitts points out, however, these arguments proceeding from the infinite replicability of digital products are merely a reassertion of the classical production boundary (2018: 191), albeit one that mistakes its own nature. These arguments do not point to a crisis of measurability in respect of possible infinitudes of value created outside the production boundary; they reduce down to the tautology that value is not created outside the production boundary at all.

Between the clear categories of material commodities (which are value-bearing commodities for the purposes of Marxian value theory) and "immaterial products" (which, as discussed above, are not) there is the somewhat unhelpful category of "services." This is an area where recourse to

Marx himself yields particularly inconclusive results (Tregenna 2011). Fortunately, however, it is for the most part a trivial matter to extract a theory of services from the core concept of abstract labor, using the logic already articulated with respect to the divide between material commodities and immaterial products.

Very often "services" are in fact nothing other than material production, in the sense of bringing material commodities to the point of exchange. Examples of this would include such "services" as the bulk transportation of goods (Marx 1969: 412), and catering. If a "service" is actually part of the production process for a material commodity at the point of exchange, then its ultimate output is that material commodity. A waiter at a restaurant is not a "server" from this perspective; they are a producer of goods. Likewise, a shelf stacker at a supermarket, a lorry driver, and so on.

Other "services" such as broadcast media, software production, research, design, and advertising fall into the category of immaterial production, insofar as the output of these production processes does not consist of commodities for the purposes of Marxian value theory for the reasons explained above. They are profitable forms of output, sure, but that does not mean that they embody value. Many "services" falling into this category where the output is not a commodity were an in-house matter in Marx's time (Tregenna 2011), and so he framed this question—notably insofar as concerns capitalists' marketing efforts—directly by reference to whether or not the labor in question was productive of value (as already noted, it is not, Marx 1978: 207–8). Accordingly, it is on those terms that subsequent Marxists who deprecate the distinction between productive and unproductive labor have generally engaged with him in respect of this issue (e.g., Pitts 2018: 227–33). The fact that there is now a "services sector," however, makes it more convenient to treat this question in the way it is treated here in step 2, that is, framed in terms of whether or not the output constitutes a value-bearing commodity for the purposes of the logic of the concept of abstract labor.

And so, this "services" question largely reduces to the question whether we are talking about material commodities or non-value-bearing outputs of immaterial production. There is, however, a residual category of "services" that do not reduce to either of these categories. These services constitute a narrow and materially exceptional category of output, being distinguished by the simultaneous physical participation of the consumer's body in the realization of the output as it is being produced; the paradigmatic example being the transportation of humans (Marx 1978: 134–35; see also 1976: 1048). Hairdressing is another popular example; other examples might be the live singer or the schoolmaster that Marx considered.

In the case of this subcategory of "services" (perhaps they may be labeled "true services") it *is* the case that the number of units available for exchange is quantitatively a function of the prior allocation of resources to their production, just as is the case with a conventional material commodity. Indeed, to that extent a train ride or a haircut or some time spent in the audience of an opera *is* a material commodity, the only difference being that the matter of the human body being transported or trimmed or vibrated at sonic frequencies, rather than matter external to the human body, is how the commodity's materiality manifests itself. As material commodities, they are capable of bearing value.

As is clear from the contrasting figures of the train driver and the schoolmaster, labor processes in this subcategory of material commodities can run the full gamut from being quite extraordinarily capital-intensive to not necessarily requiring any capital at all. This is an issue that becomes salient in step 4 (recall that in this step we are merely determining whether the output is *capable* of bearing value—the question whether the worker producing it is productive is addressed in the two steps that follow).

In summary, then, as regards step 2, output is only capable of bearing value if it is either (a) a physical commodity or (b) a service distinguished by the simultaneous physical participation of the consumer's body in the realization of the output as it is being produced. As applied to the

smile curve, the implications of this step are that the higher value-added forms of output inhabiting the upturned sides of the smile curve and associated with intangible assets are not *capable* of bearing value, even if they are sold as services on a disaggregated basis by profitable value chain nodes (e.g., outsourced design/technical/marketing services and so on). Those services are therefore participating only in value capture.

Step 3: Is the labor quantitatively predicated by the output?

The third step is to consider whether the labor is quantitatively predicated by the output commodity at the point of exchange. At this juncture it may reasonably be objected that the claim was advanced at the outset of step 2 above that *no* prior concrete labor is predicated by the value of the commodity at exchange at all; the labor predicated by the value of the commodity at exchange is notional. But that notional labor does not attach itself to the state of matter embodied by the commodity as if it had come into being arbitrarily; it relies for its existence on the prior concrete labor that in fact placed the commodity at that location, and in that produced state.

Further, specifically as *value* (i.e., as a quantifiable substance, rather than merely an account of a sequence of causation) it relies for existence on the subset of that labor which is quantitatively implicated in the commodity being in its produced state at the point of exchange. As already noted, Marx used a vivid analogy to illustrate this distinction—that of a match lighting a fire. The fire's heat is *caused* by the match, but the amount of heat generated by the fire comes from the amount of fuel thereby caused to burn (Marx 1978: 207–208). We are called upon, at this step, therefore, to distinguish between "match"-type labor (which is unproductive) and "fuel"-type labor (which is productive).

In practice, what this step requires us to do is consider the work that the worker does in quantitative terms—the number of hours the worker does, or the number of people there are doing that work—and to ask if that quantity would necessarily have to increase in order for the number of units of the commodity in existence at the point of exchange to increase. If so, the labor is quantitatively predicated by the commodity at the point of exchange, and so is quantitatively implicated in the value that arises at that juncture (as fuel is quantitatively implicated in the heat that a fire produces). And if it is so implicated, it is "productive." And if not, then it is not. To reiterate, Marx's match/fuel analogy is really very helpful indeed for these purposes if interpreted as it is here. The match is not quantitatively implicated in the heat produced by the fire—it is merely causal. The fuel by contrast *is* quantitatively implicated. If you wanted more heat, you should have brought more fuel. But you wouldn't have needed to bring a second match.

Applying this test in practice cuts across some familiar distinctions. We have already observed that some "services" in fact constitute commodity production, so that some "service" workers can be productive in this sense of their labor being quantitatively predicated by the commodity at exchange. Another familiar distinction that is categorically *not* in play here is the purported distinction between intellectual and manual labor (which is of course also subject to critique in any event, Sohn-Rethel 1978). Clearly the overwhelming majority of "manual" work in sectors such as mining, agriculture, manufacturing, and logistics is necessarily quantitatively implicated in the materiality of the commodity in question at exchange, but so is the labor of technicians, supervisors etc. (Marx 1976: 643–44), provided that (and this is the key test) more of the commodity at the point of exchange would have required the capitalist to allocate a greater quantity of labor to the function that they perform. Conversely there is work to be done at, say, a bank—cleaning staff toilets, for example—which might be categorized as "manual" in nature but is nonetheless not "productive," because the output of the business is not value bearing.

Conceptually, the hardest aspect of this test to grasp is probably the idea of productive labor in contexts where output quantities fluctuate arbitrarily. Consider, for example, a person whose role is to participate in a production process the output of which fluctuates with demand on a

short-term basis, such as a chef in a restaurant. It is crucial to recall at this juncture that capitalists will anticipate demand and allocate labor on that basis, taking into account prevailing conditions of production, and one of the conditions of production will be a maximum level of demand that the capitalist can expect to satisfy before they find it necessary to allocate more labor. It is of course the case that a chef in a restaurant is generally a fixed labor cost while output quantities vary with the number of diners, and the chef is only working at capacity when the restaurant is full, but that is not the point. The point is that if the restaurant owner wants to operate a restaurant with double the capacity, they are going to have to employ a second chef. They do not, by contrast, need to double the amount of labor that went into developing the recipes or coming up with the name for the restaurant. And that is where the distinction lies.

A large number of roles even within commodity-producing sectors can be determined *not* to be productive on the basis of the test in this step: designers, marketers, accountants, and (while, to reiterate, this has nothing analytically to do with "class") all managerial levels above those who are so close to the process that increased capacity means commensurately greater demands on their time.

It seems counterintuitive to hold that people whose "skilled" work has a clear causal connection with the form, content, and desirability of a commodity—designers, marketers, etc.—are not productive of the value embodied in it, while the "unskilled" repetitive labor of factory workers is, but the logic of abstract labor requires that stance to be adopted, nonetheless. The intuition to which this runs counter appears to be an intuitive subjective value theory; a sense that the value of a thing must be related to the features that make us desire it. It should be recalled that we are in the realm of value as an objective property. The features that make a thing desirable generally bear a *causal* relation to the fact that it undergoes exchange, but the concept of value requires something more: it is absolutely of the essence of value that it exists in a *quantity*.

This sales-causing category of unproductive worker, and their managerial and administrative colleagues—the armies of unproductive workers in the corporate sector who are associated with the enhanced capitalist profitability that can spring from intangible assets—is the one that is most significant for the purposes of critical value chain scholarship. And it should be emphasized that they are excluded here from the category of "productive" worker (even if the output commodity of the firm they work for is capable of bearing value applying step 2) not because they inhabit the so-called "sphere of circulation" but because their labor is not quantitatively predicated by the output commodity of the firm they work for at the point of exchange. *Both* upturned sides of the smile curve are match not fuel.

Step 4: Is the worker a net *producer of reorderedness?*

Historically, one of the key analytical uses to which a classical-style production boundary has been put is examining on a macro scale the phenomenon of absorption of surplus by workers who consume value (as all workers do, in their means of subsistence) but do not produce it. For example, an increasing proportion of unproductive workers has been said to constitute a countervailing tendency to such tendency as capitalism may have toward crisis (Bleaney 1976; Foster 2014: ch. 5).

This means that it is not enough to delineate the production boundary around those workers who produce value on a gross basis (i.e., around workers whose labor meets the three foregoing conditions). It is necessary for typical analytical purposes to exclude those who produce less value than they consume. In principle, the output of such workers constitutes part of the totality of social labor predicated by the totality of commodities in circulation. But if on an individual level the total amount of value they are creating with their labor is less than the value possessed by the commodities they use up, then on an individual level they are net absorbers of value, and so for most analytical purposes should be counted among the unproductive. (To be clear, this has nothing to do

with exploitation in the technical sense—this primarily about workers who produce value on a strict application of the theory and so are productive, but in quantities that are negligible, such that it makes more sense to treat them as unproductive for general analytical purposes.)

Of course, the whole point of the classical concept of surplus value is that it is a social surplus determined by reference to production as a social totality, in a context where any individual production process will have heterogeneous inputs and outputs that cannot be directly netted off against each other. We cannot look empirically at an individual person's output, their use of production inputs, and their means of subsistence, and somehow measure whether or not they are a net producer of value.

At this juncture, however, it is helpful to recall that conception of production (mentioned in section 2) as the "transformation of physical states" or, as Marx put it, the "reordering of physical matter" (Marx 1976: 133). While value is a social substance in the Marxian schema, it possesses this material substrate—"reorderedness"—which is the physical property of commodities that has the consequence that they embody a quantity of social labor by reference to prevailing conditions of production at the point of exchange (Quentin and Butler-Cole 2023). As was observed in the context of step 3, notional prior labor does not attach itself to the state of matter embodied by the commodity as if the commodity had come into being arbitrarily; on a quantitative level it relies for its existence on the prior concrete labor that in fact placed the commodity at that location and in that produced state. The prior labor, in order words, that yielded the commodity's reorderedness.

While such a putative quantity of reorderedness cannot be measured, it is possible to form a subjective impression of how a colossal quantity of it, assisted by the vast might of successive mechanized processes, might differ from a minuscule quantity of it such as is produced by human labor unaided.

For example there are large cohorts of worker in sectors like health, education, and care where (a) the labor finds itself being paid for by capital, owing to commodification in the sphere of social reproduction under neoliberalism, such that the condition in step 1 is met, and (b) the output of the labor is in principle one of those "true services" where its materiality is manifested in the bodies on whom it is performed—the eyes and ears of schoolchildren in classrooms; the bodies of patients being turned over in bed and so on—such that the condition in step 2 is met. But it is very clearly not the case that these workers are in the business of *reordering matter* on a scale comparable to the reordering of matter embodied in the means of subsistence they consume, that is, the hugely industrialized and much-transported food they eat, and so on. We cannot measure it, but it is analytically safe to treat those workers as unproductive. Their labor does not give rise to the material substrate of surplus value because (while of course not impugning the social utility of their work or downplaying the degree to which they experience economic exploitation) they do not reorder more matter than the reorderedness that they use up.

In principle, since we cannot measure reorderedness, there could be a boundary problem in applying this step, but in practice there are very few categories of worker who do not reorder matter very much but reorder it enough that they *might* be a net producer of value. Two categories of worker featuring a threshold question of this nature, however, are (a) skilled artisans or tradespeople with low output volumes over time in terms of physical product, and (b) workers at the non-capital-intensive end of the spectrum of "true services" (see above). It seems likely that, after a point, these workers use up more physical output than they produce and so are unproductive. Exactly how low the output volumes need to be, or how non-capital-intensive the services, in order to draw this conclusion, however, we cannot say. It is fortunate, then, that these kinds of workers do not form a particularly significant cohort for the purposes of macro-scale analysis. And indeed, it is often the case with these categories of labor that the condition in step 1 is not met in any event, because people are buying the skilled artisanship or the non-capital-intensive "true service" directly, as consumers (as opposed to indirectly from capitalists, such that the labor itself has been paid for by capital as an input).

The only sectors where indeterminacy under this step could potentially bleed into a macro-scale analysis are sectors like retail and catering, where there is a lot of labor transporting physical commodities, largely unmodified and largely unassisted on a mechanical level, through their final very short distances to the point of exchange. Traditionally, Marxists who observe a classical-style production boundary have tended to treat these sectors as unproductive on the basis that they form part of the "sphere of circulation." They will generally be unproductive from the perspective adumbrated in this article, but the theoretical possibility of a factory-like retail or catering environment that reorders matter on such a scale that its workers are productive of value should be acknowledged.

6. Conclusion

In summary, then, a production boundary consistent with Marx's value-theoretical innovation of abstract labor may be drawn around labor that (1) is paid for by capital as an input, (2) yields at the point of exchange an output that is either (a) a physical commodity or (b) a service distinguished by the simultaneous physical participation of the consumer's body in the realization of the output as it is being produced, (3) is quantitatively predicated by that output at the point of exchange, and (4) is one where the reordering of matter it yields exceeds what it uses up.

Accordingly, all other labor is "unproductive." Broadly speaking, the key difference between the production boundary adumbrated here and the one commonly to be found in Marxist articulations of a classical-style production boundary is that all such other labor is excluded, rather than only such other labor which also falls to be treated as forming part of the "sphere of circulation." Alternatively put, both sides of the smile curve are unproductive of value, rather than just the right-hand side. Accordingly, when we look at the structural phenomenon schematically recognized by the deep (and said-to-be-deepening) dip in the smile curve, what we are in fact looking at is the central dynamic of capitalism, that is, value valorizing itself.

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References

Amin, Samir. 2010. *The Law of Worldwide Value*. New York: Monthly Review Press.

Baglioni, Elena, Liam Campling, and Gerard Hanlon. 2021. Beyond rentiership: Standardization, intangibles, and value capture in global production. *Environment and Planning A: Economy and Space*. Accessed at: https://doi.org/10.1177/0308518X21997835.

Bair, Jennifer, Stefano Ponte, Leonard Seabrooke, and Duncan Wigan. 2023. Entangled chains of global value and wealth. *Review of International Political Economy*. Accessed at: https://doi.org/10.1080/09692290.2023.2220268.

Bleaney, Michael. 1976. *Underconsumption Theories*. New York: International Publishers.

Boss, Helen. 1990. *Theories of Surplus and Transfer*. Boston: Unwin Hyman.

Davis, Dennis, Raphael Kaplinsky, and Mike Morris. 2018. Rents, power, and governance in global value chains. *Journal of World-Systems Research* 24 (1): 43–71.

Dobb, Maurice. 1973. *Theories of Value and Distribution since Adam Smith*. Cambridge: Cambridge University Press.

Durand, Cédric, and William Milberg. 2020. Intellectual monopoly in global value chains. *Review of International Political Economy* 27 (2): 404–29.

Foley, Duncan K. 2013. Rethinking financial capitalism and the "information" economy. *Review of Radical Political Economics* 45 (3): 257–68.

Foster, John Bellamy. 2014. *The Theory of Monopoly Capitalism*. New York: Monthly Review Press.

Fuchs, Christian. 2014. *Digital Labor and Karl Marx*. New York: Routledge.

Gereffi, Gary, John Humphrey, and Timothy Sturgeon. 2005. The governance of global value chains. *Review of International Political Economy* 12 (1): 78–104.

Hadjimichalis, Constantinos. 1984. The geographical transfer of value: Notes on the spatiality of capitalism. *Environment and Planning D: Society and Space* 2 (3): 329–45.

Harvie, David. 2005. All labor produces value for capital, and we all struggle against value. *The Commoner* 10: 132–71.

Haskel, Jonathan, and Stian Westlake. 2018. *Capitalism without Capital*. Princeton, NJ: Princeton University Press.

Heinrich, Michael. 2004. *Ambivalences of Marx's Critique of Political Economy as Obstacles for the Analysis of Contemporary Capitalism*. Historical Materialism conference paper. Accessed at: https://web.archive.org/web/20071108204830/; http://www.oekonomiekritik.de/310Ambivalences.htm.

———. 2012. *An Introduction to the Three Volumes of Karl Marx's Capital*. New York: Monthly Review Press.

Hickel, Jason, Christian Dorninger, Hanspeter Wieland, and Intan Suwandi. 2022. Imperialist appropriation in the world economy: Drain from the global south through unequal exchange, 1990–2015. *Global Environmental Change* 73: 102467.

Klein, Naomi. 1999. *No Logo*. London: Picador.

Laibman, David. 1999. Productive and unproductive labor: A comment. *Review of Radical Political Economics* 31 (2): 61–73.

Marazzo, Christan. 2008. *Capital and Language*. Los Angeles: Semiotext(e).

Marx, Karl. 1969. *Theories of Surplus Value, part 1*. Moscow: Progress Publishers.

———. 1976. *Capital: A Critique of Political Economy*, volume 1. London: Penguin.

———. 1978. *Capital: A Critique of Political Economy*, volume 2. London: Penguin.

Meng, Bo, Meng Ye, and Shang-Jin Wei. 2020. Measuring smile curves in global value chains. *Oxford Bulletin of Economics and Statistics* 82 (5): 988–1016.

Mirowski, Philip. 1989. *More Heat Than Light*. Cambridge: Cambridge University Press.

Mohun, Simon. 1996. Productive and unproductive labor. *Review of Radical Political Economics* 28 (4): 30–54.

Morrone, Henrique, Adalmir Antonio Marquetti, and Alessandro Donadio Miebach. 2022. Productive and unproductive sectors' interactions in Brazil: A Miyazawa analysis. *Review of Radical Political Economics* 55 (2): 251–68.

OECD. 2013. *Interconnected Economies: Benefiting from Global Value Chains*. Accessed at: https://web.archive.org/web/20210308190557/; https://www.oecd.org/sti/ind/interconnected-economies-GVCs-synthesis.pdf.

Parkhurst, Bryan. 2019. Digital information and value: A response to Jakob Rigi. *tripleC: Communication, Capitalism & Critique. Open Access Journal for a Global Sustainable Information Society* 17 (1): 72–85.

Pitts, Frederick Harry. 2018. *Critiquing Capitalism Today*. London: Palgrave Macmillan.

———. 2021. *Value*. Cambridge: Polity.

Potts, Nick and Andrew Kliman, eds. 2015. *Is Marx's Theory of Profit Right: The Simultaneist-Temporalist Debate*. New York: Lexington Books.

Quentin, Clair. 2021. Gently down the stream: BEPS, value theory, and the allocation of profitability along global value chains. *World Tax Journal* 13 (2): 163–216.

———. 2022. Global production and the crisis of the tax state. *Environment and Planning A: Economy and Space*. Accessed at: https://doi.org/10.1177/0308518X221105083

———. 2023. Paris is burning: A cautionary tale about the politics of value. In *Constitutions of Value*, eds. Isabel Feichtner and Geoff Gordon, 86–106. Abingdon, UK: Routledge.

Quentin, Clair, and Ben Butler-Cole. 2023. Inviting the vampire in: Value and thermodynamic depth. *Science & Society* 87 (2): 234–60.

Quentin, Clair, and Liam Campling. 2018. Global inequality chains: Integrating mechanisms of value distribution into analyses of global production. *Global Networks* 18 (1): 33–56.
Ricci, Andrea. 2021. *Value and Unequal Exchange in International Trade*. Abingdon, UK: Routledge.
Rigi, Jakob. 2015. The demise of the Marxian law of value? A critique of Michael Hardt and Antonio Negri. In *Reconsidering Value and Labor in the Digital Age*, eds. Eran Fisher and Christian Fuchs, 188–206. New York: Palgrave Macmillan.
Rotta, Tomás, and Rodrigo Teixeira. 2019. The commodification of knowledge and information. In *The Oxford Handbook of Karl Marx*, eds. Matt Vidal, Tony Smith, Paul Prew, and Tomás Rotta, 379–99. Oxford: Oxford University Press.
Saad-Filho, Alfredo. 1997. Concrete and abstract labor in Marx's theory of value. *Review of Political Economy* 9 (4): 457–77.
Savran, Sungur, and E. Ahmet Tonak. 1999. Productive and unproductive labor: An attempt at clarification and classification. *Capital & Class* 23 (2): 113–52.
Seabrooke, Leonard, and Duncan Wigan. 2022. *Global Wealth Chains: Asset Strategies in the World Economy*. Oxford: Oxford University Press.
Shaikh, Anwar M., and E. Ahmed Tonak. 1994. *Measuring the Wealth of Nations*. Cambridge: Cambridge University Press.
Smith, John. 2016. *Imperialism in the Twenty-First Century*. New York: Monthly Review Press.
Starosta, Guido. 2010. Global commodity chains and the Marxian law of value. *Antipode* 42 (2): 433–65.
Steedman, Ian, Paul Sweezy, Simon Mohun, Anwar Shaikh, Sue Himmelweit, Geoff Hodson, Erik Olin Wright, Pradeep Bandyopadhyay, Michel De Vroey, Makoto Itoh, and Gerald Allan Cohen. 1981. *The Value Controversy*. London: Verso.
Sohn-Rethel, Alfred. 1978. *Intellectual and Manual Labor*. London: Macmillan.
Suwandi, Itan. 2019. *Value Chains: The New Economic Imperialism*. New York: Monthly Review Press.
Tregenna, Fiona. 2011. What does the "services sector" mean in Marxian terms? *Review of Political Economy* 23 (2): 281–98.

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