Appendix A: Markets?

An appendix to Dave Elder-Vass, *Hyperbolic Profit* (2026), Cambridge University Press.

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Abstract: This appendix explains and criticises theories of profit related to the mainstream neoclassical tradition in economics.

The most influential theories of profit fall into two main groups. In mainstream economics, discussed in this appendix, approaches to profit are dominated by the neoclassical tradition of marginalist equilibrium economics. Meanwhile critics of capitalism, discussed in Appendix B, tend to adopt approaches stemming from the Marxist tradition. Both traditions have an ambivalent relationship with profit. Neither pays much attention to the causal role of profit itself, yet both regard profit as the ultimate driver of the contemporary commodity economy, which is framed as a market economy by the mainstream and as a capitalist economy in the Marxist tradition. Also, although their advocates tend to deny it, both are largely ethical theories masquerading as explanatory theories. The common thread amongst marginalist theories of profit is that each seeks to offer a justification for profit in general; the common thread amongst Marxist theories is that they position all profit as the fruit of exploitation. I will separate the questions of explaining and evaluating profit, focusing on explanation for most of the book, but when I do return to evaluation, I will argue that we can evaluate profit differently depending on the circumstances: it is sometimes a legitimate reward, sometimes exploitative, and sometimes a mix of both. It is therefore equally wrong to applaud profit universally and to condemn it universally.

The core of neoclassical economic theory is its equilibrium model of commodity exchange in a market economy, and we can only make sense of neoclassical theories of profit once we have understood this model. There are two versions. The simpler partial equilibrium

model sees prices in any single market as determined by balancing the demand and supply for the product concerned. The more ambitious general equilibrium model sees different product markets as interconnected. The general equilibrium model dates back to the nineteenth century work of Jevons, Walras, Menger, Clark and Wicksell (Mirowski, 1991, p. 193; Obrinsky, 1983, pp. 40–49). It nevertheless remains the framework within which economics is usually taught today, and so it is also well documented in contemporary microeconomics textbooks (e.g. Cowell, 2006; or Varian, 2010). As Keen has shown, the dominant textbooks tend to adopt much of the neoclassical framework while marginalising the significance of challenges to it (Keen, 2011, pp. 57–63). In practice, many mainstream economists are sceptical of the general equilibrium model and tend to employ partial equilibrium models instead. Nevertheless, the general model remains important because it underpins many of the attempts to legitimate profit as a natural outcome of a system that produces the best results for everyone. I have given critical summaries of neoclassical economics in earlier books (Elder-Vass, 2016, pp. 72–8, 2022, pp. 19–24) but let's consider a more profit-oriented version of the argument here.

This appendix therefore begins with two sections that explain the neoclassical equilibrium models. While I have tried to so this as simply as possible, these sections are unavoidably a little technical. I then discuss some of the problems with these models, before moving on to discuss closely related approaches to profit itself. Those who are already familiar with equilibrium models could skip ahead to the section "What's wrong with general equilibrium" or even to the subsequent sections, which discuss some (less mainstream) modifications to the models, notably the work of Knight on uncertainty and Schumpeter on innovation. Both give pride of place to the entrepreneur as the source of profit, and the final section questions the value of entrepreneurial approaches to explaining profit.

Demand and supply in individual markets

The partial equilibrium model is a theory of how individual commodity markets work. This begins with the concept of a *market* as a notional space that includes all exchanges of a given product. The model assumes that markets always come to balance so that every exchange of the product at any given time takes place at the same price. Consider the example of standard sized hens' eggs in boxes of six (we must be very precise about the commodity because it is assumed that all products in the market are identical). Let's just call them 'boxes of eggs' to keep the explanation simple. If one supplier was offering boxes of

eggs for $1.50 and another was offering them for $1, the theory assumes, everyone would buy from the cheaper supplier, and the more expensive supplier would be forced to lower their price in order to sell any at all. Meanwhile, the cheaper supplier might run out and realise they could have got a better price – so we would expect them to raise it in order to increase their income. Hence, it is argued, the prices in a competitive market will always converge. This conclusion depends on a set of assumptions about the behaviour of buyers and sellers, which can be summarised by the claim that they are all economically rational: they all select the option that is best for them, given their individual preferences. In other words, suppliers aim to make as much profit as possible (so would raise prices if they could, or lower them if they are unable to sell at their initial price) and buyers aim to get the best deal possible (so would buy from a cheaper supplier if they could) (e.g. Cowell, 2006, pp. 2, 10).

But what level will prices converge at? This is explained by a further set of assumptions encapsulated in the concepts of demand and supply. On the one hand, it is assumed that the amount of a commodity that a consumer will want to buy is affected by its price: when the price goes up, consumers collectively will want to buy less of the product (e.g. Varian, 2010, pp. 3–6, 270–2). The quantity that consumers collectively wish to buy at a given price is known as the *demand* for the product. On the other hand, it is assumed that the amount of a commodity that a producer will try to sell is also affected by its price, but in the opposite direction: when the price goes down, producers collectively will want to sell less. The quantity that producers collectively wish to sell at a given price is known as the *supply*. These assumptions can be expressed in the form of curves on a diagram, as in Figure 2.1 (reproduced from Elder-Vass, 2016, p. 74).

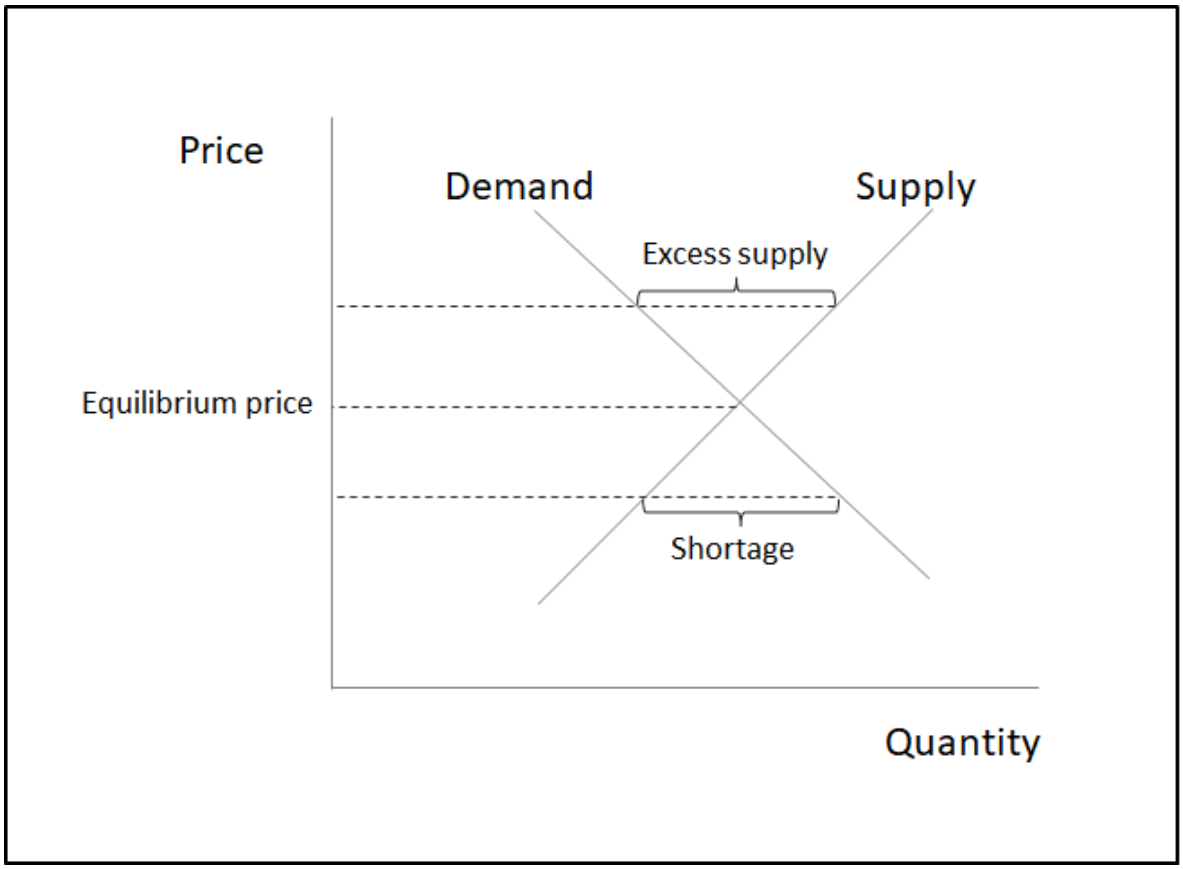

Figure 0.1 Demand and supply in a single commodity market (Elder-Vass, 2016)

Because the amount that buyers wish to purchase goes down as the price goes up, while the amount that producers wish to sell goes up, there is a point where the two curves meet, and according to the theory, this is the point that the price will settle at (Varian, 2010, pp. 3, 7–8, chapter 16). If the price is any lower, there will be a shortage compared to the amount purchasers wish to buy and it will be possible for suppliers to raise prices. If the price is any higher, there will be an excess of product on the market and buyers will be able to bid successfully for unsold stock at a lower price. The price, in other words, is determined by the relationship between the demand and supply curves for the product. The point at which the curves meet defines the equilibrium price under the current conditions of demand and supply.

This conclusion depends on further arguments that explain why the demand and supply slopes curve in the appropriate directions. As my interest is in profit, let me focus on the supply side. Here it is assumed that if a producer produces more of a product, the cost of producing the next unit, also known as the *marginal cost*, will go up, at least beyond a certain point (e.g. Cowell, 2006, pp. 9–18). If it is true that the marginal cost increases as production increases, then as the price a supplier can obtain for a commodity goes down, the amount

they will be willing to produce will go down, because otherwise the last units they produced would be sold at a loss. If they wish to maximise profit it makes more sense not to produce those last units, and so the supply available in the market will always drop (or rise) to the level at which the price in the market is equal to the marginal cost of producing one more item.

General equilibrium

The single market model rests on the belief that markets will adjust to produce a local or partial equilibrium: a price level for the product concerned where demand and supply are in balance. But things become more complicated once we recognise that different markets are interdependent with each other. One kind of interdependence is substitutability. For many consumers, for example, large eggs would be a suitable alternative to standard eggs, and when the price of standard eggs rises, some of them may switch to buying large eggs instead, which according to the model may also lead their price to increase. Another kind of interdependence arises from the fact that one kind of commodity may be used as an input to produce another kind of commodity. When egg sales increase, for example, the producers of eggs will need to buy more egg boxes to package them, so an increase in the demand for eggs produces an increase in the demand for egg boxes and thus an increase in their price too.

The general equilibrium model addresses this issue. If markets all behave according to the assumptions of the partial equilibrium model, then changes in one market can affect the demand and/or supply curves in other markets and the general equilibrium model says that the whole economy will converge on a point where all of these effects have worked themselves out and *every* market is in balance or equilibrium. The obvious challenge to this is that such a complex set of interactions would take quite some time to work itself out and in the meantime people would still need to buy and sell things, without knowing the final set of general equilibrium prices because they hadn't been established yet. Leon Walras offered, not so much a solution, but a substitute for a solution to this problem: he said that the economy could behave *as if* there was an auctioneer who took bids and offers for all products simultaneously and allowed those to iterate until the equilibrium prices had been established. All trades could then take place at these equilibrium prices (Keen, 2011, pp. 178–9; Walras, 1954). He calls this process *tâttonement*, meaning groping towards a solution by trial and error, and one interpretation is that the model requires that equilibrium is established, not only across the current prices of all commodities, but also across all future prices at the initial

point of *tâttonement*, and that no trade occurs until these prices have been agreed, so that trade never occurs except at equilibrium prices (Howard, 1983, pp. 84–5, 112, 123, 172).

By now you may be starting to have some doubts about the model. Try to suspend your disbelief a little longer so that we can see how this approach might explain the incomes that people earn from the economy (of which profit is one). In the pure version of the model, all personal incomes are payments for the provision of *factors of production*. A factor of production is something (other than earlier products, such as egg boxes or chickens) that contributes to the process of production. Economists typically divide the factors of production into three types: land, labour and capital. Each of these receives its own form of factor income: rent is paid for the use of land, wages for the use of labour, and interest for the use of capital. According to the equilibrium model, however, all three are determined in the same way: there is a market for each factor (or multiple markets for each subtype, e.g. one market for unskilled labour, another for carpentry labour, another for computer programming labour, etc.) and the price of the factor is determined by the forces of supply and demand, in much the same way as the cases we have discussed already.

In factor markets, however, different considerations are taken to lie behind the supply and demand curves. The supply of factors depends on their *opportunity cost*, which is what they could earn in an alternative employment – no-one (it is assumed) will sell their labour for $10 per hour, for example, if they could earn $12 doing something else, or rent their land out for $1,000 per month if they could rent it to someone else for $1,200. In the case of labour this is also supposedly affected by the utility (the benefit) of not working: a worker might be unwilling to work an extra hour of paid overtime, for example, if the utility of doing something else, say relaxing at home, was higher. In that case, the opportunity cost of an hour of labour is the alternative of spending an hour relaxing at home (cf. Varian, 2010, pp. 609–11). In the labour market the opportunity cost of working is taken to increase as the amount of employment increases. The consequence is that to increase the supply of a factor beyond any given level it is necessary to raise the price of the factor.

The demand for factors, on the other hand, depends on how much they could add to the value of the output being produced in the business concerned. Consider a case in which employing an extra worker for a week would add $500 to the amount of output a firm could produce. This is known as the *marginal productivity* of the worker, and it is generally assumed that after a certain point the more of a factor is added, the lower the marginal productivity will be (so the second additional worker might only add $400 to the firm's

output, for example). The consequence is that the demand for more of any given factor tends to fall as its price rises.

If we accept these arguments, then factor markets will have demand and supply curves that have similar slopes to those in commodity markets, and again the model predicts that demand and supply will balance out at an equilibrium price. Focusing again on the case of labour, the equilibrium price will be one that equals the opportunity cost of labour for the marginal worker, and also the marginal productivity of their work (e.g. Cowell, 2006, p. 27). This principle is taken to generalise across all factor markets, which leads to the conclusion that all factor incomes are determined by the marginal productivity of the factor concerned.

This conclusion is also taken to apply to capital. *Capital* is an ambiguous word, which can refer to the financial sums invested in businesses or to the physical resources such as factories and machinery in which those financial sums are invested. The neoclassical model tends to assume that it can refer to both of these equally and interchangeably (Keen, 2011, p. 142). According to the model capital is also a productive factor with a price (the rate of interest), alternative uses, and a marginal productivity, and capital markets adjust like other factor markets until the interest rate reaches an equilibrium level at which the price equals the marginal productivity of capital and also the returns that could be obtained from the best available alternative uses. This depends on the assumption that capital is fully mobile between alternative uses, so that a capital owner who finds a business that will pay more interest can withdraw their investment from one business and transfer it to another (an assumption that might work for financial capital but is more problematic for physical capital).

The model also implies that rates of profit (taken to be something different from interest) should equilibrate: but that they will equilibrate to zero. Where a business makes a loss, it will be unable to pay for its factors of production at their marginal rate of productivity, and so those factors will move elsewhere and the business will either contract or go out of business. Where a business makes a profit, it will either expand or attract imitators who expand into its space (using the factors of production released from unprofitable businesses), increasing the supply of its products, driving down their price, and reducing its profits. This leads to the conclusion that factor incomes will always take up the whole of the revenue created by a business. This in turn fits neatly with the legitimatory orientation of marginalist economics, it's use to justify the outcomes produced by the market system, since it appears to suggest that the owners of land, labour and capital each receive a reward that corresponds to their contribution to the production process. This depends on some specific assumptions about the

nature of production functions (Howard, 1983, p. 104). But it also rests in turn on the most paradoxical conclusion of the general equilibrium model: because any profit will attract investment, all profit will be competed away, and because the model assumes that equilibrium will always be reached before any trades occur, this means that there will never be any profit! We end up with a model of a system of commodity exchange that is motivated on the side of producers by the desire to maximize profit, but which can never produce any of the profit that supposedly motivates them. This paradox is the starting point for all theories of profit that operate within the neoclassical paradigm.

What's wrong with equilibrium?

In one sense, the general equilibrium model is a brilliant intellectual achievement: a complex, at first sight internally coherent, and comprehensive model of an entire economy in terms of a relatively small number of variables and equations. Unfortunately, however, almost everything about it is wrong, in the sense that commodity exchange in the real economy does not work in anything like the ways assumed by the model. As Steve Keen has put it "Virtually every concept that is taught as gospel in the textbooks has been proved to be unsound in the original literature" (Keen, 2011, p. 18). Most of the problems with the model are already well known and widely documented; Keen (2011) provides a particularly detailed critique that is focused on the internal contradictions within the neoclassical model (whereas here I am more interested in its inconsistency with the real world it claims to model) but many others have contributed to exposing the flaws. Just tracing through the introductory account above, there are problems at every step, most of which also apply to partial equilibrium models. For example:

- Many products are not sufficiently standardised for there to be an equilibrating market bringing about price convergence for them. Indeed, many products are effectively unique, such as tailor-made clothes, second-hand clothes, machines made for a specific need in a particular factory, over the counter financial derivatives and many others.
- The idea that even when products are physically identical they are sufficiently interchangeable to form the same market is suspect. The most obvious problem is location – space is ignored in the model, but however similar they are, a box of eggs in the supermarket I'm walking through is not interchangeable for me with a similar box of eggs in another city or another country, and perhaps not even with

a box of eggs in a supermarket a few kilometres away in the same town. So space is also an obstacle to markets equilibrating.

- In many 'markets' prices do not converge. A nice example is the wholesale fish market in Marseilles, where Kirman and Vriend found significant and persistent price dispersion between different sellers for equivalent products (Kirman & Vriend, 2000). Even in digital marketplaces, where convergence could be automated and prices are transparent, it is by no means the norm. In online book marketplaces, for example, the same second-hand book, apparently in the same condition, can often be found for sale from different bookshops on the very same screen at spectacularly different prices.
- Suppliers often do not aim to maximize profits but rather operate by rules of thumb that give them reasonably reliable profits – known as *satisficing*.
- Buyers are not only influenced by price when they choose which supplier to go to for a given product. They may be influenced, for example, by their previous relationship with the supplier, or by its reputation (Elder-Vass, 2016, pp. 123–9). This, incidentally, is why prices do not equilibrate in the Marseilles fish market (Kirman & Vriend, 2000).
- Sometimes raising product prices increases rather than reduces demand. Higher prices for some kinds of products are associated with higher status and may increase the apparent desirability of the product.
- Sometimes producers' costs per unit go down rather than up when the amount produced is increased – this is known as *economies of scale* – which can lead to situations in which producers are willing to accept the same or even a *lower* price when they can sell more, and the supply curve (up to a point) slopes in the wrong direction to bring about equilibrium in the market concerned (Keen, 2011, pp. 103–4, 124–6). This is particularly true when producing firms have excess capacity, which is common in many industries (Keen, 2011, pp. 114–5).
- When suppliers have unsold stock, they rarely react by reducing their prices. Instead, they hold the stock over to the next period and try to sell it then instead. Hence, prices do not adjust smoothly in response to demand shortfalls as the model requires.
- The amount of goods produced in a firm is not just a function of the number of inputs combined (Nitzan & Bichler, 2009, p. 82). The output may also depend,

for example, on how the production process is organised, on how motivated the work force is, and on external factors such as changes in health and safety regulations.

- If there is no good reason to believe that individual markets reach equilibrium prices that can be explained by the single market model, then the general equilibrium model for the whole economy, which takes individual equilibrating markets as its building blocks, is necessarily at least as unworkable. The model might be expected to take different paths, for example, depending on which firms or industries with increasing returns to scale were first to enter the positive feedback loop of increasing production and decreasing costs.
- As already mentioned in the description of the model, if there are equilibrating forces at work in real, as opposed to theoretical, commodity markets (and there are *some*, although they are far from universal and even where they are present may often be defeated by the effects of other mechanisms) they will take time to work through, and both the partial and general equilibrium models ignore this. The consequence is that it may take weeks or months for the effects of a change to work their way through the system, and during this period the system will not be at equilibrium, prices will not be equilibrium prices, and the model cannot predict or explain them. If changes are frequent enough (and often they are!) then prices will never reach equilibrium and so the conclusions of the model will never apply.
- Another effect of time is that many goods and services take time to deliver. In such cases, the price of the product is usually governed by a contract, in which the price is set at one time and the service is delivered later; indeed contracts can govern prices for extended periods. This is particularly common in factor markets: the rent for a property might be agreed for a year or for many years, for example, and wages were traditionally paid at rates that are agreed for a year (though this is changing), and only adjustable in relatively small increments after that. Interest rates on capital investments can be subject to even longer contracts, in some cases fixed for decades. These factor prices therefore cannot adjust, except in extreme circumstances, to changes in demand and supply, and they are very often out of line with the opportunity cost of the resource concerned.

- Given that output levels are not determined by neat production functions, it is challenging and may often be impossible to determine the marginal productivity of a factor of production.
- Capital is not mobile in the way that the model requires. Financial capital is often lent to businesses on medium or even long-term contracts, for the good reason that businesses use financial investments made in them to purchase physical capital that cannot be readily sold without incurring a loss. Physical capital is expected to produce a return, not by being sold but by being productive over an extended period. While capital markets may allow any given lender to sell on a loan to another lender, this does not result in productive capital moving between businesses since the borrower retains the use of the capital.

This might seem like a long list already, but it is by no means the full list of problems with the neoclassical model. Nevertheless, it should be more than enough to make clear that neither profits nor anything else in the real world can be explained by this model. Most mainstream theorists, remarkably, continue to build their work around either the partial or the general equilibrium version of this fantasy model, although when challenged they will usually take a well-trodden path. First, they will acknowledge that there are many ways in which the assumptions of the model do not correspond to the real world and claim that economics today is much more sophisticated, ironically while continuing to take much of the model for granted as the implicit bedrock of economics. Second, they will argue that some of these problems can be resolved by looking at the issue from a different perspective. Take, for example, the location problem: I may not be willing to visit a different supermarket a few kilometres away to buy cheaper eggs but someone else might, and as long as there are enough such people between different pairs of supermarkets then price pressures will be transmitted. Third, they will argue that these sorts of forces get us close enough to the situation described by the model for it to be a valid starting point for analysing the real economy. Milton Friedman famously argued that "the relevant question to ask about the 'assumptions' of a theory is not whether they are descriptively 'realistic', for they never are, but whether they are sufficiently good approximations for the purpose in hand" (Friedman, 1966, p. 15). Even somewhat critical economists sometimes accept these kinds of argument, which are central to the self-image of contemporary economics. Michael Howard, for example, argues that models focus on "fundamental relationships" that matter for actual economies and this may

be more important than lack of realism in their assumptions (Howard, 1983, p. 7). And finally, they will point to vast numbers of attempts to tweak the model to take account of one or two problems at a time. Indeed, we will be looking at some of these over the following sections.

How should we assess this kind of response? On the one hand, we must recognise that there is a small part of the model that is realistic and that should be retained in a comprehensive explanatory account of the economy. Producers do generally try to make profits and do generally prefer to make more profits rather than less – indeed they are under pressure from the capital markets to do so – and so they will often increase their prices and reduce their costs when they can. Consumers are affected by prices, and in many situations they will prefer a cheaper version of a product to a more expensive similar version. And these forces, in many but not all circumstances, can produce a tendency for prices of similar goods to converge. For example, I used to work for an electrical retail business that carefully monitored the prices being charged by its main competitors and often changed its own to match them to avoid losing sales.

On the other hand, these are only a subset of the mechanisms at work in determining prices and quantities of goods purchased, and thus the amount of sales revenue that businesses receive. The neoclassical response entails ignoring all the other mechanisms at work in order to preserve the equilibrium model. The assumption that the equilibrium model provides a good enough approximation to what happens in the economy is nothing more than an excuse to avoid discarding it. Its advocates rarely seek to test whether it does provide reasonable approximations, and when aspects of the model are tested the results typically undermine rather than confirming it. Examples include Sippel's test of whether consumers behaved in the ways that neoclassical economics considers rational (Keen, 2011, pp. 67–70) and the findings of Eiteman and Guthrie (and also, separately, Blinder) that in factories marginal costs tend to fall rather than rise as volume increases (Keen, 2011, pp. 125–6). Findings like these are generally ignored, for two reasons. First, accepting them would make it difficult or impossible to construct mathematical models of the economy, and the mainstream tradition has become addicted to the idea that mathematical modelling, often in forms that depend on the assumption of equilibrium, is the best way to cast light on how economic mechanisms work. As Mark Casson, for example, puts it, "The value of an equilibrium model lies not in the literal truth of its assumptions but in the practical utility of its conclusions" (Casson, 2016, p. 10). It's hard to see how an unrealistic model can yield useful conclusions without, as a minimum, a clear explanation of why the assumptions are

justified in the case concerned. But for the mainstream the construction of an elegant model is now more important than whether the model is representative enough of the real world to produce useful conclusions. The second reason, implicit in the first, is that neoclassical economics is no longer a genuine attempt to provide an explanatory account of what happens in the real economy. It is an article of faith, a dogma that is considered immune from empirical challenge. As Keen puts it, "in stark contrast to how a true science develops, this entire literature was developed not to explain an empirically observed phenomenon, but to examine the logical coherence of an utterly abstract, non-empirical model of consumer behaviour" (Keen, 2011, p. 63).

There are several reasons for the continuing attachment of mainstream economics to this framework. One is the legitimating function that the model performs, which helps preserve the image of economics as more respectable than the other social sciences because it provides backing for the market/capitalist system. A second is that the model is mathematically tractable: within its framework it is possible to develop and apply complex formulae which are highly valued in the economics profession. A third is that beyond the model lies a kind of chaos that professional economists who have developed their careers in the shadow of equilibrium models are ill equipped to deal with: a kind of chaos that needs psychology, sociology and other equally 'soft' disciplines to deal with and where the answers will rarely be neat and rarely take a mathematical form.

Having said that, let us suspend our disbelief long enough to assess the attempts that have been made to explain non-zero profit within this tradition.

Risk and the fourth factor

As we have seen, general equilibrium theory faces a fundamental paradox. On the one hand it sees all business as motivated by the pursuit of profit, and on the other, its model implies that there will never be any profit (unless we count interest on capital), since any possibility of profit will always be competed away by other businesses before any commodity exchange occurs. Writers in the neoclassical tradition have taken two broad approaches to resolving this paradox (Obrinsky, 1983, p. 40). The first assumes that something needs to be added to the model to explain profit: if rent, wages and interest are the rewards for the contributions of land, labour and capital to the production of goods, then there must be some other factor of production that makes a contribution to production and is rewarded for this contribution with profit. The second assumes that the model is essentially a correct

description of the way that market systems should work, and would do in the absence of imperfections, but that the world is imperfect in ways that explain the existence of profit. Let me call these the 'fourth factor' and 'imperfect world' approaches. Obrinsky tells us that "Neoclassical theory tends in the main to cling to the latter position, though some writers look for profit in the special activity of the entrepreneur" (Obrinsky, 1983, p. 40). Arguably, most approaches combine elements of both.

The fourth factor is generally identified as *enterprise*, although different authors offer different reasons for seeing enterprise as important. Most of these are of purely historical interest. Frederick Hawley, for example, writing at the end of the nineteenth century and the beginning of the twentieth, sees the entrepreneur as the key force in the productive process, but criticises theories that locate the key function of the entrepreneur as co-ordinating or organising the productive process. Clearly this function of the entrepreneur is useful: land, labour and capital collectively will produce nothing without some person or organisation taking the lead and organising them into a productive process. Enterprise in this sense, however, as Hawley recognises, is a form of labour, and in the modern corporation this is often done by salaried managers – and thus rewarded primarily with wages rather than profit. Instead, he argues, the key role of the entrepreneur is to take responsibility for production in the sense of assuming the risk of failure, and in return for this she receives any surplus that remains after the predetermined payments required for wages, rent and interest: profit (Obrinsky, 1983, p. 64).

If the purpose of fourth factor theories is to rescue the general equilibrium model, enterprise in the form of risk taking (or most other forms) won't do the job. For that to happen, risk-taking would have to be a quantifiable input to the process of production, which could be bought and sold in the market at a price per unit that could tend towards equilibrium at the point where the marginal productivity of a further unit of risk taking equalled the additional marginal profit paid as the price. Arguably there are such services, which we call insurance, but as Frank Knight pointed out, insurance policies are only available for well-defined quantifiable risks and not the unpredictable risks (which Knight calls uncertainty) that usually have most impact on profits (Knight, 1921). Risks of either kind, however, are not inputs to the process of production, and they do not have marginal productivity. Perhaps the most striking reason for this is that it is inherent to the nature of risk that it relates to a future unknown.

Let us imagine for a moment that we *could* quantify risks and that undertaking A has 100 units of risk attached to it while undertaking B, which is in other respects similar, has 200

units. Does that mean that B will generate more revenue than A, as a result of employing more of the risk factor? We simply cannot say before the event, and with this information we have no reason to believe that after the event it will turn out that B is more profitable than A – either outcome is equally possible. If the contribution of enterprise is only to take more risk then we have no reason to believe that enterprise is going to make a positive contribution to profit. In some cases the riskier option will be more successful and in others less successful but even when the riskier option turns out to be more successful it is not taking the risk that makes it so, but rather the circumstances that averted the risky outcome. No doubt entrepreneurial risk taking is necessary for a business to develop but the actual outcomes depend on a vast range of factors, including demand and cost issues but also including a whole range of external events, such as the breakout of war or the appearance of a global pandemic. It is not the risk taking that determines the profits but these many interacting influences on the business.

Nor is there any good reason to believe that risk provides a macro-level explanation of the level of profit: if entrepreneurs take more risks, there is no good reason to believe that more profits will follow; perhaps, instead, more bankruptcies will follow. It is not even clear why we might conclude that risk would produce net profits *on average* across all entrepreneurs: perhaps cases in which bad outcomes occurred and led to a loss should balance those in which good outcomes and led to a profit? Or perhaps bad cases will preponderate and the net result will be an average loss? Perhaps entrepreneurs who take good risks will survive while those who take bad ones will be driven out of business, producing a bias towards profits in the system, but there is no obvious reason why this outcome should dominate the others. None of this suggests that risk provides a useful explanation of profit.

Enterprise and uncertainty

Knight's development of the argument has been more influential. His 1921 book *Risk, Uncertainty and Profit* begins by advocating a fairly conventional version of the neoclassical framework, regarding the idea of perfect competition as a good "first approximation" to the functioning of Western economies (Knight, 1921, p. 9), but proposes to discuss some "unrealities" in its assumptions with a view to identifying the model's limitations (Knight, 1921, p. 11). He accepts that competition tends to eliminate profit, which he distinguishes from the returns to land, labour and capital (Knight, 1921, p. 18), and thus looks for the sources of profit in the imperfections of the actual economic system by comparison with the

model of perfect competition. His particular focus is on the concepts of risk and uncertainty, which he thinks previous writers, including Hawley (Knight, 1921, pp. 42–4), have failed to distinguish between. He restricts the concept of *risk* to those cases that are quantifiable and thus insurable. Typically, these are risks where there is enough statistical data about previous cases for us to know how likely they are to recur, e.g. the loss of ships at sea or the risk of a building burning down. Knight uses the example of exploding champagne bottles: at the time it was quite normal for some bottles to explode while they were fermenting in the producer's cellars, but the producers knew roughly what proportion of their bottles would explode so they could just treat this as a predictable cost (Knight, 1921, p. 213). By contrast, he uses the concept of *uncertainty* to refer to the much more radical inability to anticipate many other types of outcomes: those cases where the chances of different outcomes cannot be quantified.

Knight argues that the neoclassical model depends on producers being able to correctly anticipate future outcomes, such as the price they will be able to obtain in the future for a product they are manufacturing today. While this is obscured in the model by devices such as Walras's auctioneer, in practice it is a problem for producers (Knight, 1921, pp. 197–8). They can only know how much of a product they should produce, for example, if they are able to anticipate how much they will be able to sell and at what price, and without this knowledge there is no mechanism to ensure that equilibrium prices and quantities will be reached. It is this, Knight argues, that creates the possibility of profit: "changes in conditions give rise to profit by upsetting anticipations and producing a divergence between costs and selling price, which would otherwise be equalised by competition" (Knight, 1921, p. 198). If all potential producers were able to anticipate these changes, they would adjust their decisions to these known futures and "profit (or loss) would not arise. Hence it is our imperfect knowledge of the future, a consequence of change, not change as such, which is crucial" (Knight, 1921, p. 198).

If there were statistical models, as there are for fire risks and exploding champagne bottles, such problems could be insured against, but many cases – such as a decision on whether to expand a factory – are sufficiently unique that it is impossible to calculate the probability of a negative outcome. Nevertheless, entrepreneurs must and do make estimates of these uncertain outcomes (Knight, 1921, p. 226). It is these decisions, made in the face of true uncertainty, that for Knight create the possibility of profit. The entrepreneurs who *do* make a profit are those who understand the situation well enough to make better estimates of the likely outcome and/or who are more effective at putting systems in place to enable them to manage the consequences of uncertainty.

Knight argues that entrepreneurs' rewards consists of two parts – a wage part which is the market rate for the sort of work they do in the enterprise, and a profit part (Knight, 1921, p. 278), obtained as a residual after paying for inputs at market rates (Knight, 1921, p. 280). Often entrepreneurs also have some property – capital – in the business which according to the neoclassical model should entitle them to interest, but he makes a clear distinction between what he calls "pure profit" and interest (Knight, 1921, p. 307). Depending on the circumstances, then, the entrepreneur's income may mix pure profit with elements of wages and/or interest. One implication is that we cannot measure profit as such by the size of the entrepreneur's rewards.

Knight's work continues to attract attention, though mostly not from mainstream economists (Knöbl, 2017). The economic sociologist Jens Beckert, for example, builds on Knight's account of uncertainty in his account of the dependence of the capitalist economy on discursive constructions (Beckert, 2016). He argues that it becomes essential to compensate for uncertainty by creating fictions: imagined versions of the future that are used to persuade others of the decisions they should make. Knight's work is probably more influential amongst critics of mainstream economics than amongst its defenders, which is perhaps ironic given that Knight himself made every effort to present it as an improvement of the neoclassical tradition rather than a critique. As Obrinsky has argued, however, while Knight's book may establish a place for profit in neoclassical theory, it also undermines some of the cornerstones of the tradition. Most strikingly, it is hard to see how equilibrium could ever be established in an economy where decisions must be made today that affect outcomes in the future, when no producer knows the future prices and other circumstances that should govern their production decisions today (Obrinsky, 1983, p. 93).

We must also ask, however, just what Knight's book contributes to the theory of profit. At best, it seems to be offering a claim about the conditions of possibility of profit: that profit is only possible in an uncertain world. It certainly isn't providing a causal explanation of any particular profit, for much the same reason as I offered in discussing risk theories of profit: we cannot conclude that an increase in uncertainty will produce or even tend to produce an increase in profit in any given case. For similar reasons, we must doubt whether bolting Knight's analysis onto the neoclassical framework could explain profit at the macro level, and thus the existence of profit *on average* across an economy. Even if we think uncertainty is a necessary condition of profit, it is also, as Knight acknowledges, a necessary condition of loss, and it is only wishful thinking that leads to the belief that it will produce one rather than the other.

In the end, we must question whether Knight is offering a causal theory of profit at all. Instead, the theory seems to perform two functions. First, the legitimatory function we have discussed already: it provides a reason to argue that the heroic entrepreneur *deserves* her profit because she has successfully confronted and overcome the uncertainty of undertaking the productive venture. Most fundamentally, however, the orientation of the theory is not towards explaining profit in the real world but rather towards explaining why profit is *absent* in the general equilibrium model. If we want to produce a reason why profit could appear *in the model*, Knight shows, then we will need to introduce some other consideration, and uncertainty is the candidate he offers. The trouble is that uncertainty destroys much of the rest of the model in the process.

Entrepreneurs as innovators

Uncertainty is not the only candidate that might prevent profit from being competed away as the general equilibrium model suggests it should. For Joseph Schumpeter, writing shortly after Hawley and around the same time as Knight, the imperfection that generates profit is provided by innovation (Obrinsky, 1983, p. 60). Schumpeter also accepts that economies do tend towards equilibrium, which he calls "the circular flow" (Schumpeter, 1934, p. 128), in which state there will be no profit (Schumpeter, 1934, p. 31). In practice, however, he argues that entrepreneurs themselves generate disequilibrium.

This is different from the idea that external shocks might deflect economies from their equilibrium state since for Schumpeter innovation is internal to the economy (Obrinsky, 1983, p. 61). Innovation is not the same as invention: what matters for the theory of profit is not that people have thought up new ways of producing things but that entrepreneurs *adopt* new ways of producing things, what he calls "new combinations" (Schumpeter, 1934, pp. 66, 132, 136). These new combinations might be derived from inventions or simply from experimenting with new ways of combining inputs, for example to create new products or to find cheaper ways of producing existing products. In total, he lists five different ways in which innovations can increase profits (Schumpeter, 1934, p. 66). While such innovations could in principle be large or small, Schumpeter focuses on major innovations that ultimately transform the industry concerned, such as the introduction of mechanical looms to replace weaving by hand in the Industrial Revolution.

Schumpeter defines the very concept of the entrepreneur as one who innovates, whether they own a business or work for it as a manager (Schumpeter, 1934, pp. 74–5). He

particularly distinguishes between entrepreneurs and capitalists – the owners of capital – on the grounds that entrepreneurs can in principle fund their innovations by borrowing from capitalists or banks (Schumpeter, 1934, pp. 69–75). The entrepreneur who discovers and implements a better product or a cheaper way of producing a product will have an advantage over her competitors in the market – in the first case she will be able to charge more for her new product, and in the second she will be able to take a positive profit from selling at the same price as her competitors, even though those competitors are only covering their costs. Innovation thus produces profit (Obrinsky, 1983, p. 62).

Schumpeter accepts the neoclassical contention that such profits will be competed away: other entrepreneurs will adopt the same innovation and as a result competition in the market for the product will compete its price down until it equals the cost of paying for the inputs required to produce it (Schumpeter, 1934, p. 131). Schumpeter, however, recognises that this process will take time. At first only the innovator will know how to produce in this new way, and it will take time for others to understand that an innovation has occurred and how it confers an advantage. Once they have, however, other competitors will adopt the innovation, "first individuals and then whole crowds" (Schumpeter, 1934, p. 133). This too will take time, perhaps because they need to invest in new physical equipment or because they need to retrain workers to operate in a different way. The first imitators will also seek to obtain profits from the innovation and may be able to do so until enough competitors have caught up to meet all the demand for the product at the marginal cost of producing it. Hence there will be a period during which the market is not at equilibrium and during this period the innovator and her earlier imitators will be able to make profits.

Eventually, the innovation will be absorbed into the normal way of doing things in the industry concerned and will no longer provide profits (Obrinsky, 1983, p. 62). But there is always an incentive for producers to innovate (Schumpeter, 1934, p. 136) and if they do so quickly enough the economy need never return to equilibrium. This is also the dynamic behind Schumpeter's well-known concept of "creative destruction" (Schumpeter, 1950, Chapter 7): Innovation creates new opportunities, which can be realised because the entrepreneurs are able to borrow capital to invest in their new ideas, but at the same time the businesses that fail to innovate or imitate successfully will find that they can no longer cover their costs and will discontinue production, with any remaining capital being reallocated towards the more successful innovators. His theory thus seeks to explain not only profit but also the overall dynamics of growth and development the capitalist economy.

A century later, Schumpeter remains one of the most influential theorists of entrepreneurship (Croitoru, 2012; Swedberg, 2000), and there is no doubt that innovation has played a key part in much of the dynamism of capitalism. Schumpeter's theory thus stands up rather better than Knight's as an account of a factor that does have an impact on profit in the real economy. Having said that, it remains far too simplistic to say simply that innovation causes profit. First, as Schumpeter himself recognises, not all innovations succeed: some produce losses and some even drive the innovating entrepreneur out of business. There must therefore be other factors that interact with innovation to determine which innovations turn out to be profitable and which do not. Second, although no doubt all production techniques were innovations at some stage, once they are well established (widely known and copied) we cannot attribute their continuing profitability to innovation, and in practice many firms using stable well-established techniques succeed in remaining profitable. Thirdly, some profits arise from *suppressing* innovation, such as monopolists who buy out dynamic new competitors and close them down (Nitzan & Bichler, 2009, p. 223; Veblen, 1924, pp. 65–6). The theory of innovation, then, is a useful contribution to a theory of profit but it can only form one part of a more comprehensive theory.

Schumpeter's theory is also the most successful of this group in providing a legitimation for profit under capitalism. If profit is obtained by introducing innovations that either (a) improve the efficiency of production; or (b) make new products available to consumers that meet their needs better than existing products; then it seems that they are a deserved reward for improving the value or cost of goods to society. This argument would only apply, of course, to those profits that were obtained by innovation, and only as long as they were not maintained by suppressing innovation or imitation by others (as many contemporary corporations do using patenting). It is also worth noting, as Schumpeter does, that even if such profits are generated by entrepreneurs, they may actually be captured by owners of the businesses concerned rather than the entrepreneurial individuals that introduced them (Heilbroner, 2000, p. 296; Howard, 1983, p. 117).

Entrepreneurs and capitalists

What can we draw from these entrepreneurial theories of profit? They cannot save the general equilibrium model of the economy, most obviously because the model assumes that factor payments are all agreed simultaneously, whereas in reality and in these entrepreneurial theories there is a fundamental temporal difference between profit on the one hand, and other

factor payments. Wages, rent and interest are all agreed contractually in advance of the productive process whereas profit is a residual, the amount of revenue left over after all other costs have been paid, and it is inherently uncertain at the time the other contracts are made. Hence the idea that rates of profit could be set in the market at the same time as rates of wages, rent and interest is incoherent.

Another set of challenges revolves around the question of who counts as an entrepreneur and what their relationship is with the owners of capital. In the period before the rise of the neoclassical paradigm, most capitalist businesses were both owned and operated by the same person, or at least the same family, and there was no obvious need to distinguish between owners and entrepreneurs. Since the late nineteenth century, however, with the rise of joint stock companies and the separation of ownership from day-to-day management in many large companies, the two roles have separated. One reason for the focus on entrepreneurs in these theories is that capital owners received interest, and therefore that profit must be a reward to the providers of a *different* factor of production. Hence the proposal of the entrepreneur as the provider of the fourth factor, and the various attempts to identify what form that fourth factor might take – organising production, risk-bearing, managing uncertainty, or innovation, for example.

But it is hard to see how enterprise could work as a factor of production into the neoclassical framework. How could there be a market for enterprise? If enterprise is simply a type of labour it is remunerated with wages and profit disappears once again. If there was a separate market for enterprise, who would do the buying – isn't that part of the role of the entrepreneur, and wouldn't buying enterprise be a viciously circular concept as a result? But even if this problem could be resolved, how could a price be established for enterprise? The first requirement would be that there would have to be a unit of enterprise that could be used to define the amounts being bought and sold, but what is the unit of enterprise? If it is time spent by the entrepreneur we are back to labour and wages again. If it is an amount of money we are back to capital and interest. There is no other obvious candidate, and without a unit it is also impossible to have a price for enterprise – a rate of profit.

For the fourth factor model to work, in addition, the concept of an entrepreneur must be distinct from the concept of a business owner or capitalist, and profit must be a return to the entrepreneur rather than the capitalist when the entrepreneur is not also the business owner. As both Knight and Schumpeter recognised, however, in the real capitalist economy that is not what happens. In some capitalist businesses, profits are shared with employees through various voluntary schemes approved by the owners, but they are never earned in full and *by*

right by non-owners. Profits, in other words, do not accrue to entrepreneurs but to capitalists: to the firm and hence to the owners of the firm. The difference between interest and profit is not that they accrue to the providers of different factors of production but an *institutional* difference that arises from the temporality of production. Interest is paid contractually, at levels agreed in advance, to the providers of capital in the form of debt – those who provide loans or buy corporate bonds, for example – whereas profit is a residual that accrues to the firm and thus to the providers of capital in the form of equity – the shareholders. A further implication is that there is no mix of interest and profit in the returns to entrepreneurs who are also owners: as equity owners all of their return is profit.

This is not a particularly momentous conclusion. Every contemporary economist and anyone with a little knowledge of the financial economy knows that both interest and profit are paid to capital owners and that the difference is the institutional distinction between debt and equity finance. It does, however, blow a fatal hole in the legitimatory argument that profits are purely a reward for enterprise. Entrepreneurial activity may well contribute (alongside many other factors) to increasing profits, but profits accrue to the owners of capital. This group may *overlap* with the set of entrepreneurs, but even then they earn profits in their capacity as owners of capital, not as entrepreneurs. Indeed, many or most owners of equity in successful businesses (i.e. shareholders, including, for example, insurance companies, family trusts, pension schemes and hedge funds) share in the profits without making any contribution at all to the entrepreneurial activity.

Conclusion

Mainstream economics has failed spectacularly to provide an adequate theory of profit, which is extraordinary when its entire theoretical system is premised on the belief that production is driven by the anticipation of profit. Both the partial and general equilibrium models are utterly inadequate as even vague approximations of how the economy works. When it comes to profit, the most remarkable absence is that the general equilibrium model predicts that profit will never occur. Attempts to solve the problem by adding entrepreneurship, uncertainty and innovation have done little to rescue the situation. They do add a touch of realism to the mainstream approach, and at first appear to open up a space in which profit becomes possible. But they do so at the expense of the coherence of the original model. As Joan Robinson expressed it, these economists "were tempted to introduce into the theoretical scheme elements which, at a superficial glance, appeared to account for the

phenomena of the real world, but which completely destroyed the logical self-consistency of the theoretical scheme" (Robinson, 1969, p. 4). We can't just add in uncertainty or innovation to the general equilibrium model, as Knight and Schumpeter did, and assume that the rest of the model will still work. On the contrary, the entire model falls apart: equilibrium disappears and there is no reason to suppose that markets will clear, that factor prices will reflect marginal productivity, or that the overall outcome will be socially efficient. Amongst other consequences, this destroys neoclassical attempts to justify profits in a market system as a fair return for inputs to the process of production.

None of these arguments takes us anywhere near understanding the causes of profits in actual economies. Indeed, one could argue that they are not even *intended* to do so. Many of the mainstream theories of profit are not attempting to explain profit in the real world at all, but rather are attempting to rescue the marginalist fantasy from the problem (often ignored because it is rather embarrassing) that it has no real place for profit. They are theories about models and how to find a place for profit in them, not theories about the real world. Schumpeter's work on innovation is the most useful of them, largely because it does focus on dynamic forces that operate in actual economies, but even Schumpeter fails to escape from the belief that the neoclassical forces constantly move the economy back towards equilibrium (Obrinsky, 1983, p. 63). All these thinkers failed to make the full break with neoclassical model that is necessary if profit theory is to advance (Obrinsky, 1983, p. 67).

Still, there are things we can learn about how profit does work in the actual economy from the *critique* of the mainstream model. First, the critique of entrepreneurial models of profit makes it clear that profit, or at least cashflow-based profit, is unlike other sources of income because it accrues as a residual after the event. Second, it accrues to the firm and therefore belongs ultimately to those with a claim on the firm's income – most obviously the shareholders. It is, in other words, a return to capital. Third, it is different from interest for institutional reasons that have evolved to cope with the different temporalities of the relationships involved. Interest is contractual and thus involves less risk and less uncertainty over the amount to be received. Profit, because it is a residual, is less predictable. These differences have been institutionalised in the distinction between debt and equity, which are both forms of capital. Finally, there is no single factor (whether in the sense of a 'factor of production' or in the sense of a 'causal factor') that explains profit in the real world. Actual profits are always the result of many interacting causal forces, and there is no single causal factor that is necessarily present. Different profits require different explanations, and single factor explanations, like 'uncertainty' or 'innovation' can only ever capture a small part of

what is involved in producing any given profit. Ultimately, these single factor explanations are more concerned with providing legitimations for profit than causal explanations.

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