Volodymyr Ryaboshlyk "Turning Point vs Trend", *Journal of International Studies*, Vol. 4, No 1, 2011, pp. 56-68.

Scientific Papers
Journal of International Studies

Turning Point vs Trend

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Submitted: August, 2011
1st revision: September, 2011
Accepted: October, 2011

Abstract. At the beginning of the paper some shortcomings of the existing forecasting systems are demonstrated on examples of products of the EU forecasting service and of the Macroeconomic Prospect Team of the Treasury of the UK. And apart of it the smoothed lines of Nobel Prize winner of 2010 Professor Pissarides are considered in comparison with clear forecasts of turning points received by the author on the same time series. Then a description of forecasting of the recession of the early 1990s in the UK is given, as a part of forecasting of innovative growth. It is underlined that statistics must show explicitly 'the height of technological leap' and provide separate parameters of old and new technologies. And that the current focusing of attention on the most advanced technologies only should be broadened to all technologies which actually are being implementing in the economy. Comparison with the Cambridge Multisectoral Dynamic Model of the British Economy shows how peculiarities of reflection of new technologies could affect ability of seeing turning points. At the end some remarks are contributed to the current discussion between the competing schools. Positive aspects of the "Great Recession" of 2008 – 2010 are highlighted along with their similarity with previous crises. At that an attempt to restore the "shattered intellectual structure" of Alan Greenspan is made.

Keywords: forecasting of crises, quantitative indicators, EU countries, forecasting of the U-turns.

JEL classification: C53, C54,G17

The true test of the relevance of a macroeconomic theory
is its capacity to generate a Depression, since market economies
have regularly found themselves in such a state.
(*Hyman Minsky)*
Europe should be more open to the process of creative destruction.
(*Philipp Schindler, a vice-president at Google)*

Introduction

Numerical forecasting of crises could become much more articulated if it were embedded in forecasting of innovative growth. This old qualitative idea now has got new quantitative interpretation and approval on thousands indicators of one of the EU countries.

The transition path of whole economy to new technologies, starting from the old ones, must be traced more carefully, all structural shifts being taken into account. At that crises now

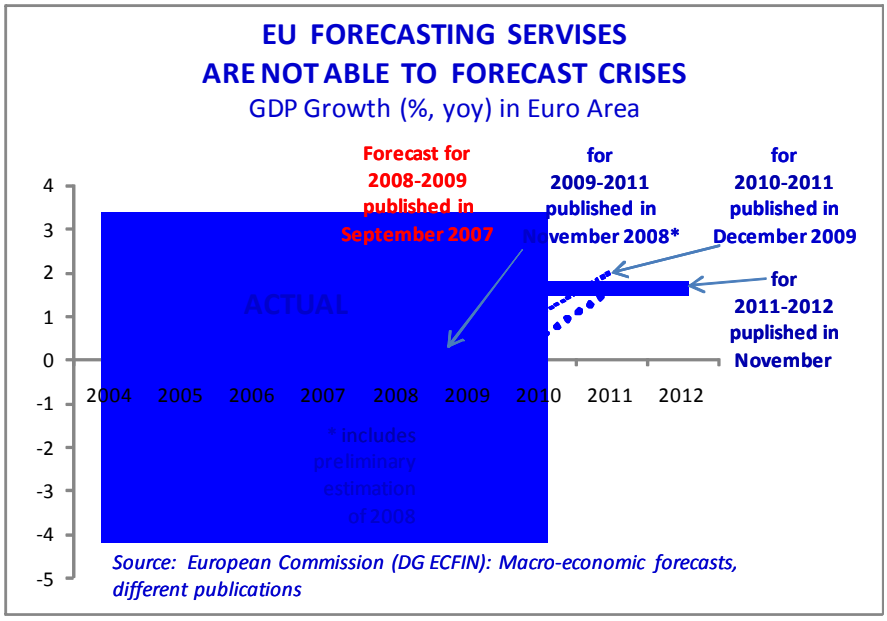
and again arise as inevitable parts of these paths. And this is one of substantial causes of crises, which is still neglected.

Just this provides forecasting of the U-turns, rather than mere extrapolations of trends.

So such real innovative aspects should be added to regular analyses of different forecasting units to enforce traditional forecasts based on financial, behavioral and other aspects.

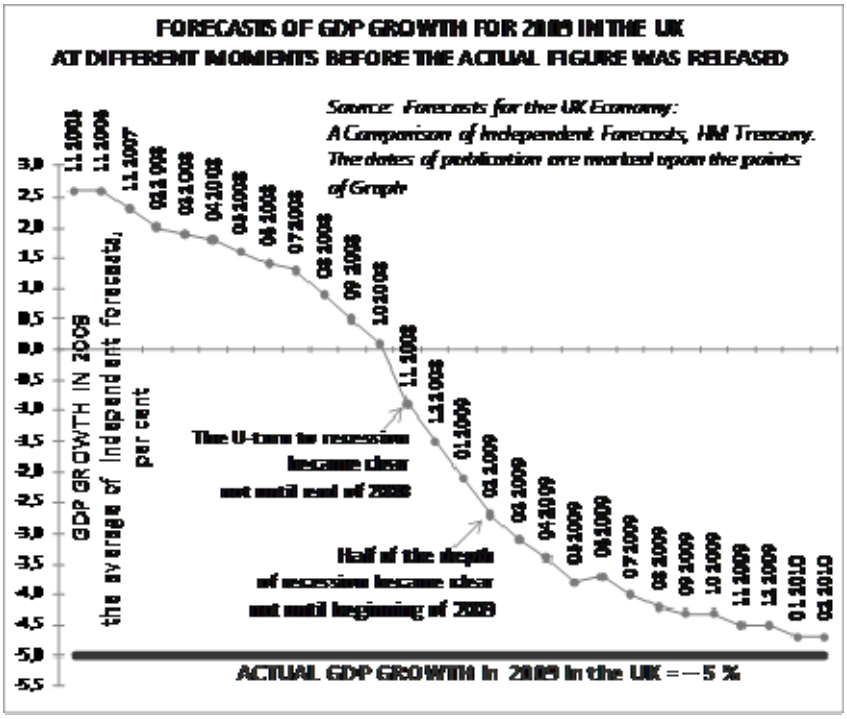
1. Turning Point is a Weak Point of the Forecasters

The decline of 2009 had been predicted almost when it actually began. In 2007 the official forecast of the EU for 2009 (for two years forward) was 2,1% of GDP growth, which resembled extrapolation of the previous facts. In the end of 2008 (forecast for one year forward) such extrapolation provided 0,4% decline for 2009, which was extrapolation of the known data as well. Actual decline was 4%.

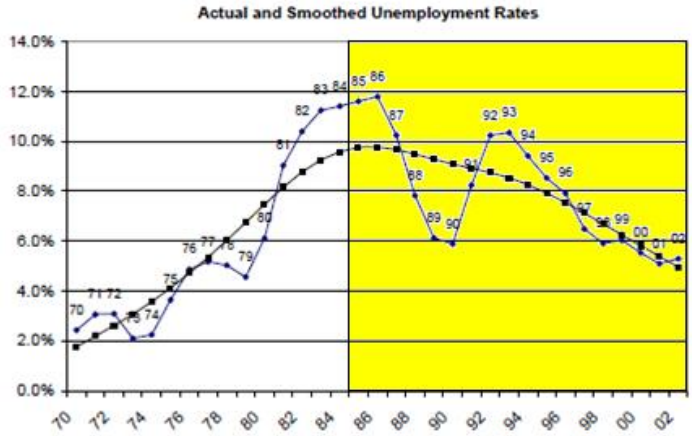


Analogous situation in the UK is illustrated by another manner. Only at the end of 2008 it was recognised that in 2009 the slowdown would turn in decline. At the beginning of 2009 the depth of decline had been guessed half right (the forecast published in February 2009 was -2,7%, actual decline was -5%.

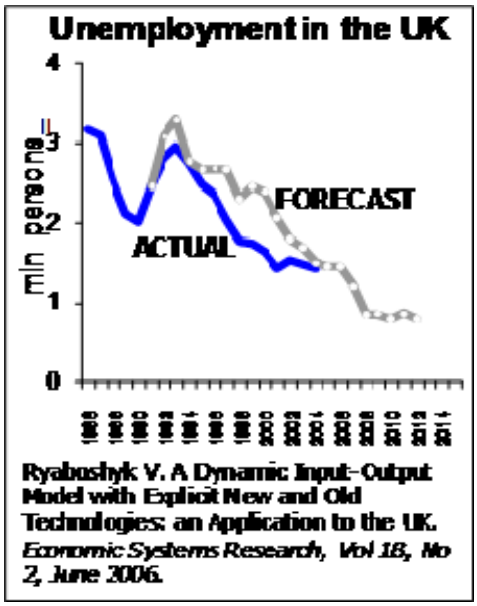
It is clear that the existing methods deal with crises not very successfully. Improvement of crises forecasting requires better understanding of their roots. First of all it should be recognised that cyclical declines and upsurges are not random deviations from some "right" deterministic trend, but they are to some extent deterministic itself.



The difference between these two views are illustrated on a pair of diagrams below, which analyse the same time series of the UK.



Pissarides C. A. Unemployment in Britain : A European Success Story. *In Werding, Martin (ed.), Structural Unemployment in Western Europe: Reasons and Remedies, CESifo Seminar Series, Cambridge MA, London, UK : MIT Press, 2006.*



Nobel Prize winner of 2010 Professor Pissarides looks at unemployment aggravation in the periods of crises as at "short-term fluctuations" from the smoothed trend. The smoothed line he is inclined to attribute to "natural unemployment". As to the residual he doubts: "whether the deviation is the cyclical component is open to question".

As distinct from this, our approach has closed this question and directly forecasted actual cyclical movements of just these time series without resort to unnecessary splitting in components.

Crisis is a situation when the Schumpeterian 'destruction' temporally take the lead

over the 'creation'. Decline of output occurs because unveiling of new production temporally falls behind phasing out of the old, no more needed under new structure of the economy.

Similarly unemployment aggravation means that new jobs creation falls behind liberation of labour from old jobs, no more needed as well.

Progress is traditionally measured by the improvement of an economy's average characteristics from year to year. Further insight must be gained by splitting the averages into explicit parameters for the new and old technologies at work within the same year, and recognising that innovative growth is driven just by the 'potential difference' between these two, by the 'height of the leap'. It must be clearly seen: what the Capital Formation forms? At that outputs produced by new and old technologies, as well as the labour and capital associated with them, should be considered separately and explicitly.

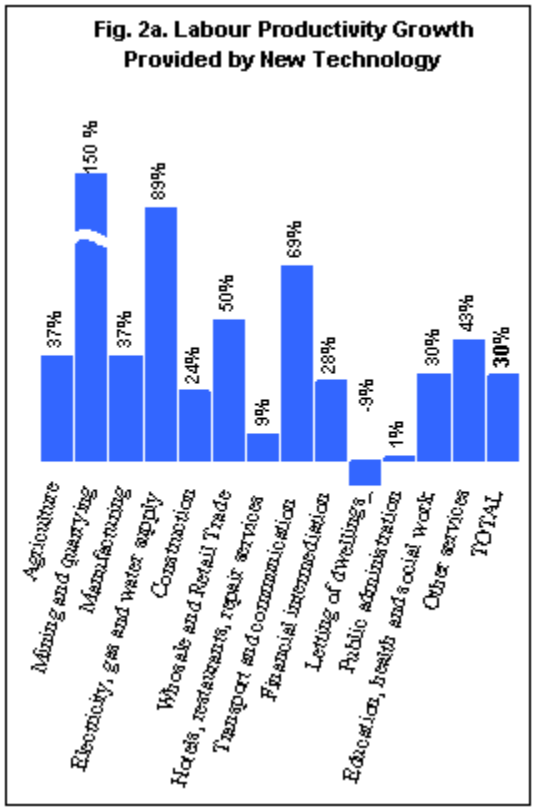
Keynes had said what remedies should be applied to crises, but he had not said when crises spring up. Filling of this gap is the crux of this approach.

2. Forecasting one Cyclical Decline in the UK

Fruitfulness of these views has been approved on the forecast of the recession of the early 1990s in the UK. For that hundreds parameters were collected and more than 5000 variables were calculated, see Ryaboshlyk (2006). Below an outline of this work is given.

The whole economy was divided in 13 industries and estimations of parameters of the existing old technologies and the new ones, which are to come, were fulfilled.

The new technologies opened the possibility to increase labour productivity and decrease power intensity and other efficiency parameters in each industry. But it must be paid for.



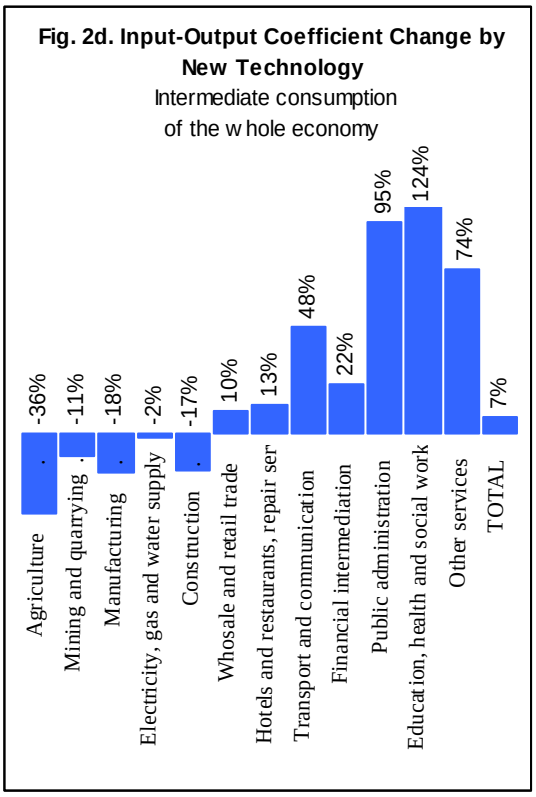
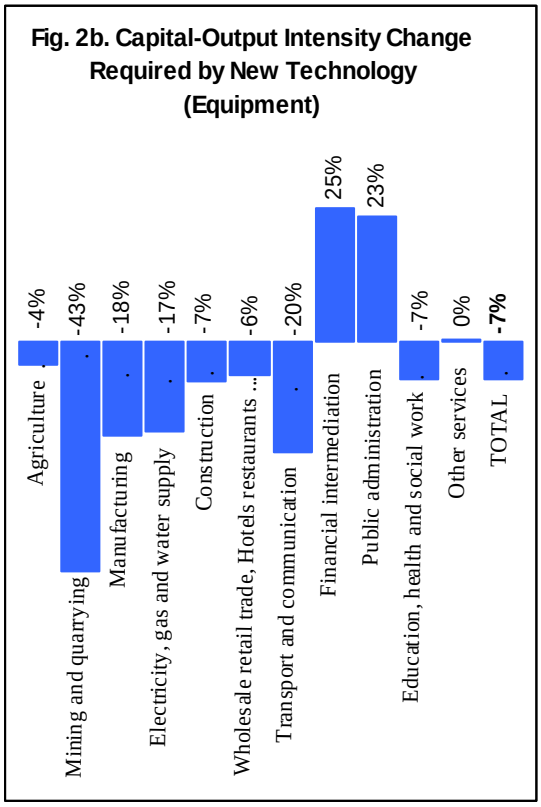


Figure 2a shows the growth in sectoral labour productivities when the new technology is used. For example in Mining and quarrying productivity becomes 2.5 times as large as with

the old technology (plus 150%) apparently due to North Sea oil and gas fields.

Figure 2d shows changes in total intermediate inputs needed per unit of output. Under the new technology the group of production and construction industries require less intermediate consumption, which testifies energy and material saving (share of the intermediates in output of Agriculture decreased in a third, for Electricity, gas and water supply – in 2% and so on). And the opposite holds services and distribution industries (e.g. share of intermediate consumption for Public administration and Education health and social work had roughly doubled and increased in 95 and 124% respectively). This could be explained as rising of quality of services due to using more medicals, textbooks, etc.

But at the same time such progress must be paid for by investments in new equipment and buildings. *Figure 2b* on shows capital-output intensity changes in relation to equipment. A clear tendency to increasing efficiency of new equipment could be observed – the capital intensity had lowered almost in all industries except for non-market Public administration and over-computerised Financial intermediation.



Analogous data was collected about capital-labour intensity, capital stocks of the existing technologies, inventories, etc. Capital lifetimes ranged from 9 to 80 years. Of course, new capital stock is absent initially and has yet to be accumulated. Calculations were performed in the real terms, using 1992 basic prices.

The new technology uniquely defines the new upper ceiling for development (i.e. the new steady state, or saturation, where the highest possible output with the given labour force and other constraints can be supported infinitely), and defines the new economic structure through which this ultimate state can be reached.

However, the path leading to this steady state, through gradual substitution of old technology via new investments, accumulation of new capital, labour redistribution and other resources reallocation, is not unique at all.

The remarkable result of these calculations is that under those characteristics of new technologies there were no transition paths to new level of development, which could escape temporary decline at the beginning, that is – cyclical fluctuation. All the variants, even under perfect coordination, did endogenously forecast the contraction that had actually taken place.

Thus, it had been proved that the recession of the early 1990s was technology-driven one and had material, physical roots. This cycle was neither "a random fluctuation that occur around a trend", nor "ups and downs of human psychology", nor "unanticipated fluctuations in aggregate demand", but quite natural deterministic process.

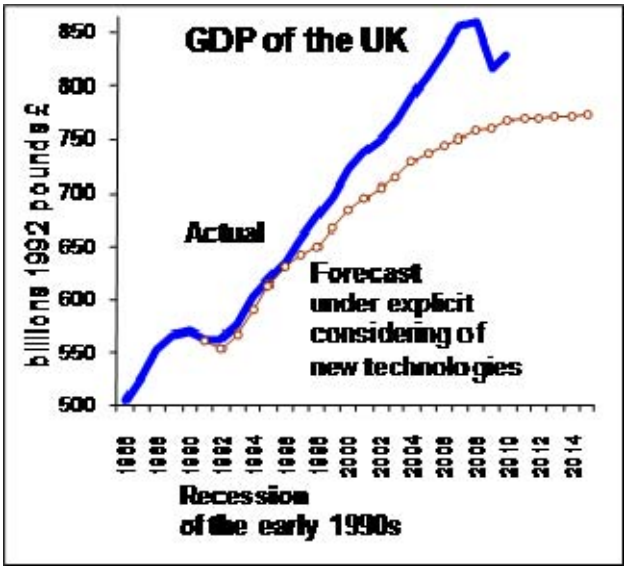
In this period the output and employment for the old technology reduced, because investments are diverted away from the old technology. At the same time, this reduction has not yet been compensated for by the expansion of the new technology.

Such temporary worsening of welfare has the same character as past epochs of primitive capital accumulation, albeit to a much lesser extent. Such periodic "developmental diseases" are unavoidable and can only be alleviated by an inflow of foreign investments, if available. But the latter option stays out of the global economy, taken in a whole, which is a closed one, and has no external sources of resources.

After overcoming of initial decline the economy is booming along an almost straight path, substitution of the old by the new being in process. The crucial moment arrives when the entire labour force has shifted to new technology and no labour is working anymore with old technology so that the saturation is achieved. Then stagnation begins. So, marking the turning points on development paths is likely to be more fruitful than simply extrapolating trends.

In reality continuous growth is a sequential adding of more and more technological leaps (which previously were called shocks) opening newer and newer possibilities. And only under absence of such leaps stagnation actually take place and investments turn into a simple supporting of the existing technology.

The right part of the graph of Prediction of GDP relates to much later years and shows how would develop the economy of UK after early 1990s if next technological leaps had not come. For Japan it was not only a supposing option in the period of 'lost decade'.



3. Anticrisis World Program

This forecast had been achieved ex post, some years later than 1992, because of shortcomings of existing statistics, which till now affords estimation of technological leap with long delay. If such a posture remained unchanged we would get additional knowledge

about the roots of current crisis in a couple of years. But it is of practical importance to predict the next crisis and prepare for it in good time.

For that this method should work in real-time regime, so that the existing regular forecasts based on analyses of financial, behavioural and other aspects of the economy would be enforced by real innovative aspects described above.

This issues a challenge to statistics and micro-data systems to organise separate and explicit statistical accounting of parameters for new technologies to be implemented in the economy and elucidation to what degree new technologies are progressive.

After such detailed information becomes available, the whole pattern of policy oriented analysis would undergo a change and include the following items:

- estimation of potential upper ceiling of development as allowed by new technologies;
- positioning of the economy in the cycle based on its position in relation to the ceiling;
- estimation of directions of structural changes including the structure of employment;
- disclosing of these general directions into more specific paths of development;
- ascertaining whether this path include temporary recession.

At that, the 'potential upper ceiling' would assume a dominating role of benchmark and substitute for the 'potential GDP' and for the 'trend'. So that statements like "we are above or below trend" might turn into "we are above or below the ceiling" or "how has the ceiling been pushed up by recent technological achievements?", "how we are close to the ceiling?"

All in all, "hunting" for turning points opened by such amendments might become more fruitful, than constructing smooth trends.

4. Forecasting Unemployment

It is quite reasonable that along with the forecast of decline in output the forecast of decline in employment (structural unemployment) had been achieved as well. That is the situation when the amount of new capital is not yet sufficient to absorb all the labour released from old technologies.

At that the widely used Phillips curve had been abandoned, because it grasps only general tendencies, not peculiarities of different phases of cycle.

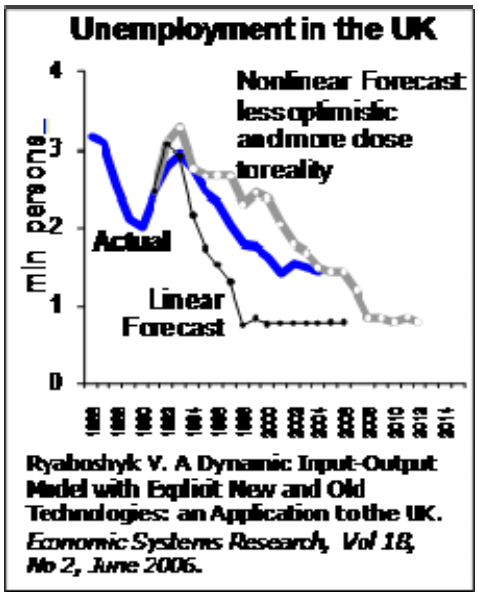
Heterogeneity (nonlinearity) of the economy had been proved to be of importance. We took in account the spread of productivities within each industry considered and this improved the results very substantially, especially the forecast of structural unemployment. This was achieved due to the fact that output contraction releases labour with the lowest productivity, preserving the most productive labour. The latter in turn means that a reduced amount of output requires relatively less amount of labour. Thus, contraction of output causes relatively higher layoffs in the nonlinear variant than could be expected from applying strict linear dependence of output from labour engaged.

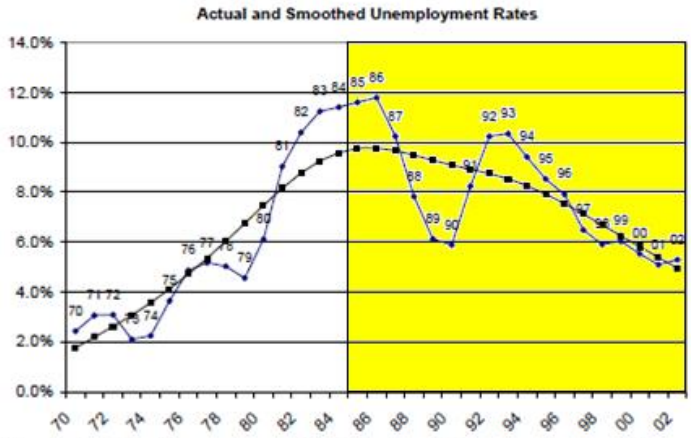
The figures below afford comparison with "smooth" analysis of the same data fulfilled by Pissarides (2006) and show some new possibilities opened by the "turning-point" approach.

This pair of diagrams shows potentials of the "turning-point" approaches to enforce forecasting ability.

Heterogeneity is a substantial feature of the economy and below we shall give only some witnesses of this. The productivity for the best plants in UK manufacturing is almost 5 times larger than for the worst plants. Such differentials remain, even for similar enterprises of one locality. For example, for 148 men's outerwear plants in the Northwest the gap between the best and the worst case was 2.5 times for productivity and 3.6 for the capital/labour ratio, Haskel (2000).

Comparing the best parts of the economy against the worst parts also opens possibility for stock market analysis, and for its integration in the mainframe of macroeconomics.





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5. The Cambridge Model Does Not Forecast Cycles (Technological Leap vs Technololgical Trend)

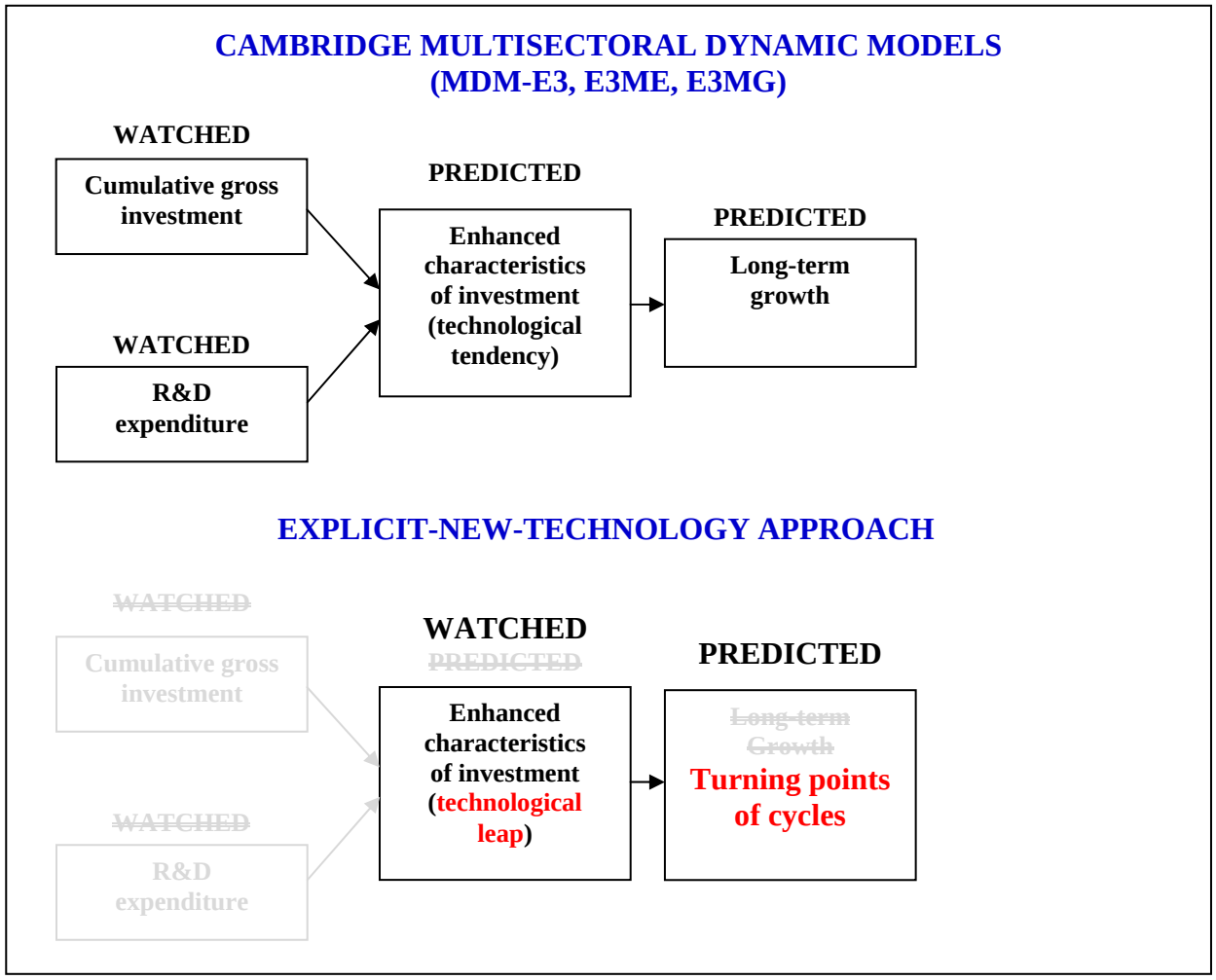
It should be emphasized that the most detailed Cambridge Multisectoral Dynamic Model of the British Economy does not predict cycles yet.

Two differences are essential here, which could be also treated as ways of improvement.

The first is that the proposed approach WATCHES properties of new technologies instead of FORECASTING them through watching R&D expenses. The latter task, the "Cantabs" try to tackle, is too complicate and the adopted simplified solutions are too rough. Whilst the proposed task of statistical watching new technologies instead of forecasting them is much easier, naturally giving more accurate data, which in turn afford more accurate further forecasts of transition path of the whole economy to new technologies.

An objection could be put that now statistical authorities give us only average characteristics of a mix of all technologies at work without splitting it in separate properties of new and old ones. That is right, still, such separate properties do exist and, say, microdata analysis could help to see them.

Below: comparative scheme of the Cambridge and the proposed approaches.



The second is that the proposed approach takes into account heterogeneity (nonlinearity) of the economy, which is especially substantial for prediction of unemployment.

6. Some Remarks on the World Crisis Discussions

Crises would still occur even under ideal financial regulation and ideal human psychology, because they have real roots along with all the other ones. Parameters of new technologies in comparison with the old ones must be watched directly and explicitly. And transition path to progrss must be forecasted.

Alan Greenspan had recognized that the recent financial meltdown had shattered his "intellectual structure" and that “unless the heart of man can change, there will be a similar crisis”.

Lord Eatwell declared that “the idea that what happened over the past two years has anything to do with a negative technological shock is nuts. … It is ludicrous. There is no possible link, but this is what most economics undergraduates in this country are being taught”. He meant Real Business Cycle Theory which says that “cycles are caused by technological shocks. Therefore, you have booms if something is invented and you will have a slump when technological progress falters”.

Lord Skidelsky in his articles with expressive titles “The business cycle myth” and “The Unreality of the ‘Real’ Business Cycle” exclaimed “It is hard to see how this type of theory either explains today's economic turbulence, or offers sound instruction about how to

deal with it. …it is difficult to identify the technological "shock" that set off the boom. …But this crisis "left no monuments to human invention, only piles of financial ruin."

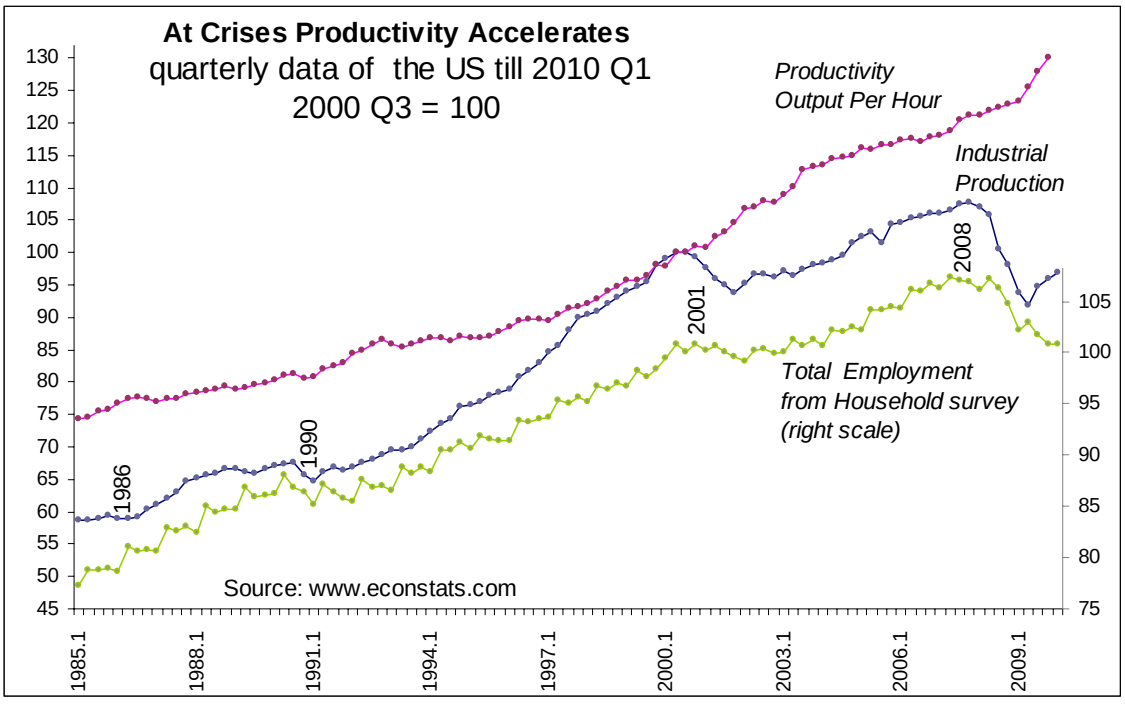
Schumpeterian Creative Destruction (creation of new capital and the destruction of old capital), to which runs back Real Business Cycle theory, ran the gauntlet as well. It "builds a mountain of mathematics …the main effect being to minimise the 'destructiveness' of the 'creation'." At that Schumpeter's 'mathematical progeny' is 'a world away' from ideas of their founder.

Niall Ferguson is sure that "the big academic winners of this crisis have been the proponents of behavioural finance, in which the ups and downs of human psychology are the key" and that the opponents "have failed to learn from decades of economic research on expectations".

In connection with all this some remarks could be put forward.

1. Recognition of psychology does not suggest complete negation of material aspects of economy.

2. This crisis did left some "monuments to human invention" in form of steadily rising labour productivity. And in the current "Great Recession" productivity is so high that it has provided output recovery (in the US from the 3d quarter of 2009) earlier than recovery of employment. That is output of fewer workers is higher than of more workers somewhile earlier. This might be seen even more clearly in terms of new productive units and their productivity as opposed to the old ones. Unfortunately, traditional statistics hide this gap behind the averages.

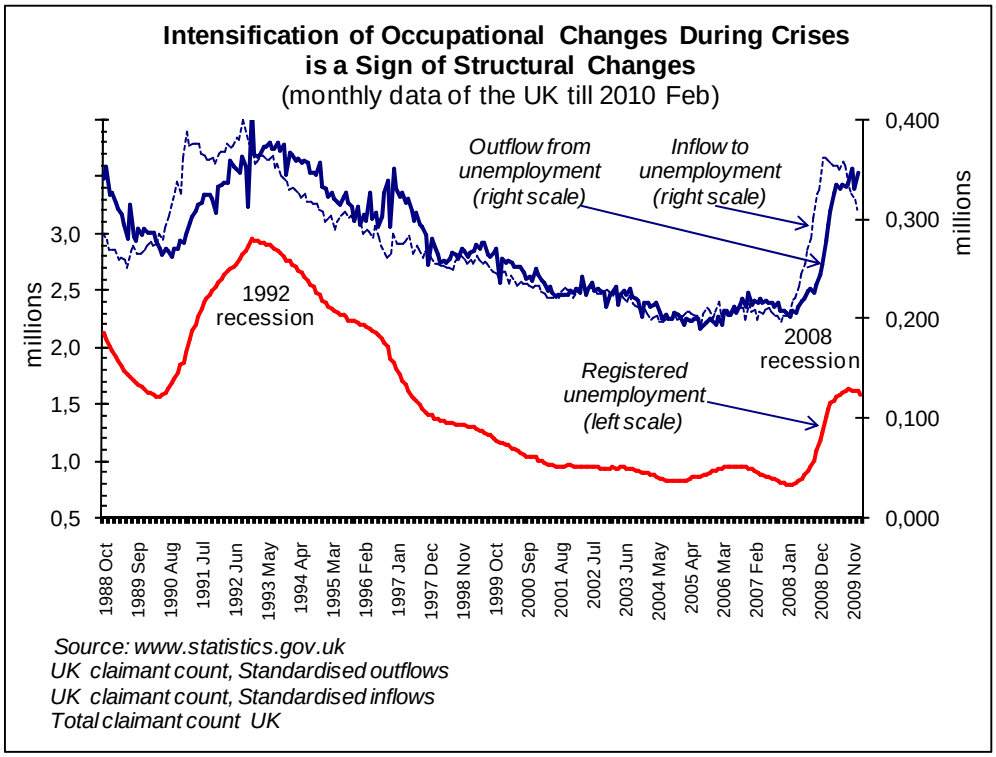


3. Correct reproaches to the Schumpeter's progeny do not mean negation of his idea as such, but a need to be interpreted more properly. The refinements already approved are the following:

3.1. *Crisis is a situation when the 'destructiveness' temporally take the lead over the 'creation'*. Decline of output occurs because unveiling of new production temporally falls behind phasing out of the old, no more needed under new structure of the economy.

Similarly unemployment aggravation means that new jobs creation falls behind

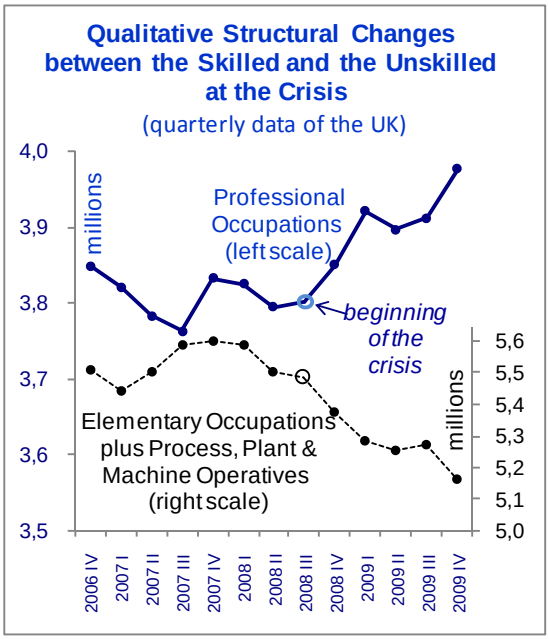
liberation of labour from old jobs, no more needed as well.



Intensification of structural changes under crises could be seen from intensification of labour mobility (a substantial increase in numbers of those who found new jobs). And only temporary advance of those who lose – leads to temporary aggravation of unemployment.

Qualitative changes could be seen from the fact that on the background of overall decline in employment, employment of the skilled is growing in contrast to the unskilled.

So, crises are not only a fire to be extinguished, but a lot of positive processes to be seen, understood and predicted.



This reasoning is very close to another thought of Alan Greenspan: "a market economy will incessantly revitalise itself from within by scrapping old and failing businesses and then reallocating resources to newer, more productive ones". And "this pattern of progress and obsolescence repeat over and over again".

If only Mr. Greenspan had added that sometimes "scrapping old and failing businesses" temporally take the lead over unveiling of the "newer, more productive ones", then the theory of crises would have been finished up as early as in 2007.

3.2. The term "negative technological shock" should be substituted by *"quasi-negative technological shock", that is it requires temporary decline before booming.*

And as to the situation "when technological progress falters", it means not a slump, but stagnation.

In other words technological progress sometimes has such parameters that before booming they stipulate decline on the transition path to new level of development. As relentless reality proves us, such situations now and again repeat, meaning crises.

3.3. *Thus, temporary declines would still occur even under ideal financial system, because there are real roots along with all the other ones. Financial crises are only a consequence and manifestation on the surface of deep processes in the real sector.* The first falling dominoes of domino effect of bankruptcies, are the producers phased out by real structural changes.

If only Mr. Greenspan had added that sometimes "scrapping old and failing businesses" temporally take the lead over unveiling of the "newer, more productive ones", then the theory of crises would have been finished up as early as in 2007

Shortcomings or merits of monetary and fiscal policy, and financial regulations significantly influence the peculiarities of crisis proceeding (and it was just such shortcomings which aggravated the crisis of 1929 to Great Depression). But still they are not the prime cause. Therefore bank regulation and derivatives issues, the West is so concerned about now, are very important, but do not bottom the roots.

3.4. *Substantial advancement in numerical measurement of technological leap is required ('Leap' is more appropriate term than 'shock').* Progress is traditionally measured by the improvement of an economy's average characteristics from year to year. Further insight must be gained by splitting the averages into explicit parameters for the new and old technologies at work within the same year, and recognising that innovative growth is driven just by the 'potential difference' between these two, by the 'height of the leap'. It must be clearly seen: what the Capital Formation forms? At that outputs produced by new and old technologies, as well as the labour and capital associated with them, should be considered separately and explicitly.

It should be asked to what degree the new technology introduced within a given year via new investments is better than the old technology? how the new technology gradually displaces the old one? how the two coexist and interact before full displacement of the latter? how proceeds the dynamical interplay of them?

And finally the main question – whether cyclical decline under these parameters is

inevitable? Structural change and structural unemployment are to be estimated along with it, as well.

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