HOW MARKET VALUE DETERMINES THE CURRENT COST OF FIXED CAPITAL.

This posting has two aims. Firstly, to explain how market value and the current cost of fixed assets inter-relate. It must be remembered at the outset that market value represents an industry or sector, it is not individual value, but the sum of individual values within the industry or sector weighted by volume. Secondly to compare current cost to replacement cost in various ways. Current cost is often confused with replacement cost. By the end of the article the reader will see why they are different. Finally I apologise having to use landscape to accommodate the graphs.

The one major methodological issue I have with Marx and Engels is over their counterposing of replacement cost and embodied cost. This is undialectical. Instead these two costs interact creating a dynamic synthesis. At first this synthesis is dominated by the old embodied cost, but over time, it's the new replacement cost that begins to dominate which rebalances that synthesis. Hence the arrow of direction is always towards the replacement cost. That synthesis is called market value. At any moment, all other conditions being equal, market value will express the weight of value provided by the original form of production and the weight of value provided by the new form of production.

Research shows that the introduction of a new technology does not immediately set the market value upon its entrance onto the market stage. Rather it takes a number of years for the new technology to become the market setter. Many factors can influence the pace of change. Firstly, market conditions. If demand is robust allowing market prices to be set by the lesser efficient producers the longevity of the older technology will be extended. Conversely if demand collapses its introduction will be speeded up, because inter-alia, the purging of excess capacity will be done on the side of the older technology. Secondly, it may be the case that the price of the new technology is kept high in order to earn extra profits. This requires a slower introduction, which only speeds up once the issue of market share arises. There are a number of subsidiary reasons as well. The fact is, if a new technology, upon its appearance, immediately reduced the market value and hence the market price to its own individual level, it would bankrupt that industry spontaneously.

The evidence is conclusive, with very few exceptions, market value continues to reside above the value of the new technology until its weight in the market dominates. This can best be seen in the printing industry which has been one of the most innovative industries. Hot press printing overlapped with cold press printing which overlapped with digital printing. Linotype, the leading hot press print producer, continued to produce machinery while cold press printing grew, that is until competition became so intense, forcing it to cut so many corners with its new machines, that they literally disintegrated in use. Despite ending its production of machines it continued to supply the hot type for existing machines for many years thereafter. The dot matrix printer and the inkjet printer were invented in the same year. Dot matrix printers dominated at first. It was only after HP was able to dramatically reduce the cost of the ink jet printer, that these printers came to dominate reducing the noisy dot matrix printers into niche markets like high volume multi-leaf printing.

Fixed Assets.

There are three elements determining the current cost of fixed capital. The first two, which in effect forms the synthesis, is depreciation and new investment. Depreciation is backward looking, and relates to embodied value, that is past labour fixed in the means of production produced in earlier cycles of production. Depreciation refers to the wear and tear on a machine which transfers some of its value to the throughput causing the wear and tear. National tax authorities, by convention, set the rates of depreciation based on the expected economic life of that machine (so many years). These economic lives vary. Buildings which last decades has one set of depreciation rules, computers which have much shorter lives, have another set of rules. In general, the aggregate rate of depreciation refers to the annual rate at which the aggregate sum of fixed assets depreciate. While depreciation depreciates the value of fixed assets, new investment adds to it, thereby up-valuing the fixed assets. The current value of the fixed assets in any given year is the product of the minuses (depreciation) and the plusses (new investment). This is the synthesis that shapes the "current cost" of the means of production in a given year, and which therefore represents its market value. By current cost we refer to the SNA definition and to the series of tables labelled current cost.

If we were to simply extrapolate depreciation and investment into the future from a base year, say 2000 to 2018, that is adding up 18 years of depreciation versus 18 years of investment we would arrive at a figure different to that provided by the BEA. The reason is write-offs ("moral depreciation" - Marx.) Firms locate their write offs on the loss side of their Profit and Loss Account. This reduces their profits or even leads to a loss, both of which reduce their tax bills. When the BEA trawls through the financial reports of corporations it relocates these losses from the Profit and Loss Account to the Balance Sheet in order to deduct these losses from fixed assets. This has the effect of raising profits while reducing assets. This is the correct result. If write offs are acute in a given year, it may be the case that profits as reported by the BEA in say NIPA Table 1.14 will exceed the profits reported to the Stock Exchanges in that year.

The net result of write offs, cumulative depreciation and investment, is the current cost of fixed assets, which forms the largest component when drawing up the rate of profit. The current cost of fixed assets is associated with the market value of fixed assets as found in the financial statements of all the corporations. This is of the utmost importance, serving to explain why historical cost cannot be used, because it has no relevance to the value of fixed assets found in these statements. Why is this so important? In order to determine how well their firm is doing, the rate of return for that firm is often determined by dividing profits by shareholder equity. In turn shareholder equity is arrived at by deducting total liabilities from total assets which include fixed assets. Hence it is the market value (current cost) of those fixed assets, not what they originally cost, which completes total assets. If the original cost was used it would upset this calculation because it would assume all assets as new, which is why it is never used except by some Marxists.

The purpose of estimating the rate of profit, is not only to read the cardiogram of the capitalist system, but also to determine whether capitalists consider it profitable to invest or not. While current cost paints a general picture, it is replacement cost that determines individual investment decisions. When the board of directors instruct their cost accountants to investigate the viability of a new or additional investment, they will go into the market to obtain the price of the machinery and equipment, etc. To this they will add the cost of working (circulating) capital to determine the overall project cost, against which they will weigh the expected return. Nothing can replace replacement cost in this decision making exercise.

But as the tables will show, replacement cost is always higher than current cost. This is the reason insurance policies are often taken out which replaces damaged goods with goods as new. If insurance only covered book value, which cheaper ones do, then in the event of say a fire, the pay-out would not cover rebuilding the plant, especially if it is old and its market value has been severely depreciated.

Onto the tables.

These tables are modelled. Table 1 is based on an annual price index of 2% compounded. It is based on simple reproduction. The value of assets in year 1 amount to 500, and each year 10% is depreciated and 10% is invested. They therefore cancel each other out, and, thus the physical stock is not added to nor reduced. However, because of inflation of 2%, the price of these assets will have increased from 500 to 600. (See row titled "Assets replacement cost")

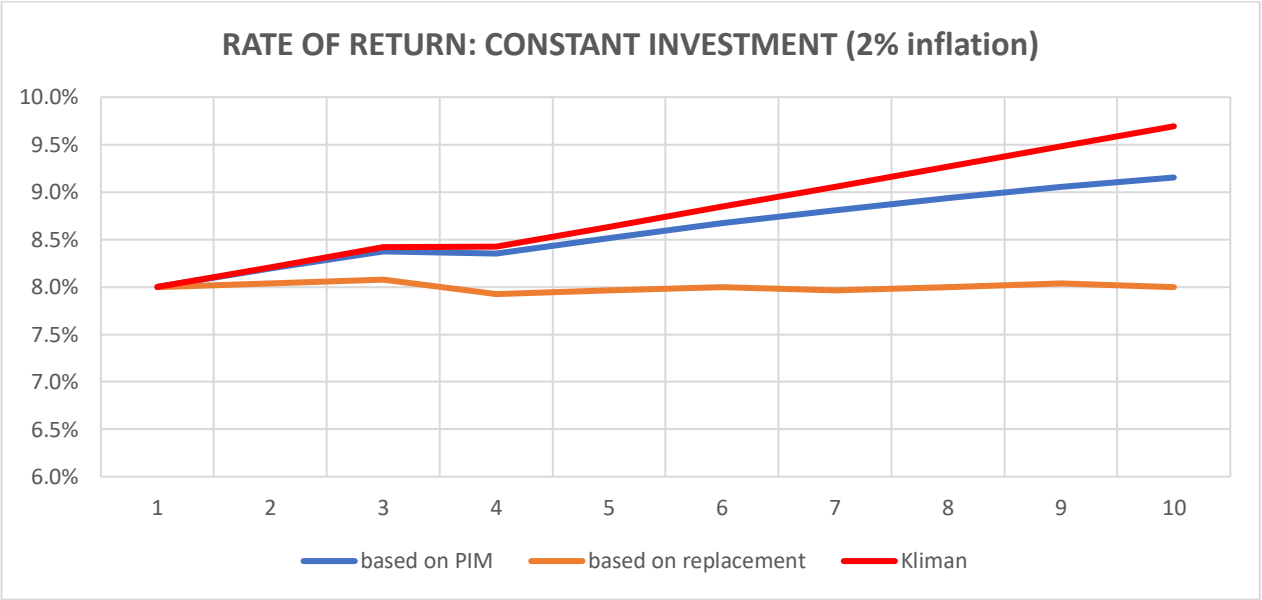
Table 1.

2% compounded annual price rise (currency depreciation)

year	1	2	3	4	5	6	7	8	9	10
Index compound	100	102	104	106	108	110	113	115	117	120
Investment	50	51	52	53	54	55	56.5	57.5	58.5	60
depreciation	50	50.5	51	51.5	52	52.5	53	53.6	54.2	54.8
investment – depreciation	0	0.5	1	1.2	2	2.5	3.5	3.9	4.3	5.2
Assets PIM	500	500.5	501.5	502.7	504.7	507.2	510.7	514.6	518.9	524.1
Assets replacement cost	500	510	520	530	540	550	565	575	585	600
difference PIM vs Replacement	100.0%	101.9%	103.7%	105.4%	107.0%	108.4%	110.6%	111.7%	112.7%	114.5%
Kliman assets										
investment deflated	50	50	50	50	50	50	50	50	50	50
investment – depreciation	0	0	0	0	0	0	0	0	0	0
Kliman assets	500	499.5	499	498.5	498	497.5	497	496.4	495.8	495.2
Assets replacement cost	500	510	520	530	540	550	565	575	585	600
difference Kliman vs replacement	100%	102%	104%	106%	108%	111%	114%	116%	118%	121%
profits	40	41	42	42	43	44	45	46	47	48
rate of return line 8	8.0%	8.2%	8.4%	8.4%	8.5%	8.7%	8.8%	8.9%	9.1%	9.2%
rate of return line 9	8.0%	8.0%	8.1%	7.9%	8.0%	8.0%	8.0%	8.0%	8.0%	8.0%
rate of return line 14	8.0%	8.2%	8.4%	8.4%	8.6%	8.8%	9.1%	9.3%	9.5%	9.7%

“Assets PIM” however does not increase in 2% increments. PIM is the method used to estimate current cost. It increases more slowly because of the imbalance between depreciation and investment. Depreciation is taken at 10% of the average value of the fixed assets on which it is based. For example take year 4. Depreciation in that year amounted to 51.8. It is arrived at by adding the replacement cost (in this case the historical cost each year) of the fixed assets, so 500 + 510 + 520 + 530 = 2060/4 = 515 x 10% = 51.5. Increasingly therefore the gap between investment and depreciation opens us because inflation adds to new investment, while the lower original prices of older assets restrains depreciation. PIM is the cost effective, but lazy way of valuing fixed assets by national statistical bureaus, allowing them to avoid the expense of audits by means of using statistical methods instead, in this case subtracting depreciation based on historical costs and adding in new investment. Kliman tries to overcome the problem caused by depreciation based on historical cost and investment in current dollars, by deflating investment. He succeeds in this quest. The price of assets remains within a couple of percent of 500. (See row marked “Kliman’s assets”) The problem with this deflationary approach, as Graph 1 shows, is to inflate his rate of return. The Kliman rate of return is further removed from the return based on replacement cost than is the rate of return based on current cost. It therefore fails the only test when estimating the true rate of profit: how proximate is the rate, to the rate on which investment decisions are based, the rate of return on replacement cost?

Graph 1.



As many other Marxist theoreticians have noted, the divergence grows with higher price indexes. In Table 2 below, the price index rises from 2% to 4%.

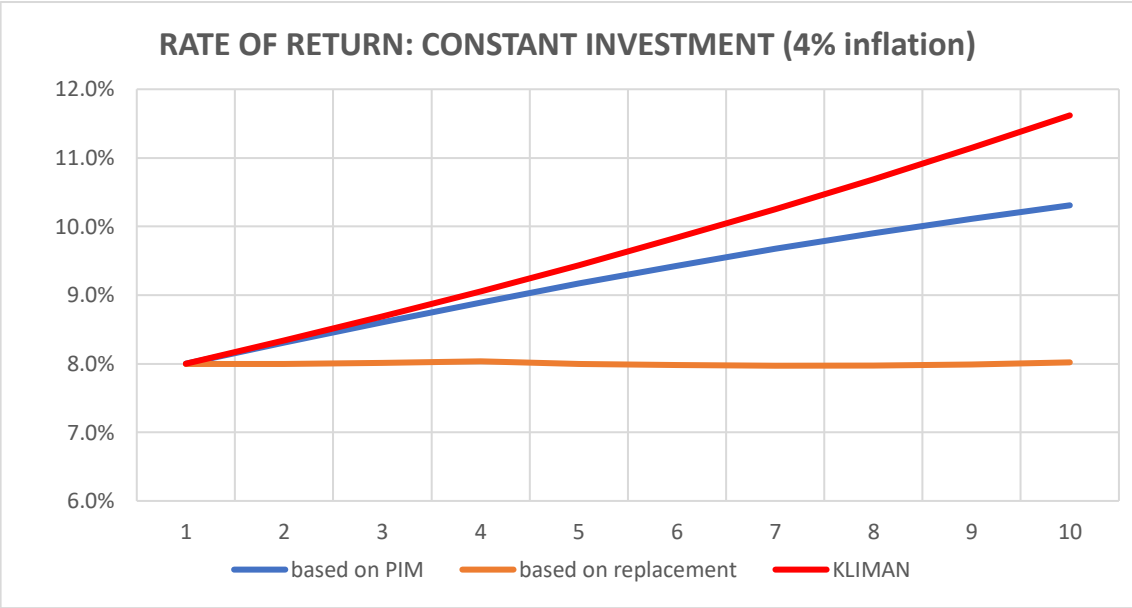
Table 2.

4% compounded annual price rise (currency depreciation)

year	1	2	3	4	5	6	7	8	9	10
Interest compound	100	104	108	112	117	122	127	132	137	142
Investment	50	52.0	54.0	56.0	58.5	61.0	63.5	66.0	68.5	71.0
depreciation	50	51	52	53	54.1	55.3	56.4	57.6	58.8	60
investment - depreciation	0	1	2	3	4.4	5.7	7.1	8.4	9.7	11
Assets PIM	500	501	503	506	510.4	516.1	523.2	531.6	541.3	552.3
Assets replacement cost	500	520	540	560	585	610	635	660	685	710
difference PIM vs Replacement	100.0%	103.8%	107.4%	110.7%	114.6%	118.2%	121.4%	124.2%	126.5%	128.6%
Kliman	500	499	498	497	495.9	494.7	493.6	492.4	491.2	490
Profits	40.0	41.6	43.3	45.0	46.8	48.7	50.6	52.6	54.7	56.9
rate of return PIM	8.0%	8.3%	8.6%	8.9%	9.2%	9.4%	9.7%	9.9%	10.1%	10.3%
rate of return replacement	8.0%	8.0%	8.0%	8.0%	8.0%	8.0%	8.0%	8.0%	8.0%	8.0%
rate of return kliman	8.0%	8.3%	8.7%	9.0%	9.4%	9.7%	10.1%	10.5%	10.9%	11.4%

In the case of 4% compounded, Kliman's asset price drifts a bit more from its original 500, but at 2%, this drift is insignificant. What is significant is that both the current and Kliman rates of return diverge further from the 8% found using the replacement rate of return. This is an expected result because what we are discussing is really the depreciation of money. In this case we have money depreciating by 4% per annum and this is elevating prices. Thus the gap between replacement cost in year 10 and year 1 has risen to 210 (710 – 500) from 100 (600 – 500) when the rate of inflation was 2%. The results of this greater divergence can be seen in Graph 2 below. The general rule applies, the higher the rate of inflation and the greater the number of years (total period), the more impractical the use of historical cost becomes.

Graph 2.



Changing the rhythm of investment.

Thus far we have been looking at a constant rate of investment. But market value is not only shaped by the regular interaction of depreciation and investment (the dialectical dance) but changes to the weight of investment itself. In the final two tables below, having dispensed with Kliman who no longer serves any purpose, we investigate two different scenarios. In the first scenario the weight of investment is concentrated in the first five years. Instead of 50, investment rises to 70. This results in a 4% p.a. physical increase over the first five years. To compensate, investment falls to 30 for the following five years which results in a 4% fall each year in the volume of assets. As they cancel each other out, this means that in year 10, the physical size of the assets are no bigger nor smaller than year 1. Conversely, in scenario 2, the weight of investment is concentrated in the second five years. In the first five years, investment of only 30 results in a contraction in the volume of fixed assets. In the second 5 years investment of 70 restores the volume of investment so that by year 10 it is similar to year 1.. The difference really boils down to this. The average age of the means of production is different between the two scenarios. In the first scenario, because the weight of investment was earlier, the assets are older on average by year 10. In the case where investment was concentrated in the second half, the assets are younger on average. This is the beauty of dialectics, depending on the actual forces at work, the resulting synthesis shifts as we are about to see.

In the case of PIM or the market value of the assets in year 10, because in the first case they are older, there has been more depreciation to whittle away their market value. The result is that the market value has fallen to 466.1 (Table 3). In contrast the PIM value in Table 4 stands at 621.5 because with newer means of production, there has been less time for depreciation to whittle away at the value of assets.

Table 3.

Investment weighted to the first five years. Year 1 - 5 of 70 followed by year 6 - 10 of 30

year	1	2	3	4	5	6	7	8	9	10
Interest compound	100	104	108	112	117	122	127	132	137	142
Investment	70	72.8	75.6	78.4	81.9	36.6	38.1	39.6	41.1	42.6
depreciation	50	52.1	54.1	56.9	59.5	61.4	62.8	63.8	64.7	65.3
investment - depreciation	20	20.7	21.5	21.5	22.4	-24.8	-24.7	-24.2	-23.6	-22.7
Assets PIM	500	520.7	542.2	563.7	586.1	561.3	536.6	512.4	488.8	466.1
Assets replacement cost	500	541	583	650	702	708	711	713	712	710
difference PIM vs Replacement	100.0%	103.9%	107.5%	115.3%	119.8%	126.1%	132.5%	139.1%	145.7%	152.3%
profit	40.0	41.6	43.3	45.0	46.8	48.7	50.6	52.6	54.7	56.9
rate of return PIM	8.0%	8.0%	8.0%	8.0%	8.0%	8.7%	9.4%	10.3%	11.2%	12.2%
rate of return replacement	8.0%	7.7%	7.4%	6.9%	6.7%	6.9%	7.1%	7.4%	7.7%	8.0%

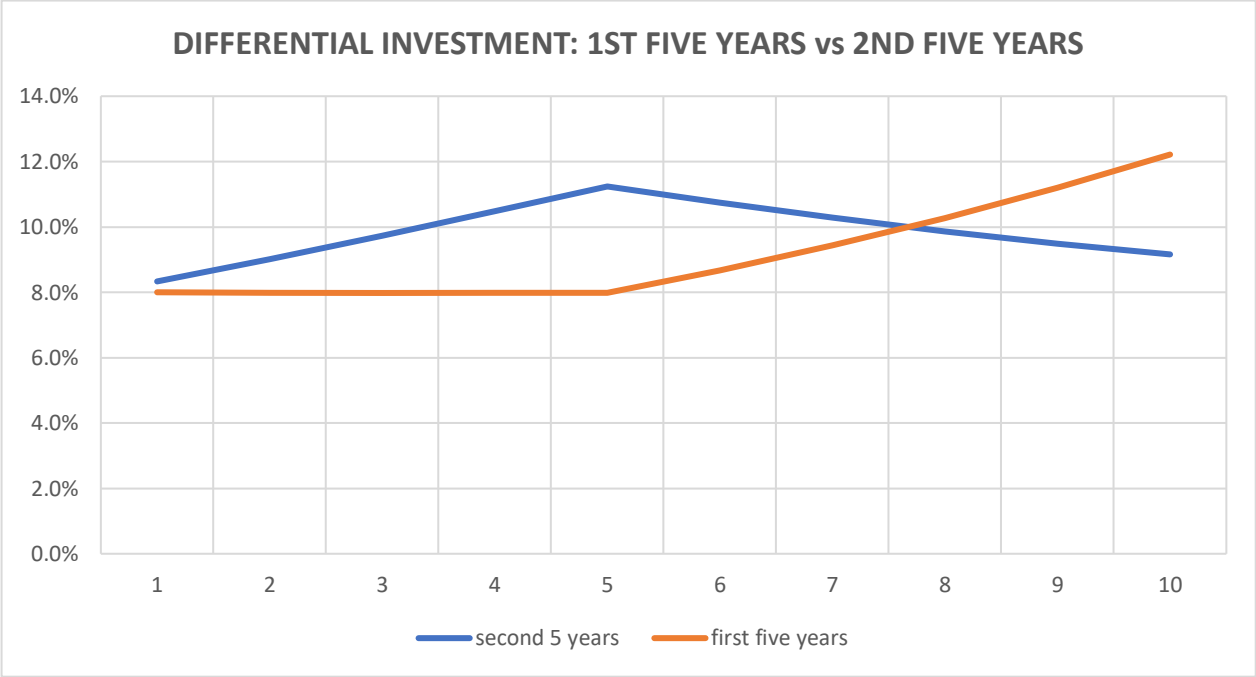
Table 4.

Investment weighted to the second five years. Year 1 - 5 of 30 followed by year 6-10 of 70

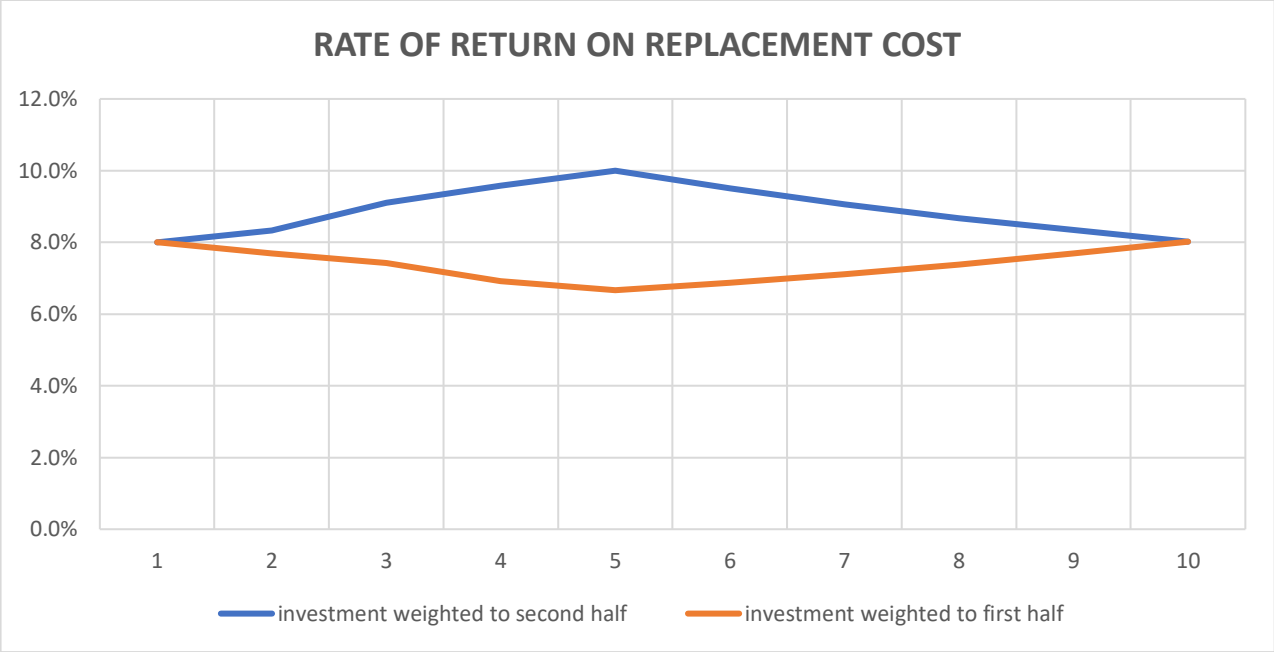
year	1	2	3	4	5	6	7	8	9	10
Interest compound	100	104	108	112	117	122	127	132	137	142
investment	30	31.2	32.4	33.6	35.1	85.4	88.9	92.4	95.9	99.4
depreciation	50	50	49.1	48.6	48.2	48.7	49.8	51.1	52.7	54.6
investment - depreciation	-20	-18.8	-16.7	-15	-13.1	36.7	39.1	41.3	43.2	44.8
Assets Pim	480	461.2	444.5	429.5	416.4	453.1	492.2	533.5	576.7	621.5
assets replacement cost	500	499	475	470	468	512	559	607	656	710
difference PIM vs Replacement	104.2%	108.2%	106.9%	109.4%	112.4%	113.0%	113.6%	113.8%	113.8%	114.2%
rate of return PIM	8.3%	9.0%	9.7%	10.5%	11.2%	10.7%	10.3%	9.9%	9.5%	9.2%
rate of return Replace.	8.0%	8.3%	9.1%	9.6%	10.0%	9.5%	9.1%	8.7%	8.3%	8.0%

This active synthesis is best brought out in the form of graphs. Below we see the alternating trends between the shift in the weight of investment between the two halves of the period. In scenario 1, the higher mass of depreciation, given the older age of the means of production, leads to the brown graph steadily rising from year five as the denominator is progressively reduced. The opposite is true for the blue graph which tracks investment concentrated in the second half of the period. Here the lower mass of depreciation leads to a higher PIM in later years depressing the rate of return. The alternating gaps in year 5 and 10 are of the same order. This is brought out in the final graph. Whereas Graph 4 is based on the rate of return calculated by PIM valued assets, Graph 4 is based on replacement cost only. In the first two tables which were based on a steady rate of investment, the rate of return on replacement assets barely moved. In tables 3 and 4 however, the uneven rates of investment do alter the rate of return on replacement assets. What is most interesting, however, is that the rate begins with 8% and is restored to 8% by year ten because the minuses and plusses cancel each other by then.

Graph 3.



Graph 4.



Conclusion.

It is time that estimates of the rate of profit used by each and every Marxist, including Michael Roberts, should be based on current cost. In any case, once we work with circulating capital, historical cost is rendered redundant. Leontief provided both because historical data has its purposes like calculating the age of the means of production. Without an army of statisticians, replacement cost is out of reach. Modelling suggests it would provide a rate of return 20% lower than the rate of return on current assets given the average age of 9 years for the means of production. (Fixed Assets Table 4.10)

As of the 2nd quarter, the pre-tax rate of profit for all corporations is 4.7%. (https://theplanningmotivedotcom.files.wordpress.com/2019/11/part-2-quarterly-turnover-1998-2019.2-pdf-1.pdf). This gives a P/E ratio of about 21 or 25 post-tax. This is not far removed from the trailing P/E of around 22 currently based

on post tax profits for the S&P 500 (Yardeni Figure 11 https://www.yardeni.com/pub/stockmktperatio.pdf) rising to nearly 28 for the entire market (Russell 3000). It is of course far removed from those who use historical cost and end up with contemporary rates of profit of between 12 and 15% yielding P/Es of between 8.5 and 6.5 . These comments are made in passing, to show that the rate of profit based on current cost is real world.

I attended three sessions at Historical Materialism. Among the gravel were a few diamonds, one in particular, Erdogan Bakir, who provided as much insight into the dynamics of capitalism as allowed without recourse to circulating capital. But even he was stumped when it came to defining the event horizon surrounding the recession. He was of the opinion it was the spike in interest rates that tipped capitalism into recession because it meant that capitalists could no longer meet their contractual obligations (really their debts). But the spike in interest rates itself has to be explained, and it can only be explained by the deceleration in turnover, which now requires additional working capital, forcing the producers and merchants to head for the banks. As Marx said, whereas the same merchants were recently depositing cash, now they come armed only with their notes receivable seeking additional cash at any price (interest rate).

I came away from Historical Materialism more convinced than ever that the renaissance of Marxism will not take place in the hallowed halls of Academia. Much of what was said, though well researched and of course referenced, was stale. Great times are ahead of us. Being an intellectual requires as much courage as a street activist. But this courage is different. It requires the strength to recognise when we are wrong, the strength to change and the strength of character needed to remain loyal to the international working class and history. It is time we came together in a new way, a fresher way, where what we wrote and what we stood by, is eclipsed by the imperative to develop the Marxist critique of capitalism so as to better prepare society for the future. The crisis of capitalism is deeper, more profound, more comprehensive and more intractable than 1914 or 1939. The patient is becoming resistant to the infusion of negative interest rates. If we are to build a future communist society, we need to at least understand how capitalism works in all its iterations.

(For an earlier review of Kliman's latest book please follow the link - https://theplanningmotivedotcom.files.wordpress.com/2018/07/kliman-review-of-the-failure-of-capitalist-production.pdf)

Brian Green, 12th November.