

The breakdown of the profit system

Letter from a WSWs reader

24 August 1999

The following letter was sent by a WSWs reader. A reply, by WSWs editorial board member Nick Beams, can be found at: <http://www.wsws.org/articles/1999/aug1999/cor1-a24.shtml>

IM's latest letter and Beams's reply continue an exchange that developed chronologically as follows:

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

<http://www.wsws.org/articles/1999/jul1999/econ-j08.shtml>

2. IM's letter in response to Beams's July 8 article: <http://www.wsws.org/articles/1999/jul1999/lett-j28.shtml>

3. Beams's reply: <http://www.wsws.org/articles/1999/jul1999/eco-j28.shtml>

4. A letter from IM on the impact of growing labour productivity:

<http://www.wsws.org/articles/1999/aug1999/cor2-a20.shtml>

5. Beams's reply:

<http://www.wsws.org/articles/1999/aug1999/corr-a20.shtml>

To the editor,

In earlier correspondence I have expressed my difficulty in understanding how the profit rate tends to decline. Let me respond to some of the points made in Nick Beams' explanation.

As in his example, let us assume that the working day is 8 hours, and that initially it takes a worker 6 hours to reproduce his or her labour power. Thus 2 hours are available for the production of surplus.

Consider what happens if we measure productivity in physical units rather than in units of labour value. As before, assume the working day is 8 hours. Initially, each worker takes 1 hour to produce 1 unit of this good. 6 units of the good are required for the labourer to reproduce his or her labour power. Again, 6 hours are needed to reproduce the input labour power, and 2 hours are available to produce the surplus. The surplus is now 2 units.

Now suppose productivity doubles. That is, the worker is now able to produce 2 units per hour. The necessary hours are now 3, and the surplus hours are 5. The physical surplus is 10 units.

Let productivity double again. 4 units are produced in an hour. Therefore, the surplus hours are 6.5. The physical surplus is now $6.5 \times 4 = 26$ units.

Let productivity double again. 8 units are produced per hour. The surplus hours are now 7.25. The physical surplus is $7.25 \times 8 = 58$ units.

Let productivity double again. 16 units are produced per hour. The surplus hours are now 7.625. The physical surplus is $7.625 \times 16 = 122$.

The general formula for the physical surplus after t periods of doubling is given by the number of hours available to produce surplus multiplied by the number of units produced per hour. This gives us:

$$\begin{aligned} & (8 - 3 \times (0.5)^{(t-1)}) \times (2^t) \\ &= 8 \times 2^{(t-1)} - 3 \times 0.5^{(t-1)} \times 2^t \\ &= 8 \times 2^t - 6 \end{aligned}$$

where " \wedge " indicates exponent.

We can check this formula for the path of the surplus against our earlier calculations:

for $t=0$: $8 \times 1 - 6 = 2$ for $t=1$: $8 \times 2 - 6 = 10$ for $t=2$: $8 \times 4 - 6 = 26$
for $t=3$: $8 \times 8 - 6 = 58$ for $t=4$: $8 \times 16 - 6 = 122$

This verifies the general formula. We can also see that the "-6" becomes of decreasing importance, and that as t becomes large, the surplus doubles each period. Thus the surplus grows in physical terms at the same rate that labour productivity increases, which seems intuitively reasonable.

While it is indeed true that the amount of surplus labour available grows at a decreasing rate, this is compensated by the growth in productivity. In physical terms, the growth rate of the surplus will show no tendency to decline.

But the labour theory of value measures the value of output in terms of the quantity of labour time necessary to produce it. When productivity doubles, the labour time required to produce the good is reduced by 50%. Thus according to the labour theory of value, the value of a unit of output is one half what it was the period before. Thus even though the capitalist obtains a doubling of the physical surplus each period, because the value of each unit of output is reduced by one-half, the total value of the surplus does not increase. Readers can ask themselves if this accords with their own sense of value. Readers can also ask themselves whether they think capitalists care about physical units or units of labour time. If capitalists' beliefs about value are unimportant, one wonders how they manage to make sensible investment decisions.

Now let me turn to the overall mass of surplus value. Nick Beams paraphrases and quotes Marx as follows:

"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).

In the beginning of the second paragraph, Marx is explaining that productivity improvements have two effects: they increase the rate of surplus value, and they decrease the quantity of labour employed. He explains that the rate of surplus value is increased by reducing the labour necessary to reproduce the labour power. It was demonstrated earlier in Nick Beams' numerical example that as time goes on, the same productivity increase results in a smaller and smaller increase in the rate of surplus value. Thus it will become increasingly difficult to increase surplus value by this method.

The second effect of productivity improvements is to decrease the quantity of labour employed. For this to be true, firms must be producing the same level of output irrespective of the productivity level. If we examine the historical path of production levels in most industries, we observe that production tends to grow over time, while employment falls. While Marx is analyzing the economy as a whole, it may be useful to analyze the experience of an individual sector.

As an example, consider agriculture. At one time in the United States more than 90% of the population was employed in agriculture, while today less than 5% is employed in agriculture. Agricultural output has more than kept pace with population growth in the same period. The evidence strongly supports Marx's contention that productivity growth results in a decline in employment. Since the amount of labour time needed to produce a bushel of wheat has plummeted over the past century, the labour value of wheat has also plummeted. Thus it may well be the case that the total labour value of U.S. wheat output has either stagnated or declined, despite the enormous increase in production. Thus agriculture may correspond to Marx's analysis of the effect of productivity change.

And yet if we look at the economy as a whole, there is little evidence to suggest that the profit rate has declined. This is because new industries have developed to exploit the labour previously employed in agriculture. Although employment in agriculture has plummeted, in both absolute and relative terms, overall employment has increased.

Here we see how Marx was profoundly influenced by the time

he lived in. (Marx is often rather scathing when he makes this comment about other economists, but that is not my intention.) Marx did not foresee the capacity of workers to develop new products. The economy of Marx's period was dominated by agriculture and textiles. Truly novel products were rare; most technological advances were improvements in production methods of existing goods. Thus Marx's concern that workers who lost their jobs to improved machines would be permanently unemployed was entirely sensible. Fortunately, the historical experience in the industrialized countries has been that new industries producing new products have been able to provide employment. Whether this is a natural tendency of capitalist economies or historical accident is open to debate, and I will not discuss it here. The point is that the creativity and imagination of workers have created sources of surplus value which Marx did not fully anticipate.

Let me summarize my main points. First, the apparent difficulty in maintaining the profit rate through productivity gains is inextricably linked with Marx's theory of value. Measured in units of physical output, capitalists can increase profits at the same rate that productivity increases. While the labour theory of value is intuitively appealing, it seems to have counterintuitive implications when we think in physical terms. Secondly, Marx's fears about technological unemployment have not been realized. For these reasons, it is not clear to me that because of pressure on profits (measured according to the labour theory of value), capitalism will inevitably experience a crisis so severe that it will collapse and be replaced by a better economic system.

Does this imply that socialists should abandon their revolutionary program? This does not follow. Indeed, I suspect that socialists will interpret this as further evidence of its necessity. If capitalism will not inevitably collapse of its own accord, those opposed to it will have to work that much harder to bring its collapse about. But if the forces behind capitalism's adaptability, resilience, and persistence are not clearly understood, such efforts are likely to be misdirected. Furthermore, understanding these forces is essential to ensuring that a socialist economy is able to harness the material achievements of capitalism and apply them in the interest of working people.

Sincerely,
IM



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