Post-Keynesian economics: uncertainty, effective demand & (un)sustainable development

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> *It may well be that the classical theory represent the way in which we would like our Economy to behave. But to assume that it actually does so is to assume our difficulties away (Keynes, 1936: 34).*

> *Keynes's vision, which one can trace back to his youth, has to do with the logic of choice, not under scarcity, but under uncertainty (Skidelsky, 1992:538)*

> *By "very uncertain" I do not mean the same thing as "very improbable". (Keynes, 1936:148).*

Summary

Uncertainty is the distinct trade-mark of Keynes's and post-Keynesian macroeconomics. The principle of effective demand can be interpreted as based on fundamental uncertainty about the future.

In this paper I will trace the impact of uncertainty on macroeconomic analysis (theory, method and policy recommendations) within environmental issues, which, unfortunately, is badly underdeveloped within PK-economics.

The analytical procedure with take departure from within Critical Realism, because the social ontology of sustainability is considered as characterized by uncertainty – that we simply cannot know the future. How can sustainable development and the impact of the macroeconomic growth process be analysed meaningfully given these methodological conditions?

It has become a part of the *new* post-Keynesian interpretation of *The General Theory* (1936) to stress that the social ontology of the macroeconomic landscape is only partly visible and guided by causal mechanisms which make a path-dependent track record through historical time. This constantly changing macroeconomic development is best understood through the lenses of an open system, where uncertainty is given a prominent role as an integrated analytical part. This has to be so, because, uncertainty is all over the place. That is the epistemological challenge to *realistic* macroeconomic theory which has the aspiration of incorporating sustainable development as one of the important macroeconomic (im)balances.

Introduction

Keynes's perception was that economies did not behave in the way economists said they did, that something vital had been left out of their accounts, and it was this missing element which explained their malfunctioning; Keynes accused economists of his day of abstracting from the existence of uncertainty – human beings take decisions in ignorance of the future. (Skidelsky, 1992: 538-9)

Keynes developed his understanding of uncertainty throughout his economic writings. *A Treatise on Probability* from 1921 was mainly about individual decision making in an uncertain environment dependent on the kind of information that was available. Through the 1920's Keynes got a vast number of practical experiences from his work in the financial sector, which was a great source of inspiration to develop his theory of 'liquidity preference' – how institutional organisation, individual uncertainty and different 'degrees of confidence' could explain parts of the working of the financial markets, of the transmission of monetary policy and of the development in the long term rate of interest.

But it was not until he had finished the writing of *A Treatise on Money* (1930) that he fully realised that the role of uncertainty had much wider implications. During the early 1930's he started to doubt that a realistic macroeconomic analysis could be kept within the boundaries of a closed model analyses. Because, if uncertainty plays a significant role at all stages of decision making, then coordination failures are unavoidable, not to speak about general equilibrium in this ever changing macroeconomic environment system. Stability (not to speak of general equilibrium) would be like a mirage. In stead, the macroeconomic system will find itself moving along a continuous path-dependent route, where a terminal point is at best unknowable, but more likely not definable.

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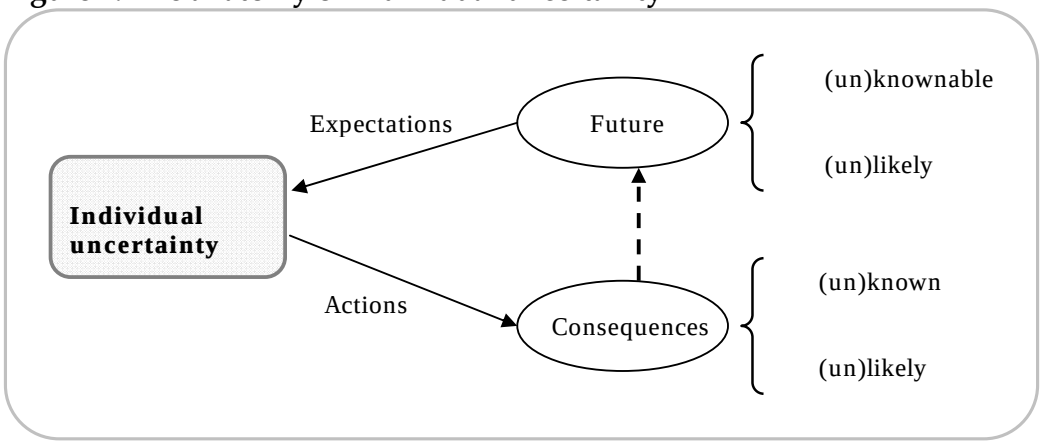
Economics is a science of thinking in terms of models joined to the art of choosing models which are ***relevant*** *to the contemporary world. It is compelled to be this, because, unlike the natural science, the material to which it is applied is, in too many respects, not homogeneous through time,* (CWK, XIV, 1937: 296/97)

By uncertainty, what do we mean?

Uncertainty is caused by lack of predictable knowledge. At the individual level there are two main reasons for that, because we act

1. without having full information about the decisive parameters behind our decisions
2. without have full knowledge about the consequences of our actions

Figure 1: The anatomy of individual uncertainty



Source: Jespersen (2009): chapter 2

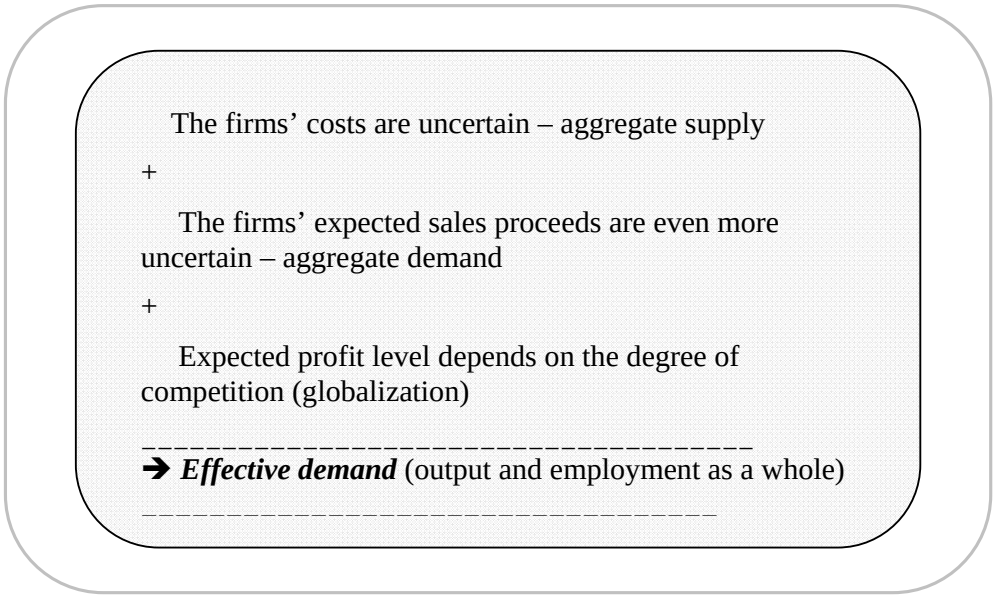
We are all, as individuals, acting without knowing the exact outcome, and we act without having exact information about factors, which carry important knowledge to act. We cannot know the future, because we do not even know fully the ever changing environment. It is misleading and pretentious to assume that agents have full knowledge about the future – so-called rational expectations. In fact, to assume rational expectations in macroeconomics is not in any real analytical sense rational – one my rather say that 'it is to assume our difficulties away', (Keynes, 1936: 34).

What are the implications for realistic macroeconomic analysis that people act under uncertainty – which can take the form of a variety of different perceptions with regard to information of the past, the present and expectations about the future? That is the situation when decision making is undertaken in real life. If we ask for certainty as a precondition for acting – then we cannot act, which in some way is an act by itself. Hence, anyone has to act on the back-drop of uncertainty. The really intrigue question is then, how to make a proper macroeconomic analysis, where uncertainty is given the epistemological role which it deserves.

Keynes's *Principle of Effective Demand* developed in *The General Theory* is an example of such an open system analysis, which integrates uncertain expectations at the firm level into the macroeconomic explanation of production and employment as a whole.

The Principle of Effective demand

Figure 2: Outlines for the macroeconomic principle of effective demand



Source: Jespersen (2009), Chapter 7

'Effective demand' is an analytical concept that can be associated to decision making by profit-maximising firms under the condition of uncertain expectations with regard to future sales and current costs in a market economy. Furthermore, effective demand will be dependent on the degree of competition within the industry which will make the required profit to change for the economy as a whole.

In any case, it is the behaviour of profit-maximising firms acting under the ontological condition of uncertainty that is at the centre of Keynes's *General Theory of Employment*. It is entrepreneurs' *expectations* that determine production and employment.

Therefore, it was somewhat unfortunate that Keynes called his new analytical concept 'effective *demand*', which might have contributed to generations of open minded macroeconomists to be misled into concluding that it was exclusively the *demand* for consumer and investment goods that drives the macroeconomic development. Hereby a gateway for the IS/LM-model interpretation of effective demand was opened.

On the contrary, it is the interaction between the sum of the individual firms' sales expectations (aggregate demand) and their estimated production costs (aggregate supply) that together determine the development in output and employment 'as a whole' in *the General Theory*.[1] Thus, it is my intention with this paper to eradicate the often presented

[1] One can always discuss what the most effective strategy is when new theories are to be presented. For Keynes it was critical to include demand on an equal footing with the supply conditions in the macroeconomic analysis when it was believed to have no existence independently of supply (Say's Law). This is probably part of the explanation for the choice of his terminology. This choice was so effective that nobody subsequently doubted that Keynes placed special emphasis on demand, unfortunately, so effective that ever since, Keynes's and Keynesian economics, in a more superficial reading, is often presented as exclusively a

point of view that Keynes's macroeconomic theory does not have a microeconomic foundation or supply side considerations. In fact, *Keynes's economics is a theory of rational choice under uncertainty*, Skidelsky, 1983.

Firms' uncertain expectations determine 'effective demand'

The supply side in the goods market is an aggregate presentation of the individual firms' cost functions considered as a whole. It shows a relation between what Keynes called 'supply price', i.e. the sales proceeds that, given the production function and cost structures, is needed to '*just make it worth the while of the entrepreneurs to give that employment*' (Keynes, 1936: 24). This means that behind the supply curve there is a combination of variable costs plus an expected profit at different levels of employment. At each level firms try to maximise their profit, if they succeed there is no (further) incentive for firms to change production or employment.

These assumptions entail that the *aggregate supply function* (what Keynes called the Z-curve) is upward sloping and represents the proceeds that has to be expected by the industry as a whole to make a certain employment 'worth undertaken', see the Z-curve in figure 2. In fact, this *aggregate supply function* looks like it was taken directly from a standard, neoclassical textbook, where d*ecreasing marginal productivity of a representative firm* is assumed; the main difference is that Keynes is dealing with the aggregate sum of the heterogeneous firms.

The other equally important part of effective demand is *aggregate demand function*, which is the value of the sales that firms as a whole *expect* at different levels of *macro*-activity measured by employment (as a whole).

In order for firms to act at on the best information available they have to form expectations about future sales which have to be both empirically based and forward looking at the same time: *let D be the proceeds which entrepreneurs <u>expect</u> to receive from the employment of N men, the relationship between D and N being written D = f(N), which can be called the Aggregate Demand Function.* (Keynes, 1936: 25, my emphasis).

It is undeniably a definition of few words that opens the possibility for a number of hypotheses with regard to how the entrepreneurs' total expectations of earnings are formed. Firstly, it is important for Keynes to make clear that aggregate supply and aggregate demand are two clearly separated entities. Keynes's main objection against 'classical' theory is exactly, that it equates the macro-supply and macro-demand functions in such a way 'that supply creates its own demand'

The concept of aggregate demand can perhaps be best understood with reference to the far newer statistical concept of a 'business sentiment index'. The business sentiment index is based on a survey among a cross-section of firms of their expectations about sales in the nearer future. This published index helps to form expectations of sales proceed for the industry as a whole or even for the entire macro-economy. It is assumed that on this basis, the firms form a kind of consensus-expectation with regard to the most likely development in sales (considered as a whole) in the nearer future.[2] This in some way

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demand-oriented theory, which is an exaggeration of at least the same dimension. The 'inheritance from Marshall' had naturally to include the fact that *macro*economic development was to be analysed as a result of the interaction between supply and demand decisions undertaken by rational actors.

[2] 'nearer future' means analytical a period that corresponds to the time of implementation decisions related to hiring and firing in the labour market.

consensus-expectation (aggregate demand) is a useful point of departure for the *individual* firms when they form their specific expectation of future sales. This sales expectation[3] will therefore especially centre on the future *macro*economic demand (and today we would also add international competition).

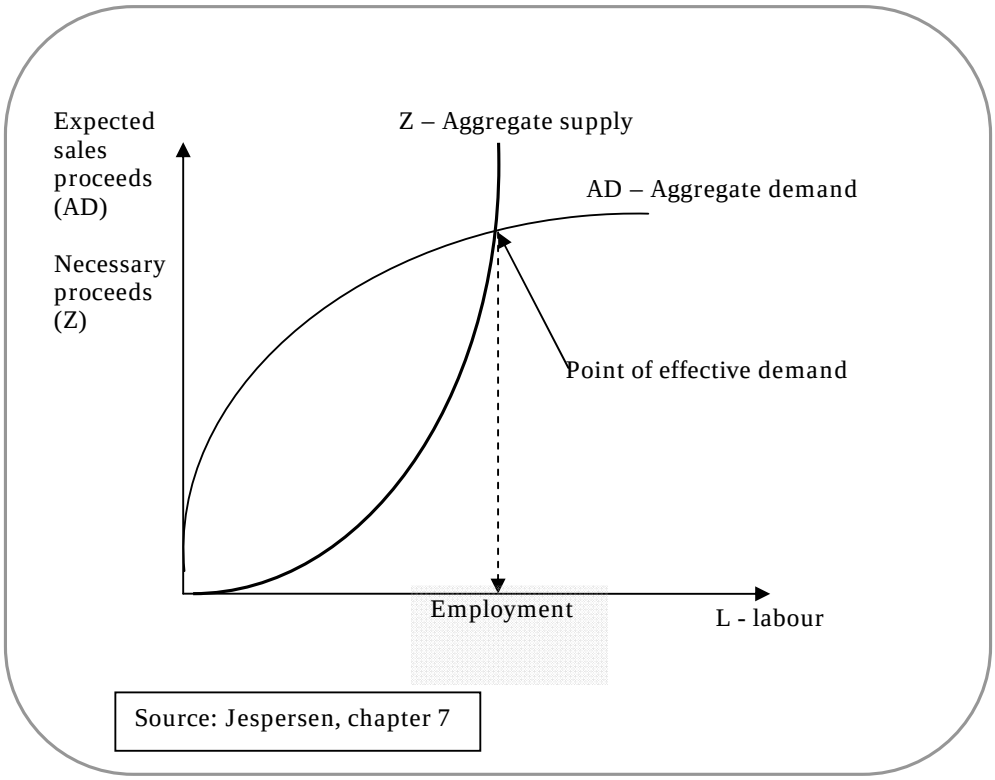
Accordingly, Keynes's *macro*-theory has a microeconomic foundation of firms trying to maximise profit, but differs from neoclassical theory by introducing uncertainty related to the future, which makes an explicit introduction of *aggregate demand* relevant i.e. the *expected sales proceeds by business as a whole*.

One possible interpretation of the behaviour of the individual firms is that they do not consider the firm specific demand as infinite at a given market price. In the short run they have to behave under the constraint of a rather fixed market share and a fixed capital stock. In this case it is not rational for individual firms to plan production as though it operates on a horizontal demand curve and should not expect the market price to be solely given 'from outside', not to speak about being constant. This means that the neoclassical assumption of firms exclusively adjusting the production on the basis of a given price and cost structures leaving demand neglected can be discharged, when uncertainty prevails. In the short run firms know that the aggregate demand at the macro-level is limited and prices flexible, which has to be included in the individual firm's production planning. This analytical semi-closure of firms operating under the constraint of a limited market share makes it relevant to assume firms as a whole to behaving like a monopolistic competitor who has to react on a change in aggregate demand. In addition, the aggregate macro-behaviour is not in dissonance with the assumption the individual firms try to maximize profit given the available, but uncertain knowledge about the future: costs, sales proceeds, market share and competitive conditions (domestic and foreign).

In this case it has been explained, why post-Keynesian economics has dismissed the neoclassical abstraction that the macro-supply curve can be presented by the behavioural relationship of one representative micro-firm. In post-Keynesian theory firms are assumed to behave with respect to their uncertain knowledge about aggregate demand (demand as a whole), and that they can only achieve a (un)certain share of this aggregate demand. Hence, demand is *not* unlimited for the individual firm, i.e. the individual demand curve is *not* horizontal within Keynes's principle of effective demand.

[3] How the total sales would be distributed among the individual firms within the branch would be of lesser importance in a macroeconomic perspective.

Figure 3. Aggregate supply and aggregate demand together determine *effective demand* for labour



The importance of competition

The degree of competition on the output-market determines the size of profit that can be achieved by the entrepreneurs. Post-Keynesian literature therefore distinguishes between two distinct market forms: *perfect competition* and *monopolistic competition*. This distinction leads to different results with regard to the size of profit and to how much employment a certain level of aggregate demand can be expected to generate in the short run. One of Keynes's main points was precisely to demonstrate that his theory was 'general', that it was valid no matter what form of competition prevailed on the goods and labour markets[4]. In fact, effective demand is a relevant analytical concept even in cases where firms were not profit maximising. Probably, he chose to assume profit-maximising behaviour and perfect competition even on the demand side of the labour market out of analytical convenience rather than realism.

As mentioned above Keynes did undertake his macro-analysis under assumption of 'perfect' competition in the sense of real wage being determined by marginal productivity

[4] The post-Keynesian literature distinguishes between 'fundamental-Keynesian' and 'Kaleckian' (named after the Polish-born economist Michal Kalecki, 1899-1970) economics. An often rather subtle distinction, King (2002), that with regard to pricing on the goods market uses two different principles: marginal cost pricing and mark-up pricing respectively, which can be attributed to two different competition preconditions. The distinction is not important, since Keynes can be interpreted as covering both market forms, which not least Keynes (1939) confirms. It was important for Keynes which market form could best be explained empirically and here he was increasingly likely to agree with Kalecki.

– goods prices are given from outside the individual firm while the aggregate demand had to be shared between firms in the market for final goods. In that case effective demand is determined as the intersection point between aggregate supply and aggregate demand, which also determines the analytical 'profit-equilibrium' (*CWK*, VII: xxxiii). At the point of effective demand there will be no inherent tendency in the business sector to change production or employment, because firms are assumed to maximise profit, as illustrated in figure 3.

Conversely, it can be illustrated that increased competition may – *ceteris paribus* – create at the micro level an incentive to increase production and employment by lowering the required profit, and the point of effective demand will move to the right. Hence, globalisation could cause employment to increase if the generally required profit level was reduced due to increased competition. Furthermore, globalisation might also lead to increased real wages, which could boost aggregate demand.

Hence, the importance of the analytical separation of aggregate demand and aggregate supply to establish the *principle of effective demand* can only be understood when uncertainty is introduced. In a certain world the two items would coincide. On the other hand it is of little importance whether perfect competition in the meaning of many small firms is assumed. The principle of effective demand works equally well under assumption of many or fewer firms, because firms have in any case to act as though the production capacity and aggregate demand is limited in the short run, which at the end of the day is a much more realistic assumption.

Individual uncertainty and macroeconomic implications

Uncertainty is caused by lack of information. Therefore uncertainty might have different intensities or 'stats of confidence'. You may feel(!) more or less uncertain, but except for rare cases all individual activities are characterized by (different degrees of) uncertainty, because one cannot know nor estimate the exact outcome. Hence, expectations are uncertain due to this inherent lack of information (and a constantly changing environment).

Risk is defined as measurable uncertainty. If an identical activity is undertaken by a large number of people who act independently of each other, e.g. natural death, then an exact outcome might be calculated with regard to the macro-outcome of the entire population. In these cases a private insurance company or some other institution, which reduces the individual uncertainty with regard to specific outcomes, might be established at a profitable basis. In the society in which we live, one can take out an insurance against the narrow economic consequences of e.g. theft, fire accidences and death. Buying an insurance imply that individual uncertainty, with regard to the money aspects of such incidents, is removed. But, as we know, most activities have also unforeseeable consequences. Therefore, even a well designed insurance contract can only reduce the degree of uncertainty, because it goes against the idea of a private insurance company to accept commitments which imply incalculable risk, i.e. uncertainty.

One important conclusion is that private undertaking cannot change the entire individual uncertainty into socially calculable risk. The real value of financial savings will always be uncertain, because no one can predict the future inflation, which is characterised by macroeconomic uncertainty.

If the consequences of individual uncertainty are not understood there is an acute risk of committing the fallacy of composition. Uncertainty prevents the epistemology of general equilibrium in macroeconomics as an analytical framework. Each macroeconomic development has its own path-dependent dynamics, which is even reinforced when natural resources is becoming of part of the macroeconomic system, Jespersen 2009: chapter 3.

Growth and Uncertainty

> *The sense in which I am using the term [uncertainty] is that in which the prospect of a European war is uncertain, or the price of copper and the rate of interest twenty years hence, or the obsolescence of a new invention, or the position of private wealth owners in the social system in 1970. About these matters there is no scientific basis on which to form any calculable probability whatever. We simply do not know (Keynes, 1937: 113).*

Keynes had little to say about macroeconomic growth, which is quite understandable taking the economic situation in the first half of 1930's into consideration[5]. On the other hand Keynes was very conscious about the importance of long-term expectations for the undertaking of real investment; but as Keynes said in 1937 – what can we know with certainty about any important matter 30-40 years ahead? - 'about these matters there is no scientific basis on which to form any calculable probability whatever'. Keynes was working within the framework of an open system, where the degree of uncertainty increases with the length of the planning horizon.

In *the General Theory* Keynes had analysed the main driving factors within a path which was not in general supply constrained; but he did not make an explicit analysis of the capacity increasing implications of real investment. Post-Keynesian economics were left alone with regard to growth theory. Harrod (1939) made an attempt to overcome the gap of investment being demand augmenting without having a direct supply effect and by that make macroeconomic theory more dynamic by combining the demand and capacity expanding effects of real investment. However, Harrod kept this attempt within an analytical framework of a closed system, where planned investments were assumed to be similar to realised saving. There was within the analytical model no room left for individual uncertainty, although the model demonstrated an inherent instability due to lack of substitution between factors of production and lack of stabilisation policies.

In real life real investment is partly undertaken due to convention (what to do with profits), and partly due to animal spirit (an entrepreneur is more like an artist than a capitalist). But, when real investments have been decided and are on stream, future business activities will be influence by these investments, because the macroeconomic development is path-dependent. Yes, endogenous growth theory is relevant also when uncertainty prevails. Hence, business cycle and growth trend cannot be separated. Firms invest in boom periods due to increased profit and optimism, whereas disappointed expectations will often have a negative effect through reduced state of confidence.

[5] One of the few exceptions is the beautifully written essay on *the Economic Possibilities of our Grandchildren* published in 1930 and included in CWK, IX, where Keynes just plaid with the idea that economic growth could go on for ever determined by the ever increasing productivity.

The long-term productivity and sustainable development

As far as I know, Keynes never wondered about the relationship between growth and exploitation of natural resources. In the inter-war period the supply of coal was vast and oil becoming more plentiful. Although the smog in larger industrial areas was already in the 1930s a daily nuisance, but the alternative a life without coal would have been unbearable. Of course, Keynes had noticed that the overall productivity had increased considerably even through the years of depression[6].

Increased productivity was in no way a new phenomenon. Looking at the macroeconomic development throughout the past two centuries would also have demonstrated a constantly increasing real wage and real production. The market-economic system has been able to display continuously increasing productivity *per capita*, often in combination with reduced working hours. The reasons for the increased labour productivity are manifold (increased capital stock, education, innovations **and exhaustion of natural resources** among other things), which has increased the supply side capacity. Increased productivity reduces unit labour costs, which – *ceteris paribus* – increases the effective demand for production, but does not necessarily increase the demand for manpower.

The increased supply potential can be illustrated by a change of the Z-curve in figure 3. It moves to the right in the diagram when the productivity and the capital stock are increased. If the increased supply potential arises from an increased factor productivity (decreased marginal costs), then the Z-curve will rather have a tendency to move downwards (swing to the right), which will also increase the effective demand for labour measured in units of efficiency. Hence, what we do not really know is, how labour and capital efficiencies evolve through time.

Even under the assumption of an unchanged AD-curve, the effective demand for output will increase when the Z-curve is moved to the right. If productivity is increased, then the intersection point between the AD and Z-curves will move – *ceteris paribus*[7]. This is due to the fact that the intersection point between the production that the firms expect to sell (AD) and the costs of undertaken the production (the Z-curve) is moved, which causes an increase in effective demand for production. On the other hand, nothing unequivocal can be said about the employment effect, because the increased productivity drives a wedge between production and employment. Production can be increased, without it automatically leading to increased employment. It is a well-known empirical phenomenon and is called 'jobless' growth. In order to determine the employment effect, the connection between production and employment must be continuously corrected for the changed productivity.

An increased effective demand for production is thus not in itself a guarantee for increased employment in a growth perspective with increased work productivity. This requires that effective demand increases faster than work productivity. Increased employment is therefore dependent on the expected volume of sales running faster than the development in labour efficiency.

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[6] Within *the Economic Possibilities of our Grandchildren*, mentioned above, he made a calculation of a trend-increase in productivity of 2 percent p.a. - which quadruples production capacity in 70 years (two generations). Then he asked the question, if we accept the living standard of today (1930), then we could reduce the daily/yearly working time considerably – and concentrate on Love, Beauty and Truth, which could also be considered as a kind of sustainable way of life!

[7] Here, the OSCP method is used, which is therefore just one step in a longer chain of reasoning.

What can be said about sustainable development? Unfortunately, very little. If the copper price in twenty years time is something of which we will say, that 'we simply do not know', then the physical living conditions in 100 years time is something that we *really* do not know. Uncertainty prevails. On the other hand we could repeat Keynes's calculation. If we stop effective demand from growing in the future – productivity gains could for instance be directed towards energy conservation and durable energy production without necessarily reducing the material living standard.

In some way it is due time to stop any further expansion of private consumption in the rich countries, because increased physically seems not to make people any happier, perhaps even to the contrary due to externalities, (Layard, 2005). On top of that we know with reasonable certainty that the size of the global population in the developing countries will continue to grow for the coming 30-40 years with another 3 bill. people. If we further assume a rising living standard for all people in the developing countries to a level which is equivalent to the average of the OECD-countries of today say $ 30.000/year, then global GDP has to grow quite substantially before it, by the end of this century, might stabilise at a much higher level.

But, if the rich countries would use all their future productivity gains (excess capacity) to protect the global environment by energy conservation and pollution reduction – their might be a chance of a reduced uncertainty with regard to sustainability (at least with regard to the greenhouse effect) for the following century, which is the time period where our grandchildren are expected to live. What the living conditions will be in other perspectives: water supply, urban life and incurable deceases, 'we simply do not know'; but living conditions will be rather differently distributed around the globe. Some continents will be relatively unexploited and 'under-populated' which might cause other tensions and attempts to migration.

The macroeconomic system is not self-adjusting. If we include the consideration of the exhaustible frame of natural resources and unpolluted environment the economy as a whole will become even less self-adjusting, but presumably follow an unpredictable, but path-dependent track into a seemingly more and more uncertain future. This means that the decisions we undertake (or do not undertake) today will have irreversible implications for the future. That is one of the less uncertain prediction related to the prevalent unsustainable development which is taking place right now, especially as long as policy decisions are building upon the conventional general equilibrium assumption that nature is economically unlimited, then the attitude that business as usual can go on unchallenged into the future will prevail.[8]

[8] One may recall the fate of Titanic. Some of us are travelling on first class, other on second class and the crowd on low economy class. When then iceberg is hit, there will only be room in the rescue boats for a section of those travelling on first class, the other passengers are left behind on the sinking boat with decreasing chances of survival. The unfortunate thing is, that it is only people at first class, who have the economic power to change the course of Titanic; but they have the least incentives to do anything!

Conclusion

> *I shall argue that the postulates of classical theory are only applicable to a special case only and not to the general case, the situation which it assumes being a limiting point of the possible positions of equilibrium. Moreover, the characteristics of the special case assumed by the classical theory happen not to be those of the economic society in which we actually live, with the result that its teaching is misleading and disastrous if we attempt to apply it to the fact of experience*, (Keynes, 1936: 3).

Keynes did present an analytical alternative to the prevailing neoclassical general macro-equilibrium framework. In this paper I have argued, that the real difference was the incorporation of *individual uncertainty* into the macroeconomic analysis.

The 'principle of effective demand' is one of the major examples demonstrating that uncertainty matters. The importance of effective demand cannot be understood without explicit reference to uncertainty in entrepreneurs' decision making process.

Very little can be said about sustainable development, except that uncertainty is increasing contemporarily with resource exploitation and increased pollution. Furthermore, it seems quite likely that poor people and poor countries will be hit the hardest through deteriorating living conditions. Whereas, those countries, which have the economic excess to undertake real environmental changes, have the least incentives to do so – they are in a stronger position to protect themselves against the negative impact of changed climate and increased migration.

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