Machinery and the origins of surplus value

Nick Beams
19 March 2002

Dear WSWS,

I have consistently found the news and analysis on your website very instructive and valuable. But there are several theoretical issues where I may be missing the point. If I understand your position, you assert that the rapid development of computer technology over the last twenty years has done little to increase the rate of profit in a way that might help to "save capitalism", because the only source of profit in a capitalist economy is the surplus value that can be extracted from the labour of human workers. Given the technologies they were personally familiar with, it's understandable why Marx and Trotsky assumed that human workers were the only source of surplus value. But does this assumption hold true at all technological levels? Is there some theoretical reason why, in principle, surplus value can only be extracted from human labour, and not from machine labour? We might, as a thought experiment, consider a machine with exactly the same capabilities as a human. Suppose such a machine were constructed, and then employed by a capitalist. Since the machine by definition can do anything a human can, why couldn't the capitalist extract the same amount of surplus labour from the machine as could be extracted from an equally talented human worker?

If no such theoretical limitation on the value of machine labour exists, then the relevant question becomes, precisely what technological innovations are required to produce machines capable of doing labour from which surplus value can be extracted? Are you quite sure that current machines can't produce surplus value? Even if current machines can't, how soon would you expect such machines to become technologically feasible? If the development of such machines is plausible within the next few decades, then it would seem to me that they might have a profound influence on the future development of capitalism.

GB

Dear GB,

In order to answer your questions it is necessary to start, not with the way things appear in capitalist society, but to go back, as Marx did, to the simple-cell form of that society, the commodity.

Emphasising the objectivity of his method in one of his last writings, Marx explained that what he began with was not "concepts" and hence not the "concept of value". These had to be derived from an examination of objective social processes.

"What I proceed from is the simplest social form in which the product of labour in contemporary society manifests itself, and this is as 'commodity'. This is what I analyse, and first of all to be sure in the *form in which it appears*. Now I find at this point that it is, on the one hand, in its natural form, a *thing of use-value*, alias *use-value*, and on the other hand, that it is *bearer of exchange-value*, and is itself an exchange-value from this point of view. Through further analysis of the latter I discovered that exchange-value is only an 'appearance- *form*', an independent mode of manifestation of the *value* which is contained in the commodity, and then I approach the analysis of this value" (Marginal Notes on Adolph Wagner in *Value: Studies by Karl Marx*, New Park, 1976, p. 214).

Marx takes the most basic social relationship of commodity-capitalist society: a quantity x of commodity A is exchanged for a quantity y of commodity B. He asks what does this equation x comA = y comB tell us? Note here at the outset Marx does not proceed from a concept or category but from an objective social process, the exchange of commodities.

If two commodities are equated in the act of exchange then it is clear "there exists in equal quantities something common to both. The two things must therefore be equal to a third, which in itself is neither the one nor the other. Each of them, so far as it is exchange-value, must therefore be reducible to this third."

Marx goes on to draw out that this common "something" cannot relate to any of the physical or natural properties of the commodity, for they only affect the use-values of the commodities.

"If then we leave out of consideration the use-value of commodities, they have only one common property left, that of being products of labour" (Marx, *Capital* Volume I, p. 45).

This sentence has been attacked by all manner of critics who claim that Marx was making an arbitrary assumption. There are, it is claimed, numerous other common properties of commodities besides being a product of labour. These common properties, however, all relate to the use-values of the commodities. However, the exchange of commodities is "evidently an act characterised by a total abstraction from use-value."

The point at issue here is this: a scientific theory must be a true reflection of objective processes. It is not that Marx makes an arbitrary abstraction from all the other properties of commodities. Rather, such an abstraction takes place objectively in the social process of exchange, in the act of exchange itself, which he is seeking to analyse and correctly reflect in theory.

What is manifested in the social process of exchange is the value of the commodity as a product, not of the particular kind of labour which went into its production—this concrete labour affects the qualities of the commodity, its use-value—but the amount of human labour in the abstract, general human labour, which it embodies. The magnitude of this value is measured by the quantity of the value-creating substance, the labour, measured by time.

From the analysis of the commodity, Marx goes on to the analysis of money and from money to capital.

The general formula for the circulation of capital takes the form of Money-Commodity-Money. But clearly in its role as capital, money, as it enters the process of circulation, comes out of circulation and re-enters it again, expands its value. How then can this process be explained in accordance with the laws of commodity production, out of which capital arises, in which equivalents are exchanged for equivalents?

The capitalist, Marx explains, must be able to find within the sphere of circulation a commodity whose use-value, realised in the process of consumption, is such that it possesses the property of being a source of value. That commodity is labour power, the capacity to work, which the worker sells to the capitalist. Its use-value is realised in the production process itself. During one portion of the working day the worker reproduces the value of his labour power. In the rest of the working day he adds additional, or surplus value, which belongs to the capitalist as the purchaser of the commodity labour power.

The consumption of the commodity labour power takes place in the process of production in which the labour works on machines and

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transforms raw material (means of production) which have been purchased by the capitalist. The value embodied in these means of production is preserved in the final commodity. The machinery adds no additional value.

Surplus value from machinery?

In order to demonstrate the falsity of the proposition that machinery can add surplus value let us consider a simple numerical example.

Suppose that the production of commodity A involves the employment of machinery embodying 20 hours of labour and that this machine is entirely used up in the process of the production, raw materials embodying 10 hours of labour, and that there is an additional 20 hours of labour added by the workers. The commodity produced will embody 50 hours of labour. Suppose that the workers take half the working day to reproduce the value of their own labour power. Then the additional, or surplus labour embodied in the commodity will be 10 hours. Suppose that 50 hours of labour has a money equivalent of $50. The capitalist will have laid out $40 to begin with ($20 for machinery, $10 for raw materials and $10 for labour power) and have in his hand at the end of the process a commodity with a value of $50 (embodying 50 hours of labour) and realising $10 of surplus value.

Now let us suppose, in line with your argument, that in addition to the $10 surplus value that the capitalist extracts from the workers, he is able to realise an additional $10 of surplus value from the machine. In other words, the commodity will have a value of $60.

Consider the production of commodity B in which there is no machinery and in which raw materials embody 30 hours of labour while an additional 20 hours of labour are added by the workers (at the same rate of exploitation.) In this case, the value of the commodity will be $50. As in the first instance, the capitalist will have laid out $40 and have in his hands a commodity with a value of $50.

Compare the two results before us. In the first case, on the basis of your argument, where machinery was employed, a commodity which embodied 50 hours of labour, would be able to realise $60, that is, the money equivalent of 60 hours of labour in the market. In the second case, where no machinery was employed, the commodity, which embodied 50 hours of labour time, would only be able to realise $50, the money equivalent of 50 hours of labour time.

What this little example demonstrates is that if your argument is correct then the laws of commodity exchange are violated. We no longer have the exchange of equivalents in the market. In one case commodities embodying 50 hours of labour will receive a money equivalent embodying 60 hours of labour, while in the other case commodities embodying 50 hours of labour will only bring a money equivalent of 50 hours.

Consider what would happen should such a situation emerge. It is clear there would be a movement of labour from the production of commodity B to the production of commodity A; that is, from an industry where the expenditure of $40 brings $50 to one where it brings $60. But the increase in production of commodity A would bring down its price. The movement would continue until the price had fallen from $60 to $50.

The claim that machinery is a source of value and even surplus value is often advanced against Marxist theory. It rests upon an uncritical acceptance of the appearances, or “facts,” of the capitalist economy.

The first of these is the obvious point that machines create additional use values and enhance the productivity of labour. But the claim that this gives rise to surplus value rests upon a confusion between use-value and exchange value. The production of material wealth and the production of surplus value and profit are not the same thing. If more can be produced in a given period of time use-values, material wealth, have increased, but the exchange value of each commodity will have decreased as it now embodies less labour time.

The second source of illusions is that for the individual firm the introduction of new machinery is indeed the source of increased profits. If a firm introduces new machinery which eliminates labour from the production process, increases labour productivity and thereby brings about a reduction in production costs, it is able to increase its individual profit.

Presenting this fact, the opponents of Marx then argue: How can it be the case that labour is the sole source of surplus value and profit, when clearly machines, which replace labour, have produced additional profits.

To understand what is taking place it is necessary go beyond the immediate forms of appearance and see what is taking place behind the back of the individual capitalist firm.

In Volume I of *Capital* Marx shows that surplus value arises from the consumption of labour power in the production process: more labour is added by the worker in the course of the production process than the labour which is embodied in the commodities needed to sustain that worker and his family.

The introduction of machinery can lead to an increase in the accumulation of surplus value but not in the way you suggest. The machine itself adds no new value, it passes on the value embodied in it.

But its introduction will lead to an increase in the rate at which surplus value is extracted insofar as it increases productivity and reduces the time taken by the worker to reproduce the value of his own labour power and thereby increases the time which he renders unpaid labour to the capitalist. This process gives rise to the illusion that the machine is the source of the additional surplus value.

But this is not the end of the matter. In Volume III of *Capital*, having revealed the origins of surplus value in Volume I, Marx turns to the question of the distribution of surplus value. He shows how the surplus value extracted from the working class as a whole by the total capital in society is divided up among its different sections. This division takes place through the competitive struggle among the different capitalist firms.

Each section of capital shares in the total mass of surplus value according to the share of the total capital it comprises provided that its production costs are line with the social average.

A particular firm which is less productive than the social average, and whose production costs are consequently higher than the norm at that point in time, will receive less than the average rate of profit. Correspondingly, a firm that is more productive than the social average, that is, a firm whose costs are lower than the average, will receive more than the average rate of profit.

Herein lies the source of the increased profits generated by the introduction of new machinery. A firm that first introduces new technology, thereby lowering its production costs to below the social average, will receive profit at greater than the average rate. But when other firms introduce the same technology and productivity rises the average social cost of production will fall, and the firm that first made the innovation will find that it profits start to fall as other firms are better able to compete. Indeed, it may even start to make less than average profits as it rivals introduce even more advanced technologies.

Impact of new technologies

One final point: It is not necessary to carry out a thought experiment or project forward to some imaginary time in the future to see the profound influence of new technologies on the development of capitalism. Rather we only need to examine the whole history of capitalist industrialisation which has involved the continuous replacement of human beings in the production process with machines that have far greater capacities to perform a given task.

Take the most recent period. With the introduction of computerised technologies into the heart of all production processes over the past 20 years there have been vast increases in labour productivity.

But this has not led to a marked increase in profit rates. The increased exploitation of labour has brought some increase in profits rates during the 1990s. But they are still well below the levels of the 1960s, in the midst of

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the postwar boom.

So great has been the pressure on profit rates that we have seen major firms, particularly in the US, resort to what is euphemistically known as “aggressive accounting” in order to boost their profits and maintain shareholder value. Their ability to do so has depended on the vast inflation of stock market values.

An article in the *Financial Times* of February 26 gives some idea of the amounts of money involved. It reports that Germany’s largest bank, Deutsche Bank, showed a profit of just over 4 billion euros on total revenues of 35 billion euros when valued according to European accounting standards.

However, on the basis of US accounting rules, its after-tax profits in 2000 were some 13 billion euros. The profit inflation was largely due to the favourable treatment under US rules of unrealised gains on equity holdings.

As we reported on the WSWS, it has now come to light that US Federal Reserve Board chairman Alan Greenspan was aware as early as September 1996 that a “bubble” was developing in the US market. This arises when shares continue to rise not because of improvements in profit rates but because money floods into the market, setting off a chain reaction. Shares in major companies rise because there is more money in the market. The increased share values then enables the companies themselves to increase their profits through purely financial operations, thereby increasing their reported profits, dragging more money into the market and so on.

As Greenspan was all too well aware, the way to stop this process was to cut the supply of funds to the stock market. Instead he did the opposite, increasing the supply of money, and becoming a spokesman for the “new economy” claiming that the rise in share values was a reflection of increased productivity.

The fact that he did so indicates the extent to which US corporations had become involved in and dependent upon the escalating stock market. This dependence in turn is an expression of the fact that, rather than resolving the contradictions of the capitalist economy, the increase in labour productivity, flowing from the vast technological innovations of the past 20 years, has tended to exacerbate them.

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