WHY THERE IS NO SUBSTITUTE FOR THE TURNOVER FORMULA.

I was recently introduced to a new unpublished paper: *Accessible Methods for the Computation of the Rate of Profit, Rate of Exploitation and the Organic Composition of Capital*, by Bruce E. Parry. Mr Parry is to be congratulated for his emphasis on turnover in this paper. In addition, his observations regarding the effect of innovation such as just in time methods, farming methods and so on improving turnover, is pertinent. Also his recognition that the primary circuit of capital is $M.C....P....C^{+}.M^{+}$

The problem lies in the execution. Mr Parry's chosen formula for determining turnover is:

NVA/inventory where NVA stands for net output.

This formula is wrong because the denominator and numerator are not commensurate. Finished inventory is always valued at **cost of production** or c + v. It is the sum of the inputs plus wages that went into its production. Pure inputs like raw materials, auxiliary materials and components would be simply c. On the other hand, NVA represents v + s. Thus, the formula turns out to be:

$$\frac{v + s}{c + v}$$

Only v is common to both sides. A similar problem arises when we use the much publicised, sales to inventory ratio. Now the equation becomes:

$$\frac{c + v + s}{c + v}$$

Selling prices always combine the past and present labour consumed producing the product. So, c (past labour) stands for the inputs consumed plus depreciation of the machinery and equipment used up in its production. It has to be so. If selling prices only included the value newly added (present labour), capitalists would not be reimbursed through the selling price for the inputs and machinery used up. They would go bankrupt in no time.

The key difference between the two formulae is self-evident. The sales to inventory ratio would yield more turnovers than would the NVA/inventory ratio because it includes c.

Mr Parry explains why he uses the NVA/inventory formula. *"My reasoning is as follows. Inventories, taken at a given point in the year, reflect the unsold portion of the total production of new value created in the year. Therefore, the ratio of the two gives a rough estimate of the number of times the total value is turned over. This is not without complications."* Indeed, it does have its complications. The use of NVA/inventory is not novel and he is not the first to propound this explanation. Taken in isolation this would be true. But ask any capitalist and Engels (Chapter 4, Volume 3) and they will tell you that working or circulating capital includes more than just inventory.

In fact, what Mr Parry is describing is the production period only, not the circulating period which includes the period between production, sale and payment. For example, let us assume the following. NVA for the year is $100 billion and inventory $10 billion. From this we can assume that the turnover is 10 or 36.5 days. But what about the period post-production, before C^{+} is turned into M^{+}? One of the easiest ways to do this is to deduct credit given from credit taken. Credit given, because it is based on c + v + s tends to be larger than credit taken which is based on the cost of inputs or c + v. As most commodities outside retail circulate against credit this net credit figure acts as a proxy for the element of turnover post-production. Thus, if the credit given less credit taken is equal to a net 9 days of

revenue, then the total period of circulation is not 36.5 days but 45.5 days. In this case turnover is no longer 10 but 9. Now $10 billion in working capital which was sufficient to cover 36.5 days no longer suffices for 45.5 days. An extra $1.1 billion is needed bring the total to $11.1 billion. There are other considerations, but they are minor and more obscure. They belong to the set-off between inventory brought forward and inventory carried over to the next year, which does not apply to credit.

On the other hand, the formula for turnover is: $\frac{GO + (GO-GVA)}{GVA \quad GVA}$

where GO stands for Gross Output and GVA stands for Gross Value Added. It is commensurate because both GO and GVA are based on c + v + s. The difference is that GO stands for duplicated sales and GVA for the final sale. If turnover is 5, and GVA is 1, then by using the formula

$$\frac{(TO * GVA)}{2} + \frac{GVA}{2} = GO \qquad \text{we find} \qquad \frac{5 * 1}{2} + \frac{1}{2} = 3$$

Using c+ v + s we could say that 3c + 3v + 3s = 3GO while 1c + 1v + 1s = 1GVA once we strip out the duplications as Marx showed in Volume 2. However, if the product was produced in a single factory from beginning to end, such that there were no external inputs, only a final sale, then GO would equal GVA.

Turnover is the Rosetta Stone.

I cannot emphasis this enough. Without turnover annual compensation cannot be reduced to variable capital. Without variable capital there can be no estimation of the rate of surplus value, the value composition of capital nor the all-important rate of profit. All contain v in their respective equations:

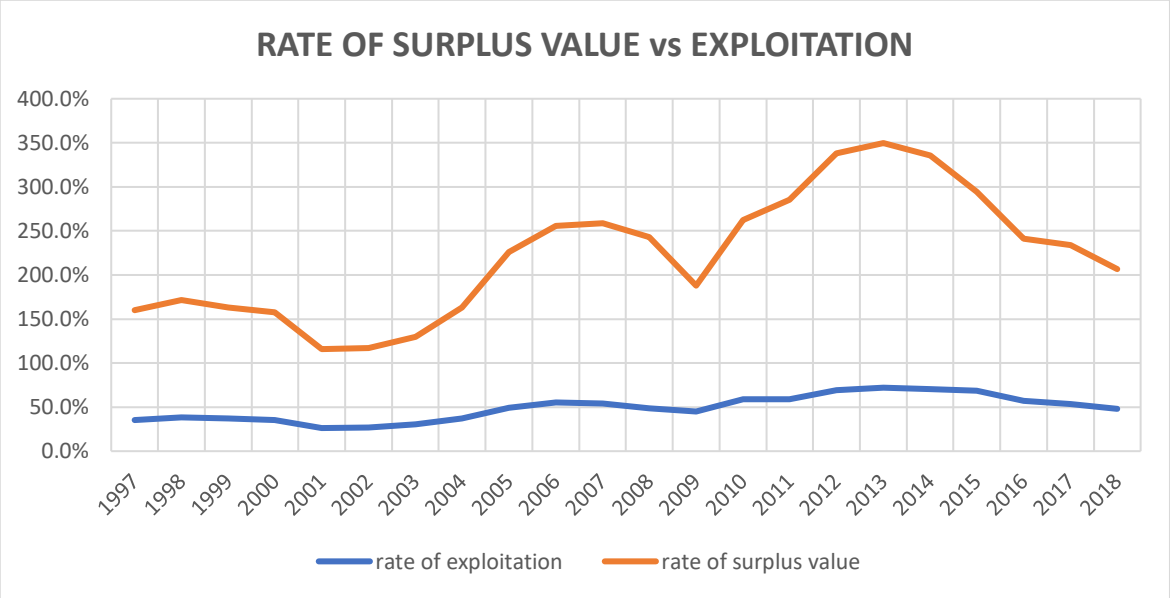
Rate of surplus value =	s/**v**
Composition of capital =	c/**v**
Rate of profit =	s/(c+**v**)

This being so, the rate of surplus value is not s/annual compensation,
nor is the value composition equal to constant capital/annual compensation, and,
nor is the rate of profit s/constant capital, or, s/(constant capital + annual compensation).

In all cases annual compensation must be reduced to variable capital first. The importance is as follows. If we assume a turnover of 5, then variable capital would be only one fifth the size of annual compensation. Thus, the rate of surplus value would exceed the rate of exploitation by 500% as would the value composition of capital. It is different with the rate of profit. The rate of profit which is based on c + v would be smaller when factoring for c only (rate of return) and bigger when factoring for c + annual compensation.

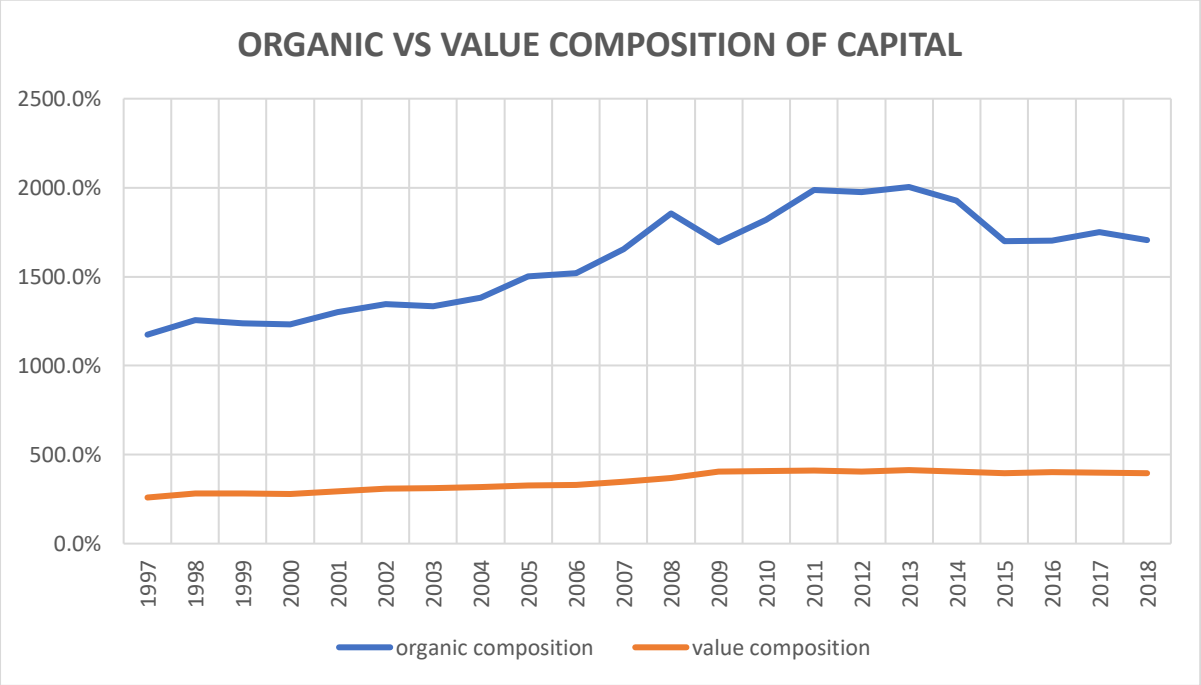
But it is not only the absolute difference that is important, it is the relative difference as well. Turnover is dynamic. It varies, not only because of technical improvements or not, but also due to market conditions changing as well, specifically the phasing of the business or industrial cycle. Thus the 500% could vary substantially due to phasing alone. It is this dynamic movement that turns the value composition of capital into the organic composition of capital. Its organic because it is dynamic. By organic Marx meant it was a pulsing gauge of all the changes in the economy. Most Marxists ignore turnover when discussing the organic composition of capital, but without turnover, the organic composition, is well, the value composition of capital, a simple arithmetical relationship.

Graph 1.



The graph above represent US manufacturing. This translates into the second graph which compares the organic composition of capital to the value composition of capital in the manufacturing sector. It shows how much more alive therefore organic, the organic composition of capital is once all the elements acting on it are in place. Compared to it, the value composition appears almost comatose.

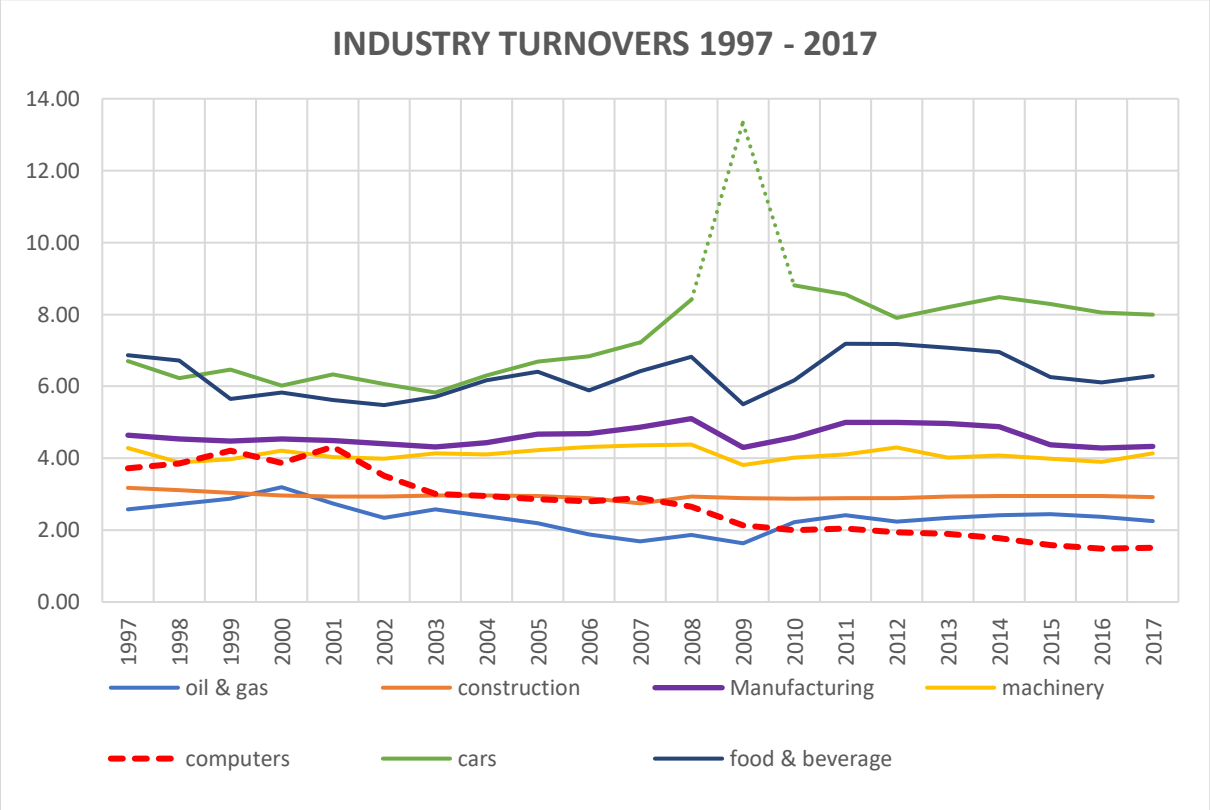
Graph 2.



Finally, Mr Parry makes the continuous error of equating the rate of exploitation (r.o.e.) or the single period rate of surplus value with the annual rate of surplus value. To explain. When Marx first discussed the rate of surplus value, he divided up the working day between its paid and unpaid parts or what is the same thing its necessary and surplus parts. If we assume an 8-hour day, and assume further, that 4 hours are paid and 4 hours unpaid, then the rate of exploitation of 100% (4/4).

Marx described it as s/v. This is Marx's rate or degree of exploitation. In Volume 1, he uses s/v inter-changeable with "surplus working time/necessary working time". This has led to a lot of confusion. Only in Volume 3 does Engels complete the formula by adding back turnover. Now the formula becomes s^n/v where ^{n} stands for the number of annual turnovers. Just as the rate of profit is an annual rate so too must be the rate of turnover. Why, because only by using a common measure, a calendar year, can incommensurate industries be made commensurate and be compared. For example, each industry produces its quantum of profit at a different annual rate, or what is the same thing during a longer or shorter period of time. Below I have mapped this diversity,

Graph 3.



(Source: Associated spreadsheet "KLEMS GO & GVA 1997+

There are two anomalies in the Graph above. Motor vehicles spike in 2009. This is due to the bailout of General Motors and Chrysler and should be disregarded. The second, is the consistent decline in the rate of turnover of computers. I have no answer for this except that the industry has become very consolidated. Computers are a big enough industry for its slowdown to have had a marked effect on the whole manufacturing sector.

Table 1. (2017 data)

Industry Name	period of circulation of capital	annual rate of turnover
Oil & Gas exploration	162.4 days	2.25
Construction	125.2	2.92
Manufacturing	84.4	4.33
Machinery	88.2	4.14
Computers	241.4	1.51
Motor Vehicles	45.7	8.00
Food & Beverage	58.1	6.29

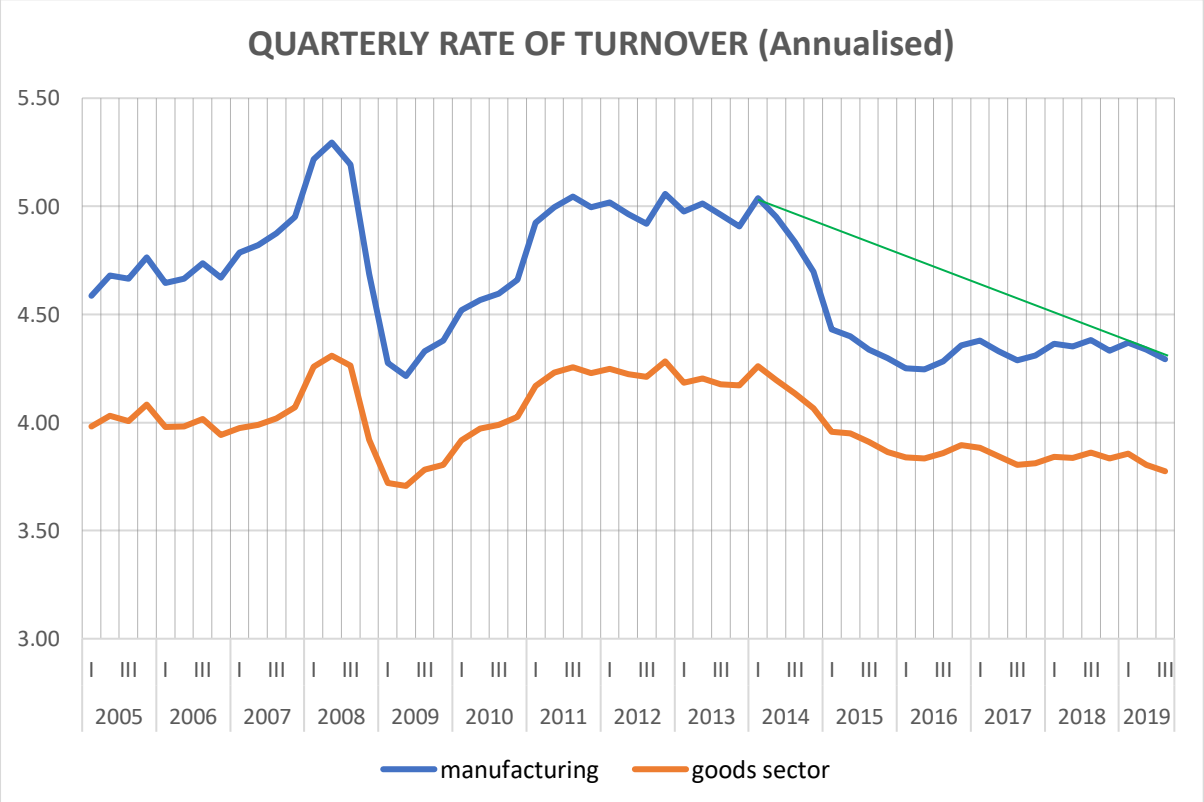
If we continue to assume a working day of 8 hours which is divided up equally, four hours and four hours, such that during the first half of the day workers are paid and the second part they are unpaid, then the rate of exploitation is 100% or 4/4. If the calendar year comprises 250 working days, then during the year the worker will be paid for 1000 hours and will work unpaid for 1000 hours. The rate of exploitation is still 100% or 1000/1000. All that has happened is that daily compensation has expanded into annual compensation and daily surplus value into annual surplus value.

However, it is by way of exception that employers need sufficient capital to pay wages for a year. That would only apply if the annual rate of turnover was 1. In that case they would have to wait 365 days before the goods they produced were sold and they were reimbursed for the capital they expended on wages. In most cases the rate of turnover is >1. On average it is between 2.5 and 8.0. Thus, while the formula for the rate of exploitation is always s/v, the formula for the rate of surplus value (r.o.s.) is always s^n/v where ^{n} stand for the number of turnovers.

Why are all these distinctions important.

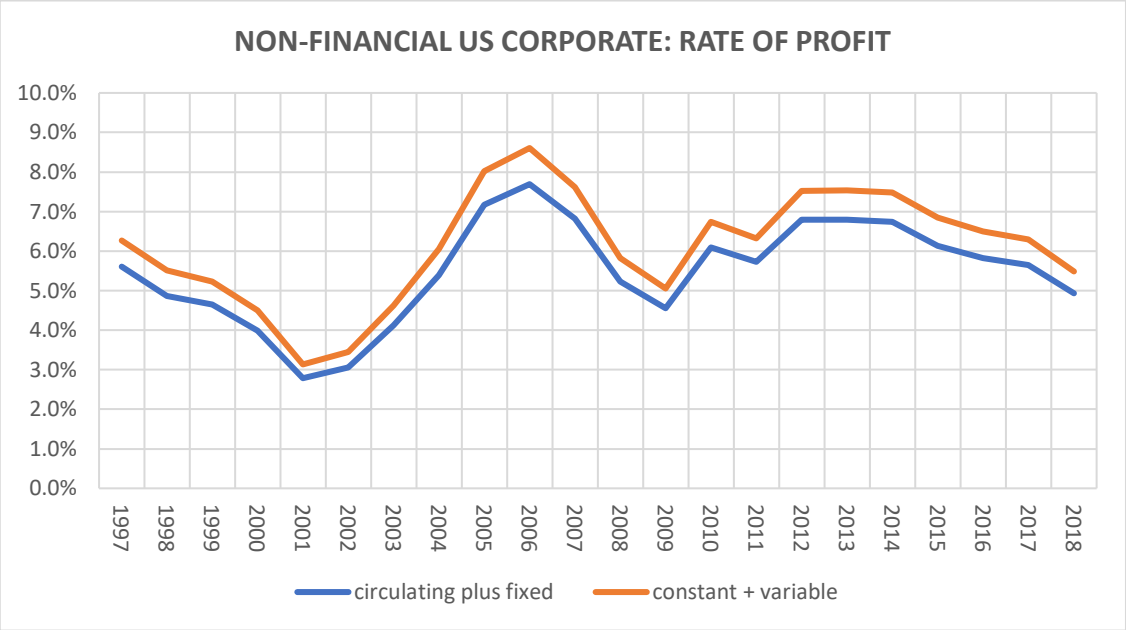
Without an objective assessment of turnover, we could not understand one of the key elements underlying the six-year fall in the rate of profit, and that is the collapse in turnovers since 2014. I reproduce the most recent graph for US manufacturing and the goods sector.

Graph 4.



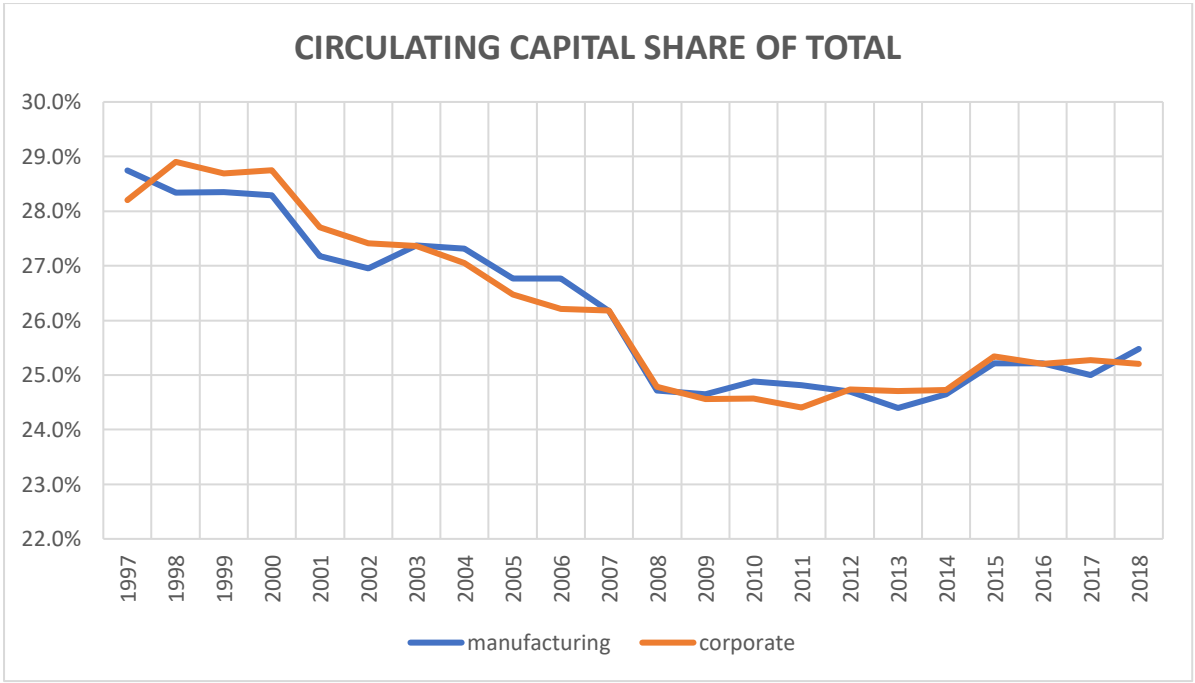
The rate of profit cannot rise against the headwind of falling turnover while it is depressing the rate of surplus value. (See the first Graph) This situation is not unique to the USA, it is happening elsewhere, including China.

Graph 5.



Its important to note that whereas the period leading up to 2008 was associated with a rise in the organic composition of capital, the period post-2014 is associated with a falling composition. This can be seen in Graph 6 below.

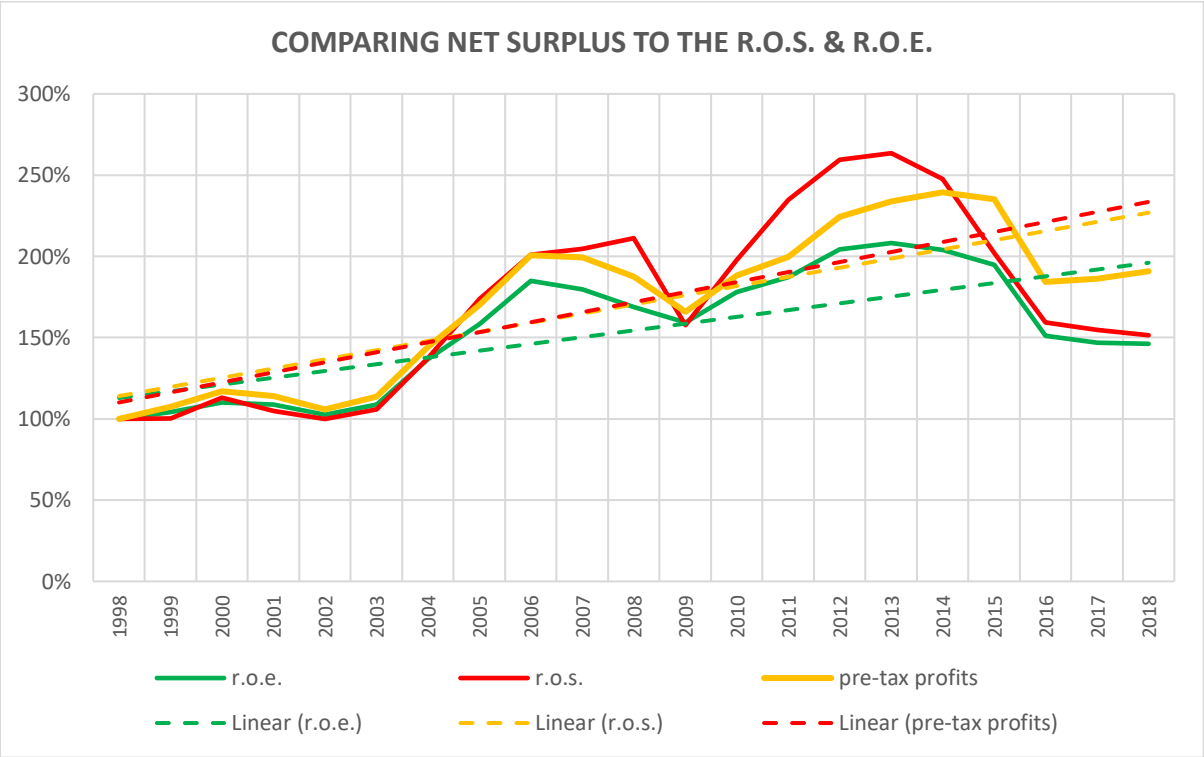
Graph 6.



We note that since 2008, with the relative fall in fixed investment and the relative rise in the employment of labour, circulating capital's share of total capital has risen. In addition, the fall in turnover has required more working capital. I believe another reason for the relative rise in working capital is the growth of luxury and personal production, which is more labour intensive, and, which is a function of rising inequality. Without turnover this relationship

remains invisible and inexplicable. Finally, only the rate of surplus value determines the movement of profits, not the rate of exploitation. Graph 6 shows the convergence of the r.o.s. and the mass of profits compared to its divergence with the r.o.e. This divergence convergence conundrum is due to changes in turnover.

Graph 7.



Non-durable Manufacturing.

Without turnover all this remains invisible. It is likely, based on this evidence, that in these abnormal times **uncorrected by a recession** needed to purge excess capital and debt, that turnover is currently exerting greater pressure on the rate of profit via the rate of surplus value than is the composition of capital. Furthermore, that this issue of turnover is intimately associated with capitalism's reliance on the absolute rate of exploitation to eke out profits.

Addendum.

Mr Parry in his paper also asks whether interest bearing capital enters into the equalisation of the rate of profit. The answer is no, it does not. The reason interest bearing capital cannot enter the equalisation of the rate of profit is that the relation between industrial and money capital is regulated, not by the movement of capital, but by the demand for and supply of money capital itself. In turn it is this demand and supply that determines the rate of interest and through it the "profits" earned by money capital. Finally, the demand and supply of money capital is a function of the phasing of the business cycle (industrial cycle Marx), and not by alterations in the composition of capital except in the most general sense.

In the down phase, when the demand for money capital by industry and commerce is depressed, the rate of interest is low and so is the rate of return on capital enjoyed by monied capitalists. Conversely during the up phase of the cycle, when the demand for money capital is greater, interest rates rises elevating the rate

of return in this sphere. Even when money capitalists convert from lenders to investors because dividends are higher than interest, and therefore their return on capital would be higher by switching their funds, this is distinct from the composition of capital influencing the return. Rather this conversion from lender to investor tends to be most intense during those phases of the business cycle when the demand from industry for money capital as its lowest, and, hoards of idle money abound. The reverse migration occurs in the up phase of the cycle where the demand for credit grows pushing up interest rates and with it returns.

The above does not detract from the fact that the ratio of equity to debt exerts an effect on the average rate of profit because it affects the mass of interest paid and therefore deducted from the mass of enterprise profits which determines the rate of profit.

Brian Green 2nd March 2020.