THE MATERIAL BASIS FOR UNDERCONSUMPTIONISM IN GENERAL AND KEYNESIANISM IN PARTICULAR.

I commented recently on an article by Michael Roberts: "Post Keynesianism: the principles" https://wordpress.com/read/feeds/313842/posts/3307057096 This article elaborates on the importance of viewing consumption both as productive consumption (investment) and unproductive (personal) consumption. This requires we analyze both Gross Value Added (GDP) as well as Gross Output. In other words to re-insert that which is omitted - circulating capital.

Gross Output can be found on the BEA Interactive Site under the section "GDP-by-industry". It is very welcome to see GO being analyzed more frequently by Marxists. Gross Output is essentially the price of all the sales found in an economy. This consists of both final sales plus intermediate sales otherwise known as inputs. Final sales are those sales where a product has been fully worked up and its use is consumed by the buyer. Intermediate sales are those sales used as inputs to complete another product, for example, raw and auxiliary materials, power, parts, sub-components and components. GDP is based on final sales.

I have attached two spreadsheets, one of which provides data from 2012 to 2019 for gross output, intermediate sales and final sales. For example, the Gross Output for Private Industries in the USA was $33.7 trillion, intermediate sales were $14.9 trillion and final sales were $18.8 trillion. The GDP for private industry is the value of the final sales adjusted for inventory which in this case is $18.8 trillion.

The reader will find that I have also included adjustments for imputed rents for owner occupiers and I.P. investment. Here the BEA pretends owners of residential properties pay themselves a rent as though they were also a landlord. They do so by inventing a fictitious sale. Of course it is nonsense distorting the data. I have shown how it boosts PCE as a share of GDP and how it slows down the rate of turnover.

It is also important to note that both gross output and gross value added derive from Volume 2 of Das Kapital where Marx for the first time deploys input-output tables in the chapters on Reproduction and where for the first time he reveals that the value of the final sale embodies not only the value of the workers finishing off the product, but the value contributed by workers in earlier stages of production. In other words the final sale embodies the value expressed throughout the chain of production.

This will become clear in the simple example I have set out below.

Table 1.

producer	Inputs used	+ Value added	= Value of sale (GO)
(1)	**(2)**	**(3)**	**(4)**
Farmer	0	10	10
Miller	10	10	20
Baker	20	10	30
Bread Stall	30	10	**40 (final)**
TOTALS	**60**	**40**	**100**

Here we have four producers and four sales. We assume that the farmer is organic and does not use pesticides nor fertilizers so there are 0 inputs used. Each producer expends 10 units of labour. The result is that the farmer sells his or her grain for 10, the miller buys the grain for 10 and through grinding the

grain sells the milled grain for 20 to the baker who uses it to bake bread before selling it for 30 to the stallholder who sells it for 40 to the final customer. Intermediate sales column (2) adds up to 60 and the final sale adds up to 40 in column (3). Together they add up to gross output or the value of the total sales amounting to 100 which is found in (4). What Marx discovered and what made the system of national accounts possible, is the observation that the value of the final sale, which is the bread in red at 40 will always be equal to the value added by all the producers in the chain of production.

It also allowed me to presume that the relation between gross output and final sales would provide the formula for distilling the number of sales and therefore lay the foundation for analyzing the turnover of circulating capital. This formula had lain dormant for over 70 years. Here it is to those unfamiliar with it.

$$\frac{GO}{GVA} + \frac{(GO - GVA)}{GVA} \quad \text{or} \quad \frac{GO}{GVA} + \frac{IS}{GVA}$$

(where GO stands for gross output, GVA for Gross Value Added and IS for intermediate sales)

or in figures

$$\frac{100}{40} + \frac{(100 - 40)}{40} = 2.5 + 1.5 = 4 \qquad \frac{100}{40} + \frac{60}{40} = 2.5 + 1.5 = 4.$$

We therefore see that the figure yields the same number of turnovers, 4, as found in the table above.

Furthermore once we have solved for turnover, we are able to calculate working or circulating capital. Once again for simplicity we will use the above tables in an expanded form. We no longer assume petty commodity relations but capitalist commodity relations. Now there are capitalists and workers and so the producers' names are changed to reflect the emergence of the capitalist social relation. In all 4 companies the value produced by workers is divided into half. Half is paid in the form of wages and half is unpaid producing the profits of the owners of these corporations. The rate of exploitation is therefore 200/200 or 100%.

Table 2.

producer	Inputs used	+ Value added	= Gross Output	Wages	Profits
(1)	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**
Farmer incorporated	0	100	100	50	50
Miller incorporated	100	100	200	50	50
Baker incorporated	200	100	300	50	50
Bread Stall franchise	300	100	**400**	50	50
TOTALS	**600**	**400**	**1000**	**200**	**200**

The formulae for circulating capital, sometimes called fluid capital by Marx to distinguish it from fixed capital, and always working capital by the capitalists, are found below.

$$\frac{\text{Gross output} - \text{net surplus}}{\text{rate of turnover}} = \frac{\text{cost of gross output}}{\text{rate of turnover}} = \text{circulating capital}$$

or $$\frac{\text{intermediate sales} + \text{wages}}{\text{rate of turnover}} = \text{circulating capital}$$

In figures using Table 2.

$$\frac{1000 - 200}{4} = 200 \qquad \text{or} \qquad \frac{600 + 200}{4} = 200$$

Thus gross output of 1000 less 200 net surplus (profits) equals cost of gross output which when divided by turnover yields circulating capital of 200. In the second case, which is more familiar, inputs plus wages also equals 200. The important thing to note is that this is the average, rather than the individual, amount of working capital for that industry. If we multiply this 200 times 4 we arrive at the cost of gross output, therefore the total capital laid out of 800. This 800 is for a single period of turnover, the time taken to grow the grain to the moment when the bread is sold. (The spreadsheet provides a calculation of working capital in the real world.) This is as far as we can go with this simple vertical example.

The System of National Accounts (SNA).

Unlike the example above the BEA aggregates countless millions of sales per industry over a set period of time. Generally the period is quarterly or annually. Clearly, the longer the period of time elapsed, the bigger the value of Gross Output and Gross Value added. For goods production in the USA the turnovers per year were 3.82 in 2019. (Because of the incorrect treatment of Intellectual Property it is about 10% higher than this.) 3.82 yields a turnover period of 95 or +-85 days after adjusting for I.P.. That is the period which begins when the employer purchases the factors of production before putting them to work, and which ends when they are paid for the resulting sold output. Marx was not alone in observing this critical period. *"In other words, the working capital cycle (calculated in days) is the time duration between buying goods to manufacture products and generation of cash revenue on selling the products."* https://efinancemanagement.com/working-capital-financing/working-capital-cycle Any competent accountant realises how crucial the management of working capital is and why the solvency of their firm depends on its adequacy. It is the inadequacy of working capital, more so than any other factor, that is responsible for bankrupting firms.

How accurate is the above data for the cycle or circuit above. It can be verified by empirical data. The inventory to sales ratio data provided by FRED or the BEA is about 1.4 months yielding a period of 43 days and an annual turnover rate of 8.5. The inventory cycle is really the production period to which must be added the circulation period, i.e. how long it takes to convert that inventory into cash. The average payment period in 2019 was estimated to be between 37 and 41 days. Together this gives a turnover period of +-82 days or within 10% of the rate yielded by the adjusted formula. This is a satisfactory result. It is also the reason I use this rate of turnover as the representative rate for the economy.

(Different sources give different payment periods but here are two worth looking into.) https://fastpayltd.co.uk/blog/average-debtor-days-company-compare/
https://group.atradius.com/publications/payment-practices-barometer-usmca-2019.html

The alert reader may ask, but does the circuit of capital not begin with a purchase and end with a sale? This is true from the vantage of the individual capitalist. But when dealing with aggregated data, it means there is always a corresponding sale for every purchase. Thus the use of sales to estimate GDP as well as the formula, is correct.

With that out of the way we can now turn to national data to review the way we examine both investment and consumption.

Adjusting consumption.

We can look at the National Accounts in two ways, by turnover period or by calendar year. The advantage of looking at it by period is that it illuminates the role of circulating capital more graphically. In effect all that happens when scaling up to a calendar year is the statistical bureaus unconsciously add up periods to complete the year. In our case the value generated in each period of around 85 days is scaled up 4.2 times to make 365 days. In the case of total private industry where the unadjusted period is 140 days because of duplications, the scaling up is 2.6 times. We will begin by examining Private Industry warts and all, and later move on to non-financial corporations and domestic industry. (The Spreadsheet 'CONSUMPTION INVESTMENT SHARE OF GO AND GVA' relates to Private Industry).

Thus if we look at the per period on the spreadsheet we find:

Table 1. (millions of dollars per period)

	2012	2013	2014	2015	2016	2017	2018	2019
(1) GROSS OUTPUT	9642.1	9997.6	10449.7	11001.2	11359.2	11843.6	12483.7	13025.7
(2) G.V.A.	5246.8	5423.0	5643.5	6103.5	6358.2	6593.0	6905.1	7257.6
(3) CIRCULATING CAPITAL	7650.8	7972.2	8326.3	8772.4	9112.4	9572.4	10180.7	10617.0
(4) C.C. SHARE OF G.V.A.	146%	147%	148%	144%	143%	145%	147%	146%
(5) C.C. SHARE OF PCE	173.6%	175.0%	175.6%	171.1%	170.6%	172.8%	175.5%	174.2%

(GVA = gross value added, GO = gross output, C.C. = circulating capital, PCE = personal consumption expenditures.)

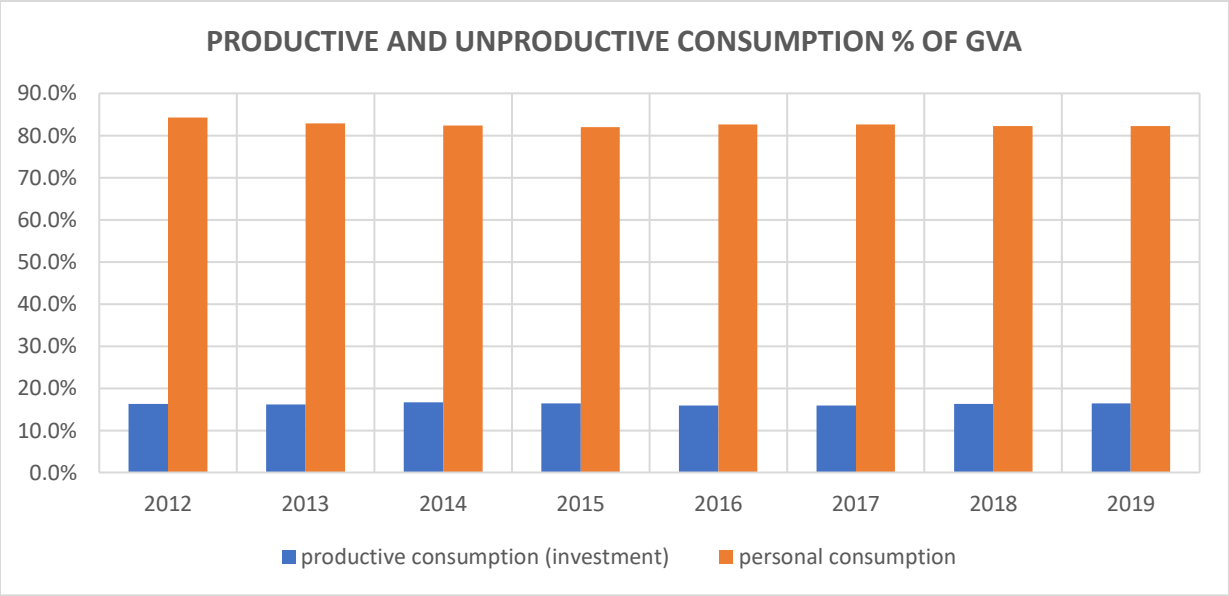
There are two vital observations. Firstly that circulating capital exceeds GVA by around 46% on average. Secondly, that when we isolate the element of personal consumption (PCE) amounting to about 84% of GVA, circulating capital turns out to be over 70% bigger. Circulating capital represents productive consumption. That is to say it has to be replenished each time, otherwise reproduction breaks down. This is what Marx meant when he said capital is thrown back into production and not withdrawn. The opposite happens with unproductive consumption (PCEs) where products are withdrawn from production in order to be privately consumed by capitalists and workers alike.

We thus see above that productive consumption, or the continuous reinvestment on which reproduction depends, exceeds personal consumption by 70%. Thus if we address the issue of consumption and in particular under-consumption, then it is clear that the dominant factor by weight, is circulating capital. When we address production we always mean reproduction. There is no such thing as immaculate production, that is production springing from a wonderous nowhere.

Recessions imply the fracturing of reproduction and that means the failure of circulating capital to be replenished. That causation is closely tied to the movement in the rate of profit which will be discussed in the final section.

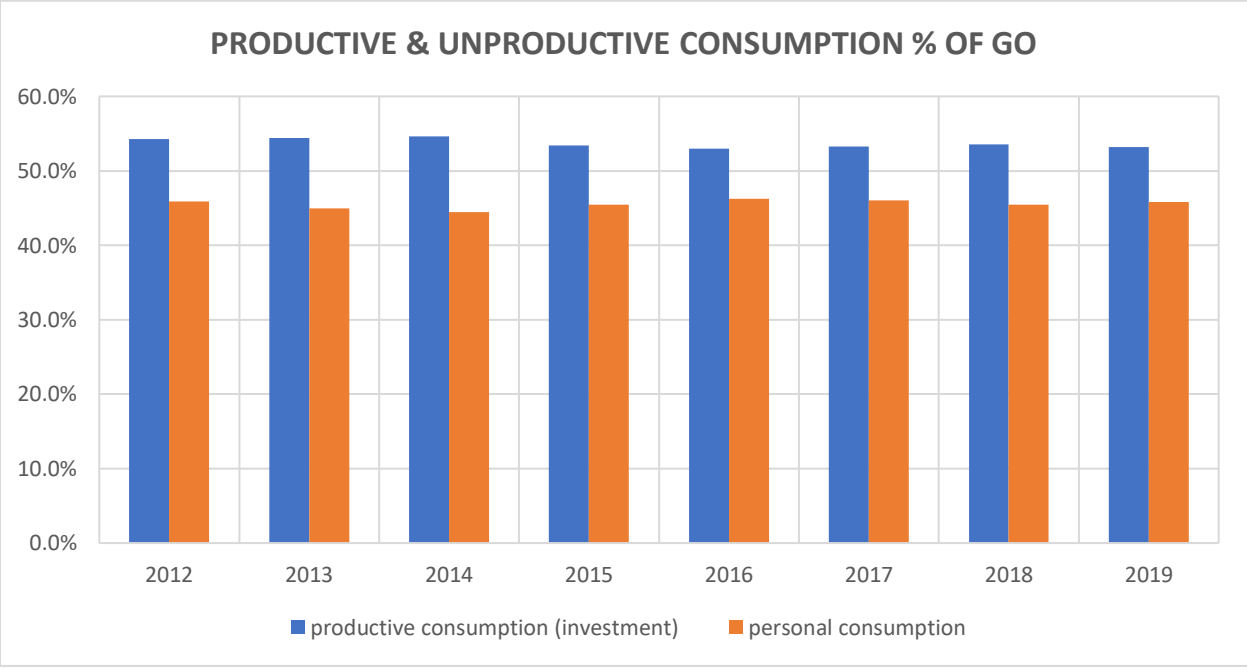
Even when we scale up to a calendar year productive consumption continues to exceed personal consumption. Using the regular calendar year data we can simplify the assumptions. The data shows that GDP is divided up 84% for PCEs and 16% for fixed investment. Thus as Graph 1 shows, when limiting investment to fixed capital by focusing only on GDP, PCEs far outweigh investment because circulating capital is ignored.

Graph 1.



But when we compare PCEs as a share of GO which includes circulating capital the roles are reversed. Now it is productive consumption or investment which dominates.

Graph 2.



Why the infatuation with GDP or GVA instead of GO. The answer is that GDP, being limited to final sales only, records the unduplicated value added by workers during the course of a year. This pool of value then forms the stream of national income and its tributaries - profits, rents, interest, wages and taxes. In turn this national income or net value added is evaluated in terms of outcome, how much is consumed and how much is invested. Now this form of investment can take only one form, final use investment, or fixed

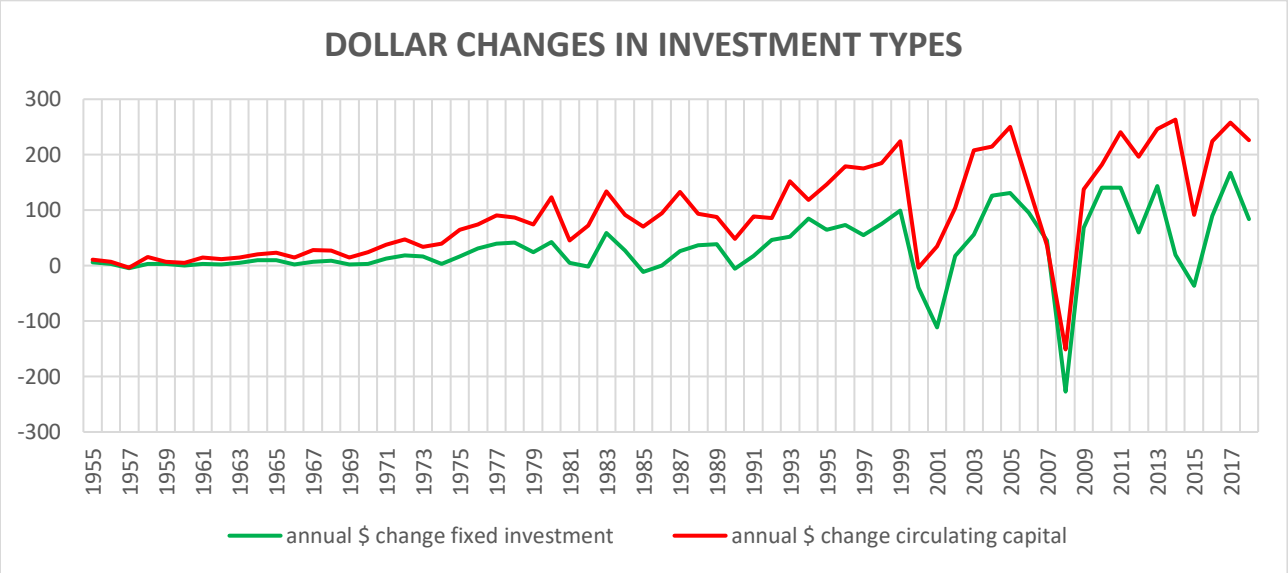
investment. In short, only those means of production, not in their intermediate form, but only in their final form can be recognised because GDP is composed only of final sales. Means of production no longer being worked up and therefore sold on.

Thus GDP cannot recognise circulating capital. This does not mean circulating capital does not affect GDP. It does. Generally a growth in circulating capital represents an expansion in production, and everything else being equal, this will lead to a growth in final sales and therefore nominal GDP. In short investment both fixed and circulating are the drivers of GDP. Conversely, a collapse in circulating capital is associated with a shrinkage of GDP.

In Graph 3 we see the absolute relationship in the growth and contraction of circulating and fixed capital. This data is taken from the non-financial corporate sector. Though circulating capital is less than one third the size of the stock of fixed capital in this sector, when looked at as flows, it is more volatile than fixed investment. The height of the peaks to the fall in the troughs exceeds that of fixed investment. More often than not peaks and troughs align when viewed on an annual basis though not necessarily in a quarterly basis. But that is for another time. (Spreadsheet: 'GRAPH $ CHANGE IN INVESTMENT BY TYPE')

Importantly, the increase in circulating capital accelerates into the pinnacle of the industrial (business cycle) and then falls precipitously as the phase of forced production collapses into the phase of recession. This ultimate acceleration consists of two parts, rapidly expanding production but also and latterly, a slowdown in turnover and therefore an elongation of the period of production-circulation as payments slow down.

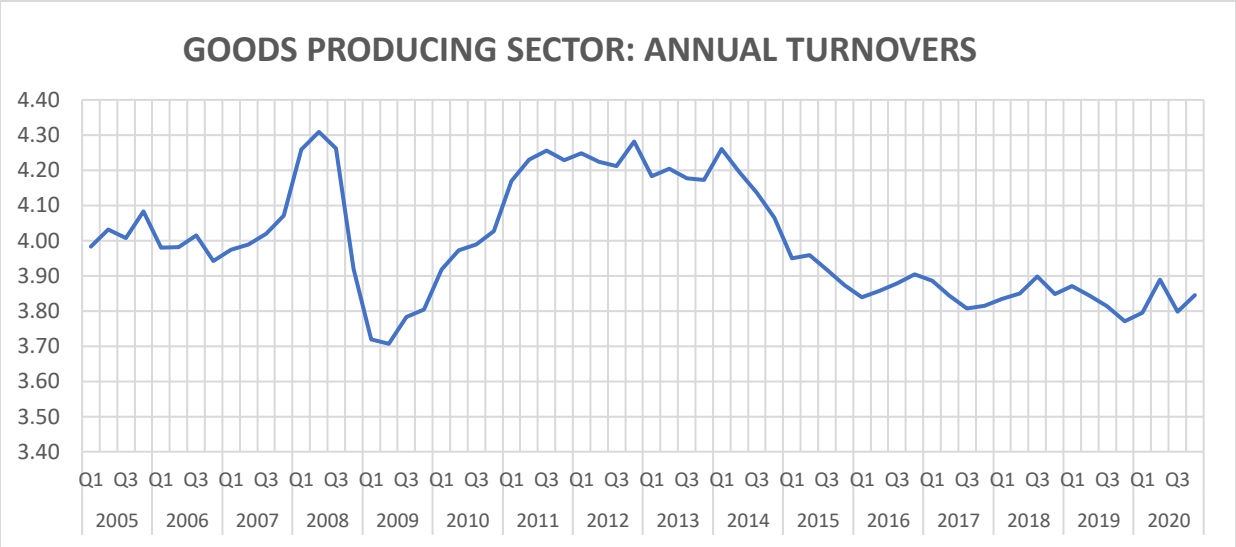
Graph 3.



(See spreadsheet 'GRAPH $ CHANGE IN INVESTMENT')

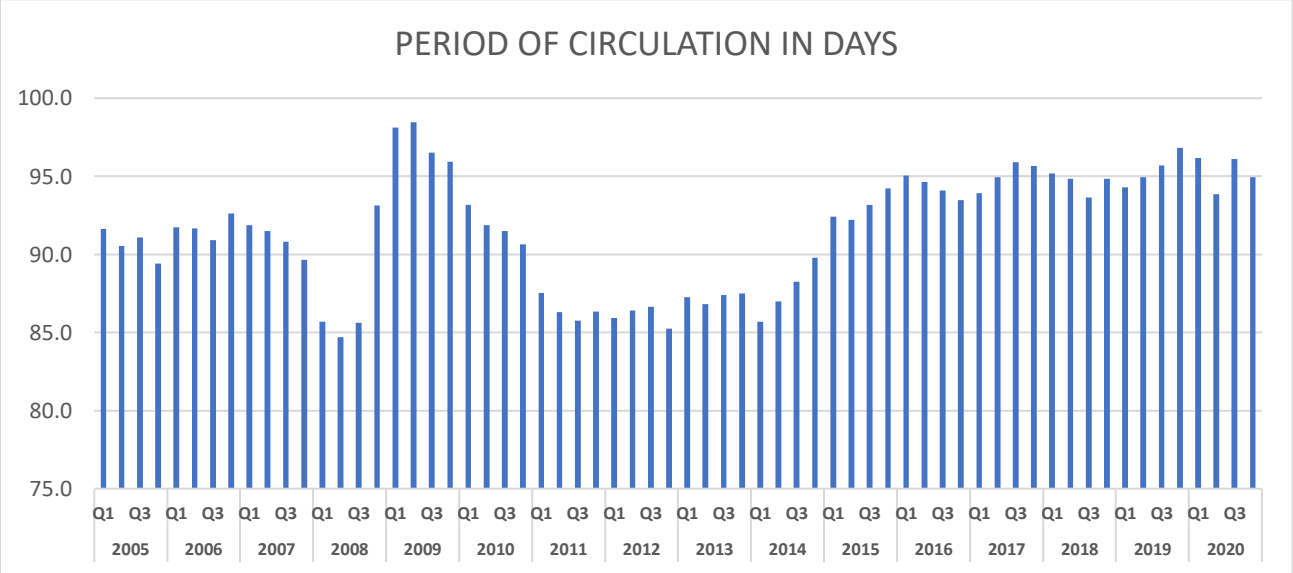
This slowdown in the rate of turnover can be seen in the graph below. We see how the rate of turnover accelerates into 2008 and then it collapses. It recovers up to 2014 and then it enters into a longer-term decline which incidentally is linked to the fall in the rate of profit since 2014. This is repeated in all the major economies. Importantly, the move from accelerating to sharply decelerating turnovers significantly raises the requirement for more working capital, and this marks the moment when the chain of credit shatters restoring money's primary role as the means of circulation. Cash on delivery, no more credit!

Graph 4.



This snapping of the chain of credit is better seen when we look at turnover as a period measured by days as the next graph shows. We note how the period increases as the crises breaks out in the second half of 2008 reaching its pinnacle in Q2 of 2009 at which point an additional 14 days or 2 weeks of working capital for a given output is needed. Only when turnover begins to accelerate and the period contracts, as happens from 2010 onwards, does the recovery in the economy proceed. This is also associated with quicker payments as liquidity improves with the return of profitability.

Graph 5.



The intricate dance between fixed capital and circulating capital.

In a comment I made on Michael Robert's blog I used the analogy of a circular highway to contrast the view of GVA and GO. I said that GVA was the equivalent of only counting the cars on the off ramps of the highways. The ones destined for final consumption. The cars on the highway itself were not being counted.

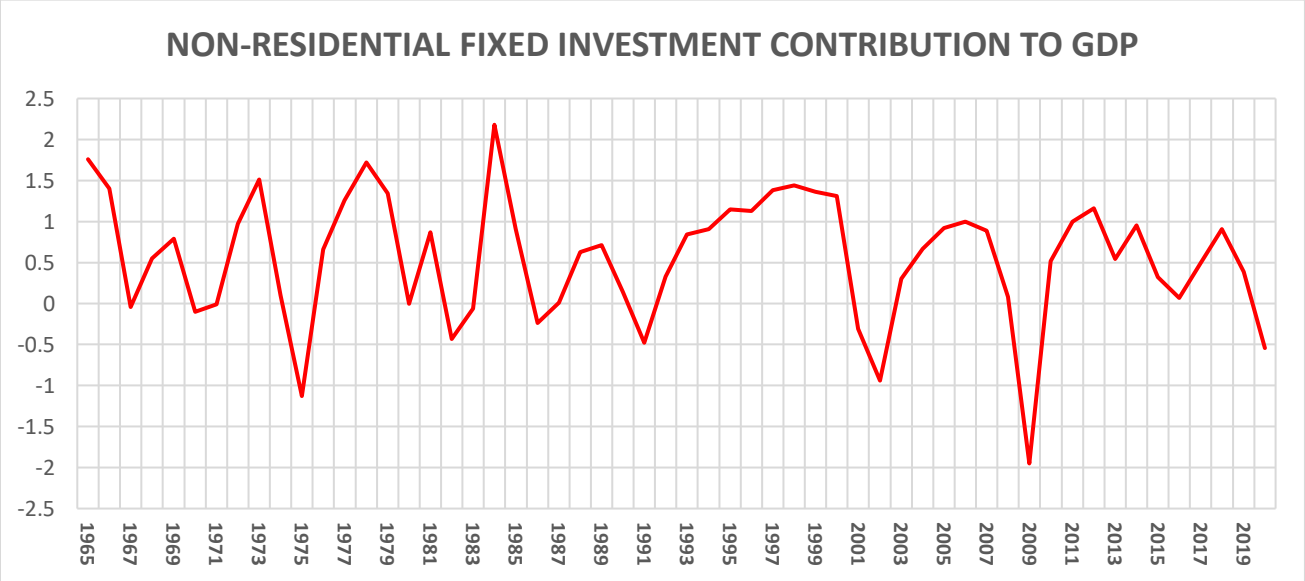
Strictly speaking I should have said these cars were circuiting in various stages of completion as they represented intermediate sales. And while the off ramps are in a specific country, the highway itself spans the globe. The under-consumptionists and Keynesians however are obsessed by the off ramps. They completely ignore the highway itself. They concern themselves only with that which is withdrawn from production and not that which is thrown back into production.

Now it is true that should a number of off ramps be closed so that cars can no longer exit in previous numbers, then grid lock would occur, forcing production to grind to a halt. This could happen if PCE reduces, or fixed investment falls, so that articles of consumption and or means of production pile up. In this case there would be an involuntary deceleration in circulating capital.

It is equally true to say that the speed at which cars, both partly and fully assembled, circulate and reach the off ramp is dictated by the pace of circulating capital during the entirety of the industrial cycle. Any slowdown in this circulation would inhibit the number of cars reaching the off ramps in any given period. The question is, how does the off ramp relate to the highway, how does the movement of fixed capital affect the movement of circulating capital.

There is an intimate relationship between these two forms of capital. The acceleration in the rate of turnover which affects circulating capital is a function of fixed investment. Here we think of investment in new techniques of production which speed up production, as well as more efficient logistics and communications. All of this minimises the period of production and circulation. The obverse also needs addressing. Will a fall in fixed investment have the opposite result, that is slow the rate of turnover and elongate the period of circulation. The answer is yes, but only indirectly, as we will see. Graph 6 will be used to explain why this is so by addressing the factor which usually inhibits fixed investment.

Graph 6.



(Source NIPA Table 1.1.2. Contributions to Percent Change in Real Gross Domestic Product)

That factor is the rate of profit. But not only the rate of profit, but the relative and the absolute fall in the rate. When addressing the relative rate of profit, we focus on the rise in the technical composition of capital. Its rise causes the rate of profit to fall, not because profits are falling, but because the point has

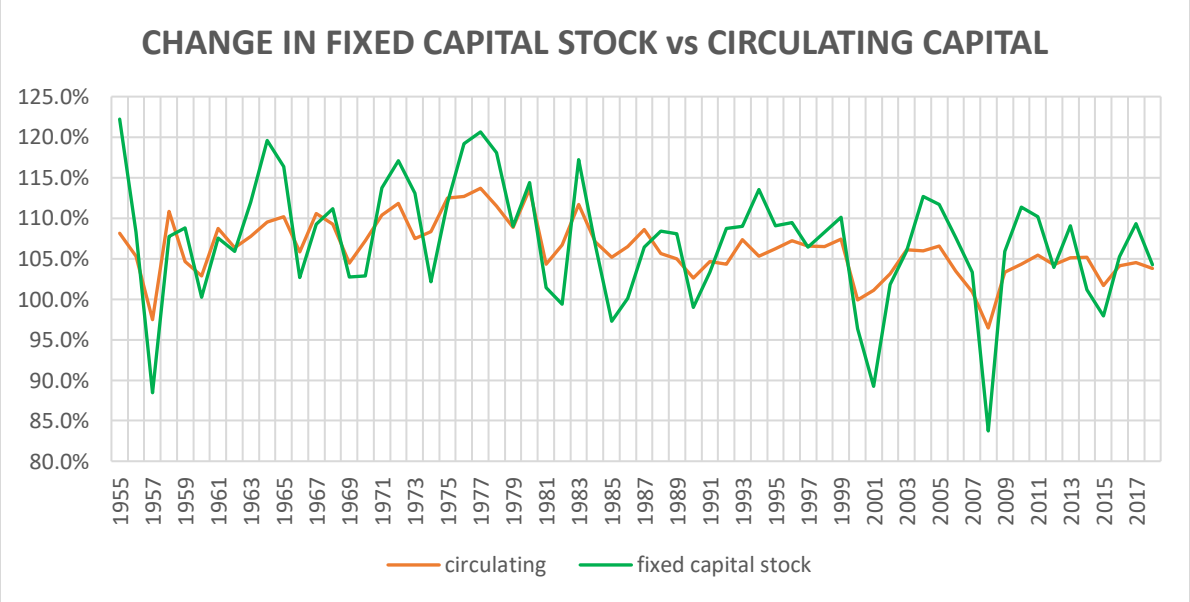
been reached where they are rising more slowly relative to the rise in fixed capital (constant capital). We therefore have a rising mass of profits associated with a falling rate of profit, i.e. the fall is only relative.

However, this fall is most acute in the highest composition capitals. For that reason it becomes less profitable to invest in new production there leading to a tapering of investment and even rationalisation. Consequently, there is a fall in overall demand as investment is curtailed first here then there. This is what Graph 6 shows. It shows that 12 to 18 months before recessions the rate of fixed investment falls. It falls as a share of final consumption. This happened in 1969 before the 1970 mini-recession, again in 1973 before the 1974 global recession. Jumping forward this was the case in 2000 prior to the 2001 recession and finally 2006 before the 2008 financial crash. The low points are recessions where investment becomes negative. (As this is a contribution to GDP, therefore an absolute figure, it is not diminished relatively by the growth of PCEs.) This graph was chosen because it is based on final sales, the off ramp.

This fall in fixed investment and its effect on demand, impacts circulating capital which is after all fluid. We have seen how the periods elongate in Graph 5 beginning with the 3rd quarter in 2008 rising to a peak a year later in 2009. Now, any elongation of the period of circulation, mainly due to delayed payments, requires more working capital to ensure liquidity. It also extends the period between unpaid labour being produced and its conversion into profits. A crisis in the realisation of profits breaks out which is really a crisis of circulation. This is the point when the rate of profit transitions from a relative fall into an absolute fall because the mass of profits is now falling.

This crisis of profitability is resolved inter alia by a fall in the value of capital over which profits are measured. Firstly, circulating capital falls as a result of a reduction in the workforce and inventories offsetting the deceleration in turnover. Secondly, not only does fixed investment fall, but there is the actual write downs and write offs of the existing constant capital. These write downs and write offs result in a greater dollar contraction in fixed capital than is achieved by the diminution of circulating capital as Graph 7 below shows.

Graph 7.

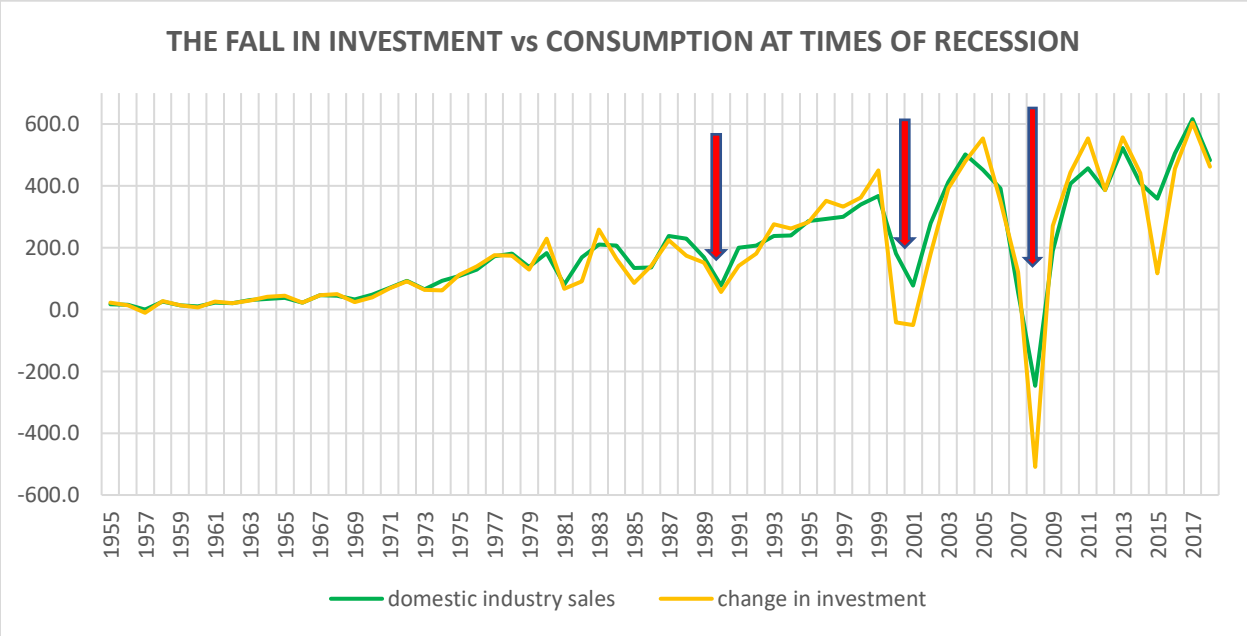


(Table 4.1 for fixed assets, KLEMS and Table 1.14 for circulating capital)

The coup de grâce

It is now time to bring all the analyses together. The final graph seeks to use the broadest brush. It is based on Domestic Industry and no longer on the non-financial corporate sector. Broader than this is impractical. We cannot use Personal Consumption Expenditures for this exercise because it is littered with imputed purchases such as owner-occupied rents. In order to compare like with like, circulating capital has been scaled up using Table 1.14 to factor in the share of corporate business falling to non-financial and then Table 1.13 is used to factor for corporate business as a share of total domestic industry. (Non-financial corporate is about two thirds of Domestic Industry measured by GVA.) Thus, circulating capital is brought in line with fixed asset investment in Table 4.1 for domestic industry and domestic industry sales found in Table 5.8.5B. The result is Graph 8 below.

Graph 8.



The change in investment above is made up of changes to circulating capital plus changes to gross fixed investment. Prior to the last three recessions, 1990, 2001 and 2008, investment rose higher then fell further than did changes to final sales for domestic industry. In 2001 investment from peak to trough fell by $508 billion vs $296 billion in sales and in 2008 investment contracted by $1062 billion vs $750 billion in sales. This graph demonstrates once and for all, that changes to productive consumption (investment) eclipses changes to unproductive consumption in accounting for the movement in GDP.

Incidentally, I would like to point to 2015. Readers familiar with this site know that I refer to the final quarter of 2015 and the first of 2016 as the pseudo recession, the recession that should have been, but did not, because of the supportive monetary policies executed by the FED. Investment at the time fell by $450 billion, lending further weight to the view that the economy had escaped recession by the skin of its teeth.

Conclusion.

For decades circulating capital has been ignored because it was felt to be elusive due to the "impossibility" of estimating turnover rates and periods. Those days are behind us. We need no longer tackle the issue of under-consumption with one hand tied behind our backs. Consumption implies both productive and unproductive consumption, and productive consumption is both the investment in circulating as well as in fixed capital.

It is in the realm of circulating capital that capitalists meet their nemesis in the form of insolvency or illiquidity. Both are the result of fixed asset investment decisions, the one within the firm the other without. In the case of insolvency this tends to follow from a failure to invest internally resulting in uncompetitive cost prices eroding or even eliminating profit margins. In the case of illiquidity this tends to result from a fall in investment in the rest of the economy weakening demand, thereby delaying or cancelling sales and depreciating prices.

In the realm of circulating or working capital, no one argues that profits are not key. Losses mean working capital cannot be renewed while the absence of profits means working capital cannot be expanded. Which is why capitalists are forced under these stringent conditions to reduce their working capital, or as they see it, their bloated inventories. And when that happens production has to be reduced or slowed down.

Finally, without the dynamic between fixed capital and circulating capital being understood the process of financial crisis and recession cannot be fully described. The fall in fixed capital is amplified by the deceleration in circulating capital it brings about, and it is this combination and only this combination, which leads to recession.

Generally this process is aggravated by spiking interest rates as circulation slows prompting a desperate search for additional money capital. But by suppressing interest rates, as central banks did in 2015/16, most companies were spared a liquidity crisis. Once again, without attention on circulating capital, the effect of interest rate policies by central banks cannot be measured.

It is by looking at capital in its entirety that the full force of profitability is understood. The fragmented view afforded by only examining fixed capital is inadequate. This article has shown how it can be done. Profit is the motive of capitalist production and the rate of profit both its measure and compass. The Keynesians who pay lip service to profitability or wilfully ignore it, show they are nothing more than Mayflies dancing on the surface of the water but never able to move beyond the surface tension. It is time to go on the offensive. The data has shown that all of Marx's hypothesis were accurate and true. It is truly a remarkable and effervescent sight.

The context for this article is the trillions of dollars in COVID relief funds pumped into the world economy which has boosted demand and supported the view that economies can be stimulated, and profitability restored by state action. I intend to write a future article on MMT once 1st quarter profits are in. It is already clear that a wave of inflation is about to hit every shore and store despite the presence of excess capacity (current capacity utilisation is under 74% and employment is down at least 8 million workers).

The surge before the ebb.

Brian Green. 2nd May 2020.