Cognitive Capitalism or Cognition in Capitalism?

_A Critique of Cognitive Capitalism Theory_

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1. Introduction

No one denies that the scale and scope of the technological development in the last 60 years are unprecedented. This includes the rapid development of micro-electronics technologies and the widespread diffusion of information and communication technologies. Bio- and nano- and alternative energy technologies are emerging as new frontiers. Not only has all this changed the everyday life of ordinary people, but the economy, especially its industrial structure, has been reshaped significantly. Productivity for existing products has significantly grown and the pace of the creation of new products has been accelerated. Economy and knowledge and/or technology are integrated with each other more closely than ever before.

All this has brought about the need to reconsider the role of knowledge, especially science and technology, and its social determination in contemporary capitalism. Many theories have been proposed to address this from different perspectives with diverse emphases and implications: new growth theory attempting to endogenise production of knowledge into growth models, economics of innovation exploring the role of intellectual property rights and evolutionary economics studying path-dependency in the knowledge production, to only name a few from economics.

One question that has drawn much interest among theorists is how to characterise the economic importance ascribed to knowledge and technological development. On the one hand, knowledge and technological development are seen to be always essential for the economy. According to this view, the lack of accounts of knowledge in economic theories is simply considered as flaws of such theories, which need to be fixed by properly incorporating the role of knowledge. On the other hand, the recent recognition of the central role of knowledge in the economy is viewed as reflecting a new underlying reality. It is argued that whilst knowledge has always been important, qualitative changes that the capitalist economy is undergoing have elevated the practical and theoretical significance of knowledge and technology to a far upper level. Such theories face the task of theorising the essence of the new reality. Terms like Knowledge-based economy, Network society and Post-industrial society represent diverse attempts to conceptualise the new reality, be they either merely rhetorical or substantial.

Cognitive capitalism theory is one such theory which takes recent phenomenal changes as representing fundamental transformation that capitalism is going through. Proponents of this theory argue that capitalism is transitioning to a new stage of capitalism even though the extent of the transformation is not so extreme that these changes do not entail the emergence of a new mode of production. According to Paulré (2004), the objective of cognitive capitalism theory is “to address the role of knowledge in understanding the evolution and transformation of contemporary capitalism.” The new stage of capitalism – cognitive capitalism – is characterised by the appropriation by workers of the cognitive aspect of work and the mutation of the power relation between capital and labour, more favourably to labour. Cognitive labour\(^1\) is a type of labour that produces knowledge, cooperation and communication, and it is suggested as the hegemonic form of labour. Consequently, this leads to the argument that determination of value of commodity by socially necessary labour time is rendered dubious because cognitive labour producing knowledge cannot be measured by labour time. Capital is seen to increasingly becoming parasitic, playing no meaningful roles in the production process. Whilst capital still appropriates part of surplus created by labour, it does so only through intellectual property rights. Consequently, profit as an economic category is disappearing and becoming like rent. In

\(^1\) Note that the term cognitive has nothing to do with cognitive science, a study of mental operation or thought. It is used “simply as an adjective derived from knowledge”, Paulré (2004).
sum, it is argued that Marx’s value theory is under crisis in cognitive capitalism.

The significance of cognitive capitalism theory lies in the fact that it is one of the few, if not the only, leftist accounts of contemporary capitalism from a viewpoint of knowledge and/or technology. This is contrasted with the flourishing development of knowledge-based economy theories based on mainstream economics, supported by governments and international organisations such as World Bank and OECD. Further, whilst Marxian political economy is actively engaging with contemporary capitalism, its focus is placed upon neo-liberalism, globalisation and financialisation. We see a clear need to develop and refine Marxian accounts of knowledge economy in order to fill this theoretical vacuum, to which cognitive capitalism theory has obviously contributed. However, this scarcity ironically requires us to critically engage with cognitive capitalism theory for the following reasons. First, any Marxian theory of knowledge economy or technological development cannot avoid being evaluated in light of cognitive capitalism theory not because of its validity but because of its scarcity. Second, the influence of cognitive capitalism theory is clearly increasing. It has drawn attention from many theorists and activists to the extent that the term cognitive capitalism is being used in much the same way as knowledge economy is. Namely, it is used casually without much theoretical consideration and reflection. For example, “[c]ontemporary ‘cognitive’ or ‘informational’ capital is ever more dependent on social production to generate value and profits”, Arvidsson (2009, p. 16). “Adaptation to participatory modes of innovation, to open models of intellectual property (IP), is antithetical to both the industrial and cognitive modes of capitalism”, Bauwens (2009, p. 132). Third, and most importantly, whilst it is argued to be based on Marx’s methods, their interpretation of Marx’s theory of capitalism in general and value theory in particular is dubious if not flawed, as we will show later.

In this paper, as part of a broader research topic to study the role of knowledge and technological development in contemporary capitalism from a Marxian perspective, we will attempt to criticise cognitive capitalism theory, focusing on how its key arguments are derived based on a wrong interpretation of Marx’s theory.

Focus of the critique

Then how do we criticise cognitive capitalism theory? One can choose to stay at the level of phenomena and engage with its interpretation of facts and numbers. Whilst we are observing phenomenal changes such as the rapid adoption and diffusion of information and communication technologies, we can still claim that they represent no fundamental changes of the essence of capitalism, but comprise only new appearances through which more or less the same essence manifests. This type of critique is simple, but can also prove to be quite efficient and effective. If we can convincingly demonstrate that the core of capitalism still remains intact, we can simply and easily discard the need to develop a new theory. Many have criticised cognitive capitalism theory from this perspective, in convincing ways, but it has not been so successful. Their arguments are neither flawed nor insufficient. Rather, they are ineffective in that cognitive capitalism theorists always respond back by arguing that the transition to cognitive capitalism is still ongoing and what matters is not the current status of capitalism but the tendencies towards a new stage of capitalism.2

Put differently, showing that contemporary capitalism still retains characteristics of industrial capitalism is necessary but not sufficient to refute cognitive capitalism theory. For example, one of its key arguments that cognitive labour is the hegemonic form of labour in cognitive capitalism is seen as a tendency, not an established fact, according to proponents of cognitive capitalism theory. It is not deniable that industrial labour still accounts for a significant portion of total workers. In addition, the relative increase of service sector, in which cognitive labour is believed to be dominant, in terms of share of total employment or GDP may be interpreted in a different way.3 All these are suggested as evidence by opponents that nothing has really changed. Whilst proponents do not disagree, they insist

that we need to focus on the trend that industrial labour and the manufacturing portion of the economy have been gradually decreasing. They expect and predict that this trend will continue as the result of the fundamental transformation of capitalism. Both of the two opposing interpretations are understandable and plausible. But arguing about which interpretation is correct is, more often than not, unproductive. This is especially because the debate between the two opposing views is not about the validity of facts and numbers, but about how they should be interpreted. In such case, it is not easy to locate a common ground where productive discussion can continue.

An alternative approach is to focus not on the major arguments of cognitive capitalism theory, but on the way they are derived. In other words, one can choose to criticise theoretical tools and methods adopted in the analysis rather than the final output. This means that one does not question whether or not we are entering into a new stage of capitalism, but attempts to demonstrate how this conclusion is drawn. Hence, in this approach, the analysis of facts and numbers is not of primary concern. Instead, the focus of analysis is placed upon the essential differences between cognitive capitalism and industrial capitalism, most notable among them being the change of the hegemonic form of labour and labour’s appropriation of the role of knowledge production. Significantly, these changes are considered to be essential not in themselves, but because value theory is allegedly unable to explain them. Although this can also be interpreted as invalidating value theory, cognitive capitalism theory chooses a half way between validity and invalidity, and ascribes the obsolescence of value theory to the mutation of the reality. Value theory remains to be valid in industrial capitalism, and the phenomenal changes which are at odds with value theory are seen to comprise the essence of the new capitalism. In short, we are told that we live in a new world where the old theory (i.e. Marx’s value theory) does not work any more.

Leaving aside the problem that cognitive capitalism theory proposes no alternative value theory which replaces Marx’s labour theory of value, the notion that value theory can be rejected because of some phenomena that contradict value theory is at odds with Marx’s view. Marx (1934, pp. 73-74) criticises such a notion, by saying that “if one wanted at the very beginning to “explain” all the phenomenon which seemingly contradict that law, one would have to present science before science” (italics in original). Given that the focus is now placed upon the explanatory power of value theory in contemporary capitalism, especially in its relation with knowledge and technological development, one can question whether or not value theory can explain the new phenomena of the new capitalism. It might turn out that value theory has not been correctly applied or that the understanding or interpretation of value theory by proponents of cognitive capitalism theory is wrong.

Our critique will take this approach, actively and critically engaging with their interpretation of Marx’s value theory. We will focus on showing that their interpretation of Marx’s value theory is so flawed that their call for a new theory or hypothesis cannot be justified. This does not preclude the possibility that the essence of capitalism is actually going through fundamental changes to the extent that we need a new theory for the new reality, but we will not engage with this debate as mentioned earlier.

The remainder of this paper is organised as follows. Section 2 summarises the key arguments of cognitive capitalism theory, especially in its relation with other theories. Section 3 demonstrates that the interpretation of Marx’s theory by the proponents of cognitive capitalism theory is flawed, especially in its interpretation of abstract labour and value. Section 4 outlines an alternative theory, which is a Marxian theory of knowledge economy.

2. Cognitive Capitalism, Regulation Approach, Post-workerism and Knowledge Economy

Before embarking on our critique of cognitive capitalism, it is necessary to trace the origin of cognitive capitalism, focusing on their similarities with and differences from the regulation approach, knowledge-based economy theories and post-workerism. This will situate our critique in a proper context.

Whilst the origin of cognitive capitalism theory dates back to early 1990s, Toscano (2007, p. 5), its development as a
separate research stream started when the thesis of cognitive capitalism was drafted during a symposium held in Amiens in 1999, Paulré (2004). Major contributors include Antonella Corsani, Patrick Dieuaide, Maurizio Lazarrato, Jean-Marie Monnier, Yann Moulier-Boutang, Bernard Paulré and Carlo Vercellone. The early thoughts are summarised in the document (“Draft”) which describes the cognitive capitalism research program of MATISSE (Modélisations Appliquées, Trajectoires Institutionnelles, Stratégies Socio- Économiques) – “Le capitalisme cognitive comme sortie de la crise du capitalisme industriel (Cognitive Capitalism as an exit from the crisis of industrial capitalism)”, Corsani et al. (2001).

Regulation Approach

The Draft shows that the thesis of cognitive capitalism has been developed under the significant influence of the French regulation school. This is more than evident in the use of concepts like regime of accumulation or mode of development. Cognitive capitalism is suggested as a new regime of accumulation that arises out of the crisis of Fordist regime of accumulation. In the same vein, Paulré (2004) defines cognitive capitalism as a new system of accumulation. “Cognitive capitalism is a system of accumulation” in which the accumulation is centred on knowledge production, especially science and technology. However, the concept of cognitive capitalism goes beyond the regulation approach because the transition to cognitive capitalism involves discontinuity or rupture from the Fordist regime of accumulation. Clearly, cognitive capitalism theory is not a theory of post-Fordism. The transition is considered as an exit not only from the crisis of Fordism but also from that of industrial capitalism which encompasses both Fordism and post-Fordism as its stages. Hence, cognitive capitalism theory occupies “a unique position”, Corsani et al. (2001, p. 5), within the regulation approach. Braudel’s study of the long dynamic of capitalism inspired this view on the transition, where industrial capitalism itself is considered only as a stage of capitalism.

Knowledge-based economy and the likes

Cognitive capitalism theory also draws from other contemporary economic and social theories that try to capture the mode of development or “dynamic efficiency” of capitalism as opposed to “static efficiency” represented by the general equilibrium framework, Antonelli (2007, p. 13). Such theories include knowledge-based economy theories, new growth theory, economics of innovation, evolutionary economics and theories of post-industrial society and network society. They are useful and instrumental for stimulating the debate on the role of knowledge, especially science and technology, in contemporary capitalism. They provide raw materials for the production of cognitive capitalism theory - the role and nature of knowledge, effects of the diffusion of ICTs, public policy on education and intellectual property rights, to only name a few. These theories focus on the peculiar aspects of knowledge as compared with material goods and its role and its peculiar way of production and diffusion in the broader economy. However, they do not go further to ask if these changes are linked to more fundamental transformation. Cognitive

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4 As time goes by, quite a few varied views within the theorists have emerged even if they should not be considered as alternatives, according to Paulré (2008).

5 “We believe that the crisis of Fordism disguises in fact, or indicates that of industrial capitalism”, Paulré (2004).

6 “It is necessary to note that the notion of cognitive capitalism has also been developed as a response to the insufficiency of the interpretations of the current mutation of capitalism in terms of the transition from a Fordist to a post-Fordist model of flexible, or what is sometimes referred to as ‘Toyota-ist’, accumulation. … Theories of post-Fordism, while capturing some significant elements of rupture, often remain bound to a factory-inspired vision of the new capitalism seen as a further development of the Fordist-industrial logic of the real subsumption of labour by capital. For these reasons, the category of post-Fordism appears to us to be inadequate for comprehending the profound transformation of the antagonistic relation of capital to labour related to the development of an economy founded on the driving role of knowledge and the figure of the collective worker of the general intellect”, Vercellone (2007, p. 14).

7 For the details, see Corsani et al., (2001). Moulier Boutang (2002) suggests 14 features of cognitive capitalism, some of which, for example, the emergence of network form, knowledge as public good, expansion of the scope of positive externalities and importance of tacit knowledge are also well-known as the features of knowledge economy.
capitalism theory takes the phenomenal changes identified by them as the given, but attempts to provide an alternative interpretation. Whilst cognitive capitalism shares the same characteristics with knowledge based economy or information society where knowledge is seen to play a central role, they are fundamentally different from each other. Cognitive capitalism theory criticises these theories to be technology-deterministic, ahistorical, positivist and non-confrontational as they lack social and historical analyses and rather focus on the rapid technological development as the source of social and economic changes, Vercellone (2004). “The interpretation provided by neo-classical theories of endogenous growth and knowledge-based economy take into account neither the antagonism between capital and labour nor the conflicts between knowledge and power investing the transformations of the division of labour”, Vercellone (2005). In cognitive capitalism, “there is antagonism, but it is new”, Moulier-Boutang (2006). Though the quantitative growth of knowledge sectors and/or knowledge workers is certainly a notable change, it is not sufficient enough to explain or substantiate the establishment of a new (knowledge) economy considering that knowledge has always been important for the economy, Paulrée (2004).

In contrast, the notion of cognitive capitalism aims to capture the qualitative changes of the underlying social forces. A new form of the conflictual capital-labour relation marked by the hegemony of cognitive labour and the rise of rent as the central category represents such fundamental changes. In the same vein, technological determinism is clearly rejected. “The emphasis on technology should not be interpreted as meaning the determining role of technology as exogenous causal factor”, Corsani et al (2001, p. 8). “Cognitive capitalism cannot simply be equated with a society characterised by the development of the new ICT (information and communication technologies)”, p. 12. “Investments in the information and communication technologies in the physical sense of the term, on which economists often focus their attention, are rather a symptom or a signal of change”, Paulrée (2004).

Post-workerism

Whilst it is not so evident in Draft, no one will fail to notice the affinity between cognitive capitalism and post-workerism, a strand of autonomist Marxism. Major proponents of post-workerism include Antonio Negri, Michael Hardt and Maurizio Lazzarrato. They have much contributed to a French journal, Futur Antérieur and its sequel, Multitudes, central themes of which include Autonomist Marxism, post-workerism and cognitive capitalism theory.

Vercellone, a proponent of cognitive capitalism, co-wrote an article about cognitive capitalism with Negri recently, which indicates that post-workerism and cognitive capitalism theory are converging. Further, in his latest English book, Reflections on Empire, Negri tends to agree with cognitive capitalism theory. He says, “today, we find ourselves in a way of life and in a way of producing that are characterized by the hegemony of intellectual labour. It has been said that we have entered the era of cognitive capitalism”, Negri (2008, p. 64, italics in original). More fundamentally, post-workerism and cognitive capitalism theory share similar views on class struggle, history and interpretation of Marx’s value theory, so that many of the strengths and weaknesses of post-workerism are also found in cognitive capitalism. Due to such similarities, it is unavoidable that we do not clearly distinguish cognitive capitalism theory from post-workerism, and our critique of the former partly takes the form of criticising the latter. Hence, it is important and instrumental to briefly summarise some of the key arguments of Autonomist Marxism in general and post-workerism in particular.

First, capitalism consists of several stages, each of which is characterised by distinct class subject, class antagonism and dominant form of labour. Transition from one stage of capitalism to another is driven by class struggle.

Second, contemporary capitalism is the third stage of capitalism or the third cycle of struggle between labour and capital. Post-workerism tries to capture the essence of the third stage with the concept of immaterial labour and
social (or socialised) worker. Post-workerism is built upon the collapse of workerism, which corresponds to the end of the second cycle of class struggle represented by mass worker\textsuperscript{10} and social factory. Similarly, mass worker emerged from the crisis of the first cycle of class struggle as a new class subject, responding to the attempts of capitalists to subsume the previous class subject - professional worker - by way of automation of production process and introduction of assembly lines. Struggles of mass worker against capital took the forms of sabotage, refusal to work and worker-student alliance, and class subject was redefined through this mass movement as more creative and flexible labour power.

Third, the transition to the third cycle of struggle – the age of Empire and Multitude – which is still underway, started with the formation and struggle of mass worker against capital. In other words, labour is seen to play the leading role in the class struggle between labour and capital. In the face of sabotage and refusal to work of mass worker, capitalists had to take different strategies in order to reconfigure class composition. Globalisation of production sites, off-shoring, shift to service work, outsourcing and adoption of flexible production methods are some of the countering strategies adopted by capitalists. More specifically, capital had to abandon the production mechanism represented by Fordism and assembly lines to cope with this new class subject. “Capital had to abandon the large scale factory, its linear production, its inflexible working day and its mechanistic logic and employ open networks and flexi-time and give space to creativity”, Aufheben (2006, p. 29). Hardt and Negri (2000, p. 276) argue in Empire, “Capital was forced to move into immaterial production to dominate a new labour power that had redefined itself, autonomously, as creative, communicative and affective”. Similarly, “if there had not been worker and student revolts in the 1960s, if there had not been 1968 and the second wave of the women’s movements, if there had not been the whole series of anti-imperialist struggles, capital would have been content to maintain its own arrangement of power, happy to have been saved the trouble of shifting the paradigm of production!”; p. 275.

Fourth, with the collapse of class struggle represented by mass worker, what was rigid before is now replaced by flexibility. Labour becomes increasingly immaterial, and so does the capitalist control. Labour is more involved in the production of images, meanings, and cultural elements of material goods, which in the previous stage was monopolised by capitalists or a group of specialised workers. The mass refusal was “not only a negative expression but also a moment of creation”, p. 274. Capital has to be flexible as labour becomes increasingly flexible, creative and communicative. As “the truly creative moment had already taken place”, p. 276, capital needs to appropriate this moment, rather than creating it anew.

Fifth, immaterial labour replaces industrial labour as the hegemonic form of labour in the third cycle of class struggle. Immaterial labour is not measurable, and in its nature, cooperative, flexible, communicative and affective,\textsuperscript{11} encompassing both intellectual work and service labour. Immaterial labour or biopolitical labour is immeasurable because being measured means being imposed, which is in diametrical opposition to its being flexible, creative and communicative. Labour becomes life itself.\textsuperscript{12}

Sixth, despite the immeasurability of immaterial labour or biopolitical labour, labour is still seen as the source of value. According to Hardt and Negri, “what is different today, however, in the era of biopolitical production, is that intellectual and/or affective invention has become the primary source of value and wealth in society”, Brown and Szeman (2005). However, no detailed account of the new immaterial labour theory of value is provided.

Cognitive capitalism theory

\textsuperscript{10} Mass workers are deskilled workers doing repetitive/manual work which “meets Marx’s definition of ‘abstract labour’”, Bowring (2004, p.106) in assembly lines.

\textsuperscript{11} This aspect of immaterial labour is crucial in distinguishing cognitive labour from immaterial labour. See Hardt (1999) for more about affective labour.

\textsuperscript{12} Caffentzis (2005, p. 96) criticises Negri and Hardt that they seem to “willfully ignore the well known ontological distinction between labour and action.”
Whilst sharing many characteristics, cognitive capitalism theory is distinguished from post-workerism in several respects. The key difference lies in its focus on the central role of knowledge. Instead of immaterial labour, cognitive labour – a type of immaterial labour\(^{13}\) – is suggested as the hegemonic form of labour in cognitive capitalism.\(^{14}\) Likewise, class struggle between capital and labour is centred on which class takes the role of knowledge production, instead of encompassing all aspects of life as implicit in the category of biopolitical labour. In addition to narrowing down the focus onto knowledge, cognitive capitalism theory attempts to conceptualise the new reality at more logical and abstract level than post-workerism. In such respect, its analysis of the economic aspect of contemporary capitalism is more advanced and sophisticated than that of post-workerism. “Of course, this problem will basically be addressed from the viewpoint of economists”, says Paulré (2004).

Cognitive capitalism, as the nomenclature suggests, is also based on the view that capitalism consists of several stages even though cognitive capitalism theory and post-workerism periodise capitalism in different ways. Whereas post-workerism tries to periodise “the history of real subsumption”, Bowring (2004, p. 105), identifying three successive stages of capitalism whose first stage dates back to only 1848, cognitive capitalism theory shares Braudel’s view that capitalism has a long history, which came into being far earlier than industrial revolution, around between 1780 and 1815, Moulier-Boutang (2002).\(^{15}\) According to this view, cognitive capitalism is the third stage of capitalism, preceded by industrial capitalism which starts with the first industrial revolution. In its first stage, capitalism was mercantilist capitalism “based on the models of production of the putting-out system and of centralised manufacture” Vercellone (2007, p. 15). In this respect, as mentioned earlier, the transition to cognitive capitalism is called a rupture compared to the transition from Fordism to post-Fordism within industrial capitalism. The transition to cognitive capitalism is seen to be so profound that Moulier-Boutang (2002) puts it as a “grand transformation” in a Polanyian sense. We need new theories for the new capitalism. Hence, “it makes us leave behind the political economy born in the eighteenth century”, Moulier-Boutang (2006).

The originality of cognitive capitalism theory lies in its view of the succession of stages of capitalism mainly as the logical and historical development of the capitalist division of labour.\(^{16}\) According to Vercellone (2007), the three stages of capitalism correspond to three successive forms of capitalist division of labour – formal subsumption, real subsumption and general intellect respectively, all of which are found in Marx’s works. Each form of division of labour is distinguished from the others in its distinctive way of production and appropriation of knowledge. Whereas knowledge was originally produced, owned and controlled by workers in the stage of formal subsumption or mercantilist capitalism, the role of knowledge production was systematically detached from workers and centralised to a small group of specialised workers. (Scientific and/or technological) knowledge in this stage of capitalism normally exists as embedded in fixed capital with commodity production being mainly based on large scale machinery. Further, enhancement of production methods becomes ceaseless and institutionalised. In this form of division of labour, workers are seen to play a passive role, and are under real subsumption to capital or separation between conception and execution. The situation is being reversed as we transition to cognitive capitalism or the stage of general intellect where the role of knowledge production or conception is being re-appropriated by workers.

\(^{13}\) “Conventional terms such as service work, intellectual labour, and cognitive labour all refer to aspects of immaterial labour”, Hardt and Negri (2004, p. 108)

\(^{14}\) Cognitive labour has at least fixed the ambivalence of immaterial labour which encompasses low-paid precarious paid jobs.

\(^{15}\) “It is a confirmation of one of the lessons of Braudel who, in opposition to approaches assimilating too early the essence of capitalism to its industrial configuration, reminds us that capitalism is an ‘old history’”, Corsani et al (2001, p. 14).

\(^{16}\) Whilst this view is already present in Draft, no one except Vercellone and Moulier-Boutang associates periodisation of capitalism covering all the three stages of capitalism with the evolution of capitalist division of labour. However, considering that this view is already present in Draft, we may conclude that silence of others on this matter does not mean rejection of this view, but implicit approval. At least, we see a general agreement among theorists that the emergence of cognitive labour and a new form of capitalist division of labour is a necessary condition of the transition to cognitive capitalism. In addition, cognitive capitalism reinforces the development of the cognitive form of division of labour.
In this stage, “the traditional terms of the opposition between ‘dead labor and living labor’ of industrial capitalism gives way to a new antagonism between the ‘dead knowledge’ and ‘living knowledge’”, Corsani et al. (2001, p. 19). Social knowledge exists as a “mass intellectuality”, Virno (2007, p. 6) or a “diffuse intellectuality”, Vercellone (2007, p.16) within living labour as opposed to fixed capital. “The centrality of living labour which is not reduced to dead labour in machinery”, Moulier-Boutang (2002).

The evolution of the capitalist division of labour is certainly not just a technical process. As is the case in post-workerism, it is seen as the terrain as well as the result of class struggle. Technological determinism is clearly rejected. Rather, knowledge production and its technological application are understood as means of undermining and containing resistance of working class. Especially, in the stage of industrial capitalism, capital incessantly attempted to introduce new production technologies in order to subordinate labour to capital and to empty workers of traditional production knowledge. As this involves deskilling and “degradation of work”, Vercellone (2007, p. 17), “labour process remains irreducibly conflictual”. “Thus, the analysis of technical progress as an expression of a relation of forces concerning knowledge is everywhere present in Marx’s work”, p. 18. As the labour process debate has shown, this process is not linear but conflictual. The deskilling thesis of Braverman should be understood as a tendency, not a mechanical law. Further, in the tradition of autonomist Marxism, technological development is understood as weapons for capital against working class rather than as the means of structural unfolding of imperatives of capital. As Aufheben (2006, p. 29) puts it, “this is class struggle which appears, post facto, crystallised in the objective laws of capital or in the objective rationale of innovation, progress and development of capitalist production”.

In sum, the conflictual relation centred on knowledge is the defining feature of the capital-labour relation in cognitive capitalism. Cognitive capitalism is basically a result of class struggle around knowledge production. Based on this view on the determining role of class struggle in historical development, Vercellone (2007) goes further and argues that the re-appropriation of knowledge by workers was possible through the expansion of public education, which is also a result of struggle between labour and capital in industrial capitalism, or Fordism more specifically.

3. Cognitive Capitalism and Value Theory

Having reviewed key arguments of cognitive capitalism theory, especially their relations with other competing theories, we are now ready to move on to our critique. As mentioned earlier, we will focus on demonstrating that value theory is misinterpreted in cognitive capitalism theory, which finally leads to the bold argument that we live in a new world. We do not question whether or not this argument is correct, but the way it is derived. In short, the marginalisation of direct labour time in the knowledge-intensive sectors is viewed in cognitive capitalism theory as representing the demise of value theory and industrial capitalism where labour time is the measure of wealth. We will show that the marginalisation of direct labour time does not necessarily contradict value theory, and thus does not immediately warrant that cognitive capitalism has emerged.

Our critique begins by first drawing attention to the argument that value theory or the law of value presupposes a specific form of division of labour, and thus is valid only in a specific stage of capitalism. In this sense, value theory is taken by cognitive capitalism theory as a barometer of the status of industrial capitalism. As long as new phenomenal changes can be explained by value theory, capitalism remains to be industrial capitalism. On the contrary, such phenomena that seemingly contradict value theory are taken to indicate that fundamental mutations are taking place behind them.17 Significantly, this argument is based on a naturalistic interpretation of value theory, which views (abstract) labour as pure expenditure of human energy. (Ahistorical) abstract labour is seen to become

17 However, this does not mean Marx is wrong. Given that the object of value theory is believed to gradually disappear, rejecting the validity of value theory in cognitive capitalism conforms to Marx’s methods and his historical materialism. As a new reality emerge, new theories are required.
the substance of value under a specific form of division of labour where the role of conception is deliberately separated from workers and is monopolised by capitalists. Specifically, it is argued that simple execution work prevails in industrial capitalism and corresponds to such definition of abstract labour. In this sense, separation between conception and execution is implicitly considered a defining feature of industrial capitalism, not a consequence of it.

Second, related to the first point, that abstract labour and value are social categories, expressing equivalence between human labours, is neither acknowledged nor recognised. Simple execution work is seen as immediately abstract labour, and quantitative relations between human labours are ignored. In other words, conversion of concrete labour times into abstract labour times is not studied, and social processes involved in this conversion are short-circuited, where knowledge plays an important role. Knowledge is seen to be solely produced by capitalists and to contribute nothing at all to value production. We will show that this is a false representation of value theory. Knowledge plays an important role in the determination of value through what we call virtual intensification of commodity-producing labour. According to our interpretation, shortening of direct concrete labour time does not necessarily reduce abstract labour time and thus value in the same proportion. Consequently, the marginalisation of direct labour time does not necessarily mean that labour time ceases to be the source of wealth. We may live in a new world, but not for the reasons provided by cognitive capitalism theory.

Third, and more fundamentally, such misinterpretation is based on a unique view of cognitive capitalism theory on the relation between conception and execution. Different roles of conception and execution in the production of use value and value are not analysed in cognitive capitalism theory. Instead, although both conception and execution are inindispensable parts of the production process as a whole, labour is seen to create wealth as either conception alone or execution alone. Not only are conception (or cognitive labour) and execution (or industrial labour) contrasted with each other, but the two mutually exclude each other. Put differently, the one is viewed as the negation of the other and no inter-relation between them is analysed. According to this interpretation, Marx’s value theory is degraded into execution-labour theory of value where no consideration of conception (or knowledge) is present. Likewise, what holds for the old theory – the labour-time theory of value – is considered obsolete for the new theory – the labour-knowledge theory of value. For example, in cognitive capitalism, the existence of single measure of wealth is dubious, and the distinction between material wealth and wealth in general disappears. As a result, the new theory does not seek to explain quantitative determination of price and value is not attempted in cognitive capitalism.

Although not directly related with value theory, we will touch upon two other points of cognitive capitalism theory. The first concerns the argument that general intellect which Marx speaks of in Grundrisse anticipates the re-appropriation of the role of knowledge production by workers. Whilst it is true that Marx discusses the contradiction between the expanded role of knowledge in the production process and the relations of production based on the measure of wealth by labour time, he does not mention that living labour represents generally intellect. Rather, general intellect refers to social knowledge in general, if not, in a more narrow sense, knowledge objectified in fixed capital.

The second concerns the alleged collapse of the distinction between profit and rent and the role of intellectual property rights in cognitive capitalism. Without a theory of quantitative determination of value and price, surplus appropriation in cognitive capitalism cannot take an economic form. Whilst wealth in cognitive capitalism is produced by workers alone, capitalists continue to appropriate a portion of wealth through intellectual property rights, without contributing to the production process at all. Hence, intellectual property rights is viewed as the main terrain of class struggle in cognitive capitalism where capital and labour stand as two independent classes, with no internal relation between them. We criticise that the history of intellectual property rights is neglected, especially its role in what is called industrial capitalism. Given that Marx views competition between capitalists as the contradicting processes of innovation and catch-up, intellectual property rights significantly affects these processes, and should be first analysed as part of social processes that determine value production. Only after that, one can speak of the transformation of the significance of intellectual property rights in the new capitalism.
Law of value in crisis and cognitive labour as source of value and wealth

Let’s start from the law of value. What is meant by the law of value? As Caffentzis (2005, p.89) correctly points out, “the ‘Law of value’ is not explicitly defined in Marx’s work” to the same extent as other laws such as the law of the tendency of the falling rate of profit. “[T]he phrase is not in common use outside of the pages of post-Marx Marxist and Soviet-era economists”, p.91. It is neither in the works of cognitive capitalism theorists that the law is defined clearly. Notably, Negri and his followers have been using this term more frequently than others since as early as 1978.\textsuperscript{18} Hardt and Negri (2004, p. 145) say, “according to this law of value, value is expressed in measurable, homogeneous units of labor time … This law, however, cannot be maintained today in the form that Smith, Ricardo, and Marx himself conceived it. The temporal unity of labor as the basic measure of value today makes no sense”. It seems that the law of value, in their usage, refers to the determination of the magnitude of value by the temporal unit of labour, that is to say, labour time. Vercellone (2007 and 2008) also points out that the law of value is founded on “labour time”. The crisis of the law of value reveals more fundamental crisis, the crisis of the entire political economy based on the law of value. “The categories of political economy (trade, value, ownership, production, consumption, labor, etc …) are in crisis”, Corsani et al (2001, p. 16).

Although the law of value is not explicitly defined, an example provided by Vercellone (2007) reveals that the law of value refers to the determination of value by labour time and the determination of price by value. “[T]he time of labour directly dedicated to the production of commodities intensive in knowledge becomes insignificant; or, to put it in the language of neoclassical economy theory, where the marginal costs of reproduction are practically nothing or extremely low, these commodities should be given for free”, p.34. This suggests that the value of commodities is close to zero because the labour time expended to produce each commodity in knowledge-intensive sectors is very little. If the law of value is still operative, price needs to be determined by value, and must be, in turn, close to zero. However, the reality is that such commodities as software and microprocessors are sold at the price far higher than their marginal cost or labour time expended per unit. Considering that the emergence of such knowledge-intensive sectors is understood as the epitome of the new stage of capitalism, this example seems to vindicate cognitive capitalism theory.

Despite the crisis of the law of value, value remains as a central category of cognitive capitalism, and labour is still the source of wealth, even if wealth in cognitive capitalism cannot be taken as the same wealth in industrial capitalism. “Labour does remain the fundamental source of value in capitalist production, that does not change”, Hardt and Negri (2004, p 145). “Labour, particularly in the form of knowledge, remains nevertheless the principal source of the creation of wealth, but it can no longer be measured on the basis of labour time directly dedicated to production.”, Vercellone (2007, p. 30). “The main source of value now lies in the creativity, versatility and strength - invention of employees - and not in capital assets and in the work of execution”, Vercellone and Negri (2008). In conclusion, cognitive capitalism theorists argue that instead of labour-time theory of value, we now need labour-knowledge theory of value.

Although cognitive capitalism theory provides no detailed account of the new value theory, we may assume that the value of commodities produced in the knowledge-intensive sectors is determined by knowledge produced by cognitive labour, not by duration of expended industrial labour.\textsuperscript{19} One difficulty here is that knowledge, once produced, can be re-used regardless of number of commodities produced based on that knowledge. In other words, cost for production of knowledge is not marginal cost but fixed cost. This means that value created by cognitive labour or knowledge-producing labour needs to be either duplicated as soon as additional unit of commodity is produced or distributed among commodities, as long as we maintain that value in cognitive capitalism remains to be

\textsuperscript{18} Negri (1991, p.24) speaks of “[m]oney as the crisis of the law of value” (italics in original).

\textsuperscript{19} The magnitude of value is measured by the quantity of the value-forming substance, labour. The quantity of labour is measured by its duration according to Marx (1867, p.129). In this case, the quantity of knowledge replaces the duration of labour as the measure of the quantity of labour.
value of commodities. In addition, for knowledge-producing labour, labour time is not a good measure. The distinction between labour time and non-labour time disappears as labour becomes cognitive. Ideas just flash through mind and workers can still think at home. More importantly, same amount of labour time can lead to both useless idea and epoch-changing idea. Whilst better commodities or more commodities can be produced in a give period of time as knowledge-producing labour time increases, certainly labour time is not a decisive factor in evaluating the economic value of this benefit.

Alternatively, value may be attached to knowledge, not commodities any more. According to Vercellone (2007, p.34), wealth is based on “abundance and use-value, and therefore on free appropriation”. The level of general social knowledge plays far more important role than commodity-producing labour in the production process in cognitive capitalism, and thus is more proper measure of wealth than labour time. In the same vein, Hardt and Negri (2004, p. 150) argue, “[w]e must understand the production of value in terms of the common”. However, cognitive capitalism theory does not provide any analysis on the quantitative determination of labour-knowledge-value, or in Hardt and Negri’s term, value of the common. Further, qualitative equivalence between different types of knowledge are not questioned. Either the new value theory needs to be further developed or homogenisation is seen to be unnecessary.

As long as social wealth in cognitive capitalism is represented by the abundance of use values, knowledges do not have to be homogenised or their magnitudes do not have to be expressed by a single measure. In addition, Negri and his followers are hostile to measure. For example, Hardt and Negri (2004, p. 153) criticise that “economics has evolved as a theory of measure”, being “completely fixed and static”. Measure is seen to be not only unnecessary but impossible. “One can no longer hope to find any natural units of measure”, p. 156. This point is made most clearly by Virno (2007, p. 6) who says, “[the models of social knowledge] are not units of measure; they constitute the immeasurable presupposition of heterogeneous operative possibilities”. According to Caffentzis (2005, p. 96), “[t]he value they cherish and refer to … is both immeasurable and beyond measure”. Hence, whilst labour remains as the source of value and wealth in cognitive capitalism, it does so in a quite different sense than in industrial capitalism.

Abstract labour and value in cognitive capitalism theory

As mentioned earlier, cognitive capitalism theory derives a proposition that the law of value is in crisis from the observation that direct labour time required to produce a unit of commodity is getting close to zero in some knowledge-intensive sectors. It is seen to be in crisis because whereas the value of commodities produced in such sectors is close to zero, their price is far higher than zero. According to this view, it is obvious that price is not determined by value. We will ultimately reject this view by demonstrating that labour time does not immediately determine the magnitude of value. Above all, concrete labour times are not immediately equated with abstract labour times. More importantly, knowledge plays an important role in determining the conversion ratio of a specific concrete labour time to abstract labour time. In this section, we will demonstrate that cognitive capitalism theory fails to recognise the role of knowledge in the value production, and it is due to its misinterpretation of the nature of abstract labour and value.

First of all, abstract human labour, the substance of value, is considered as a product of mental generalisation. All the qualitatively different (concrete) industrial labours are “equivalent or commensurable because they each contain a common element, abstract labour, labour in general, labour without respect to its specific form”, Hardt and Negri

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20 Virno (2007) speaks of abstract knowledge. For example, he says, “the fact that social relations are ordered by abstract knowledge rather than the exchange of equivalents”, p.6. However, neither does he define abstract knowledge, nor analyses social processes that establish qualitative equivalence between different (concrete) knowledges. The scale and scope of the trade of knowledge, which is not identical with trade of commodities, is certainly rapidly increasing, and we may say that out of this generalised knowledge exchange, abstract homogenous knowledge is formed, with economic value of knowledge expressed in the money form. The question is what the substance of this economic value. It is safe to conclude that economic value of knowledge is not measured by abstract cognitive labour time. Cognitive capitalism theory should be extended to the extent that they can present a consistent and coherent value theory, without which there can be no systematic economic theories that are specific to the stage of cognitive capitalism.
Although this definition of abstract labour is not wrong in itself, abstract labour or labour in general is seen as a physiological category only, as expenditure of human energy irrespective of its specific form. Its social and historical aspect, which is more fundamental than the physiological aspect, is neither acknowledged nor recognized. Abstract labour being expenditure of energy, the magnitude of abstract labour contained in each concrete labour is measured by expended human energy of average worker, which is proportionate to labour time. Abstract labour conceptualized in this way is a natural category, one of “natural units of measure”, p.156. In sum, according to this interpretation, Marx’s labour theory of value belongs to the “energy and entropy paradigm of labour”, Moulier-Boutang (2002).

Marx’s view is different from such naturalistic interpretation. For Marx, abstract labour is primarily a social category. In Capital volume 1, immediately after he suggests abstract labour as the common element contained in various concrete labours, he calls it “social substance”, Marx (1867, p.128). He does so before he introduces more complex concepts such as money and capital. What Marx attempts in the first chapter of Capital is to answer the question of what lies under generalised commodity production and exchange. Apparently, that all the commodities are product of (physiologically) abstract homogenous human labour, which is true any time and anywhere, is not the answer. It does not explain the historical specificity of generalised commodity production and exchange. Marx’s answer is that it expresses a historically specific social relation between men. Isolated individuals produce commodities for others and make a living by selling them and buying necessities produced by others in the market. Such social relation between men, which appears as a relation between things, is based on the equivalence between human labours. Notably, the equivalence between human labours is not an historical fact. It holds true in specific times and places only. The historical and social nature of abstract labour is more evident when Marx mentions Aristotle’s failure to recognize that human labour is the common element contained in two different commodities exchanged with each other. It is because “Greek society was founded on the labour of slaves, hence had as its natural basis the inequality of men and of their labour-powers”, p.152. In sum, abstract labour is socially and historically equivalent human labour that is expressed through generalised commodity production and exchange. The physiological definition of abstract labour attains its significance only after the social and historical nature of abstract labour is properly understood.

As abstract labour is a social and historical product, so is abstract labour time – the common measure of value. Whilst abstract labour has no concrete existence and abstract labour time cannot be immediately measured by any means, they exist and they are no less real than concrete labours and concrete labour times. The point is that in the capitalist mode of production, different concrete labours produce value and are measurable, but not because they can be measured by a common concrete measure, but because a social measure is formed out of social processes. In a physiological sense, labour is always abstract labour. But it is only in the capitalist economy that abstract labour becomes the substance of value, and products of labour take the commodity form in general.

Second, the ahistorical ideal measurability of labour and value by labour time is seen to attain practical truth only in industrial capitalism. Contrary to the previous stage of capitalism where measuring labour by labour time had little social significance, time is established as the measure of labour in industrial capitalism as a result of separation of the cognitive aspect of labour from workers. Commodity production is organised on the basis of the production of (exchange) value, resulting in the subordination of the labour process into the valorisation process. Capitalists

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21 In cognitive capitalism, the energy paradigm does not hold. “the source of value becomes the cooperation between brains and not just use a force of muscular work, energy, energy expenditure”, Moulier-Boutang (2004).
22 It is not that the common element, i.e. abstract labour, does not exist before exchange and are created by exchange. In the capitalist mode of production, exchange and production are not separated from and independent of each other, but different moments of the whole, related with each other internally.
23 On the contrary, universal measures for length, mass, time, electronic current, thermodynamic temperature, luminous intensity and amount of substance exist and defined in concrete terms. For example, the definition of the second is, “the duration of 9 192 631 770 periods of the radiation corresponding to the transition between the two hyperfine levels of the ground state of the caesium 133 atom”, Bureau International des Poids et Mesures (2006, p.113).
appropriate the role of knowledge production whereas workers are forced to perform simple labour, based on the rhythm and pace dictated by capitalists. In other words, there exists a law-like tendency that labour is deskilled and degraded in industrial capitalism. In this form of division of labour, commodity-producing labours are primarily about expending human energy, rather than being purposeful activity. Labour becomes "ever more abstract, not only under the form of exchange-value, but also in its content, emptied of any intellectual and creative quality", Vercellone (2007, p.24).

On the contrary, for Marx, time is the measure of labour and value in capitalism at more abstract level, before introducing division of labour and any law-like tendencies. Whereas generalised commodity production and exchange is presupposed in his analysis of (labour-time) value, the concept of capital is introduced to the analysis only after money is derived as one of the value-forms. The real existence of value logically, if not historically, precedes more complex phenomena such as division of labour (within a workplace). In this sense, social production organised on the basis of value determines division of labour, not the other way around. Likewise, law-like tendencies are derived on the basis of, but not solely from, value. A specific form of division of labour cannot be taken as a prerequisite for labour-time theory of value, or for the real existence of value. Deskilling and prevalence of simple labour in capitalism should be understood as a product of commodity production on the basis of value production.

Third, the quantitative conversion of concrete labour time into abstract labour time is not analysed in cognitive capitalism theory. All the commodity-producing labours are considered identical, as a result of deskilling, producing same amount of value in a given period. However, despite seeming homogeneity between concrete labours, their qualitative difference does not simply disappear by any means. Of course, concrete labours can be measured by time. But concrete labour times cannot be directly compared with each other even if they are expressed in the same unit of time. For example, when a worker produces two desks for an hour, and three desks for another hour, the two one-hour works are not identical; the one is ‘one-hour-work-producing-two-desks’ and the other is ‘one-hour-work-producing-three-desks’.

On the contrary, when labours are measured as abstract labours, they are considered identical. The problem is that abstract labour time cannot be directly measured. Abstract labour exists in the form of concrete labours, and abstract labour times take the form of concrete labour times. Hence, we face the problem of conversion of concrete labour times into abstract labour times. In our example above, one-hour-work-producing-three-desks is converted into 1.5 times as much abstract labour time than one-hour-work-producing-two desks, because abstract labour time required to produce a desk is constant. The conversion requires consideration of other factors. For example, difference in personal capabilities, difference in technologies and difference in complexity of labour affect the conversion. If worker A produces three desks and worker B produces two desks for an hour, one-hour work of worker A is counted 1.5 times as much as that of worker B. Similarly, depending on the difference in productivity, desk-producing workers of firm A may produce more desks in a given period than workers of firm B, and one hour of concrete labour of firm A may count as more abstract labour time than that of firm B. Finally, when worker A produces one watch and worker B produces one desk for an hour, one-hour-work of worker A may count longer than that of worker B. Considering that there are so many other factors affecting the conversion, and it is generally not feasible to isolate one factor from others, it is almost impossible to technically convert concrete labour times into abstract labour times.

Fortunately, this conversion is not a technical process, taking place in the head of mathematicians, but a result of social processes. Hence, the difficulties above are not the difficulties of the conversion itself, but those of theoretical analysis of how the conversion is carried out. Everyday practice of exchange between commodities assures that the conversion works well. Of course, the conversion is not carried out through exchange between commodities, but expressed through exchange. Significantly, we should start from the result of the conversion of concrete labour times into abstract labour times that goes behind individual producers, not from observed concrete labour times.24 The task

24 Through these social processes, all the concrete labours are normalised, synchronised and homogenised. In other
of theory is to trace and lay bare the social process by which concrete labour times are converted into abstract labour times, and reproduce them in thought.

Whilst abstract labour and value expresses the equivalence between human labours in capitalism, their qualitative differences do not just fade away during the social process of equalisation, but is reflected in the quantitative conversion of concrete labour times into abstract labour times. In other words, equalisation between human labours is not only qualitative but also quantitative.

What implication does this have for our purpose? First, even relatively simple labours cannot be equated with abstract labour. In other words, concrete labour time can never be directly converted into abstract labour time. Qualitatively different concrete labours cannot become homogenous by eliminating cognitive aspect of labour. They remain qualitatively different even if abstract labour, the social substance, attains its palpable existence as the result of the tendency of simplification of labour or deskilling. Second, given that the quantitative conversion is not a technical process, but involves social processes that are determined by and reproduce socio-economic structures, Fine (2002, p. 16), it is necessary to analyse such processes and structures. For example, “the various proportions in which different kinds of labour are reduced to simple labour as their unit of measurement are established by a social process that goes on behind the backs of the producers”, Marx (1867, p.135, emphasis added).

Fourth, viewing value theory as a product of a specific form of division of labour, cognitive capitalism theory short-circuits social processes and structures by which qualitatively different concrete labours are equalised, but with quantitative differences. Especially, cognitive capitalism theory ignores the social process of virtual intensification of commodity-producing labour. Marx defines socially necessary time as “the labour-time required to produce any use-value under the conditions of production normal for a given society and with the average skill and intensity of labour prevalent in that society”, Marx (1867, p.129, emphasis added). This means that as skill and/or intensity of labour vary, the same concrete labour time is converted into different abstract labour times. Intensity of labour, which is not explicitly defined Marx, is the degree of expenditure of labour power during a given period of time and is related with the pace of work. Thus, more intense work has the same effect as extension of the working day. With given conditions of labour, intensity of labour generally remains unchanged, but introduction of better production methods usually leads to increased intensity of labour because the transformation of the labour process often involves more efficient utilisation of workers, removing any kind of unnecessary breaks during labour. Virtual intensification refers to a social process by which the same amount of labour time produces more value without any changes to intensity of labour. In other words, capitalists employ different means than intensifying commodity-producing labour to achieve the same result, creating more value in a given period of time. Marx says, “exceptionally productive labour acts as intensified labour”, Marx (1867, p. 435) and “[m]ore complex labour counts only as intensified, or rather multiplied simple labour”, p. 135, italics in original.

As we will outline in the next section, virtual intensification of commodity-producing labour is a product of mutually contradictory social processes, by which average or dominant level of knowledge within a sector and/or across sectors are formed. Whereas some capitalists benefit from virtual intensification through the use of production methods based on advanced or innovative knowledge, this competitive advantage from virtual intensification soon vanishes as others catch-up. As a result, the level of general social knowledge continually increases. Virtual intensification is of significance importance in our discussion of the determination of socially necessary labour time. In short, with the existence of virtual intensification, simply labour does not always count as simply labour. If we go back to our example of knowledge-intensive sector, although concrete direct labour time to produce a unit of micro-processor is close to zero or far smaller than other components of average cost, it is likely that direct micro-processor producing labour is virtually intensified or acts as intensified labour. In other words, direct labour portion of value of micro-processor is higher than zero. The law of value is not necessarily in crisis.

words, they are equalised as abstract human labour. For more details on normalisation, synchronisation and homogenisation, see Saad-Filho (2002), chapter 5.
Finally, and in conclusion, the argument that the law of value or value theory is in crisis because price of commodities produced in knowledge-intensive sectors are no more determined by value of such commodities is wrong. As we have seen so far, this argument is due to misinterpretation of Marx’s value theory. Value is understood as a mental construct; the reality of value is ignored or rejected; abstract labour is considered as an ahistorical naturalistic category; labour time is only seen to be established as measure of labour and value as a product of a specific form of division of labour; quantitative relations between concrete labours are ignored and real social processes that are the basis of the conversion are short-circuited.

Cognitive labour and industrial labour as two independent forms of labour

The failure to consider objective social processes related to the equalisation of human labours stems mainly from the limited understanding of the nature of labour. Whilst labour is viewed as the source of wealth both in industrial capitalism and in cognitive capitalism, labour creates value either in its industrial form alone or in its cognitive form alone. Further, industrial labour and cognitive labour are contrasted with each other to the extent that they appear as if mutually excluding each other. The one is repetitive, pure consumption of human energy and the other is creative, cooperative, intellectual; the one is measured by time and the other is immeasurable by time; the one is expended in the labour process as dictated by capital and the other organises and coordinates itself; the one produces commodities according to knowledge objectified in fixed capital or machinery, the other produces such knowledge. The contrasts between industrial labour and cognitive labour are so extreme that the one looks as if it is a pure negation of the other. In other words, cognitive labour is labour which is not industrial labour; industrial labour is labour whose cognitive aspect is deprived deliberately by capitalists.

It is true that any type of division of labour involves separation between conception and execution, justifying the division of labour into cognitive labour and industrial labour. However, as long as of both forms of labour are required and indispensable for the production process, their different roles in the value production should be recognised and analysed. Commodity production always requires both conception and execution. Execution alone cannot produce commodities, and thus value either. In addition, knowledge and cognitive work are not only necessary for the value production, but they affect the magnitude of value. They allow for virtual intensification of commodity-producing labour. Execution cannot stand on its own without conception, and vice versa. In that sense, conception and execution are inter-related. This internal relation may appear in many different forms (e.g. the seeming autonomy of research institutes in contemporary capitalism) which change and develop historically. Conception and execution is now separated to the extent that knowledge can be bought and sold, and knowledge production is aimed at not only enhancing productivity or developing new products, but also selling knowledge. However, this should be analysed on the basis of the internal relation between conception and execution at the abstract level, as the externalisation of internal relation between them. In sum, for Marx, commodity production, and thus value production is anchored firmly in the dialectical unity between conception and execution. On the contrary, in cognitive capitalism theory, the internal relation between conception and execution is lost. They are seen to oppose with each other, and look as if the one can exist irrespective of the status of the other.

Likewise, value theory in industrial capitalism is understood as an execution-labour theory of value. As commodity-producing labour, simple repetitive work is considered as the only source of wealth in general in industrial capitalism. Whilst capitalists produce knowledge which is indispensable for commodity production, this is seen not to affect production of value in any way. Wealth in industrial capitalism is seen to be represented by execution-labour-time alone. Hence, the introduction of new production methods that reduce necessary labour time is seen to threaten the law of value, as it decreases wealth, measured in labour time. The way knowledge production affects the conversion of concrete labour times into abstract labour times through virtual intensification of commodity-producing labour is ignored.

We have so far criticised cognitive capitalism theory by demonstrating that it misinterprets Marx’s value theory. We
reject their claim that the marginalisation of commodity-producing labour should be understood as the crisis of the law of value and the emergence of cognitive capitalism on this basis, not because this argument is wrong, but because they way it is derived is wrong. Whilst we criticise one interpretation of the decreased role of direct labour in the production process, we have not provided an alternative theory. Of significance to this issue is ‘Fragment on Machines’, a section of Grundrisse, where Marx provides his view on the increased role of knowledge and capitalism.

“Fragment on Machines” and cognitive capitalism theory

Whilst the marginalisation of commodity-producing labour does not contradict value theory, that does not guarantee that value theory still holds true. Significantly, in ‘Fragment on Machines’, Marx argues that with the rapid development of science and technology, at some point, labour times will cease to be the measure of value. ‘Fragment on Machines’ has drawn a lot of attention from the commentators, especially those from the tradition of Autonomist Marxism which includes cognitive capitalism theory. This section of Grundrisse is often suggested as strong evidence that Marx shares the same view as theirs and anticipates the advent of cognitive capitalism.

As we have seen earlier, the new form of division of labour in cognitive capitalism is considered to correspond to the definition of general intellect. Notably, the ‘Fragment on Machines’ is interpreted through a lens of cognitive capitalism theory and general intellect is equated with living knowledge vis-à-vis knowledge objectified in fixed capital, or dead labour. For example, Vercellone (2007, p. 18) speaks of “the relation of living knowledge/dead knowledge”, and Virno (2007, p. 6) suggests mass intellectuality, “the entirety of post-Fordist living labour” as “the prominent form in which the general intellect is manifest today”. Clearly, as Virno admits, Marx’s notion of general intellect is different, p. 5. For Marx, general intellect coincides with fixed capital, the dead knowledge.25 On the contrary, for Virno, the dead knowledge objectified in fixed capital is only formal knowledge whereas informal knowledge plays more crucial role in the new stage of capitalism. It is notable that the distinction between formal knowledge and information knowledge is very similar with that of tacit knowledge and explicit knowledge. The distinction and opposition between living/informal/tacit knowledge and dead/formal/explicit knowledge reveals that complete separation of knowledge or cognitive aspect of work from workers is impossible. Certain knowledges, in their nature, cannot be written down or codified. In addition, the social process ofdeskilling, separating deliberately cognitive aspect of work from workers, involves use of methods of production based on new technologies, in the course of which new skills emerge and workers are re-skilled. When mutually contradictory tendencies operate, both of which are consequences of capital accumulation, it is impossible to predict the outcome. We can only affirm that the distinction and opposition will persist even if it may take different configurations as time goes by.

Marx (1857-8) apparently views that knowledge is basically objectified in fixed capital. He says, “[t]he development of fixed capital indicates to what degree general social knowledge has become a direct force of production, and to what degree, hence, the conditions of the process of social life itself have come under the control of the general intellect and been transformed in accordance with it”, p.706, emphasis added. This does not mean that knowledge of living labour is ignored although he definitely places more emphasis on dead knowledge than on living knowledge. Rather, in “Fragment on Machines”, Marx concentrates on the role of knowledge in general, be it either formal or informal. With the rapid development of science and its technological application, Marx views that knowledge increasingly plays an important role in the production process in large scale industry and knowledge is one of the sources of real wealth as opposed to wealth in general or wealth expressed in terms of value. As Marx (1857-8, pp. 704-5) puts it, “the creation of real wealth comes to depend less on labour time and on the amount of labour employed than on the power of the agencies set in motion during labour time, whose ‘powerful effectiveness’ is itself in turn out of all proportion to the direct labour time spent on their production, but depends rather on the general state

25 Note that Vercellone (2007, p. 27) disagrees with Virno. “[O]ur interpretation diverges from that of Paolo Virno, according to which Marx identifies the general intellect with fixed capital in toto, in contrast to the way that the same general intellect presents itself as living labour”.
of science and on the progress of technology, or the application of this science to production”, emphasis added. He continues, “as soon as labour in the direct form has ceased to be the great well-spring of [real - added] wealth, labour time ceases and must cease to be its measure, and hence exchange value [must cease to be the measure] of use value”, p. 705. Quoting William Petty, Marx (1867, p. 134) says, “l abour is the father of material wealth, the earth is its mother”. Considering the role of knowledge, to this must we add knowledge. Whilst knowledge is also product of human labour, another source of real wealth, it is distinguished from material goods in that it can be re-used unlimited times, that is to say, use of knowledge does not accompany its deterioration. More specifically, whereas knowledge dictates what is to be produced and which technologies will be used in the production process, labour produces commodities in the production process as dictated by knowledge.

Labour has always been an essential source of real wealth irrespective its historical forms and labour time has always been playing an important role either at the individual level or at the social level. As Marx (1867, p. 164) puts it, “[i]n all situations, the labour-time it costs to produce the means of subsistence must necessarily concern mankind, although not to the same degree at different stages of development”. In addition, whilst it takes different forms throughout history, it has always been true that some people do not have to work, but appropriate, by whatever means, products of labour of others. Of course, capitalism is different from pre-capitalist modes of production. In capitalism, “[the] equality of the kinds of human labour takes on a physical from in the equal objectivity of the products of labour as values”, and “the measure of the expenditure of human labour-power by its duration takes on the form of the magnitude of the value of the products of labour”. But the fact that labour is a major source of real wealth does not change in capitalism.

In “Fragment on Machines”, Marx is envisioning a society where labour remains to be necessary for the creation of real wealth, but only plays a minor role. In such society, production of real wealth, i.e. use values, will more depend on the state of science and technology rather than on total direct labour time, both at the firm level and at the national/global level.

If “Fragment on Machines” is not about the collectivity of cognitive workers, what is it about? It is basically about a clash between forces of production and relations of production. Marx (1857-8, p. 706) says, “On the one side, then, it [capital] calls to life all the powers of science and of nature, as of social combination and of social intercourse, in order to make the creation of wealth independent (relatively) of the labour time employed on it. On the other side, it wants to use labour time as the measuring rod for the giant social forces thereby created, and to confine them within the limits required to maintain the already created value as value”. Capital is a “moving contradiction”. He argues that capital, as one of its consequences, pushes forces of production to the limit to the extent that it shakes the stability of its relations of production. Marx does not mention counter-tendencies which are also consequences of capitalism. As mentioned earlier, Marx does not consider knowledge of workers, which is the result of mutually contradictory processes of deskilling and reskilling. Nor does he mention that human needs are redefined as new products are introduced and old products vanish. As is the case with the LTRPF (law of the tendency of the rate of profit to fall), we cannot predict outcome of the mutually contradictory interplay of the tendency to minimise the role of direct labour and such counter-tendencies. Going back to our question of how to interpret the decreased role of

26 Caffentzis (2008) calls this “incommensurability tendency” because this tendency refers to the increased role of knowledge.
27 In the same vein, Smith (2008, p. 25) says, “[b]ut this tendency existed alongside a tendency for the workforce as a whole to develop new capacities and new forms of tacit knowledge, despite being dominated by machine systems. These capacities and forms of knowledge played a profound role in the incremental and radical innovations that occurred throughout the period in question, however much the reality - and the ideology - of “deskilling” prevented this from being recognized adequately”.
28 Caffentzis (2008) seeks to explain the relation between the incommensurability tendency and the LTRPF, but mistakenly equates the former with the transformation of commodity values into prices of production. He says, “in the transformation of commodity values into prices of production the incommensurability thesis is preserved and finally made compatible with the falling rate of profit tendency. If the value-to-price-of-production transformation did not occur, the high organic composition industries would suffer from inadequate profit rates and would be unable
direct labour, we cannot give a definite answer. At this point, it is sufficient to say that theories dealing with this topic should consider counter-tendencies as well as the tendency to minimise the role of labour.

One thing to be noted is that the distinction between real or material wealth and wealth in general is instrumental and important. Whereas labour, knowledge and nature are indispensable sources of material wealth in capitalism, labour is the only source of wealth in general which is expressed in terms of value. It does not mean that knowledge and nature have nothing to do with the production of wealth in general. Total social labour time in a given period of time, is more or less fixed. Suppose that total social labour time in a society per year is 1 million hours and this number does not change for five years. As the general level of social knowledge increases, in the form of human as well as fixed capital, material wealth produced in year two will be more than in year one even if total social labour time remains to be 1 million hours. However, for the same reason, newly created wealth in general in year 2 is the same as that created in year 2. We may conclude that wealth in general is determined by the total labour time only, not affected by the general level of social knowledge. But it is not the case. Increase of the general level of social knowledge is the result of mutually contradictory social processes – innovation (i.e. production of new knowledge) leading to virtual intensification of commodity-producing labour versus catch-up resulting in the nullification of the virtual intensification of first-movers.

Intellectual property rights and rent

According to Marx, a social relation between men in capitalism takes a form of a relation between things. The fact that some people do not have to work, but appropriate what others produce, a definite social relation, takes the form that profit accrues to capitalists, a relation between things. Fundamentally, social relations in capitalism are based on human equality or equivalence between human labour, which takes the form of abstract labour and value. As a result, labours are measured by single abstract labour time, establishing a dimension of value. This allows for economic analysis of capitalism in quantitative terms. More generally, definite social relations in capitalism exist as economic categories, relations and laws. Whilst they are inherently social relations and thus are transient, they look autonomous from human actions, and function as a “regulative law of nature”, Marx (1867, p.168).

On the contrary, in cognitive capitalism where labour time ceases to be the measure of value and wealth, general law of cognitive capitalism, if such thing exists, cannot be analysed in quantitative terms. Whilst prices remain to exist, there are no economic laws by which prices are determined. Then how is the appropriation of surplus products by capitalists is possible at all in cognitive capitalism?

It is argued that the category of profit disappears in cognitive capitalism, but not for the reason that a relation between human does not take an economic form any more. According to Vercellone (2008a), there are two conditions of existence of profit in industrial capitalism. The first concerns that the role of capital is essential in the production process. Capitalists manage, supervise and organise the labour process, and this shows “the correspondence between the figure of the capitalist and that of the entrepreneur”. The second condition is related with reinvesting surplus value or profit for expanded accumulation of capital. It is argued that these two conditions are only a “transient outcome of a period in capitalism, that is, that of industrial capitalism” and fully realised “during the golden age of Fordist growth, when the logic of the real subsumption of labour under capital and that of mass production come into being”. Further, Vercellone (2008a) argues that profit or surplus value stems not only from surplus labour time of to develop into a hegemonic presence in production. Indeed, the transformation makes it possible for there to be electricity-generating nuclear power plants that successfully realize an average rate of profit (on the basis of an enormous investment in fixed and circulating capital) even though the workers within them create a tiny fraction of the surplus value created by workers in a typical sweatshop”, pp. 63-4. For Smith (2008, p.35), the theme of the general intellect is present in Capital, though Marx does not use this term any more. He says, “Marx stressed the intrinsic connection between relative surplus value and the systematic tendency for the scientific-technical knowledge to play an increasingly important role in the production process. This is the concept of the general intellect, even if the term itself is not employed.”
individual workers, but also from co-operation between workers. Capitalists are seen to appropriate the latter part of surplus labour free of charge. “As Marx has already pointed out about the factory, this surplus-value is not intended as a simple sum of the individual surplus-labour of each wage labourer, but also as the gratuitous appropriation of this surplus generated by the social cooperation of labour.”

This is different from Marx’s explanation. In this view, profit is understood as “the remuneration of capital” as Vercellone (2008a) acknowledges. On the contrary, Marx’s view is that profit accrues to capitalists not from any roles they play in the production process, but from surplus labour time performed by workers who must work for capitalists to make a living due to the monopoly of means of production by capitalists. Capitalists add nothing to the surplus value they exploit from the workers.

In cognitive capitalism, the role of organisation, cooperation, coordination of production process is now appropriated by workers. Capitalists are increasingly detached from the task of management, supervision and organisation of the labour process, and do not contribute to the production of final commodities as much as in the previous stage of capitalism. As a result, the exploitation of surplus value, which is inherent in the capital-labour relation in industrial capitalism, is no longer feasible. In addition, as cognitive capitalism theory neither provides a theory of quantitative determination of value and price, nor is favourable to single measure of wealth, appropriation of surplus product cannot be theorised in economic terms.²⁹

Appropriation of surplus is achieved by way of the expansion of the sphere of market “through a progressive colonisation of the common goods of knowledge and life by means of strengthening Intellectual Property Rights”, Vercellone (2008a). “[T]he solution sought by capital is now to establish strict intellectual property rights aiming at capturing monopoly rents”, Vercellone (2004). A new enclosure movement or primitive accumulation takes place, around which the antagonism between capital and labour is reconfigured. As Dyer-Witherford (2006) puts it, cognitive capitalism is “commercial appropriation of general intellect”. As a result, the boundary between rent and profit collapses. “Because as the law of value-labour time is in crisis and the cooperation of labour appears to become increasingly autonomous from the managerial functions of capital, the very frontiers between rent and profit begin to disintegrate”, Vercellone (2008a). Capital appropriates part of surplus value created by living labour by way of intellectual property rights, and this portion of wealth is putatively becoming rent. Consequently, rent becomes the central category in cognitive capitalism. “The current transformation of capitalism is characterised by a full-fledged comeback and proliferation of forms of rent paralleled by a complete change in the relationship between wages, rent and profit.” In other words, cognitive capitalism is a stage of capitalism where capital tries to “accentuate and exercise direct control over places or people with knowledge or potential of technical creativity”, Corsani et al. (2001, p. 10). The term cognitive capitalism captures “the current issues of conflict related to the redefinition of intellectual property rights and intangible and we call new battle fences (enclosures)”, Moulier-Boutang (2002).

This means that the class struggle in cognitive capitalism increasingly takes the form of distribution struggle, where no pre-existing economic rules apply. It is a pure clash between capitalists and workers by which surplus products are divided. Whilst knowledge should be freely available due to its non-rival nature, capitalists attempt to impose intellectual property rights from outside, so that they can monopolise the use of knowledge, and thus appropriate monopoly rent accruing from the (artificially) limited use of knowledge. Hardt and Negri (2000) argue that exploitation in the new stage of capitalism requires non-economic political compulsion. From a point of view of cognitive capitalism, political compulsion takes the form of intellectual property rights.³⁰ This reveals the view of

²⁹ “One can no longer hope to find any natural units of measure and even when such units appear they are merely fleeting results that arise a posteriori from the common organization of society and the continuous resolution of the antagonisms that run throughout it. Economics, then, which has exhausted its powers, has to open itself to politics; it has to yield to political practice and recognize that it cannot do otherwise”, Hardt and Negri (2004, pp. 156-7, emphasis added). “Only the power of money, in fact, can represent the generality of the values of production when they are expressions of the global multitude”, 156.

³⁰ For Hardt and Negri (2000 and 2004) who considers not only knowledge production but also broader aspects of
autonomist Marxism (and cognitive capitalism theory) on the relation between capital and labour. Capital and labour are understood to be independent from each other. Here, a group of people called working class, and another group of people called capitalists fight with each other on who takes control of the role of knowledge production. Now we have two super-powers, confronting each other. “There is a clash of Titans”, Holloway (2002b, p. 88).

For Marx, capital and labour are inter-related. They are not two independent factors of production as they appear in the aggregate production function. Capital cannot be replaced by labour and vice versa. Their inter-relation is obvious in the category of variable capital. The concept of capital includes labour as its constituent part. As Holloway (2002b, pp. 88-9) puts it, “to overlook the internal nature of the relation between labour and capital thus means both to underestimate the containment of labour within capital (and hence overestimate the power of labour against capital) and to underestimate the power of labour as internal contradiction within capital (and hence overestimate the power of capital”).

Whilst no economic analysis on rent is provided, we can point out that rent is understood in a Marshallian sense as acknowledged by Negri and Vercellone (2008). Marshall conceptualises as the categories of rent and quasi-rent the portion of value that is accounted for by the use of better production methods or inputs than social average. Similarly, many commentators have argued that the productivity increase attributed to the monopoly of production methods or knowledge or natural conditions can be analysed with Marx's category of ground-rent, even if they do not necessarily sign up for any theory of new capitalism. For example, Harvey (2005, p. 395) says, “all rent is based on the monopoly power of private owners of certain portions of the globe. Monopoly rent arises because social actors can realize an enhanced income stream over an extended time by virtue of their exclusive control over some directly or indirectly tradable item which is in some crucial respects unique and non-replicable”. Hence, rent is seen to take many different forms – “financial, real estate, cognitive, wage etc.”, Negri and Vercellone (2008). In this respect, financialisation is understood as another way of appropriating rent.

Marx’s category of ground-rent is different from Marshallian rent. As Fine (1979, p. 248) points out, in the analysis of ground-rent, “Marx’s starting point then is the existence of landed property as a specific means by which surplus value can be appropriated in the form of rent”. Rent is “immediately linked to the historical conditions of existence of landed property”. “There is therefore no general theory of rent”. In sum, “rent cannot be analysed simply on the basis of its effects … Logically, rent would then arise wherever there was any obstacle to capitalist investment, that is in all but the most abstract existence of the capitalist mode”. Intellectual property rights certainly constitute a type of barrier to capitalist investment in that the use of protected technologies or knowledge requires licensing of technologies or other forms of transfer of knowledge. However, intellectual property rights are different from landed property in several respects. First, whilst landed property is a pure barrier for capitalists, intellectual property rights are beneficial to some capitalists. Second, intellectual property rights have contradictory impacts on capital.

immateriality of contemporary capitalism, political compulsion can take more diverse forms. “[T]he indexes of command (like those of economic value) are defined on the basis of always contingent and purely conventional elements.” As no systematic approach to exploitation is feasible, the political compulsion that is necessary for exploitation cannot be associated with order or measure. Rather its effectiveness is based on “destruction (by the bomb), on judgement (by money), and on fear (by communication)”, Hardt and Negri (2000, p.355).

31 Holloway also criticises the stage view or cycles of class struggle: “It rests on a notion of duration. Society is painted as being relatively stable during a certain period, and, in this period, we can recognise certain solid parameters. A paradigm creates a space in which we can say the world is so … A paradigm paints an orderly world of correspondence. The negative impulse which is the starting point becomes converted into a positive science. The working-class refusal is slotted into a world of order”, Holloway (2002b, p. 84). Also see Holloway (2002a), chapter 9.

32 “[T]his is what Marshall described as a rent, to distinguish this good as "free gift" which results from the general progress of society from normal sources of profit”, Negri and Vercellone (2008).

33 “[T]he point of departure and main character of the current transformations of capitalism are neither financialisation nor the IT revolution; on the contrary, two phenomena lie at the core of the crisis of the Fordist relation”, Vecellone (2008). “[T]he genesis of the current process of financialisation maintains a close relationship with conflictual transformation in the division of labor driven by the crisis of Fordism”, Corsani et al. (2001, p.14).
accumulation. On the one hand, it drives innovation by preventing competitors from imitating or catching-up. On the other hand, for the same reason, increase of the general level of social knowledge is retarded. On the contrary, capitalists confront landed property as pure barrier to capital accumulation. Hence, landed property and intellectual property cannot be considered identical, and the category of ground-rent cannot be imposed upon intellectual property rights.

Significantly, intellectual property rights are not an invention of 20th century. Its modern origination dates back to as early as 1474 when the patent statute of Venice was issued. The United States and France enacted their patent laws in 1790 and 1791 respectively. Hence, before analysing the significance of intellectual property rights in cognitive capitalism, one needs to study the role of intellectual property rights in the capitalist mode of production and how it has affected capital accumulation. Although we cannot attempt to develop a theory on Intellectual Property Rights here, it is worth mentioning that intellectual property rights is the basis of commercialisation of knowledge. According to Arora et al (2001, p. 43), the size of the worldwide market for technology in 1990s ranges from $35 - $50 billion, which is about 1% of the world GDP in 1990s. The market for technology and its relative size as compared to GDP must have rapidly been growing in the 21st century. This requires that the nature of knowledge, its role in the capitalist mode of production and the essence of price of knowledge need to be explained on the basis of value theory.

4. Concluding remarks: Extension of Value Theory

So far, we have criticised cognitive capitalism theory by focusing on demonstrating that the underlying interpretation of Marx’s theory is flawed. But this critique does not warrant that Marx’s value theory is valid in contemporary capitalism where it is believed that economic growth is driven by immense accumulation and effective dissemination of knowledge, and economic success of individuals, firms and nations increasingly depend on knowledge. This poses a question of whether Marx’s value theory can be extended to incorporate the role of knowledge.

I have attempted to extend value theory to incorporate the role of knowledge elsewhere, Jeon (2008). It is suggested that the distinction between conception and execution is central to understand how commodity production in capitalism is structured. A key difference between knowledge labour (conception) and commodity-producing labour (execution) lies in the reusability of the product of knowledge labour. Knowledge labour does not produce value of commodities directly or indirectly through transfer of the value of the labour time contributed in a piecemeal fashion (like fixed capital). Instead, it allows for virtual intensification of commodity-producing labour, increasing the “value-producing capacity”, Saad-Filho (2001, p.177), of commodity-producing workers.

Knowledge allows for virtual intensification through two different mechanisms: intra-sectoral virtual intensification and inter-sectoral virtual intensification. Commodity-producing labour of an individual capitalist may be virtually intensified by both mechanisms at the same time. In case of intra-sectoral intensification, if an individual capitalist makes more productive use of knowledge than the sectoral norm, the commodity producing labour will have a lower individual value and be able to accrue extra surplus value over the norm in the form of higher profit. In this case, if one has a higher labour productivity than another, this might be because of different use of collective knowledge or because of differences in skills of individuals. In case of inter-sectoral intensification, the sectoral average level of knowledge might be higher than the social average. In this case, commodity-producing labour of all the individual capitalists in this sector acts as intensified labour. The average commodity-producing labour of such a sector serves as complex labour. Complex labour produces more value precisely because it requires significant efforts in education and training, incorporating more knowledge than other simple labours. Even if machinery dominates individual workers, workers use machinery as instruments of production at the collective level. Knowledge produced in its own (non-value) generation process serves, in the labour process, as the knowledge of the value-producing collective

34 For a brief history of patent, see Guellec and Pottelsbergh de la Potterie (2007), especially chapter 2.
worker. Even if individual workers perform simple labour, collective knowledge can virtually intensify that labour.

In this way of incorporating the role of knowledge into value theory, knowledge labour is not only necessary for the production of use-value, but also contributes to the production of value. Here, the inter-relation between knowledge labour and commodity-producing labour is obvious. They have different roles. Whereas knowledge labour determines the value-producing capacity of commodity-producing labour, commodity-producing labour produces value. Value production is not possible if one of the two is missing. Division of labour and separating between conception and execution does not nullify this inter-relation.

Significantly, incorporation of the role of knowledge does not require altering any assumptions or propositions of Marx’s value theory. This is contrasted with new growth theory, where incorporating knowledge as a factor of production resulted in abandoning the assumption of perfect competition due to the peculiar nature of knowledge – non-rivalry and partial excludability.35

We have criticised cognitive capitalism theory and demonstrated that value theory can be extended to incorporate the role of knowledge. This does not mean that we can reject any theories of post-capitalism. It is one thing that value theory does not contradict the expansion of the role of knowledge in capitalism. It is quite another that capitalism can sustain despite ever increasing role of knowledge in the production process. But it is not of our immediate concern to go further and try to find out whether essential changes are taking place.

Our primary task is to develop a Marxian theory of knowledge economy based on value theory, which has received little attention so far. This is important not on its own, but it is so in relation with other themes like financialisation, neo-liberalism and globalisation.36

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36 This point is acknowledged by proponents of cognitive capitalism theory. See Paulré (2008) for financialisation and Moulier-Boutang (2004, 2005)
References


Guellle


capitalism in 2006.


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