An exchange of letters

The impact of increasing labour productivity on the crisis of profit system

Nick Beams
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The following is a reply by WSWS *editorial board member Nick Beams to a letter from a reader, IM. The reader's letter can be found at:* http://www.wsws.org/articles/1999/aug1999/cor2-a20.shtml

IM's letter and Beams's reply follow an earlier exchange on the subject of growing US indebtedness. That initial exchange consisted of:

1. Beams' July 8 article, "When will the US 'debt bomb' explode?"

2. IM's letter in response to Beams' July 8 article

3. Beams' reply to IM's letter

Dear IM,

Thank you for your further e-mail and the question you have raised on the relationship between technology and the accumulation of profit. As I understand it, your question can be formulated as follows: why does the increasing productivity of labour tend to bring about a fall in the rate of profit?

Before coming to the question, it is necessary to clarify a point of confusion on the labour theory of value. You suggest that Marx really had two theories: that he sometimes implies that the value of a commodity is determined by the unit of labour time and at others that it is determined the amount of time required to produce the worker's means of subsistence.

You write: "My fundamental confusion is that I find Marx unclear as to which of the fundamental measures he actually follows. (In general, I believe he uses both, using the unit of worker's time formulation when he wants to keep things simple to make it easier for the reader to understand his point. But I think that in his long term analysis he uses the unit of time formulation when he should use the subsistence formulation.)"

Nothing could be further from the truth. Throughout all his writings Marx makes clear that the value of a commodity is determined by the amount of labour time which it contains. It was only on the basis of this discovery that he was able to disclose the origin of surplus value and profit.

Marx begins *Capital* with an analysis of the simplest cell of capitalist society—the commodity—and its most basic social relationship—the exchange of commodities. A commodity is first of all a use value, that is, it satisfies a definite want. But in addition it is a value, which manifests itself in its exchange with other commodities.

The value of the commodity is not determined by the material needs and wants it satisfies—these qualities relate to its use value—but by the amount of labour time which it takes on average to produce it under the prevailing conditions of production. That is, the various proportions in which commodities exchange are not random fluctuations, arising from the will or caprice of their buyers and sellers, but are determined by the socially necessary labour they contain.

Now let us consider the question which has given rise to your confusion, and that of many others as well. What commodity does the worker sell to the capitalist in the wage contract? Clearly he does not sell his labour, that has yet to be performed. Nor does he sell the commodities he has produced during the course of the working day—they are never his to begin with and cannot be sold by him.

The worker sells to the capitalist the one commodity which he possesses, his labour power, or capacity to work. The capitalist having purchased this commodity is, like every other purchaser of a commodity, entitled to consume it and realise its use value. This he does by setting the labourer to work for a day. The use value of the labour power is that it is a source of value. During the course of a day of, say, 8 hours, the worker adds new value to the value which is already embodied in the raw materials and machinery used up in the production process. Or, to put it another way, the means of production preserve their values as they are materially transformed by the labour process into new commodities.

The value of the commodities which result from the labour process will be the value of the raw materials and machinery used up plus the 8 hours of new value which is added by the worker. Notice that at this point, we have said nothing about the wages paid to the worker. The value of the commodity emerging from the end of the production process will be the same whatever the wage paid to the worker—it contains 8 hours of labour plus the labour embodied in the machinery and raw materials.

Now we come to the question of the value of labour power—the commodity which the worker sells to the capitalist. Its value is expressed in the form of wages. The value of labour power is determined, like every other commodity, by the amount of socially necessary labour time which it takes to reproduce it. The value of labour power will be determined by the value of the commodities which are required to reproduce the worker the next day and to sustain his family and so maintain the supply of wage labour in the future. This is not simply a bare subsistence, but contains an historical element, which is determined by the previous struggles of the working class and the general development of society as a whole.

The value of labour power is given by a definite amount of socially necessary labour time. After working for a portion of the working day, the labourer will have reproduced the value of his labour power. But he continues to add new value after this point. This is the source of the additional or surplus value which he renders to the capitalist.

In other words, the working day divides into two parts: a portion in which the worker reproduces the value of his labour power (necessary labour time) and a portion in which he renders surplus labour to capital.

You write: "In this framework, the only way to increase the production of surplus value is to reduce wages. Technological improvement makes it possible to produce greater quantities of output, but since we're following the labour theory of value, the value of the greater output is no more than the previous level of output because the level of labour input is unchanged. If we reduce the labour input, the value will actually fall.

"But technological improvement will also reduce the amount of labour

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required to produce the labourer's subsistence, so technological change will in fact alter the rate of surplus value. That is, the rate of surplus value is not exogenous when we look at the production process as a whole. It is dependent on the production technology."

The points you raise here are in general correct. But you seem to imply that Marx somehow overlooked the impact of technology, and the transformation it brings in the development of labour productivity and the production process as a whole, upon the accumulation of surplus value. In fact, this question is central to his whole analysis of the historical evolution of capitalist production and the emergence of its contradictions.

Let us look at the issue more closely. In the beginning, Marx explains, capitalism simply takes over existing labour processes as they have been handed down to it by previous historical development and places them under its control. Capital can, as you say, increase surplus value by reducing wages but there are limits to this. Of greater significance is the drive to increase the production of surplus value by lengthening the working day.

In this period of capitalist development, corresponding roughly to the first stages of capitalist industry in Britain, we have as yet what Marx calls only the formal subsumption of labour to capital. This stage of development, however, "stands in striking contrast to the development of a *specifically capitalist mode of production*" in which capital "not only transforms the situations of the various agents of production, it also *revolutionizes* their actual mode of labour and the real nature of the labour process as a whole." (See Marx *Results of the Immediate Process of Production* in Capital, vol. 1. Penguin edition, p. 1021.)

On the basis of pre-existing methods of production capital has only one way of increasing the appropriation of surplus value—lengthening the working day. But with the development of the working class as an organized social force there are limits to this process.

Given the limitation of the working day, capital can increase the accumulation of surplus value if it can develop the productivity of labour so that the time taken by the labourer to reproduce the value of his labour power is reduced.

Suppose that the working day of, say, 8 hours is initially divided in the following proportions: 6 hours of necessary labour and 2 hours of surplus labour. Now suppose that the productivity of labour throughout the economy is developed to a point where necessary labour is reduced to 3 hours. Out of a given working day of 8 hours, there will now be surplus labour of 5 hours. That is, for an overall doubling of the productivity of labour, the amount of surplus labour will have risen from 2 to 5 hours, a 2.5 fold increase, or 250 percent.

Now suppose that there is a further increase in the productivity of labour such that the necessary labour is reduced to just 1.5 hours. The amount of surplus labour will have increased from 5 to 6.5 hours. That is, there will have been an increase of 30 percent.

Suppose that the necessary labour time is once again halved. The amount of surplus labour will rise from 6.5 to 7.25, an increase of just over 11.5 percent. Continuing the process we can see that for every doubling of the productivity of labour, due to technological innovation, the proportionate increase in the mass of surplus labour appropriated grows ever smaller.

Having correctly pointed to the fact that technological development by increasing the productivity of labour tends to increase the amount of surplus value extracted from each individual worker, you then write that: "As long as technological progress is made, more surplus value is created, and despite capital accumulation the profit rate can be maintained. If technological progress ceases, then indeed the accumulation of capital will lead to competitive pressure that reduces the profit rate. As far as I can tell, Marx is implicitly assuming that technological progress cannot be sustained at a level that would prevent the profit rate from declining."

But this assertion directly contradicts the fact that Marx **explicitly** rejected the conception, advanced initially by Adam Smith, that falling profit rates were the result of increased competition between capitalists. Furthermore, in opposition to Ricardo, who maintained that falling profit rates were the result of declining productivity in agriculture, which tended to lift wage rates, Marx insisted that the tendency of the rate of profit to fall was a result of **increased** technological development and the consequent **rise** in the productivity of labour.

We obviously need to go deeper into the question. Viewed from the standpoint of society as a whole, it is clear that the mass of surplus value available to capital as a whole depends on the number of productive workers (workers who produce surplus value) and the rate at which surplus value is extracted from each individual worker.

The development of the productivity of labour manifests itself, Marx explains, in two ways. On the one hand it brings an increase in the mass of surplus value by reducing the necessary labour time of each individual worker. At the same time, it decreases the number of productive labourers required to set in motion a given quantity of capital.

"The two movements," Marx writes, "not only go hand in hand, but mutually influence one another and are phenomena in which the same law expresses itself. Yet they affect the rate of profit in opposite ways. ... The surplus-value ... as a total is determined first by its rate, and second by the mass of labour simultaneously employed at this rate ... One of these factors, the rate of surplus value, rises, and the other, the number of labourers, falls (relatively or absolutely). Inasmuch as the development of the productive forces reduces the paid portion of employed labour, it raises the surplus value, because it raises its rate; but inasmuch as it reduces the total mass of labour employed by a given capital, it reduces the factor of the number by which the rate of surplus value is multiplied to obtain its mass. Two labourers, each working 12 hours daily, cannot produce the same mass of surplus value as 24 who work only 2 hours, even if they could live on air and hence did not have to work for themselves at all. In this respect, then, the compensation of the reduced number of labourers by intensifying the degree of exploitation has certain insurmountable limits. It may, for this reason, well check the fall in the rate of profit, but cannot prevent it altogether" (Marx, *Capital*, vol. III, p. 242).

We are now in a position, on the basis of the labour theory of value, to examine the impact of the historical development of technology upon the accumulation of surplus value.

If the proportionate increase in the surplus value extracted from each individual worker, arising from the development of the productivity of labour, is greater than the proportionate decrease in the number of labourers employed, then the overall mass of surplus value will tend to increase and the process of capital accumulation will proceed. But if it is smaller, then the mass of surplus value will tend to decrease.

Given that an increase in the productivity of labour affects the mass of surplus value in opposite ways, is the final outcome of the process indeterminate? Or does there necessarily arise a point at which further increases in the productivity of labour will bring about a decrease in the mass of surplus value?

We have seen from our previous analysis that there is. This is because the more the productivity of labour has already been developed the smaller will be the proportionate increase in the amount of surplus value extracted from each individual worker for every given increase in the productivity of labour.

When the productivity of labour was relatively low, that is, when it took 6 hours for the worker to reproduce the value of his own labour power, we saw that a doubling of the productivity of labour (the halving of the number of workers employed by a given quantity of capital) brought about a 250 percent increase in the amount of surplus value extracted from each of them. But when the productivity of labour had been developed to the point where the worker reproduced the value of his labour power in just

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1.5 hours, we saw that the proportionate increase in the surplus value extracted from each of them was just 11.5 percent.

Obviously, we cannot say with mathematical certainty when the point will arise at which increases in the productivity of labour will bring a decrease rather than an increase in the overall mass of surplus value. But we can outline the general trend of historical development.

The history of the capitalism—its continuous revolutionizing of the mode of production which Marx explained was one of its essential distinguishing features as compared to the forms of production which had preceded it—is the history of the continuous reduction of necessary labour time through the development of the productivity of labour. This means that a point will be reached where the necessary labour time has already been reduced so far that further increases in the productivity of labour, rather than bringing about an increase in the mass of surplus value, thereby advancing capital accumulation as they did in the past, now tend to bring about a decrease in the mass of surplus value, thereby creating a crisis of accumulation.

Our analysis of this process has been conducted at a high level of abstraction. That is, we have removed from consideration all manner of concrete factors which operate. But such a method of procedure is necessary because it enables us to focus on the driving forces of the capitalist mode of production, and provides the key to understanding what lies behind many of the complex problems of the present-day situation.

There is no question but that over the past 20 years, we have experienced an enormous increase in the productivity of labour. With the introduction of computer technology, bio-technology and a whole series of other innovations, production processes have been transformed. There is no doubt, given the present level of material production, that it would be eminently possible to provide **all** the peoples of the world with the material conditions necessary, not only to ensure basic living standards, but the enjoyment of life.

But capitalist production is not production for material wealth as such, much less the advancement of living standards. Its driving force is the accumulation of surplus value and this has brought about great advances in the productivity of labour. But this advance in labour productivity, which is the indispensable material foundation for the advancement of mankind, produces a crisis in the capitalist process of surplus value accumulation.

Capital responds to this crisis in the only way possible. Within the framework of a social system based on private profit and wage labour, regulated through the struggle on the market, it seeks to overcome the crisis of surplus value accumulation, to which its very development of labour productivity has given rise, by clawing back every available portion of surplus value from the immediate producers—the working class. This is why the past two decades of growth in labour productivity have seen a continuous assault on the living conditions of broad masses of working people in all the countries of the world—in the so-called advanced and under-developed countries alike.

The list of mounting social problems is almost endless—falling real wages, longer working hours, chronic unemployment, cuts in all forms of social services and welfare, rising economic insecurity leading to growing social problems, deepening social polarisation and growing inequality both between nations and within them. Hardly a day goes by without the publication of a report somewhere in the world on the deepening social crisis confronting the majority of the world's people.

In the final analysis, these social disorders are the result of the drive by capital to overcome the crisis of surplus value accumulation. Our analysis has pointed to the origins of this crisis in the very heart of the capitalist mode of production itself. And it also points to the solution: the abolition of the system of production based on the exploitation of wage labour for surplus value and profit and the establishment of a new social order based on common ownership in which the productive forces—science and technology—are harnessed to meet human need.

Yours sincerely,

Nick Beams

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