

VALUE PRODUCTION, MEASUREMENT, AND DISTRIBUTION UNDER DIGITAL CAPITALISM

A Critique of the Theory That the Law of Value Has Failed

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Abstract: Western Marxist scholars take "immaterial labor," "audience labor" and "prosumer labor" as the core categories to explain the problem of the value creation and profit sources of digital capital in online production and consumption activities in the Web 2.0 era. By analyzing the production process of digital capitalism, they have come to the conclusion that contemporary capitalist production has taken on an overall "novel" character. On the basis of the special cost structure of digital capitalist production, the increasing "fuzziness" of production time and living time, and the disappearance of the boundary between paid labor and unpaid labor under digital capitalism, they draw the conclusion that the law of value has become invalid in the era of "digital production and consumption." However, once digital labor and its results are placed within Marx's analytical framework, and are interpreted in terms of such categories as "direct production process of capitalism," "fixed capital accumulation pattern" and "classification of productive labor and non-productive labor," it becomes clear that the brilliant achievements of digital capital are best understood as the results of innovative modes of surplus-value possession or distribution, rather than of new methods of surplus-value creation, and that the conclusion that the law of value has failed represents a misreading or misinterpretation of Marx's labor theory of value. Although the digital capitalist mode of production is serving partially to dissipate the role of the law of value, this law as the general principle regulating global capitalist production remains effective in the contemporary world.

Keywords: digital capital; law of value; productive and non-productive labor; information rent; the measure of value

The development of Information and Communication Technology (ICT), with its various aspects such as the internet, big data, cloud services and artificial intelligence, is reshaping our production and our wider lives, creating the so-called “new economy” in which digital processes fashion new industries, models, business forms, organizations and modes of coordination. Corresponding to the changes in economic practice, the theorization of this economic form or phenomenon in line with globalization trends within Western Marxist theoretical circles has been characterized by such theoretical constructs as “knowledge capitalism,” “information capitalism,” “cognitive capitalism,” “platform capitalism” and “digital capitalism.”¹ This diversified process of theoretical construction inevitably gives rise to theoretical debates and to different interpretations of core categories. At the heart of these debates and differences is the question of whether the law of value remains valid, and the resulting controversies have seen the rise of two completely opposed views on the law of value, summed up as “obsolescence theory” and “validity theory.” The debates among Western scholars on this issue concern both the scientific understanding and application of Marx’s labor theory of value, and the scientificity of Marxist economics, namely, how much explanatory power Marx’s labor theory of value has in reality under digital capitalism. It is thus of great significance to clarify the theoretical understanding of this issue in the increasingly deepening and expanding contemporary society.²

Debates by Western Marxist Scholars on the Validity of the Law of Value within the Digital Economy

Since the publication of Dallas W. Smythe’s (1977) “audience labor,”³ Alvin Toffler’s (1980) “prosumer labor,”⁴ and Antonio Negri and Michael Hardt’s (1999) “immaterial labor,” a debate has emerged on the validity of the law of value. With the development of ICT, especially in the Web 2.0 era, new changes have occurred in the relationship between online production and consumption on the internet platform. Meanwhile, the need to explain value creation and the source of profits in online production and consumption has again made the categories of “audience labor,” “prosumer labor,” and “immaterial labor” hot topics for research aimed at defining the forms and functions of digital labor in the digital economy. Accompanying the controversy over the definition of digital labor has been debate on the effectiveness of the law of value under digital capitalism, and this has led to the formation of two diametrically opposed propositions, the “obsolescence theory” and the “validity theory” of the law of value. The most representative views in these debates have been those of Antonio Negri and Michael Hardt, Carlo Vercellone, Adam Arvidsson and Eleanor Colleoni, Christian Fuchs, etc.

“Immaterial labor” has always been the core category of Hardt and Negri’s analysis of contemporary capitalism. According to Hardt and Negri, digital capitalist production in the post-Fordist era is a kind of “life-political labor” with immaterial labor as its core feature. The nature of this labor has fundamentally changed under digital capitalism, and labor has become increasingly complex, cooperative, and immaterial.⁵ In the field of immaterial labor, the normal rhythm of factory production and its clear division between working hours and non-working hours is tending to decline, and the connection between the factory time system and Marx’s law of value is dying out. Hardt and Negri point out in *Multitude: War and Democracy in the Age of Empire* that, on the one hand, large companies like Microsoft blur the boundaries between home and workplace and between labor time and free time by creating a family-oriented environment. On the other hand, precarious workers may be engaged in multiple jobs in their spare time, blurring the boundaries between labor time and free time still further (Hardt and Negri 2004, 145). This production, which is analogous to the politics of life, cannot be measured because it cannot be quantified in fixed units of time (146). For this reason, Marx’s theory of value is said to lose its relevance to this production, and the law of value to lose its validity.

Following the logic of Hardt and Negri, Vercellone argues that the evolution of capitalism from the formal subjection of labor to capital (that is, actual subjection) to cognitive capitalism puts the law of value based on the abstract measurement of labor time in crisis. In digital production, the cognitive dimension of “living knowledge” or “living labor” becomes the main force of production (Vercellone 2007) and the dominant source of value creation and accumulation (Vercellone 1999); meanwhile, this new image of collective workers (“diffused intellect”) reflects the ability to organize production cooperation independently from capital, which makes the role of capitalist command or organizational coordination redundant (Vercellone 1999). At the same time, the objective basis for capitalist command and its value also disappears (Vercellone 2009, 63–98). Moreover, the material carriers of digital goods (e.g., CD-ROMs as software carriers) that result from living labor and immaterial labor such as general intellect have a special cost structure, in which the production of the first good usually generates extremely high initial fixed costs in the form of large-scale R&D investments, while the “reproduction” cost of subsequent units (“marginal cost”) becomes negligible or even close to zero (Vercellone 2004, 63–74). The “value measurement of social labor time” is thus in crisis.

Christian Fuchs critiques the claims by theorists to have invalidated the law of value, maintaining that a scientific understanding and analysis of value creation and exploitation on the internet and social media requires the reintroduction of orthodox Marxist class definitions, so as to construct a more general analytical framework. In

order to apply Marx's class analysis framework to information capitalism, Fuchs follows Smythe's "audience commodity" and Toffler's "prosumer labor" categories, and investigates Google, YouTube, Myspace, and Facebook and other social media platforms with a view to analyzing the issue of digital labor and exploitation. He concludes that these platforms and other forms of information capitalism rely on what Tiziana Terranova calls "free labor" (Terranova 2000), which makes "all knowledge workers, unpaid and paid . . . part of an exploited class" (Fuchs 2010, 192). For Fuchs, internet users create value and surplus-value in two ways. The first is that users create "information content" in the form of consumption activities, which platform capitalists sell to advertisers as commodities. The second is that users constitute the audience of advertisements, and generate value and surplus-value by paying attention to them. Therefore, Marx's law of value applies to the analysis of income from media capital—labor time (users' online time) constitutes a measure of the value created by social media. The more time a user spends on social media such as Facebook, the more data about him/her can be generated. These data are provided to advertisers as commodities (Fuchs 2012). As a result, in Fuchs's view, value creation occurs everywhere on the internet.

Arvidsson and Colleoni criticize Fuchs's revised reading of Marx's labor theory of value. For these two scholars, digital goods based on the free labor of prosumers rarely need any kind of monetary payment in exchange for the knowledge spent by participants. As a result, value creation has gone beyond the formal conditions prescribed by Marx's theory, or the theory itself is no longer valid. This is first of all because value-creating labor, for Marx, needs a means to quantify the exploitation of workers, and only if we can identify the "free labor" of consumers as the source of surplus-value can we say it is exploited. Nevertheless, "free labor" is free without any charge, and therefore it cannot be a source of value. The absence of such formal mechanisms means that Marx's theory of value—at least in the case of digital prosumption—is not applicable (Arvidsson and Colleoni 2012). In the next place, the informatization and financialization of global capitalism means that it is no longer possible to understand the value creation seen in today's digital capitalism using Marx's theory of the direct production process of industrial capitalism, with its basis in the 19th century. This is because social production and online participation within digital capitalism often coincide with living time, just as Facebook users regard Facebook as part of their daily communication and interaction. This makes it more difficult to distinguish between "productive time" and "non-productive time," let alone to define the time that constitutes a source of value. Finally, since surplus-value is realized through "complex networks of inter-firm cooperation," it is impossible to directly correlate market prices with the labor time invested in commodity production. On the contrary, the empirical precision that enabled Marx to determine

how labor creates value is obscured by intangible relationships characterized by emotions, brand reputation and other unquantifiable attributes, in which the link between reputational (or emotional) value and the acquisition of financial rents becomes the fundamental issue.

In general, the debate on the validity of the law of value in Western Marxism can be summarized in the following five points. First, digital capitalism is replacing industrial capitalism as the dominant form of social production, i.e., capitalism has acquired an “overall novelty.” Second, the special cost structure of digital goods causes the measure of value to lose its foundation and validity. Third, digital labor makes it more and more difficult to distinguish between living time and production time, which renders increasingly meaningless the measure of value, based on the distinction between necessary labor and surplus labor, of the law of value under capitalism. Fourth, under digital capitalism the boundary between unpaid labor and paid labor disappears, which means that the measure of value or surplus-value loses efficacy. Fifth, the possession and realization of value need to be understood as elements of the expanded social process centered on finance, in which the link between reputational (or emotional) value and the acquisition of financial rents becomes fundamental. However, the fact remains that there are misreadings and misunderstandings of Marx’s labor theory of value, whether these are the “invalidity theory” or “revision theory” of the law of value.

Productive Labor and the Validity of the Law of Value under Digital Capitalism

The debate among Western Marxist scholars on the validity of the law of value under digital capitalism has converged around the two poles of “invalidity theory” and “revision theory.”⁶ To some extent, this controversy reflects a misunderstanding of Marx’s definition and classification of productive labor and non-productive labor. As a result, the discussion of the law of value under digital capitalism needs to return to Marx’s scientific assertion concerning the relationship between labor form and value production.

For Marx, the only source of value is undifferentiated general human labor, and the fundamental measure of value is socially necessary labor time. Nevertheless, not all labor creates value and surplus-value under the capitalist mode of production, while only productive labor creates surplus-value.⁷ Therefore, it is first necessary to judge which activity is productive if we want to judge which activity under digital capitalism is labor that creates value and surplus-value, both of which rely under capitalism on a scientific classification of productive labor and non-productive labor. According to Marx’s principle of the duality of labor, the fact that a commodity has exchange value, or can be monetized, depends on

the use-value of this commodity, whether this use-value is the result of the activity or the activity itself. The labor that produces use-value, and which exists in any socioeconomic form, is called general productive labor by Marx. Under capitalism, surplus-value is produced only by labor that produces use-value through purposefully transforming and occupying nature. In other words, the quality of general productive labor is a necessary condition for labor that produces capital (but not a sufficient condition, which is the production of surplus-value). Therefore, it is necessary to clarify whether an activity represents general productive labor if we want to judge whether it is capitalist productive labor. The distinction between general productive labor and labor that produces capital is crucial to delineate productive labor and non-productive labor under capitalism.⁸

Regardless of the economic form of a society, it is necessary that people engage in certain activities to realize the production and reproduction of material life so as to ensure the reproduction of this economic form itself and of its members in society. The basic activities that a society must engage in include production, distribution (including income distribution), circulation, consumption, and reproduction of the social order (Savran and Tonak 2020). Some of the activities that make up this totality, however, do not constitute production, and they cannot be called general productive labor. For this reason, Marx points out that “All production is appropriation of nature by the individual within and by means of a definite form of society” (Marx and Engels 2010a, 25). In other words, Marx’s view is that those who engage in productive activities provide human society with indispensable reproduction factors by interacting with nature. No society can live on the edicts of kings or on contracts of life insurance without drawing from nature the means of its livelihood (Savran and Tonak 2020). These means can be obtained only through production, so only the labor engaged in such production can be considered as general productive labor.

Once this logic is followed in defining general productive labor and dividing human activities, it can be seen immediately that consumption (meaning individual consumption rather than productive consumption) and distribution activities are excluded from general productive labor since they do not involve the consumption of labor. At the same time, activities specializing in the reproduction of the social order are also non-productive. The general productive labor analyzed here is just a starting point for the distinction between productive and non-productive labor under capitalism, since the labor that creates productive capital is considered a subset of general productive labor. Capitalist production is not only a labor process that reaches a “certain point” but also a process of increasing value “beyond a certain point.” Meanwhile, commodity production and surplus-value production are primary characteristics of capitalism, and this proliferation process is always a continuous process of expanded reproduction. Here, the capitalist labor process is subordinated to the capitalist value proliferation process. In this regard, Marx points out,

Since the direct purpose and the *actual product* of capitalist production is *surplus value*, only *such labour is productive*, and only such an exerter of labour capacity is a *productive worker*, as directly *produces surplus value*. Hence only such labour is productive as *is consumed* directly in the production process for the purpose of valorising capital. (Marx and Engels 2010c, 442; italics in the original)

From this, a progressive logic of the significance of productive labor under capitalism can be derived. First, only the labor that must be subordinate to and under the control of capital, i.e., wage labor, is productive. This is also known as the labor exchanged with capital. Second, only the labor involved in the direct production process is productive. Finally, only the labor that produces surplus-value is productive. In this way, those workers engaged in “outsourcing” and “crowd-sourcing” work on the basis of the producer’s domestic labor are excluded from capitalist productive labor because they are only “sellers of commodities, not . . . sellers of labour . . . Their production is not subsumed under the capitalist mode of production” (Marx and Engels 2010c, 141).

According to Marx, wage labor exchanged with capital is a necessary but not a sufficient condition for labor productivity under capitalism, which involves circulating labor. This is reflected in the capital cycle formula $M-C \dots P \dots C'-M'$, which is the most general expression of the self-proliferation of capital. At the $M-C$ and $C'-M'$ stages of the capital cycle, although the workers engaged in labor are wage workers, their labor only realizes the transformation of value form and not the value proliferation, so the labor in these two stages is non-productive. In fact, under capitalism, as a result of the development of the division of labor, some activities originally performed by specialized industrial capital are gradually separated and become specialized in different functions originally undertaken by the same capital. For example, some functions of money capital are taken over by interest-bearing capital (commercial and investment banks, brokerage firms, mortgage companies, insurance and reinsurance companies, etc.), while the functions of commodity capital are taken over by commercial capital (wholesalers, department stores, other large stores and retailers, etc.). In performing these functions, they themselves become an essential part of the capital reproduction process, and these capitals need to employ wage workers. However, these activities are inherently non-productive, so the labor used by these capitals remains non-productive after they become independent of specialized capitals. In this regard, Marx points out:

If by a division of labour a function, unproductive in itself although a necessary element of reproduction, is transformed from an incidental occupation of many into the exclusive occupation of a few, into their special business, the nature of this function itself is not changed. (Marx and Engels 2010e, 135)

Nevertheless, it should be noted here that non-productive wage labor in circulation does not include activities such as transportation, packaging, sorting, warehousing, etc. These activities are productive since they represent a continuation of the direct production process in circulation, and they create value and surplus-value.⁹

In the case of the Web 2.0 platform, the essence of the nature of labor and its role as a source of value can be grasped on the basis of Marx's distinction between productive and non-productive labor. The capital that relies on the Web 2.0 platform, represented by firms such as Google, Myspace, and Facebook, obtains most of its profits from advertisers. In other words, the platform acts as an intermediary in the circulation between the advertisers who realize surplus-value and the users, and a strong user scale is simply a factor on which the overall advertising revenue depends. Google, in particular, bundles users by offering a range of services grouped together by its software, aiming to ensure that as many of the online activities of these users as possible are subject to its monitoring. In the actual operation of the platform, the profits of the platform capital are derived from two aspects. One is the sale of processed user data to advertisers in order to enhance the accuracy with which advertisements are targeted, thereby reducing advertising costs and accelerating commodity circulation. In this regard, the workers directly involved in this data production process are not the users who log onto the social media platform, but the data engineers employed by the platform. The original browsing and click traces from users of the platform only provide data engineers with "raw materials"—the "metadata" of original emotional content, preferences, and behavior habits. Moreover, the use made of the platform by these people is merely a consumption activity, and as explained earlier consumption is not part of general productive labor, or even labor. Further, it is of course impossible for this usage to become productive labor under capitalism. The fact that users' data is processed and sold by platforms is simply the result of legal and technical factors (e.g., user agreements and program usage regulations require content producers to authorize the platform to use this content). Therefore, what constitutes the productive labor of digital capitalism is the labor of data engineers, and this labor is regulated by the law of value. The value of the means of production consumed in the data processing process (hardware, raw processing software, big data algorithms) and the cost of compensating engineers for the living labor consumed constitute the cost of the inputs to this labor process, and the amount by which the value realized exceeds the value of living labor constitutes the surplus-value of this production process. Without taking monopoly into account, this value is measured by the socially necessary labor time consumed in the production process, and is not related to the time users spend online. The second source from which platform capital derives its profits is the sums paid by advertisers to rent

advertising space. This rent, however, is created neither by the platform nor by the users, and comes only from productive industrial capital dividing its surplus-value with non-productive capital. For advertisers, the role of data is to reduce costs, improve advertising effectiveness, and accelerate commodity circulation, rather than selling data as commodities themselves. Advertising activities, as circulation labor, cannot create surplus-value directly, either for advertisers or for the platform. The claim that users “work” for Google or Facebook is, at best, a misleading metaphor.¹⁰ As Facebook Inc. notes in its annual report, “If the marketers don’t believe that they can get more competitive returns on the advertising investment they work with us than other alternatives, they won’t do business with us” (Facebook Inc. 2013). As a result, it is not correct to regard users’ consumption activities as unpaid labor for capital, or to argue on this basis that the law of value is invalid. It follows from Marx that even if users who produce content (e.g., videos) for sale on blogs and online communities or who display platform advertisements in their own personal spaces for profit perform activities that are a kind of labor, these independent labor activities amount only to petty production. Further, these activities are non-productive from the point of view of platform capital, since these users are not subordinate to platform capital, or rather, to Web 2.0 capital. In the case of so-called sharing platforms such as Uber and Didi, the direct production process of the drivers participating in the platform might seem, in terms of form, to create value and surplus-value for the platform capital. In essence, however, there is no labor–employment relationship between the platform capital and the drivers, but only a commercial partnership. The income of the platform is only the information rent charged by the platform to the drivers—who in the Marxian sense are small producers—through the monopoly of scale formed by the network externality, that is, the so-called deprivation accumulation based on direct possession. For this reason, what such platforms provide is only an intermediary service.

The above analysis shows that the viewpoint of Fuchs—that labor value creation activities are ubiquitous on the internet—is not valid either.¹¹ In other words, Fuchs’s viewpoint on the validity of the law of value in the Web 2.0 era is correct, but he generalizes the scope of productive labor, which represents an abandonment in another form of Marx’s theory of the distinction between productive and non-productive labor. As outlined above, Fuchs believes that all of a user’s online time is productive because it generates user data, and that the resulting value is realized in the display of advertising and the sale of data. Therefore, “if Internet users become productive Web 2.0 prosumers, then in terms of Marxian class theory this means that they become productive laborers, who produce surplus-value and are exploited by capital because for Marx productive labor generates surplus-value” (Fuchs 2011). In addition, “the production of surplus-value and hence exploitation is not limited to

wage labor, but reaches society as a whole” (Fuchs 2010). Marx’s analysis of commercial capital, however, would indicate that the amount of fees that advertisers are prepared to pay to the platform capital is not directly related to the user’s online time or to the assumed value of user data, whereas it is related to the increased likelihood of realizing surplus-value. As a consequence, Fuchs does not find a convincing time scale to explain the value of “consumer goods.” While Fuchs confuses productive and non-productive labor, Arvidsson and Colleoni replace Marx’s theory with an idealistic interpretation. In this respect, Arvidsson and Colleoni, like the Ricardian School, fall into the “Ricardian puzzle,” which confuses the categories of labor and labor force, surplus-value and profit. Arvidsson and Colleoni, failing to observe the distinction between labor and labor force, and more importantly, between surplus-value and profit, view the possession and realization of value under information capitalism as part of an expanded, society-wide process centered on finance. They then interpret the link between reputational (or emotional) value and the acquisition of financial rents as a fundamental element of this process, and thus attribute the source of value to brands, emotions and other subjective factors. In fact, both the monopoly income based on brands and the financialized spot discount of the expected returns from the accumulation of emotions (expansion of network size and users) are essentially derived from the division of the surplus-value created by global industrial workers. In this regard, Duncan K. Foley draws the correct conclusion that the brilliant achievement of the digital economy is best understood as a new model of surplus-value appropriation, rather than a new method of surplus-value creation (Vercellone 2007).

The Special Cost Structure of Digital Goods and the Validity of the Law of Value

Digital capitalism scholars, represented by Hardt, Negri, and Vercellone, believe that digital goods such as data and information have a special cost structure different from tangible goods; the initial unit has an extremely high production cost, while reproduction (copying, downloading, etc.) has a tiny cost. In other words, the material cost of the supporting carrier of data and information (for example, a CD-ROM) is negligible when production operates at scale. The fact that digital goods can be reproduced approximately without cost means that “The law of value founded on the measure of abstract labour time immediately dedicated to production enters into crisis” (Vercellone 2007, 29).

On the surface, the argument that the special cost structure of digital goods causes the law of value to fail seems tenable, and the arguments for it appear quite intuitive and simple. In other words, it seems plausible that the intrinsic determination of the form of value cannot regulate the production of goods on the basis of labor time if

the existence of exchange value depends on scarcity, as in marginalism, or on the difficulty of production, as in classical political economy. The problem, however, is that the commodities do not exist merely as elemental forms of capitalist wealth under the capitalist mode of production, but as the result of capitalist production, i.e., the products of capital. The value of commodities as capital products, or as the result of the direct production process of capitalism, is not determined in isolation. For this reason, the view that the law of value fails on the basis of the direct metric dilemma of the value of the individual commodity is a misunderstanding of the form that the law of value assumes in practice under capitalism, a misunderstanding based on a metaphysical view of the intrinsic determination of the value form of labor products. In the more abstract and simple form of value, a commodity can reasonably be regarded as a single product whose value can be determined in isolation by the amount of socially necessary labor materialized in that single product. But even then, this single product exists as an average sample of its kind. This formal contradiction disappears as soon as the commodity is regarded not as the premise of capital but as the result of capital production.

In analyzing the determination of the value of simple commodities at the abstract level, Marx first defines the labor that produces value, namely,

The labour, however, that forms the substance of value, is homogeneous human labour, expenditure of one uniform labour power. The total labour power of society, which is embodied in the sum total of the values of all commodities produced by that society, counts here as one homogeneous mass of human labour power, composed though it be of innumerable individual units. Each of these units is the same as any other, so far as it has the character of the average labour power of society, and takes effect as such; that is, so far as it requires for producing a commodity, no more time than is needed on an average, no more than is socially necessary. (Marx and Engels 2010d, 49)

On this basis, Marx defines the determination of the value of a commodity, i.e., the value of a commodity is determined by the socially necessary labor time spent in producing that commodity. Commodity exchange should be based on the value amount, with an exchange of equivalents, and the single commodity is only an average sample of this total commodity.

However, a commodity, as a result of capitalist production and as a precondition for it, has different provisions. “Capitalist production annihilates the [original] basis of commodity production, isolated, independent production and exchange between the owners of commodities, or the exchange of equivalents” (Marx and Engels 2010c, 360; square brackets in the original). The single commodity, as the precondition or starting point for capitalist production, acquires two

special historical characteristics under the capitalist mode of production. The first is that the value of the commodity is expressed as a combination of paid and unpaid labor. The second is that not only the single commodity is expressed materially as a part of the total product of capital or a divisible part of the mass of products produced by capital, but its value can only be a divisible part of the total labor value. In other words, what is expressed as the result of the direct capitalist production process is no longer a single commodity,

but a *mass of commodities* in which the value of the capital advanced + the surplus value, the appropriated surplus labour, has been reproduced. Each of these individual commodities is a repository of the value of the *capital* and the surplus value produced by it. (Marx and Engels 2010c, 363; italics in the original)

These two characteristics of the commodity that arise as a result of the direct production process of capital have greatly changed the method of measuring commodity value relative to the commodity as a precondition of capital production. In this regard, Marx points out,

The labour applied to the individual commodity can no longer be calculated at all—if only because this would be a calculation of the average, hence a notional estimate, which covers the part of the constant capital which enters into the value of the total product merely as depreciation, and also the conditions of production that are consumed communally, and finally because it is the directly social labour, which is balanced out and estimated as the average labour of the many cooperating individuals. The labour applied to the individual commodity counts only as the aliquot part of the total labour which falls to this commodity and is estimated *notionally*. (Marx and Engels 2010c, 363; italics in the original)

Therefore, to achieve the old capital value and the surplus value “it is by no means enough for the individual commodities or part of the individual commodities to be sold at their value” (Marx and Engels 2010c, 364). At the same time, the value of labor materials in the form of constant capital materials features a special mode of turnover, which determines that the value of commodities resulting from capitalist production can only be measured by the value of the total products. As Marx says,

It was also shown that it continues to serve in the labour process over a long period, and that the part of the value that it gives up over a particular period of time to the product produced during that period can be estimated according to the ratio between that particular period and the total period during which it is

used up as a means of labour, thereby losing its total value and transferring its total value to the product. (Marx and Engels 2010c, 365)

In other words, in the process of direct production, the constant capital transfers only the value of the average valuation part to the commodities, while the value of the remaining constant capital, which continues to function as a means of labor, is independent of the value composition of the commodity already produced. In this way, the single commodity as a product of capital is expressed as a part of the total product in terms of its use-value, and as a divisible part of the total value produced by capital in terms of its value. Correspondingly, the value determination of a single commodity also undergoes a transformation from an average of a sample of similar commodities to a divisible part of the total product of capital, and the abstract law of value is transformed into a more concrete law of value—the law of value under capitalism, the law of market value. In this case, the value of the total product is not expressed as the sum of the values of single commodities, but the value of the total product is determined first, and then its value is distributed equally by each single commodity. The law of value is transformed into the law of production price when the analysis of more diverse capital is introduced.

It is now quite understandable that the determination of value under the capitalist mode of production has gone beyond the abstract determination of value as the average of a sample of similar commodities, that is, beyond the determination of value of a single commodity in isolation. Moreover, digital capitalist theorists make the same mistake as the “Smithian dogma” when they accept the so-called “marginal cost” category in order to negate the law of value; this should be assigned great significance if we are to understand the value determination of so-called cognitive commodities such as numbers and information. When subjected to Marx’s logic, the argument advanced by the digital capitalist theorists, to the effect that the special cost structure of digital goods invalidates the law of value, loses all its foundation. The disequilibrium between the huge production cost of the first commodity and the negligible cost of the subsequent reproduction is meaningless in terms of value determination, because the value of each subsequent product is a divisible or equal part of the total value of the production process. What really constitutes the reproduction of digital goods is not the so-called copying or downloading, but more likely the improvement, upgrading and re-optimization of the digital information goods themselves. This process still consumes capital materialized labor (such as plants, computers, original production software, etc.) and living labor (labor for software upgrades, improvements, etc.), and is still subject to the regulation of the law of value. For this reason, the argument that the so-called special cost structure of digital goods invalidates the law of value is not tenable.

The Real System of Digital Capitalism and the Validity of the Law of Value

No matter how fierce and diverse the debates on the validity of the law of value are among digital capitalism theorists, one claim that all these theorists make is that the production based on data, knowledge, information, and other content of the internet economy represents a new mode of value production, and is becoming the dominant social production system.¹² In the view of these scholars, this new mode of value production has even overcome the resource and energy constraints of the industrial capitalist mode of production, so that “economic growth” can last indefinitely in the post-industrial capitalist economy. Nevertheless, the characteristics of “zero cost” reproduction of the information commodities and network externality of digital capital have, on the whole, weakened the role of the law of value. In particular, according to Hardt and Vercellone, the increasing dominance of global digital capitalism is consigning Marx’s law of value to the dustbin of history, since the income of digital capital is increasingly derived from the numbers and images of its audiences, and from the business model of earning income without paying anything. In other words, intellectual property and network externality are becoming key elements of digital capitalist value production, while finance is the fundamental accumulation mechanism for anchoring “audience labor” (Boyer and Saillard 2002). The question, however, is whether the digital capitalist mode of production is dominating production within contemporary capitalism. If the answer is yes, the form of digital labor and its nature will inevitably lead to unsustainable value production centered on labor time. If the answer is no, the judgment that the law of value as a whole has been consigned to the “dustbin” of history will not be borne out. As a result, there is an epistemological problem that pits the theoretical construct against the real production system.

That is to say, there is a problem surrounding the question of whether digital capitalism (either the knowledge capitalism, cognitive capitalism, and information capitalism that express different aspects of abstract generalized capitalism, or the much more concrete platform capitalism) is an abstract category or a real economic system. If digital capitalism is only an abstract concept of the capitalist mode of production, then when applying it to analysis of the capitalist system it is necessary to take into account the spatial coverage of this theoretical system and the corresponding interrelationship of the different socioeconomic relations built on the various parts of the space. On this point, Immanuel Wallerstein in his analysis of the capitalist world economy has questioned the contention that where there is a proletariat, there is capitalism. According to the definition of the capitalist mode of production, there is no doubt that this must be so. But what is the appropriate unit of analysis? England, Mexico, or the West Indies? Does it mean that each of these

three has its own mode of production? Or rather, is it that the appropriate unit of analysis should be the European-centered world economy (from the 16th to 18th centuries), including England and Mexico? In this case, what is the “production” mode of the world economy (Wallerstein 1979, 10)? Similar questions can also be asked concerning the extent to which digital capitalism as a theoretical abstraction matches up with digital capitalism as a real system of capital accumulation, and to which digital capitalism as a real system of accumulation controls the lifestyle and mode of production in our era.

In the case of Wallerstein’s question, Marx provided a clear answer as early as his treatise on the method of political economy:

In every form of society there is a particular [branch of] production which determines the position and importance of all the others, and the relations obtaining in this branch accordingly determine those in all other branches. It is the general light tingeing all other colours and modifying them in their specific quality; it is a special ether determining the specific gravity of everything found in it. (Marx and Engels 2010a, 43; square brackets in the original)

In Marx’s view, this is why the abstract concept as a theoretical construct does not amount to a complete functioning system of reality, although there is always a dominant relation of production in the production of a particular society that determines the mode of labor and the nature of society. This is true for a given society and even more so for the globalized system as a whole. Of course, the capitalist mode of production is not directly equivalent to the real capitalist system, but analysis of the capitalist system is inseparable from the category of the capitalist mode of production. Ernest Mandel discusses this point in detail in his *Late Capitalism*, and concludes that the main part of the integrated world economy is still outside the capitalist mode of production (Mandel 1983, 82–120). In his view, a major source of the excess profits obtained by the developed capitalist sectors is the value extracted from the pre-capitalist mode of production through primitive accumulation mechanisms.

Nevertheless, capitalism has undergone profound changes in the period of almost 50 years since the publication of *Late Capitalism*.¹³ The system of capital accumulation has shifted from a “Ford” system of accumulation to a “flexible accumulation” system. This provides the flexibility required by capital globalization on account of the globalized production system caused by the profit-seeking nature of capital. To the greatest extent possible, capital globalization incorporates the productive resources of all world economies into the capitalist system. Nevertheless, the basis of capital accumulation in the era of globalization has not changed fundamentally, and it is precisely this unbalanced system of development that sustains

the non-productive activities of the developed capitalist sectors. In other words, the productive activities of the trading countries provide a divisible surplus-value for the non-productive activities of the financial countries. According to Foley, half of global GDP is surplus-value, and this surplus-value pool is conservatively estimated to reach \$30 trillion (Foley 2013). As a result, although the “new economy” shaped by digital capitalism has led to a dramatic increase in the income of internet and other forms of digital capital, its share through profit rate averaging is still insignificant compared to global production. Furthermore, Foley points out that the dramatic growth of knowledge and information-based income from digital capital through intellectual property and network externality may create the illusion that there is no investment except for human creativity and ingenuity, even though information and knowledge-based commodity production can create value. The income from intellectual property may be enormous, but it comes from the global pool of surplus-value generated through the exploitation by capital of global productive labor (Foley 2013). For that matter, it is premature for digital capitalism theorists to judge the overall novelty of contemporary capitalism. Although the wave of new technologies based on ICT is reshaping our economic life in all respects, it is still financial monopoly capitalism that dominates the world system. In addition, the basis on which financial monopoly capitalism exists is still the maintenance and development of industrial capitalism. The view that contemporary capitalism has thrust the law of value into the dustbin of history represents a misunderstanding of Marx’s theory and its methods.

Conclusion and Prospect

The neglect and misunderstanding of Marx’s distinction between productive labor and non-productive labor and the metaphysical approach to value measurement are the main reasons why digital capitalist theorists have come to the view that the law of value has failed. Moreover, their phenomenological approach to analyzing the labor process in digital capitalism deepens this misunderstanding. Once these problems are examined, it can be seen that the logic of operation of the digital economy within contemporary digital capitalism does not diminish the scope of the law of value, which is still valid, but the form of its role has changed from the abstract law of value to the law of production price. The income surge in the so-called “new economy” is nothing more than a fragmentation of the global pool of surplus-value, which is transformed into financialized income and information rent income.

It should be pointed out that our critique and response to the theory that the law of value has failed under digital capitalism does not claim that capitalism is eternal, but sets out precisely to analyze the economic relations of capitalism by placing the system in a specific and concrete historical context. This thesis aims to demonstrate

that digital capitalist theorists, based on analysis of the digital capitalist labor process and value proliferation process, misunderstand Marx's labor theory of value. In fact, the development of ICT, with intelligent algorithms, data storage and processing, and big data technology at its core, is reshaping contemporary production methods. In addition, digital devices are enabling ever-closer linkages between producers and consumers, and increasingly precise matching between supply and demand. In particular, the dramatic increase in production automation, associated with smart manufacturing, is minimizing the proportion of variable capital allocation, and consequently decreasing the production of value and surplus-value in these sectors. A fully automated production activity does not produce any new surplus-value but only transfers the old value of constant capital, since it is productive wage labor that is the source of surplus-value. The law of fixed capital accumulation is partially destroying the law of value. That is to say, the more capital aims at the proliferation of value, the greater becomes the inevitable tendency for capital to "increase the productive power of labour and to bring about the greatest possible negation of necessary labour" (Marx and Engels 2010b, 83). While "in the same measure as labour time—the simple quantity of labour—is posited by capital as the sole determinant of value, immediate labour and its quantity disappear as the determining principle of production, of the creation of use values" (Marx and Engels 2010b, 85–86). In other words, the more capital aims at value proliferation, the more it has to increase its productivity, so as to make the individual value of its own goods lower than the social value and obtain excess profits. Capitalist competition, in turn, transforms this intrinsic mechanism into an external compulsion applying to all capital, and the disproportionately rapid growth of constant capital relative to variable capital results in capital's self-negation:

It is reduced both quantitatively, in that its proportion declines, and qualitatively, in that it, though still indispensable, becomes a subaltern moment in comparison to general scientific work, the technological application of the natural sciences, on the one hand, and also in comparison to the general productive power originating from the organisation of society in overall production, a productive power which appears as a natural gift of social labour (although it is an historical product). Thus capital works to dissolve itself as the form which dominates production. (Marx and Engels 2010b, 86)

As a law, however, this represents only a historical trend, and it still requires a long process of the self-negation of capital in the real world.

The development of a globalized production system incorporates the production activity that creates value and surplus-value into the global capitalist system, and the global expansion of labor-intensive production sectors, in particular,

counteracts this trend to the dissipation of the law of value. The global economic aggregate is still dominated by the law of value. The expansion of those economic sectors that undermine the law of value depends on the expansion of this law on a global scale. The law of value allows the digital capital of developed capitalism to obtain monopoly income—rent and financial income—in the form of trade secrets and intellectual property rights, representing a share in the division of the surplus-value created by global production activities. From the perspective of value, capital accumulation is thus a contradictory process that undermines the law of value to a certain extent, but expands it on a global scale. The law of value is still the general principle of the whole system, and capitalism cannot exist without its prevalence:

This being so, it becomes evident that the material productive power already available, already elaborated, existing in the form of fixed capital, as well as the SCIENTIFIC POWER, population, etc., in short, all the prerequisites of wealth, all the conditions for the maximum reproduction of wealth, i.e., for the rich development of the social individual—that the development of the productive forces, brought about by capital itself in its historical development, at a certain point abolishes the self-valorisation of capital, rather than posits it.

Beyond a certain point, the development of the productive forces becomes a barrier to capital, and consequently the relation of capital becomes a barrier to the development of the productive forces of labour. Once this point has been reached, capital, i.e., wage labour, enters into the same relation to the development of social wealth and the productive forces as the guild system, serfdom and slavery did, and is, as a fetter, necessarily cast off. (Marx and Engels 2010b, 133)

In terms of its current development, however, digital capitalism is still far from what Marx termed “a certain point”—the integral self-negation of global capitalism. The law of value remains valid as the general principle regulating global capitalist production.

Notes

1. Different theoretical constructs reflect various aspects of the changes brought to the mode of production by the new wave of technology. The differing nuances of these constructs make it difficult for people to reach agreement on how to analyze this production. For the sake of simplicity, this thesis accepts Dan Schiller’s (2000) definition and refers to the new phenomenon collectively as “digital capitalism.”
2. In a certain sense the development of the digital economy, or the process of economic digitization, includes the two dimensions of industrial digitization and digital industrialization. Since

the debate between Western digital capitalism theorists on the validity of Marx's law of value is directed mainly at the process of digital industrialization, this thesis focuses primarily on the process of digital industrialization and discusses the relevant topics.

3. In Smythe's view, so-called audience labor refers to the free labor performed for advertisers by the media's audience groups when the latter learn to buy a particular brand of consumer goods and spend their revenue accordingly.
4. Prosumer labor was originally referred to those consumers involved in the types of production in which consumers participate in the creation of products or services for their own consumption activities, such as buffets, etc. Toffler's category was later used to describe consumers on the internet who are not only consuming, but are also engaged in the production of digital information for internet capital.
5. Arguing from the perspective of their definition, Hardt and Negri as representatives of the Autonomist Marxist School not only completely reject or discard Marx's distinction between productive and non-productive labor, but also replace "abstract labor" with "immaterial labor."
6. If Hardt, Negri, and Arvidsson completely abandon the distinction between productive labor and non-productive labor, then Fuchs blurs this distinction.
7. It should be noted here that in Marx, the distinction between productive labor and non-productive labor under capitalism is examined exclusively from the perspective of capital. In this regard, Marx points out:

Only the narrow-minded bourgeois, who regards the capitalist form of production as its absolute form, hence as the sole natural form of production, can confuse the question of what are *productive labour* and *productive workers* from the standpoint of capital with the question of what *productive labour* is in general, and can therefore be satisfied with the tautological answer that all that labour is productive which produces, which results in a product, or any kind of use value, which has any result at all. (Marx and Engels 2010c, 443; italics in the original)

In this way, Marx excludes from productive labor the category of independent labor that is not yet subordinate to capital—labor performed for the workers' own purposes, including the labor of small producers and peasants, and some labor engaged in the production of science and art. Marx describes this type of labor as a "transitional form" in relation to capitalism (Marx and Engels 2010c, 448).

8. Here, we accept the view of Savran and Tonak (2020) and regard labor that produces capital as a subset of general productive labor.
9. The classification of productive and non-productive service activities is of course more complex. This classification, however, is not relevant to our discussion here, and will not be discussed in this thesis.
10. It should be pointed out that another argument advanced by digital capitalism theorists to demonstrate the failure of the law of value is that the home-based work environment and the fact that workers use their free time to engage in multiple jobs blurs the boundary between labor time and free time, which in turn makes value measurement based on socially necessary labor time impossible, and the law of value invalid. In reality, this is a groundless and erroneous conclusion. According to Marx, the production of surplus-value in capitalism has undergone an evolution from the production of absolute surplus-value to the production of relative surplus-value based on absolute surplus-value, i.e., an evolution from increasing the production of surplus-value through intensifying labor and extending the working day in absolute terms, to the process of increasing labor productivity and extending surplus labor time in relative terms. Therefore, the blurring of the boundary between labor time and free time alone does not negate the law of value, because it is

only an absolute extension of the working day to attract workers to work overtime in a home-based work environment, which does not change the fact that a productive worker creates new value for capital. If people in unstable employment hold several jobs at the same time (which is the case for many workers in the gig economy), this merely proves that they create value for several capitals simultaneously, and that their labor is not condensed in one but in several different commodities; it does not change the fact of value production described by Marx. The latter elaborated on this point in his remarks on the industrial reserve, especially the “stagnant” population, which

forms a part of the active labour army, but with extremely irregular employment. Hence it furnishes to capital an inexhaustible reservoir of disposable labour power. Its conditions of life sink below the average normal level of the working class; this makes it at once the broad basis of special branches of capitalist exploitation. (Marx and Engels 2010d, 637)

That is to say, all these workers in unstable and abnormal jobs constitute the conditions of capital accumulation—the complete embodiment of the role of the law of capitalist value.

11. In reality, Fuchs’s purpose is to try to find a time measurement corresponding to the value of prosumer goods based on the labor theory of value within the logical framework of Smythe’s audience commodity theory, and then to uphold the labor theory of value. However, the misinterpretation of the labor process of Web 2.0, especially the erasure of the boundary between productive and non-productive labor, means ultimately that Fuchs’s revision of the labor theory of value not only fails to serve the purpose of upholding the law of value, but causes even greater confusion and theoretical chaos.
12. According to Hardt, Negri, and Manuel Castells, information occupies a hegemonic position in contemporary capitalism, and information-based production gives contemporary capitalism its “overall novelty.” See Hardt and Negri (2000) and Castells (2010, 69–76).
13. These extensive changes are not only reflected in the profound transformation of productivity, but also in the transformation of global relations of production. Countries on the periphery of global capitalism have been integrated into the system by capital globalization, the capitalist mode of production has largely replaced feudal relations of production, and so-called newly industrialized countries have emerged. Meanwhile, the disintegration of the Soviet Union and the reform and opening-up of certain socialist countries have also brought various socialist “territories” into the capitalist world system. Nevertheless, the essential logic of the capital accumulation mechanism has not changed fundamentally. It is simply that Harvey’s “predatory accumulation” is now used to explain contemporary capitalism instead of Mandel’s “primitive accumulation.”

Acknowledgements

The article is translated from Chinese by Associate Prof. Yexia Sun at the Northeast Normal University in China.

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