

The Rate of Profit

Introduction: definitional issues

The rate of profit per year is defined as profits (an annual flow) divided by capital advanced (a cumulated stock of past investments). While the definition seems precise, there is a great deal of ambiguity over what to include. The numerator, profits, can conceptually be considered as anything from all net output that is not wages to a narrow accounting definition of what remains after all obligations have been met. As regards the denominator, Marx included wages, because wages were payment for labour-power which was subsequently consumed in the labour process as actual labour performed. In reality, wages are typically paid in arrears as workers are compelled to extend credit to capitalists, and (along with circulating means of production) are small relative to the stock of fixed capital. So the denominator, capital advanced, is conventionally a measure of money tied up in fixed assets and inventories. What definition is appropriate is ultimately dependent on the purpose of the analysis for which it is required.

As a measure of the return to capital advanced, the rate of profit is a crucial statistic for a mode of production based on profitability. Competition will tend to equalise all rates of profit through capital flows from less to more profitable activities but, at any point in time there will be a range of individual profit rates dispersed around such a notional equalised rate. In contrast, the aggregate or macroeconomic rate of profit for the economy as a whole is a weighted average of individual rates of profit (the weights being the proportions of capital advanced by each individual firm to the total capital advanced in the economy, both evaluated at the prevailing prices). It is most

easily measured as the proportion of net output not returned as wages to the aggregate fixed capital stock. Since this macroeconomic rate of profit is a measure at any point in time of how profitable all firms are relative to the total fixed capital stock, it can be considered as a measure of the profitability of 'capital in general', and this rate of profit is generally used in empirical work.

LTRPF in historical context

Marx's law of the tendency of the rate of profit to fall (henceforth LTRPF) is one of the most celebrated and controversial aspects of his work. It touches on what is meant by a tendential law, it presumes a particular approach to technical change, and it is closely related to his theory of crisis. Curiously, it took some time for this to be established. Crisis (whether of profitability or underconsumption or disproportionality) was originally interpreted as an expression of the contradictions of capitalism, realised through the anarchy of the market as a break or interruption in the circuits of capital. But by the end of the twentieth century, the LTRPF as the generator of crises was one of the defining features of 'orthodox' Marxism. And it was interpreted as a matter of necessity: the accumulation of capital was necessarily punctuated by crises because the LTRPF was necessarily produced by that same accumulation. Without an argument for necessity, the way was considered open for reforms of capitalism that could manage accumulation and avoid crises. So intertwined with the argument for necessity are subtexts concerning orthodoxy, fidelity to Marx, revisionism and reformism, but space precludes further consideration of these.

However, the argument for ‘necessity’ is complex. Rather than a logical deduction from a priori axioms, the Hegelian tradition interprets ‘necessity’ as something that is ‘real’. That is, a tendential law explains real patterns of capital accumulation as rational, as theoretically comprehensible, but it does not say anything about what other patterns of accumulation might be possible. A major difficulty in the arguments about the LTRPF is a lack of clarity in the distinction between necessity in this Hegelian sense, and necessity as a logical deduction, and this lack of clarity is a recurrent theme in what follows.

The idea of a falling rate of profit was not specific to Marx. It was commonplace in the political economy of the first half of the nineteenth century, deriving from the work of Smith and Ricardo. For Ricardo, the rate of profit would fall because of diminishing returns to land and an unchanging technology of production. As cultivation spread to land of inferior quality, landlords of better quality land could extract more rent; with wages given by subsistence requirements, profits would therefore be squeezed until the incentive for accumulation disappeared entirely, and the economy entered a stationary state. Marx replaced the ‘natural’ determinants of rent (diminishing returns), wages (biological subsistence) and profits (a residual) with social determinants (including organisations of labour processes in industrial production that generated productivity increase). In so doing, he replaced the Ricardian vision of falling profitability and long-run stagnation with a different vision of profitability that depended not on stagnationist tendencies but on the dynamism and technical progressivity of capital accumulation.

LTRPF: the issues

Expositions of the LTRPF occur in a number of different frameworks, but there are two positions that between them embrace most of the arguments. What they have in common is an interpretation that Marx considered that the rate of profit would indeed actually fall (but see Reuten 2004). What divides them is their assessment of the cogency of what they see as his argument.

One position (sometimes dubbed ‘fundamentalist’) argues that the LTRPF is an empirical law generated by technical change; the rate of profit is ‘really’ falling, and should the empirical evidence show the contrary, then either there is something wrong with the measurement of what is shown, or this contrary evidence is but a temporary deviation from the long-run trend. The opposite extreme (sometimes dubbed ‘Sraffian’ or neo-Ricardian) argues on the basis of the individual behaviour of profit-maximising capitalists that Marx was wrong in his argument that the rate of profit would fall. If it falls, it cannot do so for the technical change reasons that Marx gave, but only in response to wages rising more than in proportion to productivity. So, in the extreme case of a constant real wage rate, the fundamentalist position is that the rate of profit *must* fall because of technical change, and the Sraffian position is that the rate of profit *cannot* fall in the presence of technical change..

These two positions frame much of the debate, but they are both misleading. The approach taken here will emerge out of consideration of five issues.

1. The nature of technical change: individual capitalists innovate in order to out-compete their rivals. Innovations increase labour productivity through reorganisations of the labour process that increase the means of production per

worker. The innovating capitalist will therefore be able to sell at a lower value and take extra market share. What is the adequacy of this description of innovation?

2. Innovation and the rate of profit: how does innovation impact on the rate of profit? How should the fundamentalist and the Sraffian arguments be assessed?
3. Profitability and crisis: does a falling rate of profit lead to crisis?
4. Measurement: how should the variables in the argument be measured (in labour values or in prices, and if the latter, then which)?
5. Empirical analyses: what is the empirical time-path of the rate of profit?

Issue 1: the nature of technical change

Why does technical change *have* to involve the substitution of non-labour for labour inputs? Profit-maximising capitalists are interested in any viable cost reductions, so that it is hard to see why labour costs should be privileged over non-labour costs. But putting the matter like this rests on a confusion between the two senses of ‘necessity’ mentioned earlier. As a matter of logic, no costs are privileged. Yet historical development has indeed seen a fall in the proportion of production labour costs to total costs, and this historical development has to be theoretically comprehended.

Were other types of technical change to occur in historically significant manner, they too would have to be theoretically comprehended. This immediately raises the challenge of how to understand contemporary technical change in the service sector, in which many outputs are inseparable from the labouring activity that produces them. This strongly suggests that there is a historical specificity to Marx’s own explanation,

in which the cotton industry was particularly important, and that later developments in capitalism require his method rather than his specific answers.

Issue 2: innovation and the rate of profit

A common ('fundamentalist') argument runs as follows. Competition will force the generalisation of an innovation across all capitalists, so that in the aggregate, the value of capital advanced rises. Since constant capital (in the denominator) can in principle rise without limit, but surplus value (in the numerator) is bounded (absolute surplus value by the length of the working day, and relative surplus value because the value of labour-power cannot go to zero), then the rate of profit must necessarily fall.

There are a number of difficulties with this. First, there are counteracting tendencies to the LTRPF. Marx identified five: raising the rate of exploitation, cheapening the elements of constant capital, depressing wages below the value of labour-power, relative overpopulation and foreign trade. The last three are somewhat eclectic, and the list could be added to with little difficulty. The problem rather lies with the first two, for it is not obvious why they are 'counteracting', since they are intrinsic to the processes that produce the LTRPF. This in turn raises the more general question of what is a tendency and what is a counteracting tendency.

One way this can be understood is to focus on the circuit of capital as an organising category. The process of production converts productive capital into commodity capital of greater value. The values that prevail are the values of the productive capital, that is, the pre-production process values. Only when post-production process outputs are sold are new values realised. So changes in values (falls in the value of

labour-power raising the rate of surplus-value, and/or cheapening the elements of constant capital) are counteracting because they require the impact of circulation for their establishment. What is fundamental is the change in labour productivity, a process that is prior to the consequent changes in values. This locates the LTRPF, not as an empirical fact, but as a tendency of the production process considered abstractly, before the effects of circulation are considered. It identifies the LTRPF and its counteracting tendencies as a way of organising thinking about how the rate of profit is formed in reality through the structures and processes of capital accumulation. An analogy sometimes used is the law of gravity: everything tends to fall to the ground. There are counteracting tendencies such that, for example, people and buildings stay upright, but the processes that give rise to these cannot be understood except on the prior basis of the law of gravity.

This same approach explains movements in the compositions of capital. For Marx, it was definitionally true that the only way to gain productivity increases on given commodities was to increase the mass of means of production per worker. He called this ratio the “technical composition of capital” (TCC), and, given his definition of innovation, the TCC must rise over time. But in value terms matters are more complicated, because the translation of a rise in a ratio theoretically denominated in use-values to one denominated in values depends on how the patterns of (productivity-enhancing) innovation reduce unit values. This clearly affects the conversion of the TCC into a value ratio. One way to proceed is to abstract from the effects of productivity increases on values. Then the TCC becomes, in Marx’s terminology, the “organic composition of capital” (OCC), a ratio of constant to variable capital at pre-production process values, and if the TCC rises, the OCC must

necessarily rise. Allowing feedback effects of the fall in values resulting from productivity increases converts the OCC into the “value composition of capital” (VCC). Marx successfully formulated the difference between the OCC and the VCC, but asserted that as the OCC rose, the VCC would also necessarily rise, if not by as much. The pattern of productivity increases and the consequent falls in unit values are contingent, so that movements in the VCC can diverge from movements in the OCC. In general, one would expect the two to move together. But empirical actuality and logical necessity are not the same, and the interpretation of Marx’s assertion depends on which sense of ‘necessity’ is used.

The OCC is measured in pre-production values, and hence is the index that pertains to the process of production itself. The VCC allows for the feedback of circulation and the establishment of new values. Hence the OCC is relevant to the LTRPF and the VCC to the counteracting tendencies. Overall then, the issue is not one of the simultaneous consideration of a multiplicity of different factors that impinge on the quantitative determination of the rate of profit. It rather concerns the sequential order of determinations at successively lower levels of abstraction to make sense of a complex yet determined concrete reality (Fine 1992).

A further difficulty with the effect of innovation upon profitability is commonly encountered in the Sraffian literature. Suppose the real wage is constant. Why would innovation take place at all, if it results in lower profits after the innovation is generalised? One appealing response is to say that competition forces the issue; each individual capitalist innovates to obtain a temporary advantage, but the actions of all, taken together, produce a fall in the rate of profit, behind the backs, as it were, of each

individual capital. This argument is, however appealing, logically incorrect. The Okishio theorem shows that, provided the real wage is constant, the overall outcome after the innovation is generalised cannot lower the rate of profit (Roemer 1981). This result depends upon the specification of a linear technology, a particular notion of competition, and an equilibrium methodology establishing prices of production that support an equalised rate of profit. Then whatever are the new equilibrium prices consequent upon a technical change, the (equalised) rate of profit can be no lower than the (equalised) rate of profit that obtained prior to the innovation, as long as the real wage is constant. In this approach, the only way to guarantee a fall in the rate of profit is through a rising real wage rate; then labour-saving technical change might be considered a counteracting tendency (Himmelweit 1974).

As an exercise in the comparative statics of equilibrium prices, the Okishio theorem is well-established. But its relevance to the LTRPF is controversial for three reasons. First, methodologically, its simultaneous equation approach is different from Marx's sequential successive determinations approach, and this requires some caution in identifying causality. Secondly, as a matter of logic, to assume a constant real wage (an unchanging basket of use-values) is quite different from assuming a constant value of labour-power (an unchanging amount of social labour time represented by what workers receive for the sale of their labour-power). Thirdly, and empirically, the theorem fails accurately to reflect historical patterns of both competition and capital accumulation. The typical historical pattern of accumulation and technical change exhibits rising labour productivity, rising compositions of capital, falls in the value of labour-power, rises in the rate of exploitation and rises in the real wage. Assuming a

constant real wage means that all the gains of technical change accrue to capital, and historically this is just not true.

Issue 3: profitability and crisis

It is not obvious why a falling rate of profit should in and of itself lead to crisis. Forward-looking competing capitals will try to do the best they can whatever the prevailing conditions of general profitability. If the general rate of profit falls to 5% from 10%, say, then nothing is implied, other than that less money can be made today than yesterday. For this to result in an interruption in the circuit of capital (through for example cash-flow problems creating difficulties in meeting obligations such as servicing past debt), more information is required on how firms have financed their past and current activities. And different methods of financing are historically contingent: sometimes they will lead to crisis and sometimes they will not. Hence falling profitability alone will not result in crisis; greater specificity and more detail (at lower levels of abstraction) are required in order to show whether and how crisis occurs.

Issue 4: measurement

In Marx's theory of value, at the level of capital in general, commodities are denominated in money, formed out of the ratio of the value of the commodity in question to the value of money. Marx generally took the latter to be gold with an assumed value of unity, so that the value of a commodity was the same numerically whether measured in units of socially necessary labour time or in units of money. Prices thus formed ('direct' prices or 'simple' prices) are incompatible with the formation of a general rate of profit through flows of capital in competition. So the

notion of a value rate of profit (as the ratio of surplus value to constant capital, both measured in units of socially necessary labour time) is not logically coherent, unless two conditions hold. First, profits are equal to surplus value divided by the value of money, and second, the sum of the money invested in non-labour inputs is equal to the sum of those nonlabour inputs measured in units of socially necessary labour time divided by the value of money. In general, these two conditions cannot both hold.

This problematises the significance of the value rate of profit.

One response is to assert the irrelevance of value analysis to economic analysis and to propose an analysis based entirely on prices. In the Sraffian approach, labour values are indeed unnecessary, and arguments such as the Okishio theorem proceed as expositions of the implications of price of production equilibria. What is lost from this excision of the labour theory of value is any notion that total value added represents total labour-time expended. The labour theory of value is thereby mis-identified with a theory of equal exchange. A second response is to argue that the rate of profit in terms of prices is a more concrete expression of the value rate of profit. Retaining the notion of profit as unpaid labour-time then requires some account of the unequal exchange that quantitatively transforms constant capital from value terms (for some value of money) to price terms, and a precise and convincing account of this quantitative transformation has not thus far been forthcoming. A third response is to argue that this second response is misconceived. The labour theory of value requires both that aggregate value added exactly represents total social labour-time expended, and that the value of labour-power is the money wage multiplied by the value of money. Then aggregate profit exactly represents unpaid labour-time. This framework applies to any set of prices, not only the equal exchange prices necessary for the

meaningfulness of the value rate of profit, and not only the unequal exchange equilibrium prices of production necessary for the Okishio theorem. With generalised unequal exchange, unlike in the other responses, the labour theory of value retains its explanatory power in the empirical analysis of aggregate relations of production for any prices whatsoever. The higher order determinations and abstractions thereby retain their encompassing explanatory power (Foley 1986, Mohun 1994).

Issue 5: empirical analyses

The art and science of empirical work are not easy. Research must show how theory can comprehend the data. But at the same time, great care must be taken to identify any anomalies that appear to contradict the fundamental determinations of the theory. Adding immunising ad hoc explanations in the face of anomalies renders theory tautological and thereby discredits it as a theory. But neither is theory merely description of empirical reality. It is a self-determined articulation of concepts which can explain significant features of the historical processes of capital accumulation and technical change. Successful explanation is then confirmatory of the theory, but anomalies must always be interrogated to understand whether they can ultimately be understood by the theory, or whether they undermine the theory.

There has been considerable empirical work on the rate of profit through the last quarter of the twentieth century, mostly focused on the US economy because of the long runs of data that exist for the USA (for example, Weisskopf 1979, Moseley 1991, Duménil and Lévy 1993, Duménil and Lévy 2004, Mohun 2006, Mohun 2009). The first issue concerns the reliability of that data. For the US economy, productive and unproductive labour can only plausibly be estimated from 1964, and the

distinction relies upon combining rather different data sets using annual data. If the distinction is ignored, then quarterly data are available from 1948, and annual data from 1929. Prior to 1929, the data have to be drawn from a variety of sources. While aggregate annual net output and wage data are reasonable back to around 1890, the fixed capital stock data prior to 1925 are much less reliable.

Different studies are rarely directly comparable, sometimes because the time periods are different, but more generally because the data are very sensitive to different assumptions made. These include whether analysis should consider the whole economy, the corporate sector or just the manufacturing sector; whether the focus should be on the pre-tax or the post-tax rate of profit; how general government (supplying goods and services financed by taxes and debt) should be treated, and how the self-employed should be treated; whether (all, some or none of) the imputations in national accounts data should be eliminated; whether the housing stock should be included in the stock of fixed capital; and what sort of data should be used (labour values derived from input-output tables, or national accounts data, and if the latter whether at historical or replacement cost prices). Further, different studies have different aims, ranging from whether the data support some interpretation of Marx to how a Marxist approach can understand what has happened. Choices made are not arbitrary, but depend upon theoretical presuppositions, and upon what the analysis is designed to show.

A second (but not independent) set of issues concerns the decomposition of the rate of profit. To consider the rate of profit as the ratio of the rate of surplus-value to the VCC (essentially following Marx) raises the issues of how, if at all, to account for the

distinction between productive and unproductive labour, and whether it makes conceptual sense to think of a Marxian rate of profit (the outcome of considering productive labour alone, and, perhaps, the OCC rather than the VCC) as behaving differently from the actual rate of profit. Of course, the same issues arise with an alternative decomposition of the rate of profit into the product of ‘profit share’ (the ratio of profits to net output) and ‘capital productivity’ (the ratio of net output to the fixed capital stock), but this decomposition is in many ways easier to use. The profit share depends on the ratio between real net output per hour, or labour productivity, and the real wage rate per hour, rising (falling) when the former increases faster (slower) than the latter. Capital productivity depends upon the ratio of labour productivity to real fixed capital per hour (a proxy for the TCC), rising (falling) when labour productivity increases faster (slower) than the TCC proxy. (It also depends upon a price term, neglected for simplicity.) The advantage of this decomposition is now transparent, for it focuses directly on the relationship between labour productivity and the TCC, and labour productivity and the real wage. The classical Marxian decomposition is less transparent in this regard.

Figure 1 extends the data presented in Mohun (2006) to cover the period 1946 to 2009. In terms of the major choices that have to be made, the data are pre-tax, at current prices, for the whole US economy; General Government and Private Households are excluded entirely, as are all imputations except employer contributions for health and life insurance; and the income of the self-employed is divided into a wage and a profit component. Profits are defined as net domestic product less wages, and the fixed capital stock includes tenant-occupied residential structures and inventories.

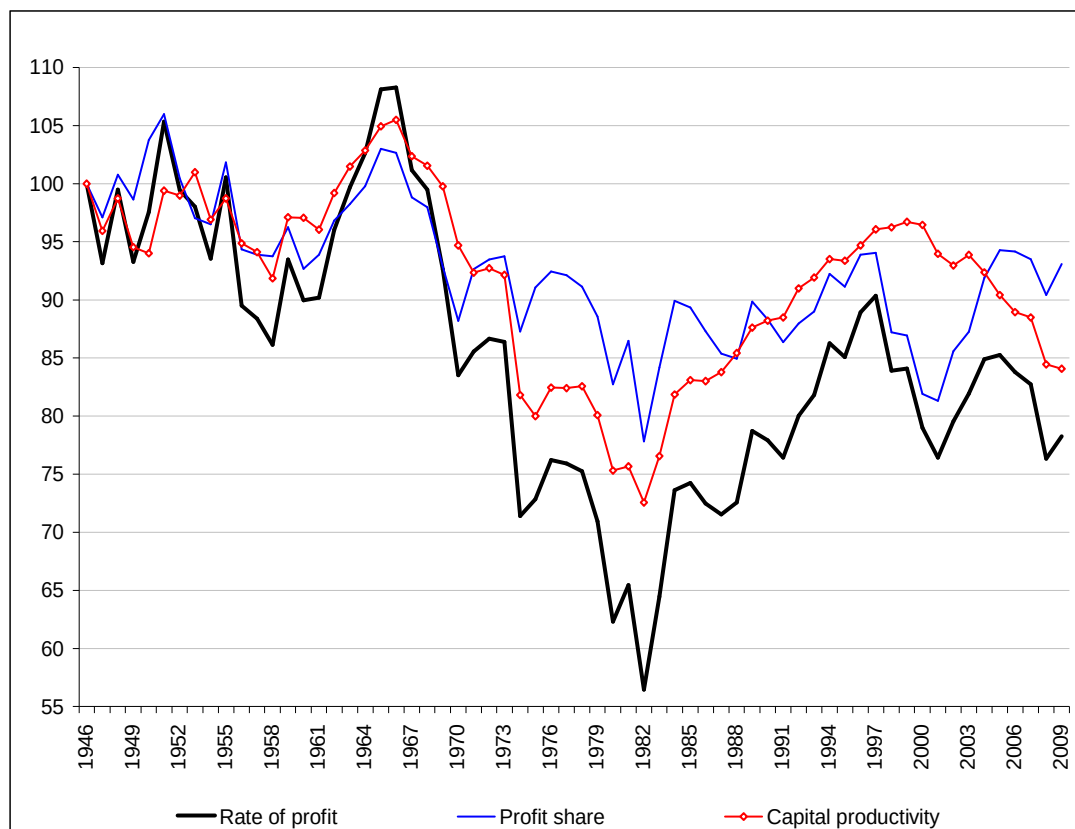


Figure 1. *The US Rate of Profit and its Decomposition, 1946-2009 (1946 = 100)*

Several features are of interest. First, there is no simple long-run tendency for the actual macroeconomic rate of profit to fall. Rather, the post-war period was characterised by a sustained downswing (1966-1982), and a sustained upswing (1982-1997). Secondly, a focus on secular rather than cyclical movements throws a sharp light on capital productivity. There were periods when it was broadly flat (1946-53) so that there was little change in the increase in the TCC required to elicit a given productivity increase. There were periods when it fell (1953-58, 1966-82, and 1999-2009), so that given increases in labour productivity required the TCC to rise more rapidly (the classical Marx case). And there were periods when it rose (1958-66 and 1982-99) when labour productivity rose faster than the rise in the TCC. Moreover, while the profit share and capital productivity tend to move together, this is not true for the years 2000-09. Thirdly, there have been just two significant crises since 1946.

One of these, culminating in 1982, was a classic falling rate of profit crisis. The other, beginning in 2007, was not.

Conclusion

Arguments concerning the LTRPF and its counteracting tendencies require some care, both logically and methodologically. The method of determination through greater concretisation is a difficult one, because the successive abstractions are both ordered and defined each in relation to all the others. Further, greater concretisation can produce effects that appear to contradict higher order abstractions. But those effects still derive their meaning through the higher order abstractions and their determination (that buildings stay up does not negate the law of gravity). Further, this self-reflexivity of the whole nexus of abstractions and their development does not mean that the articulation of concepts cannot be investigated for logical coherence; neither does it mean that their articulation is arbitrary. The ultimate test is whether that articulation comprehends and illuminates actual concrete historical development. Neither the fundamentalist nor the Sraffian approaches pass that test.

The LTRPF is an essential part of the theoretical framework with which to comprehend the world. But it is only a part, and it should not be interpreted as some sort of mechanistic empirical law of a falling profitability. Empirical reality, just like the theory that has to comprehend it, is both richer and more complex than that presupposed by any mechanistic interpretation of the LTRPF as an empirical law. The LTRPF and its counteracting tendencies provide a framework, but no more than that. The challenge then is to explain the historical reality of significant periods both of falling and of rising profitability.

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