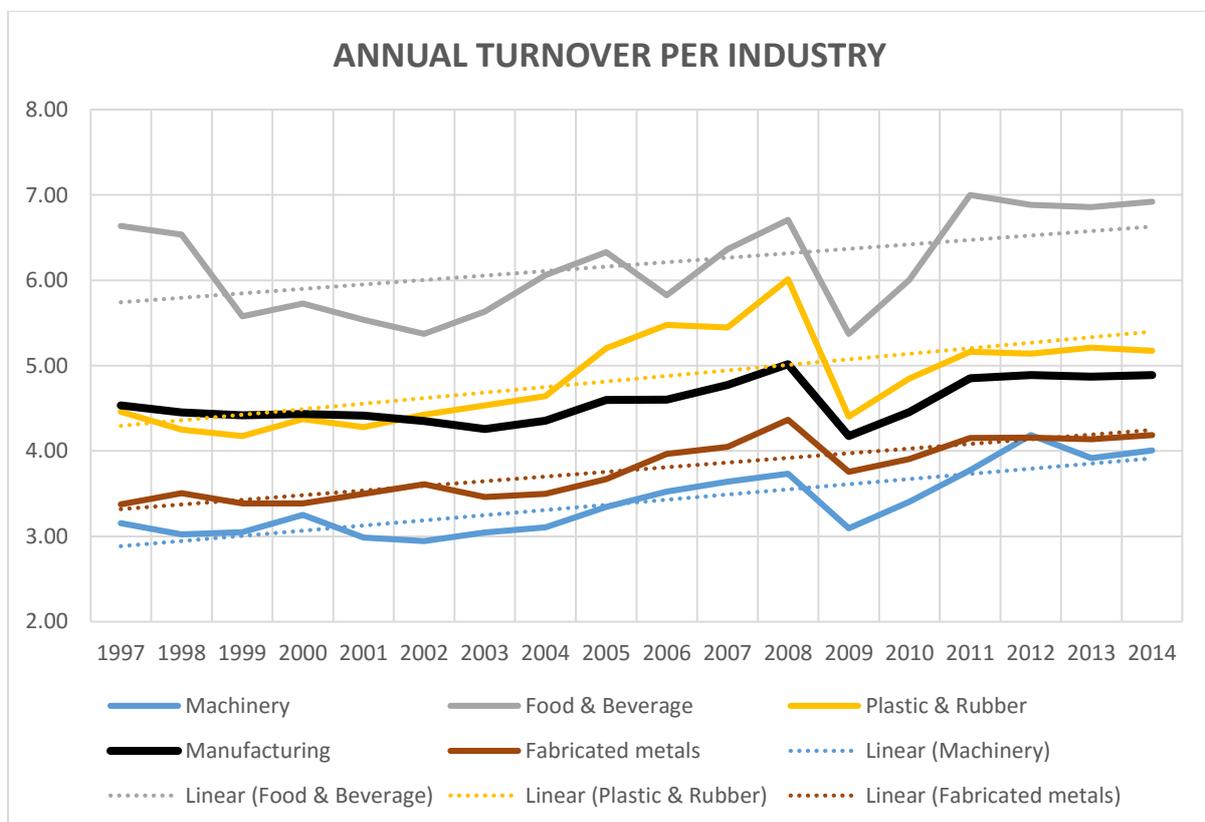


## HOW THE RATE OF EXPLOITATION, SURPLUS VALUE AND TURNOVER INTERACT TO DETERMINE THE RATE OF PROFIT.

*In a previous posting entitled Compounding the Organic Composition (C.O.P.) of Capital the effect of turnover on the Organic Composition of Capital was demonstrated. Not only did it reveal that in all cases the c.o.p of Capital was much higher, but high turnover capitals tended to have a higher c.o.p. than did the lower turnover capitals due to turnovers reducing variable capital relative to constant capital. In this posting, which should be considered the second part, the rate of surplus value is introduced to demonstrate that the rate of profit is the product of the balance between the c.o.p. and the rate of surplus value (s/v). Four out of the original six industries are chosen, two which have above average rates of turnover and two which have below average rates of turnover.*

In this posting, each of the four industries will be looked at sequentially. 3 stages are chosen, 1997, 2007 and 2014. Each represented a peak in the rate of profit. After that date, the rate of profit declined as it has done most recently in the second half of 2015. Additionally, trend lines connect 1997 to 2014. These trend lines cover the compounded organic composition of capital, the rate of surplus value and the rate of profit. The growth in constant capital is not trended as it is included for reference purposes only in order to act as a proxy for the growth of the technical composition of capital. 1997 is treated as the base year. All the rates are reset to 100. While this has disadvantages because industries differ in their absolute quantities, it does have the advantage of revealing the relative increases in the rates of surplus value and profit as well as the increase in the composition of capital that binds these years together. We begin with the turnovers for the four industries which are; Food and Beverage, Plastic and Rubber, Fabricated Metal and finally Machinery Building.

**Graph 1.**



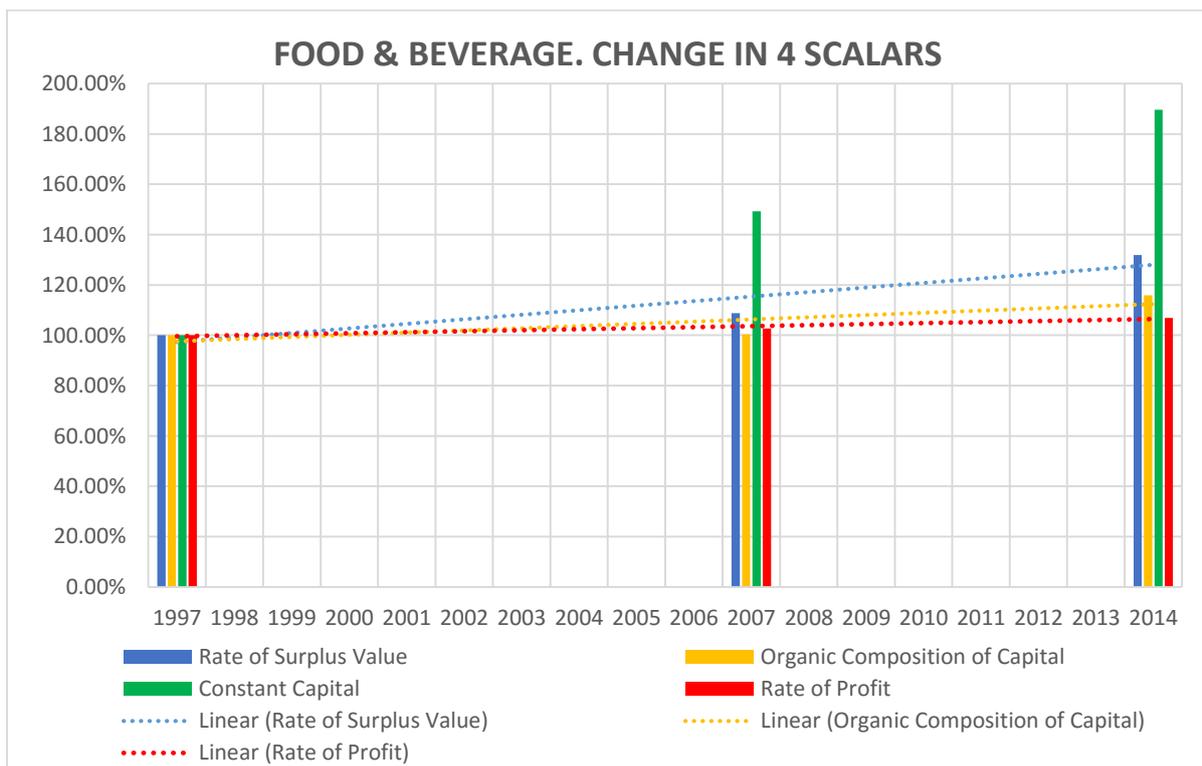
(Sources: BEA Interactive Data, KLEMS, Composition of Output).

The thick black line represents the average for manufacturing. Its rise is somewhat subdued but this is due to the effect of the fall in turnovers of the Computer Sector described in the above mentioned and prior posting. All the other industries as expected show an upward trend in turnovers. Food and Beverage together with Plastic and Rubber sit above the average while Fabricated Metals and Machinery sit below the average. Between 1997 and 2014, turnovers in Food & Beverage increased by 4%, in Plastics & Rubber by 16%, Fabricated Metals by 24% and Machinery by 27%. In other words, the lower turnover industries had higher rates of growth in their turnovers over these 17 years.

**FOOD & BEVERAGE.**

In Graph 2 below four scalars are shown. The growth in constant capital, the growth in the composition of capital, the growth in the rate of surplus value and the all-important rate of profit. We are reminded the rate of profit is arrived at by deducting compensation from net value added per industry. (All sources are identical to those detailed in the earlier posting on *Compounding the Composition of Capital*)

**Graph 2.**



The key determinant for the trend of the rate of profit, is provided by the interplay between the rate of surplus value and the composition of capital. In all cases, where the rise in the rate of surplus value exceeds that of the composition of capital, there is a rise in the rate of profit and vice versa. The more robust the growth in the rate of surplus value relative to the composition of capital, the faster will be the growth in the rate of profit.

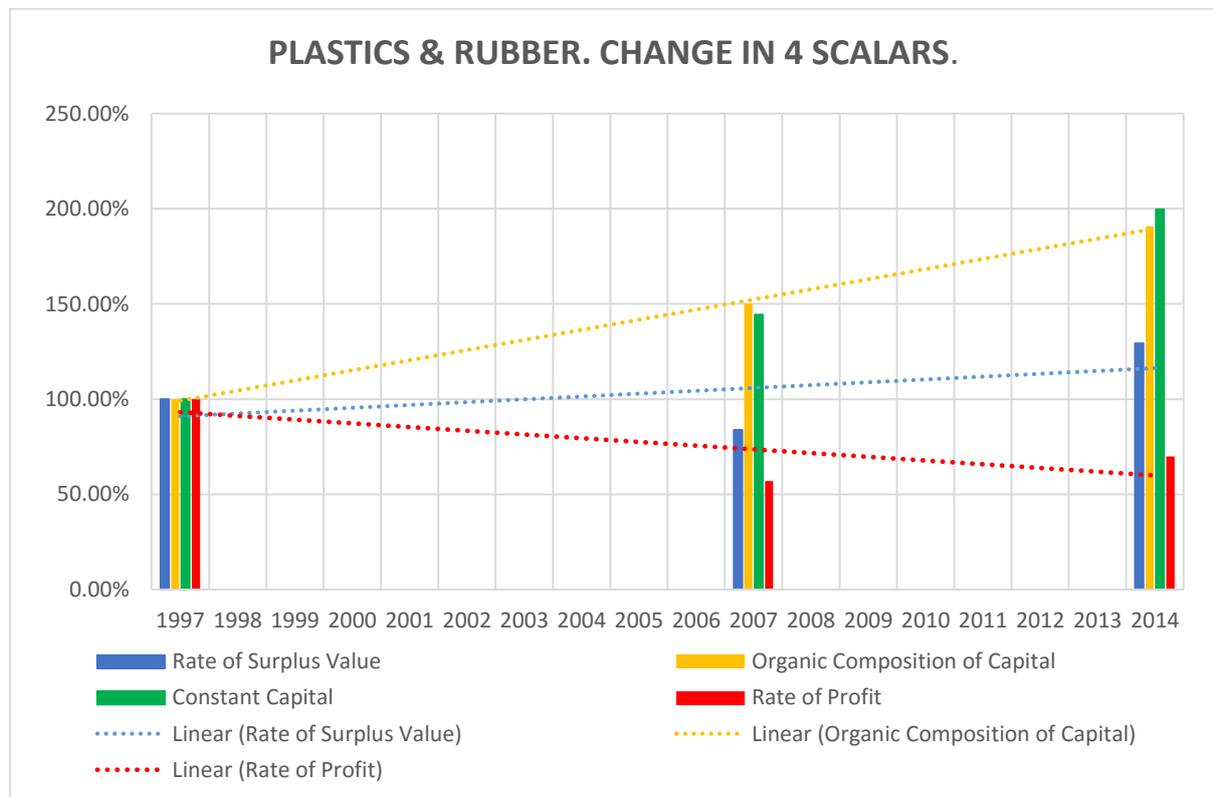
This is true for Food & Beverage Industry. This is the only industry of the four where employment actually grew between 1997 and 2014. In this industry the rate of surplus value grew by 32% over this period. This was due primarily to an increase in the rate of exploitation of 26% (Note 1.) rather than

an increase in the rate of turnover of only 4%. Nevertheless, the relatively high turnover of 6.9 meant each percentage point increase in exploitation was significantly amplified. A 1% increase in exploitation per period multiplied by 6.9 turnovers would of course yield an annual increase of 6.9% in surplus value everything else being equal, compared to 4% were there to be only 4 turnovers. The result of the increase in the rate of surplus value beyond that of the composition of capital ensured that the rate of profit increased by 7%. It is worth noting that in the background, the Food Industry bore the second highest increase in the growth of constant capital at 90%.

**PLASTIC & RUBBER PRODUCTS.**

The second industry enjoying above average turnovers is Plastic and Rubber Products. Changes in this industry are represented in Graph 3 below.

**Graph 3.**

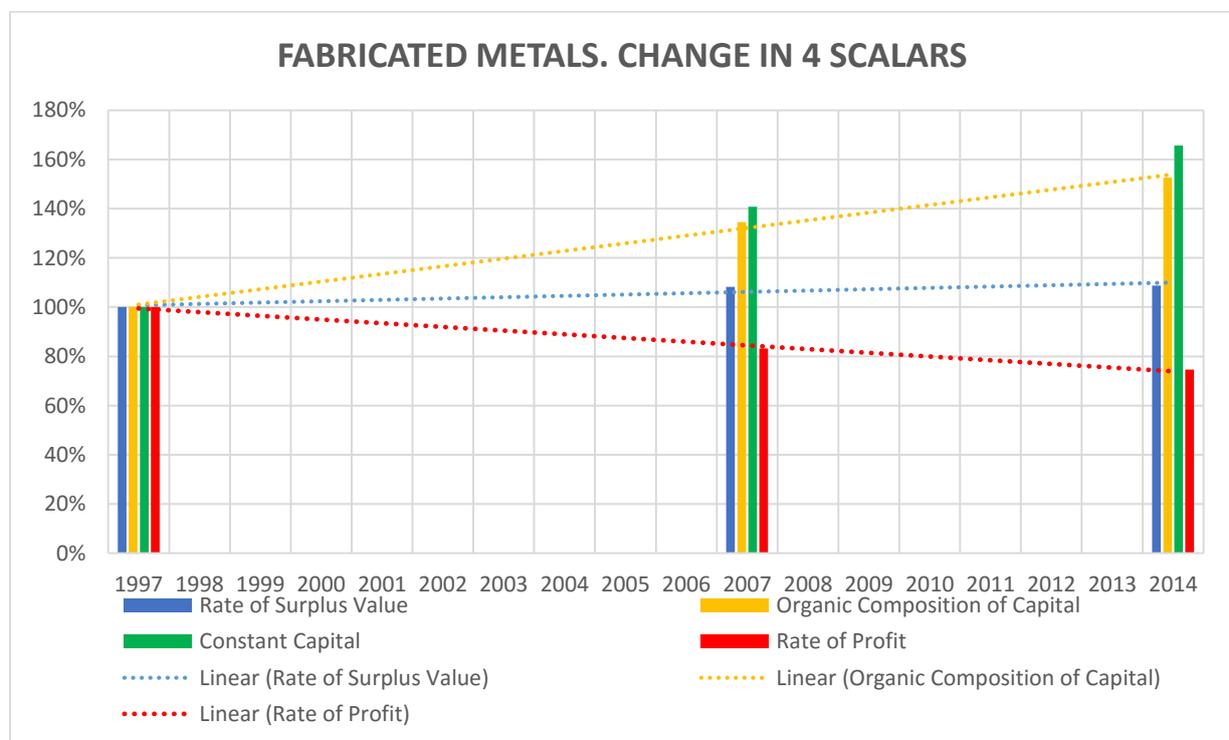


Unlike the Food industry, here we find a falling rate of profit between the peaks. In this industry it is not the rate of surplus value that is responsible for the fall in the rate of profit. This industry has enjoyed a similar increase in the rate of surplus value (30% vs 32% for the food industry). Unlike the Food Industry the combination of exploitation and turnover is reversed. The rate of exploitation rises by only 11% compared to 26% but is amplified by a 14% increase in turnover compared to 4% in the Food Industry. What is different is the magnitude in the increase of the compounded organic composition of capital (91% vs 16%). It overwhelms the increase in surplus value of 30% resulting in a substantial fall in the rate of profit (1997 = 13.2%, 2014 = 9.2%). This rapid rise in the compounded organic composition of capital was due to a much sharper increase in the underlying technical composition of capital. While the stock of constant capital rose 95%, employment fell 27.5%. It was the rise in the technical composition and the rise in turnover that was responsible for the growth in the composition of capital.

## FABRICATED METALS.

Next we turn to the two industries that have below average rates of turnover. Each however has manifested above average growth in their respective turnovers which makes them interesting. Like Plastics and Rubber, Fabricated Metals manifests a falling rate of profit. The contrast between the two industries is instructive. Fabricated Metals has enjoyed a 24% increase in turnover vs 14% for Plastics & Rubber. On the other hand, there is a substantial difference in their rates of exploitation. Fabricated Metals has experienced a fall in the rate of exploitation of 12% whereas Plastics and Rubber has experienced a rise of 11%. The most significant observation in this posting follows: despite the fall in the rate of exploitation, the rate of surplus value has risen by 9% because of the 24% increase in turnovers (versus only 14% in Plastics and Rubber). Accordingly, despite experiencing a fall in the rate of exploitation, the fall in the rate of profit of 25% is actually smaller than the fall of 30% experienced by the Plastics and Rubber Industry. Here underlined is the importance of turnovers.

Graph 4.



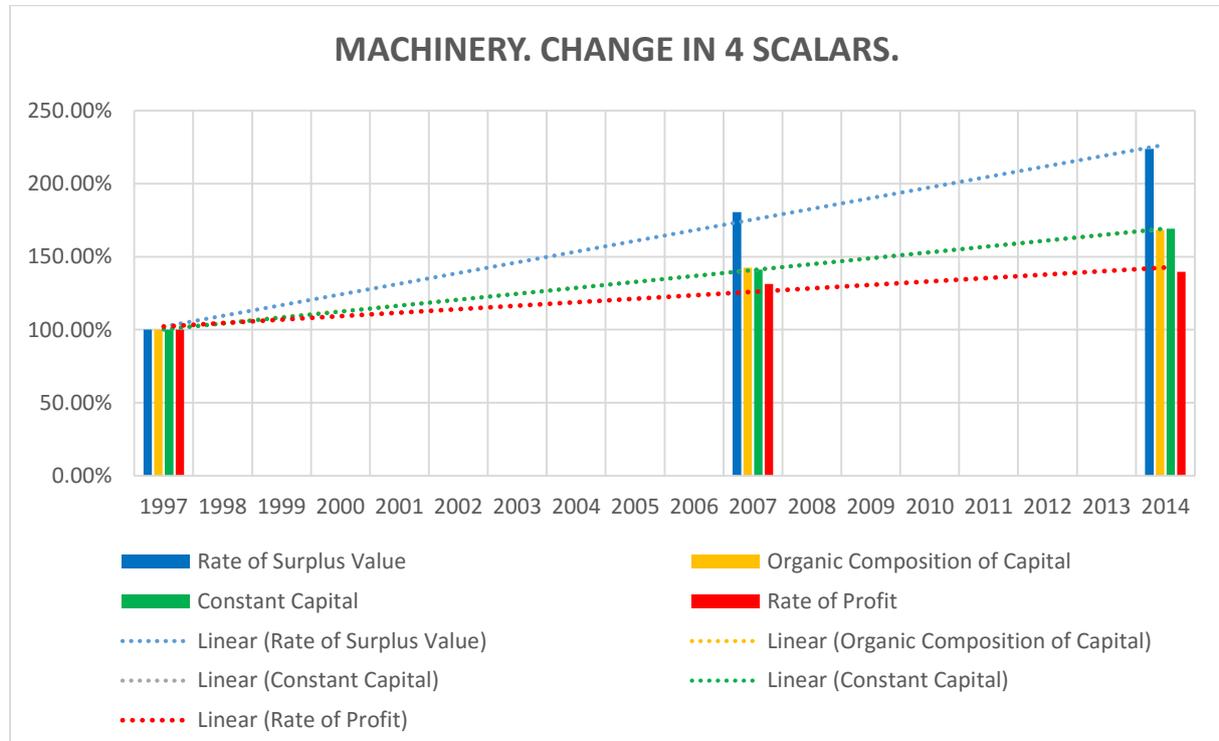
## MACHINERY.

The final industry examined is the Machinery Building Industry. This industry has experienced the highest increase in the rate of profit, which also coincides with the highest rate of increase in turnovers of 27%. It is also the industry with the highest increase in the rate of exploitation, an unacceptable 76%. It is of course the industry most exposed to international competition. It is also the only industry out of the four where the top graph is the one plotting the rate of surplus value. The rate of surplus value has increased by an astonishing 223%. This is primarily, but not exclusively, due to the increase in exploitation of 76% multiplied by an increase in turnovers of 27%.

This compares to the rise in the composition of capital of 68% (the second highest increase of the four industries). Here it is turnover that is primarily responsible for the growth in the composition of capital because it depresses variable capital relative to constant, while at the same time increasing the rate of surplus value. Turning to Graph 7 we note a second phenomenon. This, the highest increase in the

rate of turnover yields the largest gap between total capital (which includes variable capital) and constant capital. This is due to the effect of turnover on variable capital, which modulates total capital but not constant capital. (Note 2. Graph 7)

**GRAPH 5.**



**CONCLUSION.**

These four industries demonstrate the complex interweaving of the rate of exploitation, the rate of surplus value and the composition of capital. One general law stands out, the rate of profit can only increase if the rate of surplus value expands faster than the composition of capital. A subsidiary law is also present: the rate of surplus value can still grow, even if the rate of exploitation falls, provided turnovers increase sufficiently. If we group the four industries, two groups stand out. Group 1 includes the Food Industry and Machinery. In both cases the increase in the rate of surplus value exceeds the increase in the composition of capital. Where this excess is greatest – Machinery – so too is the increase in the rate of profit. Here the absolute difference in turnovers is not decisive, what is decisive is the growth in turnovers which in machinery is nearly seven times faster than the Food Industry. Group 2 includes Plastics and Rubber together with Fabricated Metals. Both have a growth in their rate of surplus value which falls below the growth in the composition of capital. In the instructive case of Fabricated Metals, the rapid increase in turnovers compensates for the fall in the rate of exploitation. While both experience an increase in the rate of surplus value, this increase falls below the increase in the composition of capital leading to a fall in the rate of profit.

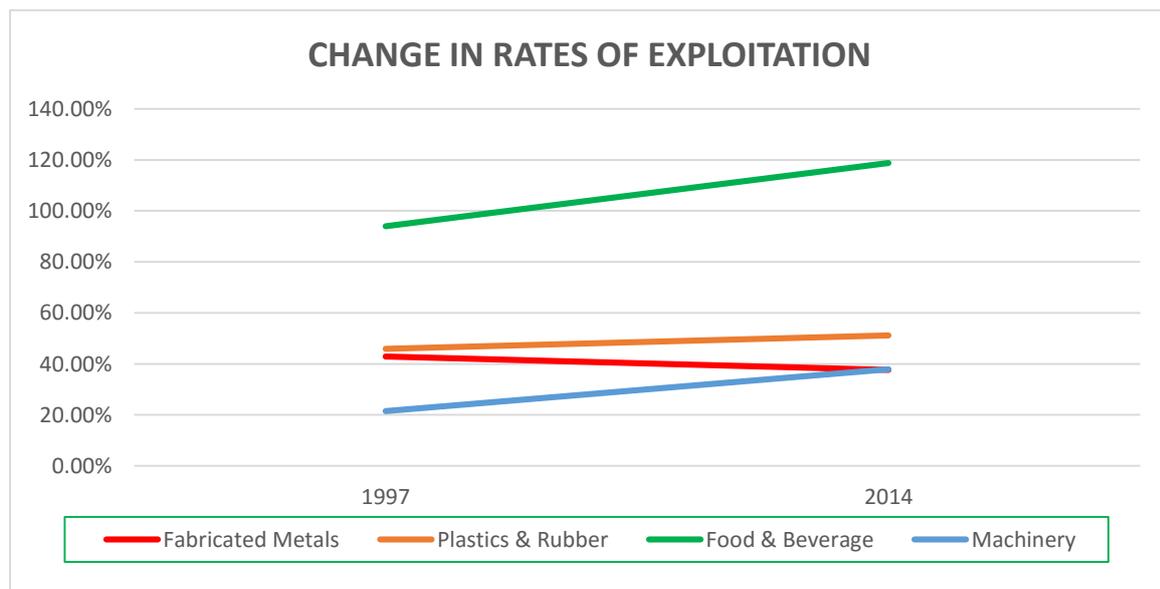
These movements are a vindication of the categories developed by Marx and do not overturn the tendency for the rate of profit to fall. Out of the four industries examined, two have experienced a fall, one a marginal increase and only one a substantial increase. What they show collectively is that to offset the rise in the technical composition of capital, the rate of surplus value must increase proportionately. And as the rate of surplus value is a product of exploitation times turnover both need to increase in order to yield a higher result. In this regard the Food Industry is the most instructive and consequential of the four industries. The Food Industry enjoys a high rate of turnover 6.92 (it's all-

time high is 7.00). The scope for increasing it appears to be limited. In 17 years it has risen only 4% and over the last 5 years it has been stuck at the same level. Similarly, with the car industry. Since 2007 its turnovers have settled on a plateau of between 7.2 and 7.5 turnovers p.a. From this we may conclude that in the case of high turnover industries the scope for increasing turnovers is more limited and what increases can be achieved are a declining fraction of the whole. It also appears that the increase in constant capital in high turnover industries yields a reduced increase in turnovers though not of exploitation. In the case of the Food Industry where constant capital grew 90% but turnover only 4%, the rate of profit rose only 9%, compared to the Machinery Industry where constant capital rose by only 69% but turnover by 27%. Here the rate of profit rose substantially. Even after this 27% increase in turnover, the Machinery sector enjoyed a rate of turnover of only 4 compared to that of Food with its 6.92 turnovers. Should capitalism lose the ability to increase turnovers this will act as a brake on the improvement in the rate of surplus value thereby undermining the rate of profit. Not only because more rapid turnovers provide more days in which to produce profits, but more importantly, because the increase in the rate of exploitation is no longer amplified. In the end, the two most significant counter-vailing factors; the increase in the rate of exploitation multiplied by the increase in the rate of turnover add to each other. If turnover becomes a constant, instead of the formula being written as:  $A \times Z$  where A stands for the increase in the rate of exploitation and Z for the increase in turnover, the formula would be rewritten  $A \times 1$ . At that point, the counter-vailing influences are significantly reduced, even when adding back all the other factors described by Marx. Herein lies the importance of turnover.

(Note 1)

Below is the rate of exploitation. It is calculated by subtracting compensation from net value added to obtain the annual surplus. This annual surplus is then divided by annual compensation to obtain the rate of exploitation. The rate of exploitation describes a single period whereas the rate of surplus value is this single period multiplied by annual turnovers. As a result, the rate of surplus value exceeds that of exploitation by the number of turnovers. We note that the highest rate of exploitation occurs in the food industry. Only fabricated metal shows a fall in the rate of exploitation.

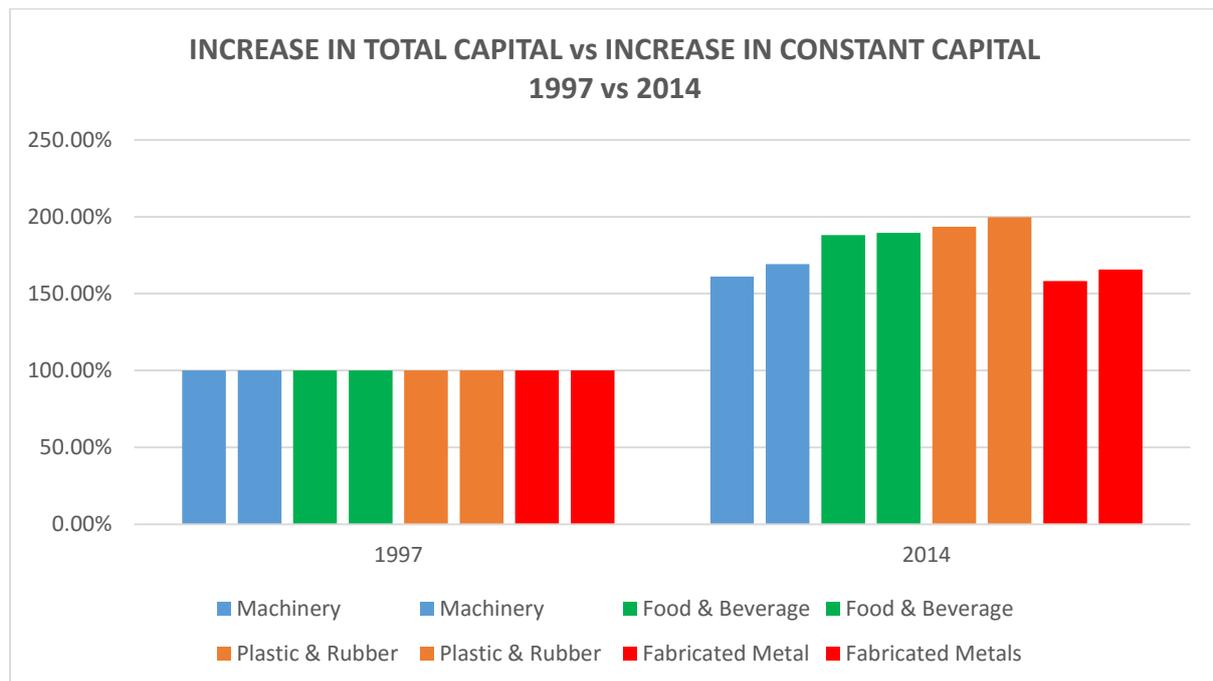
**Graph 6.**



Note 2.

We observe that with the exception of Food & Beverage there is a difference between constant capital and total capital in 2014. Total capital is larger because it includes variable capital. The gap develops because the growth of variable capital is slower than that of constant capital due to the reduction in workers, the rise in their exploitation and of course changes in turnover. The gap is greatest in those industries which enjoyed the most pronounced growth in their turnovers. It is worth associating these gaps to turnover in ascending order: Food industry 0.8% (4% increase in turnover), Plastic and Rubber 3.2% (+11%), Fabricated Metals 4.7% (+24%) and Machinery 5% (+27%). There is thus a strong association between turnover and Total Capital, though it must be borne in mind that this is confounded by employment levels as well.

**Graph 7.**



In most cases variable capital now forms a small part of total capital. Over time, as the technical composition of capital rises even further it will form a smaller and smaller fraction of total capital. Any decrease in the relative value of variable capital will thus have a declining influence on the growth of total capital. This is merely an expression of the decline in the counter-vailing forces acting on the rate of profit as the mass of constant capital expands.

This posting examines four industries. It is thus limited. Global figures between 1995 and 2011, a period similar in duration to the one dealt with earlier, covering 93% of global GDP, shows a steady 0.5% increase in turnovers per annum. The result was an average global turnover of 5.2 by 2011. Whether this has continued up to 2014 and particularly after this time, is not known (Timmer, M. P., Dietzenbacher, E., Los, B., Stehrer, R. and de Vries, G. J. (2015), **"An Illustrated User Guide to the World Input–Output Database: the Case of Global Automotive Production"**, *Review of International Economics*, 23: 575–605 which can be found on [www.wiod.org/new\\_site/database/wiots.htm](http://www.wiod.org/new_site/database/wiots.htm))

The great question is this, while globalisation clearly increased turnovers, can it continue to do so? On the answer to this question hinges the future direction of profitability.