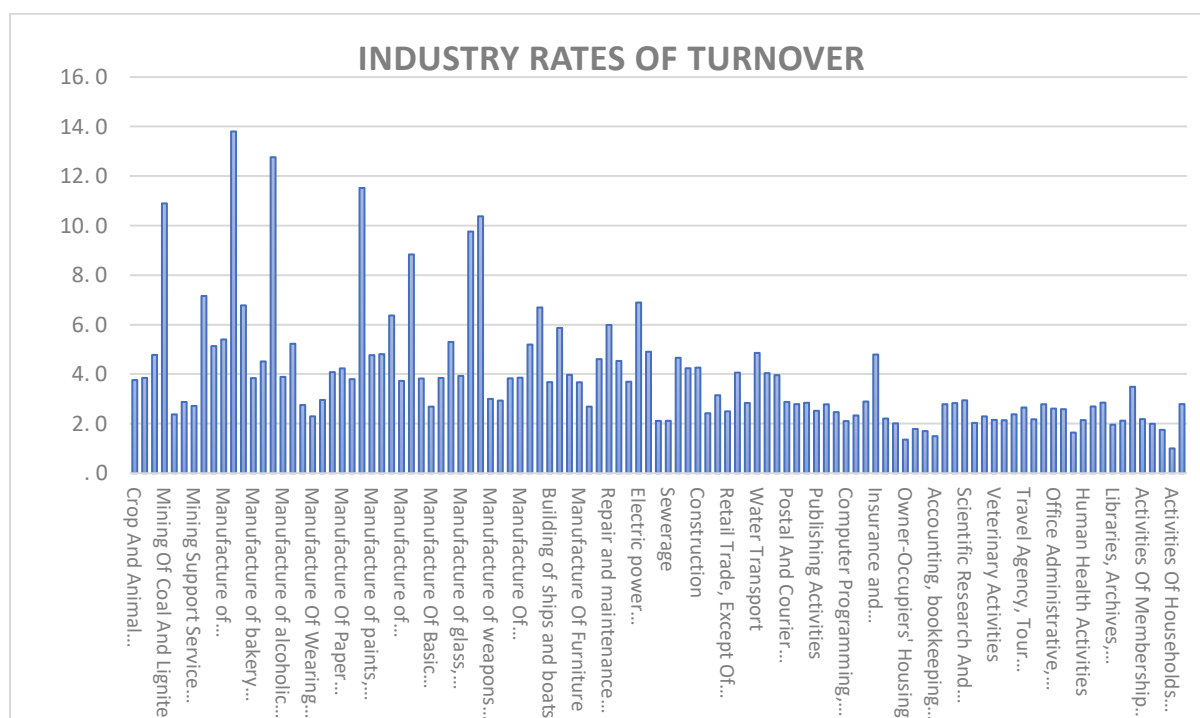


UK WORKING CAPITAL. GOING BEYOND APPEARANCES.

Marx always reminds us that the scientific method would be superfluous if the appearance of a thing coincided with its essence. If this was the case then we would be all-knowing because nothing has to be explained as everything would be self-evident. Of course, scientific analysis is needed because the appearance of a thing belies its complex and often contradictory subterranean interior. This is particularly true for circulating capital which is surrounded by a spectrum of misconceptions and which turns out to be much more complex than first envisaged.

This analysis is based on the 2016 input-output analysis contained in the spreadsheet attached to this article. The reader is encouraged to view the graphs in the spreadsheet as the portrait format used here does not lend itself to the size of the graphs. Graph 1 below shows the wide range of turnovers found in the UK economy which ranges from 2.5 in publishing (column BU) to 13.8 in Manufacture of prepared animal feeds (column R).

Graph 1.



However, for the purposes of this investigation two contrasting industries are chosen. “Manufacture of bakery and farinaceous products” found in column P with a turnover of 3.84 and “Manufacture of Coke and Refined Petroleum Products” found in column AA with a turnover of 11.52. The first industry has a capital composition well below the average while the latter has one well above the average. In the vernacular, the bakery sector is “labour intensive” while the petroleum sector is “capital intensive”.

The first superficial observation is startling. Why should the bakery sector have a much lower turnover at 3.84 than the petroleum industry? Is it not the case that the production period of bread is very quick? Since the genetic modification of yeast, bread can be leavened in hours instead of overnight. This means flour can be turned into bread and delivered to shops and supermarkets within 24 hours. Surely then its turnover must be in double figures?

To answer this conundrum, we examine two companies who are representative of these two industries: Warburtons the largest UK baker and BP the giant petroleum producer and refiner. All the data used is drawn from their published audited accounts. The links for these accounts can be found at the end of the article. The page numbers referenced belong to the pdf versions of their accounts. The figures are colour coded, bread brown for Warburtons and green for BP. Figures are in Millions of Pounds for Warburtons to begin with and Billions of Dollars for BP. When Sterling is converted into Dollars, the average exchange rate for 2017 is used, \$1.29 to £1.00.

Table 1. Revenue/inventory ratios

Company	Revenue (sales)	Inventory (stocks)	Ratio	Page numbers
Warburtons	£525 million	£5.4 million	97	12
BP	\$240.2 billion	\$19 billion	13	125, 128

It clearly takes less time to bake a loaf of bread than it takes to produce a litre of petrol or diesel. Warburtons stock turns over 97 times a year or twice a week while BP's stock turns over once a month. Ah, it will be said, the turnover formula is wrong because capital simply cannot circulate faster in BP than in Warburtons, given that inventories circulate 12 times faster in Warburtons. Later we will see how deceptive appearances can really be, or what is the same thing, superficial observations.

The next step is to introduce the first logical element of complexity. The normal sales to inventory ratio is based on sales divided by inventory. This is useful but wrong. Useful because in providing a larger number it is more sensitive to changes in market conditions, but it is wrong because stocks are usually valued at cost-price not market-price, while revenue is measured at market price. Therefore, to get a more accurate determination for stock or inventory turnover, inventory should be measured by the cost of turnover, not by turnover (revenue) itself. Once done, the difference in their anatomy begins to affect the result shown in Table 3.

Table 2. Cost of revenue/inventory ratios

Company	Cost of revenue	Inventory (stocks)	Ratio	Page numbers
Warburtons	£284 million	£5.4 million	52.5	10, 12
BP	\$179.7 billion	\$19.1 billion	9.4	125, 128

There is a sizeable fall in turnovers in both companies. However, there is a bigger fall in Warburton than in BP. The relative fall in Warburton is 46% compared to 27% in BP. The reason is that the two industries are structured differently. In the case of the bakery industry, most of the value added to the bread comes from baking the bread itself. In the case of Warburtons it contributes 42% of the value found in the bread. In the case of BP, its share of the products it sells is only 25%.

Table 3. Actual value added as a share of Revenue. (Note 1.)

Company	Revenue (1)	Purchases (2)	'Actual' Value Added (1) – (2) = (3)	Ratios (3)/(1)	Page numbers
Warburtons	£525 million	£284 million	£241 million	46%	10
BP	\$240.2 billion	\$179.7 billion	\$60.5 billion	25%	125

We therefore find that Warburtons share of value added at 46% was nearly double that of BP at 25%. As we add the next degree of complexity we will see why this structural difference is important. We know that inventory or stocks is only one part of circulating capital, even when it is the dominant element in some cases. The second degree of complexity is the introduction of the circulation period.

The method used here to measure this aspect of turnover is to deduct credit taken from credit given. The balance is then added to or deducted from inventories. Both companies are situated in the realm of production. Here commodities tend to circulate via credit instead of money. However, in the case of BP its forecourt business (filling up the tanks of cars with pollution) is based on cash payments even if this involves credit cards. This reduces credit given by BP. Not so in the case of Warburtons which sells into retail rather than the consumer. Its bread is usually sold on credit, with the supermarkets undoubtedly pressing for extended terms and indulging in late payments.

Table 4 below incorporates the balance between credit given to customers and credit taken from suppliers. In the case of Warburtons this is a positive figure and in the case of BP a negative figure. It should also be pointed out that in the case of BP, current liabilities or assets belonging to joint ventures is excluded because the associated revenue figures are omitted from BP's accounts. Secondly, all current liabilities belonging to the BP tragedy and spill in the Gulf of Mexico is omitted as well. Details of this breakdown can be found on pages 144 and 161 of the accounts in section 20.

Table 4. Credit balance plus inventory.

Company	Credit given	Credit taken	Balance	Inventory	Total (balance+inventory)	page
Warburtons	£67.9 million	£19.2 million	£48.7 m	£5.4 million	£54.1 million	27
BP	\$23.1 billion	\$27 billion	-3.9 billion	\$19.1 billion	\$15.2 billion	161

We note that BP receives more credit than it gives, with the opposite being the case with Warburtons. In fact, Warburtons gives much more credit than it receives. In the case of Warburtons, which has inter-company debts, only trade debtors are taken. As "amounts due to group undertakings" are not specified, there may be a degree of understatement of credit given. Despite this credit given exceeds credit taken by a wide margin.

This does not mean that the average period for credit given exceeds the period for credit taken. The most important reason for the differential is that Warburtons sales exceed its purchases due the value added by Warburtons workers during the production process being relatively high. The value of sales is 47% higher than the value of purchases, and this alone, everything else being equal, would result in Warburton giving 47% more credit than it received compared to BP's 25%. We now see the importance the structure of an industry plays in determining the volume of working capital utilised.

We are now in a position to determine the rate of turnover of circulating capital for these two companies without using the turnover formula. The equation used instead is:

$$\frac{\text{Cost of sales}}{\text{inventory plus credit balance}}$$

The calculations are found in Table 4 below.

Table 5. Individual rates of turnover.

Company	Cost of sales	Inventory + credit	Annual rate of turnover
Warburton	£284 million	£54.1 million	5.2
BP	\$179.7 billion	\$15.2 billion	11.8

If we compare these rates of turnover to the ones found in the attached spreadsheet we find that the comparable turnover for the petroleum industry is 11.52 and for bakeries it is 3.84. In the case of BP the turnover of 11.8 arrived at by this manner is within 0.3 turnovers yielded by the turnover formula

and in the case of Warburton, it is 1.4 turnovers apart. The Warburton figure which is above the industry average, may be flattered by unspecified “group undertakings” which could include trade creditors within it. (If we take the turnover for the whole Warburton’s group *under Warburtons 1876 Ltd*, which reduces inter-company noise, the turnover falls to under 4.8, or within a turnover of the formula).

The purpose of the investigation was not to prove a match between these rates of turnover and those provided by the formula as contained in the spreadsheet. (In any case, it must be remembered they represent two different years – 2017 versus 2016.) Rather the purpose was to show how distant these turnovers are from inventory turnover and why the order is now reversed. To begin with, the crude inventory turnover for Warburtons at 97 was over seven times faster than BP, but despite this, it transpired that BP’s turnover of fluid capital was twice as fast as Warburtons. Truly a case of appearances being deceptive.

The question of profitability.

How does this turnover of circulating capital impact the rate of profit for these two companies? To make comparisons clearer and more direct, it is now necessary to introduce the size of their respective workforces. This is done in Table 6 which additionally includes how much value added each worker produces. On page 183 BP provides a figure of 74,700 employees worldwide earning a total of \$10.2 billion or \$133,868 dollars on average. The much smaller Warburtons employs only 4565 workers earning a total of £185.5 million or £40,635 on average equal to \$52,400. Clearly it is more remunerative to get one’s hands black with oil than work in the safer though dustier environment of a bakery. (All exchange rates are at \$1.29: £1.00).

Table 6.

Company	Value added	Employee numbers	Value added per employee
Warburton	£241 million	4,565	£52,793 or \$68,100
BP	\$60.5 billion	74,700	\$809,906

The actual value added by BP workers is on average 11.9 times greater than that added by the average Warburtons worker, while the wage differential is only 2.6. It is clear that such a large value differential needs to be explained. Is it due to differences in productivity or something else? Marx was able to explain this conundrum as it was beyond the abilities of the classical economists who preceded him. The explanation for this difference in value added begins with Table 7.

Table 7.

Company	Fixed capital	Employee numbers	Capital per employee
Warburton	£274.5 million	4,565	£60,131 or \$77,570
BP	\$147.8 billion	74,700	\$1,978,581

BP’s figures are found on page 128 and are limited to property, plant, equipment and intangible assets only. Intangible assets are included because oil is a knowledge-based industry dependent on intellectual property tied up with exploration. The fixed capital invested per worker in BP turns out to be 25.5 greater than in Warburtons. The reader may observe that the difference in value added is less than the difference in capital per employee. Per unit of capital BP’s workers produce only half as much value added.

But even these ratios are about to be undermined yet again. The next table abandons **actual value added** for **realised value added** per \$ of fixed capital. There is a big difference between actual value added

and realised value added. Actual value added is the difference between sales and cost of sales (inputs needed solely for production.) The cost of sales is the **cost of production** only. Realised value added on the other hand, is the difference between sales and the **cost of doing business** (total inputs including clerical, not only inputs relating to production). BP is a much more complex business than Warburtons. Warburtons does not have to dig for wheat. BP has much more extensive inputs compared to Warburtons as even a cursory glance at the two trading accounts shows. Thus, relatively speaking, the cost of doing business at BP is much higher, and realised value much lower, than is the case with Warburtons. Realised gross value is calculated by adding together the sum of employee compensation, gross profit, depreciation and taxes on production. It is the same methodology used by the ONS and BEA to determine GVA. We note that BP's realised value-added compared to Warburtons is reduced from 11.9 to only 7.9. (From now on the data in the tables are \$s per worker.)

Table 8.

Company	Fixed capital	Value added	ratio
Warburton	\$77,570	\$67,530	1.15
BP	\$1,978,581	\$496,653	3.98

Realised value added (GVA) is the usual metric used to analyse capital to output ratios. By reducing the comparison to a per worker basis, a clearer picture is presented. We note that the capital to value added ratio in BP is triple the ratio found in the labour-intensive Warburton.

The penultimate step in this series, before circulating capital is added in, is to examine the gross surplus yield. This is obtained by removing compensation and production taxes from realised value added, leaving depreciation and gross profits. The gross rate of return for both companies now differ by about a quarter, despite BP's fixed assets being twenty-nine times greater per worker.

Table 9.

Company	Gross surplus	Fixed capital	ratio
Warburton	\$15,115	\$68,100	22.2%
BP	\$336,010	\$1,978,581	17%

The final step in this series is to remove depreciation in order to arrive at the pre-tax and pre-interest **rate of return**. Depreciation in Warburtons amounts to \$40.1 million and at BP it amounts to \$15.6 billion (page 129). Per worker this translates to \$8,784 in Warburtons and \$208,621 at BP. When this depreciation is deducted from the gross surplus the following rate of return is found.

Table 10.

Company	Net surplus	Fixed capital	ratio
Warburton	\$6,330	\$68,100	9.3%
BP	\$127,389	\$1,978,581	6.4%

The gap is reduced from 5.2% (22.2% - 17%) to 2.9%. Slowly the data is converging.

The importance of circulating capital.

The gap in the rate of return between the two companies still stands at thirty percent in relative terms. The question is; will the gap be further reduced when we add in circulating capital?

To obtain the amount of circulating capital, the net surplus is deducted from revenue in both firms to obtain the cost of gross surplus. Revenue is equal to gross output or $c + v + s$. By removing s , we arrive

at $c + v$ or the cost of annual gross output. But annual figures should not be confused with single period figures. The annual figure needs to yield actual working capital. This is done by dividing the annual cost of output by the number of turnovers that went into its production. These calculations are carried out in Table 11.

Table 11.

Company	revenue	less net surplus	= cost of gross surplus	No. of turnovers	Working capital
Warburton	\$148,300	\$6,330	\$141,970	5.2	\$27,302
BP	\$3,212,851	\$127,389	\$3,086,462	11.8	\$261,565

To confirm this figure, it would be useful to apply the turnover formula as well. The calculation for BP below is in green and Warburtons is in brown. To obtain gross value added (GVA) for BP and for Warburtons, staff costs, depreciation and gross profit were added together. In the case of BP production taxes as well. This conforms to the methodology found in the SNA. (Figures here are totals, not per worker.) Gross output corresponds to the revenue figures for both companies (Table 1).

$$\frac{\text{\pounds}525\text{m} + (\text{\pounds}525 - 239)}{239} = 3.4 \qquad \frac{\text{\$}240.2\text{bn} (240.2 - 55.2)}{\text{\$}37.1\text{bn} \quad 37.1} = 11.9$$

This compares to 11.8 for BP and 5.2 for Warburtons found in Table 5. Warburtons is now more proximate to the annual rate of turnovers yielded by the formula in the input-output tables, while BP's turnover remains unchanged. Table 12 examines how the rates of 3.4 and 11.9 affects working capital.

Table 12.

		Table 12	Table 12	Formula	
Company	cost of gross surplus	Turnover	Working capital	Turnover	Working capital
Warburtons	\$141,970	5.2	\$27,302	3.4	\$23,588
BP	\$3,086,462	11.8	261,565	11.9	259,367

BP's working capital undergoes little change but Warburtons increases by fourteen percent. Having done these calculations, the all-important rate of profit is determined in Table 13 using the the two sets of working capital.

Table 13.

Company	Fixed capital	+ circulating	= Total capital	net surplus	rate
Warburtons	\$68,100	\$15,423	\$83,523	\$6,330	7.6
BP	\$1,978,581	\$259,367	\$2,237,948	\$127,175	5.7
Warburtons	\$68,100	\$23,588	\$91,688	\$6,330	6.9
BP	\$1,978,581	\$261,565	\$2,082,301	\$127,175	5.7 (Note 2.)

The most important point to note is that when adding in circulating capital, the difference in the rate of profit is reduced from 2.9% (rate of return) to between 1.2% and 1.9%. There has been an equalisation of their respective profits. The Warburton family are therefore not motivated to shut their bakeries to open oil refineries and vice versa over a mere percent or two. What began as two very diverse companies, structurally different and with widely varying ratios, has in the end converged

around the all-important average rate of profit. From a difference of 1190% to begin with, the difference is reduced to 20% and will actually close in 2018 as the price of oil rises.

The inclusion of circulating capital halved the difference in the rate of profit between the two companies compared to their rate of return. In relative terms it reduces the gap from 31% to 17%. It is therefore inconceivable that any attempt to explain the equalisation of the rate of profit, by for example Anwar M. Shaikh, is possible when circulating capital is excluded. On average circulating capital accounts for a significant 20% of total capital.

The deviation of prices from values.

This convergence between the rates of profit has been made possible by only one factor; the deviation of market prices from market values. There is a transfer of value via the pricing mechanism from companies like Warburtons, with its below average composition capital, to companies like BP with its above average composition of capital. The market price of oil is thus above its market value and for bread it is below its value.

The extent of this transfer of value is difficult to gauge accurately until the intensity of labour has been homogenised and the degree of skill reduced to units of simple labour, which of course requires a socialist society. But it is worth hazarding a guess. To begin with each productive BP worker “adds” twelve times as much value as does a baker in Warburtons. In terms of wages, each worker in Warburtons earns \$52,420 while BP workers earn on average \$135,546 (page 183) Even if we were to assume a non-Brexit exchange rate and similar labour market conditions, we could assume a skill differential of between 2 and 2.5x. Taking this into account, BP workers seem to be adding between four and five times as much value added per \$ of wage adjusted for skill.

It is therefore likely that the actual cost of oil could be as low as a quarter compared to its market price, which is elevated by the averaging out of the rate of profit driven by the movement of capital. Conversely it means that bread could be under-priced by a similar factor. Bad for hungry people, good for drivers.

This of course has implications for socialism. Assuming we do not stop oil production altogether in order to save the planet, the price of oil would be reduced to its actual cost of production, while the price of bread will rise to cover its actual cost of production. No longer will the purpose of the pricing system be to reward profit. Rather it will be transformed to reward workers accurately for the expenditure of their labour. This will be called “the socialist price discovery” which is likely to be full of surprises, not all pleasant. The establishment of an objective pricing system will be one of the first and most vital tasks facing a socialist society, which is why it is necessary to firmly dismiss utopians like Paul Mason and their talk of a pending “priceless future” populated by “immortal machines”.

Conclusion.

The associated spreadsheet is full of turnovers some surprising others not. All represent different industrial or commercial anatomies. I have always been of the opinion that it is better to use sectoral turnovers rather than individual turnovers because individual rates can diverge sharply in either direction. For manufacturing as a whole, turnovers range from a low of 2.8 to a high of 13.8 with the average being 4.6.

Using 4.6 as the control figure, the adjusted inventory turnover is 5.0 (cost of sales/inventory) and the unadjusted inventory turnover is 7.8 (sales/inventory). Taking the latter figure of 7.8 this translates into a 47-day inventory period (365/7.8). To this is then added the average payment period of 63 days adjusted for credit given and taken remembering that credit given will exceed the amount of credit

taken and we are interested in the difference only. For the source of this data visit <http://www.abfa.org.uk/news/Documents/ABFA%20white%20paper%20-%20Payment%20days%20by%20sector.pdf>

According to the spreadsheet, value added is equal to 55% of inputs. If we apply this to the 63 days we get 35 days which when added to 47 days for inventory yields a total period of 82 days. In terms of the rate of turnover this 82-day period yields a rate of 4.5. This rate of 4.5 is proximate to the rate of 4.6 yielded by the formula. (Note 3 for calculations) This is not an unexpected coincidence because manufacturing as a whole is a large segment of the UK economy where differences are averaged out.

This two-part posting was intended to examine the resilience of the UK economy and whether it can withstand Brexit shocks. The improvement in profitability of the UK economy, as has been shown in Part 1, is entirely due to ratcheting up of the absolute rate of exploitation. This has been made clear by the recent report "Skills and Employment Survey 2017". These five yearly reports showed workers working harder for longer and with less control over the work process compared to 2012. It also showed that the majority of workers come home exhausted after work. Many workers also claimed Brexit was being used as a pretext by their bosses to hold down wages and reduce working conditions.

https://www.cardiff.ac.uk/_data/assets/pdf_file/0009/1309455/4_Intensity_Minireport_Final.pdf
Other surveys showed British workers worked an additional 3.3 hours each week compared to the average European worker which translates into an additional 40 minutes each day.

If the hard Brexiteers had their way, the reduction in regulations would give them a free hand to further intensify exploitation and adulterate products. However, a reliance on the absolute intensity of labour is not a strength it is a weakness. While Brexit would give employers additional leverage, what would be gained from exploiting low paid labour in the low value serving and servant sector would be more than lost because of the damage done by Brexit to Britain's few competitive sectors such as aerospace, pharmaceuticals, light motor vehicle sector, machinery etc.

In addition, not only are these industries the most dynamic part of the economy they are also the most concentrated. Typically, in most countries, the top ten exporting firms accounted for 42% of total exports. It is these firms that are the most globalised, most dependent on international supply chains, and the ones most vulnerable to a Brexit shock. These giant corporations act as the light around which the smaller companies flutter. If they and the city of London stumble, then the whole economy will be undermined by the little Englanders.

Whatever the case, as part 1 showed, the continuing depression of the price of labour power (wages) below the value of labour power is having political consequences. The vast majority of British society are now hostile to the conditions they find themselves in. This has been the political wave that relaunched the Labour Party.

It has even forced May to promise an end to austerity at her Conference despite the fact that the Office for Budgetary Responsibility has projected austerity running to at least 2020. Just another example of a dishonest, but headline grabbing pledge from this party. That pledge together with taking control of immigration and tinkering with housing were the only offerings on display.

The highlight of the now ended Tory conference in Birmingham was of course Boris Johnson's address to the party faithful. The audience of 1,500 rapturously applauded his demolition of the Chequers plan. Here was the man who single-handedly was going to save their little island from the European hordes. In fact, he did such a demolition job and grabbed so much attention, that May did not refer to her Chequers plan by name once during her concluding address to the bored party faithful.

The Tory conference was not so much about “out of Europe” as it was “out of this world”. To talk of “opportunity” in a country ravaged by austerity, drowning in debt, driven mad by precarious conditions was not only out of touch, it was unworldly. Little wonder May did a mad jig on her way to the Podium. Seems she was trying to avoid stepping onto a Brexit trapdoor while shadow boxing with Boris. But as usual, the sycophantic media judged that her speech had put heart into her party, without acknowledging that she was addressing a heartless party.

It is clear that May leads a broken party. Already there were dark mutterings by the DUP on the fringes that they would not tolerate any form of border between Britain and the north of Ireland, even if it was in the stratosphere. While part of her party prefers the Norwegian option, another part prefers the Canadian option with added ice. These two positions are irreconcilable.

This leaves May with two options. Threaten the right with another election and a Corbyn government unless they concede on a free trade agreement. Or, on the other hand, propose a deal sufficiently enticing to Labour to win a majority in parliament, even if this means splitting the Tory Party. She has made her position clear. In her speech she repeatedly emphasised that she will put the national interest first, which always and everywhere means the interest of big business. This implies despite the bravado, that even if Brexit were to happen, it will be the softest of Brexits.

Brexit is not taking place in isolation. Time is running out, not only legal time, but time for the world economy. The success or failure of any Brexit is contingent on conditions prevailing in the world economy and these conditions are deteriorating. The leavers may see Brexit as the means of detaching Britain from Europe so that it can sail freely forth to the new world, but they may find that the loss of an anchor in a stormy sea can be fatal for such a small island.

Note 1. It is important to distinguish between actual value-added and realised value-added. When the statistical bureaus use the term “value added”, they are describing realised value added. For the purpose of input and output tables all inputs need to be deducted from revenue. Thus, these deductions relate to the cost of doing business not to the cost of production. This ensures that the value added attributed to a productive firm, is smaller than the actual value added by that firm. This has a bearing on the division of labour into productive and unproductive labour as many of the clerical inputs relate to unproductive labour, which is why they are found on the Loss side of the Profit and Loss Account. Whatever the case, realised value added has the advantage that it will always be the sum of the compensation paid to workers, plus gross profit, plus taxes on production. In short the value-added belonging to the firm before its division between capital and labour.

Note 2. On page 19 of its report BP gives its own average rate of return of 5.8%. The fact that this is adjacent to the Marxian rate of profit is purely coincidental. BP’s methodology is explained on page 295. The rates are similar because Table 13 in the article does not adjust for tax, interest and exceptionals. Were it to be adjusted for these items thus converting the gross rate of profit into the enterprise rate of profit, the Marxist rate of profit would be reduced to 4.2%, or, 5% if the oil spill contingency payment was omitted.

Note 3. Total value added of £162,284 million is 55% of the value of intermediate sales of £292,755 (columns M to AX taken from the spreadsheet attached).

Links to audited accounts for BP and Warburtons.

<https://www.bp.com/content/dam/bp/en/corporate/pdf/investors/bp-annual-report-and-form-20f-2017.pdf>

<https://beta.companieshouse.gov.uk/company/00178711/filing-history> 22nd June 2018 full filing pdf,

Brian Green, October 2018.