

On the Reality Behind Money

Erik Händeler

Most schools of economics discuss the monetary symptoms of economic development. The economist Nikolai Kondratieff (1892–1938) proposed that money was the result rather than the cause of economic development: the latter was to be found in the sector-specific changes occurring in real life. In view of the financial crisis his perspective on sector-related real economics is an opportunity of opening up a fresh debate on the basic assumptions of economics.

It is impossible to ignore the growing criticism of economics of being unrealistic, an ivory tower, intellectually dishonest. Its proponents are more disunited than virtually any other branch of science. Because mainstream economists neither foresaw the post-2008 financial crisis nor are really able to explain its deeper-seated causes, it is becoming easier for alternative theories to get a hearing. This not the inconsequential babble of a couple of theoreticians, but has to do with the question of how we visualise reality. The theories which the majority consider realistic are dependent on which economic policy is widely accepted, how we perceive the impending economic crisis, i.e. approach the turbulence in order books and on stock exchanges, how we gear our businesses, how we work. Future prosperity is determined by the quality of economic debate.

Macroeconomists have hitherto perceived their discipline mainly through its monetary indicators. They discuss money: prices, interest rates, wages, taxation and state spending. At the same time, since Max Weber over 100 years ago, we know that prosperity is first and foremost a cultural achievement. The Russian economist Nikolai Kondratieff also thought that the reason for economic development was to be found in the changes of real life. It has to do not only with steam engines or computers, in other words tangible things, but with new patterns of success, organisational forms, management methods, educational requirements – changes in human beings' heads and behaviour. Kondratieff, with his all-embracing

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perspective, provides an approach to understanding how the virtual/monetary and real/material side of the economy are linked. It is a perspective which changes the perception of the unstable post-2008 world economy, leading to a different economic policy which begins with scarce factors of production.

Towards a More Holistic View of Economics

For decades bankers were highly respected until, all at once, all over the world, they supposedly decided to become greedy and gamble away our prosperity. So they are blamed for the real economy suffering and fewer goods being bought – that is how the general public perceives the economic turmoil. **But nobody goes on to ask why many companies and house owners failed to service their loans specifically from 2008 onwards**, why bankers previously gave loans to people who could not actually afford them. Why then have interest rates stayed so low since the turn of the millennium? Afterwards, when the New Economy crashed and during the post-2008 financial crisis, why did share prices and raw material prices go crazy?

The answers are to be found in real life: since the 1970s the computer has hugely boosted our productivity, has saved working time and resources, thus making new investment profitable and creating new jobs. It worked for us until shortly after the turn of the millennium and subsequently in the emerging nations. Yet at some point every technology network underwent sweeping expansion. Anyone now wanting to invest money was no longer able to find lucrative opportunities. The over-supply of free capital put pressure on interest rates, which no longer yielded much – so money went into speculation on shares, raw materials or real estate and drove their prices to heights as yet unknown. If share prices rise within a short period this does not mean that the companies have increased in value (as we all believed), but that in real life there is nothing else which represents a worthwhile investment. The amount of free money stimulated irresponsible lending – the symptom of a structural cycle at its end. But it did not cause the economic slump. The bubble burst because there was a feeling in the real economy that the usual advances in productivity were absent. Prices and profits were subject to downward competition, it was hardly worth employing people or investing, the global economy faltered.

Nothing out of the ordinary. There have always been times of uncertainty throughout history, whenever a technology network has spread extensively but the infrastructure and skills of the next technology network have not yet developed sufficiently. For instance, the Founders' Crash of 1873 in the years after the railways were constructed, after electrification in the 1920s and after the Auto Boom into the 1970s. Later on, after the 1973 oil crisis more and ever better cars were indeed built. The driving force increasing productivity, however, was now the computer, with the aid of which cars could be built more cheaply, better and of superior quality – until recently. Since now ever more, ever better information technology can no longer noticeably improve any texts or designs, the economy

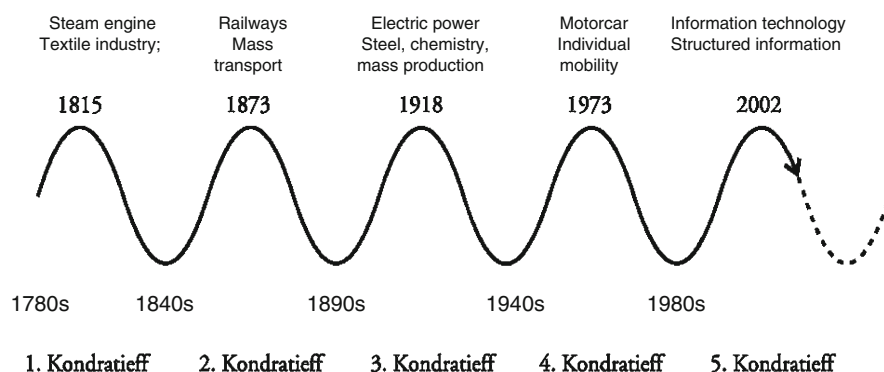


Fig. 1 Schematic diagram of Kondratieff long waves. The Y axis symbolises economic dynamics, i.e. the rhythm of macroeconomic productivity trends. From: Erik Händeler, *Die Geschichte der Zukunft*

will initially mark time until we succeed in climbing onto the next rung of prosperity using new tools and new skills (Fig. 1).

For Kondratieff it is these historically pivotal inventions which carry the economy to a new level of prosperity – for example the steam engine, which was developed not for fun but out of economic necessity arising from the greatest shortage of the time, the shortage of mechanical power. When it drove spinning wheels they were 200 times more productive than a manual spinning wheel. Many more textiles could be produced at far lower prices; many more people could afford clothing. A new infrastructure was needed for this: steam engines need coal; more ore had to be mined and transported by canal. The workers became a relevant social class. Because of one invention there were so many new applications that the whole economy grew for 20, 30 years – until there was another limiting factor.

If someone has five left shoes and seven right shoes, how many pairs does he have? Not six, only five pairs, because he cannot increase the number of left shoes in the short term. The same is true of factors of production, which do not all keep pace with the economy. At some point one in the relationship becomes so expensive that entrepreneurs no longer find expansion worthwhile, and that was the transportation of ore, coal and industrial goods after Kondratieff's first wave. Productivity stagnated, also because the hitherto dynamically growing technology network had spread extensively. Entrepreneurs no longer made a profit and therefore had no reason to invest further and employ workers. A long and deep economic crisis followed. Although the high unemployment of those days has not been measured statistically, the novels of the time, for example those of Victor Hugo (*Les Misérables*) and Charles Dickens, have passed it down.

Only after the 1840s, when large-scale railway construction took place, was the economy able to grow again. Transportation costs fell; trade and production became widespread, larger quantities paid off. Railways were not built because people no longer felt like travelling by coach, but because there were competing businessmen

who had to cut their costs, and in those days the greatest productivity reserves happened to be in railway construction. People do not like altering their behaviour, however, and that is why at the start they are always held back by the structures required for a new Kondratieff cycle.

Princes did not want railways to cross their land boundaries – they were afraid of losing power. Medical experts predicted brain disease just from looking at a train travelling at more than 30 km/h; preachers fulminated that if God had wanted men to move on wheels he would have given them some. Until at some point the economic pressure was so intense that local businessmen got together and collected their money, rolled up their sleeves and built a railway to the nearest big town. As a rule the requisite changes do not come from above, or from art or the universities, but from economics. In the 1848 Revolution businessmen campaigned for freedom of the press and freedom of assembly in order finally to have a say in the investment decisions of the inefficient princely state. Although the revolution failed – the citizens got frightened of the workers and dutifully went back home – in return the German monarchs guaranteed free economic activity at last and the railways could be built.

The economy set a breathtaking pace – for a quarter of a century – until the additional benefit of a further kilometre of railway again diminished. Since at the beginning of this Kondratieff cycle the big cities were linked to rural regions, fresh food could be delivered to the metropolises every day – and only then did large industrial enterprises become feasible, with armies of workers which had previously not been so easy to feed. At some point, however, only branch lines were built, which were not so economical. Productivity stagnated again, in Germany after the Founders' Crash of 1873. Once again the world suffered a decade-long economic crisis which contemporaries perceived as the “deep depression”.

Only when the next bottleneck was overcome, mass producing goods with the aid of electrical power, could the economy grow again. What a revolution: production no longer depended on hot, hissing steam engines, but power could suddenly be metered and carried silently to the precise spot on the factory floor where it was needed. Mass production became possible, electric power meant that steel manufacture improved, the chemical industry could really get going. The economy boomed from the 1890s into the First World War; the war sped up electrification. Yet at the beginning of the 1920s most of the factories in Europe and the USA were powered by electricity, by the end of the 1920s almost every household was connected to the electricity grid. Productivity therefore stagnated, accompanied by the usual symptoms: low interest rates, distribution battles, trade wars, falling prices, wages and profits. So the world economic crisis originally had nothing to do with the First World War – in that case things would have been bound to go downhill after the Second World War as well. Misery came because investment in electrification was by and large complete.

In different countries the crisis lasted for different lengths of time, in many like France and the USA until the Second World War. Then innovations to do with individual mobility pulled the economy up again – the combustion engine and assembly line together with the ability to refine large quantities of petroleum energy

cheaply. The German “economic miracle” did not really happen because of Ludwig Erhard, the Marshall Plan and the efficient Germans, but because during the Third Reich (for military reasons) they had already invested so heavily in new infrastructure: the autobahn, prisoners of war subsequently built more roads, soldiers sat the driving test. The whole national economy invested so much in factories making tanks and VW Kubelwagen (military utility vehicles), that after the war this technology network was efficient and economic enough to kick-start the economy (all over the world, for that matter, even in countries which were not involved in the war). Again transport costs fell, allowing far more goods than before to be distributed – for example in shopping centres on arterial roads. People were again freed from a lot of enforced social restrictions. Limitless individuality became possible, at least as an option. This was reflected in music, art, residential building, and family structures.

The economy grew until the oil crisis of 1973/1974. Currencies tumbled, trade barriers went up again, zero growth and stagflation (from stagnation and inflation) seemed to become entrenched. But neither OPEC nor the Arabs were to blame for this crisis: the major motorways had been built, every middle class family had its car, the marginal utility of the automobile investment network diminished. For the first time, however, this Kondratieff downturn was very short: the American military had previously spent enormous amounts from the defence budget on computer development, defence and space travel. Soon government authorities were using the computer in administration, it diffused into the American economy. From kitchen scales (now a computer with a weight sensor) through word processing to robotic control, the technological principle is always the same: the entire world economy is carried by its advances in productivity. Until all the working operations which can be meaningfully taken away from humans have by and large been streamlined.

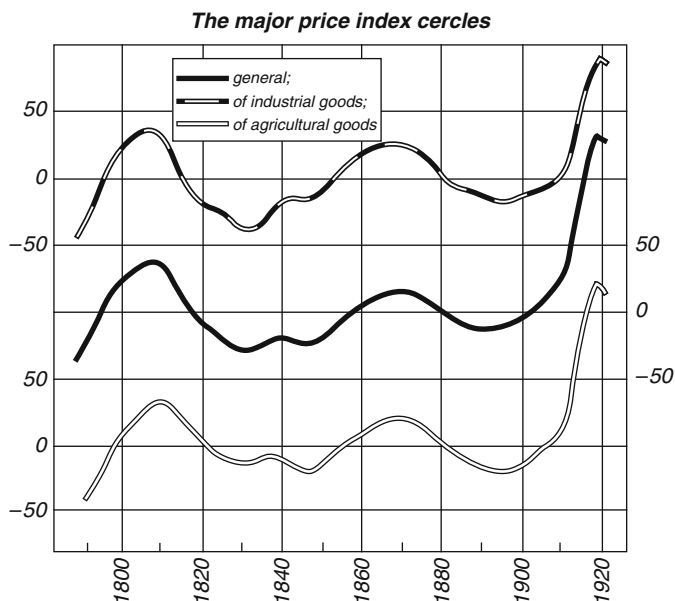
The Russian economist Nikolai Kondratieff had already conceived this real economic perspective over 80 years ago. Although it was incorporated in the work of Joseph Schumpeter and became known in the West, it attracted hardly any attention compared with the monetary-mathematical models emerging in the 1940s.

The “Inner Laws of Socio-economic Development”

For Kondratieff the theory of long wave cycles started with the question of why “the dynamic of economic life in the capitalist social order was not simple and linear, but of complex and cyclical character”¹ – in short, why it fluctuated so dramatically. For when he investigated dynamic change in growth rates of the quantities and prices of several goods in England, France and the USA since the late

¹Kondratieff, N.D: Die langen Wellen der Konjunktur. In: Archiv für Sozialwissenschaft und Sozialpolitik, 56 (1926), p. 573.

eighteenth century, in the early 1920s he found two and a half cyclical waves roughly 47–60 years long (see graph), including in coal consumption, interest rates, wages, bank deposits and production by individual branches of industry. His original statistical approaches are unimportant in explaining his theory – he linked long cycles to the increase in a “fund of interrelated capital goods” in real life, subsequently termed “basic innovation” by Schumpeter. For the sake of completeness his methodological point of entry will be explained below in a few paragraphs.



Among the numerical series studied by Kondratieff were “net worth elements” such as rate of return on investment, wages, bank deposits; “mixed character elements”, i.e. those influenced by both “value” and “natural” factors, for example the full scope of foreign trade expressed in values, and “net natural” elements such as production in various branches of industry and the consumption of certain goods. In their “untreated” state the long waves would “not have emerged at all, or not clearly enough”. Kondratieff first converted the country data, some of which went back to the eighteenth century, into per capita per year so that the curves came as close to real growth as possible, even though he remarked in a footnote, “that – with a few exceptions – the same results are achieved without this division”.²

²Kondratieff, Lange Wellen, p. 576. The US Kondratieff economist Brian Berry confirms this: the dynamic of his curve for overall US economic growth and that of the growth curve per capita show no essential difference. See Brian J.L. Berry: Long-Wave Rhythms in economic Development and political Behavior. Johns Hopkins University Press. Baltimore, Maryland and London (1991), p. 2.

For Kondratieff the numerical series thus obtained were still combined variables from two factors: firstly from the “general trend” – in the discussion on the German economic miracle after 1948 the concept later turned up as “growth path” – i.e. from the long-term linear average of the numerical series. “In essence the cyclical is missing” in this general trend. He thought the other variable was “the acceleration of development”: the value of how strongly 1 year’s growth actually deviated from this “secular trend”.

Both the change in the rhythm of ascent and its acceleration are fluctuating variables and reflect the changing economic climate. This, however, is the result of waves of varying length as well as of regional influences and global economic coincidences. In order to filter out long waves in the deviation of empirical numerical series from their long-term average, Kondratieff analysed the numerical series on a sliding average basis. To do this he selected a moving average of 9 years in order to cancel out the influence of short, medium and random fluctuations.

Kondratieff dated the rise of his first wave between 1789 and 1814, so it lasted for 25 years. Its fall began in 1814 and ended in 1849, encompassing 35 years. The cycle of price movement was complete in 60 years. According to his data the second wave rose for 24 years, from 1849 to 1873, and then fell over 23 years until 1896. This price movement cycle took 47 years to complete. His third wave rose again for 24 years, from 1896 to 1920, and was in the process of falling while he was writing his articles. He thus identified two and a half long waves which fluctuated between 47 and 60 years. Kondratieff was unable to identify any long waves in French cotton consumption or in US wool and sugar production.³

By and large the numerical series of all the industrialised countries ran in parallel, but only by and large: in the USA the second long wave reached its upper turning point in 1866, shortly after the Civil War and much earlier than in Europe in 1873.⁴ Kondratieff knew that the data material was only a kind of smoke, not the fire itself: the causes of the economic situation would have to be sought “in the inner laws governing socio-economic trends”⁵ – what he meant is explained below. On the whole Kondratieff did not consider the existence of long waves to be proven because he was only able to study a 140-year period, but there was enough data to explain their cyclical character as very probable.

³Long waves cannot be identified in saturated markets such those for sugar or basic commodities. Even in the 4th Kondratieff downturn households certainly did not economise on sugar because they had to make do on a low household budget.

⁴Kondratieff, Lange Wellen, p. 578.

⁵Kondratieff, N.D.: Die Preisdynamik der industriellen und landwirtschaftlichen Waren (Zum Problem der relativen Dynamik und Konjunktur). In: Archiv für Sozialwissenschaft und Sozialpolitik, 60 (1928), p. 1–85, here p. 36.

In the synchronous waves, on the other hand, his critics saw only external coincidences, wars, revolutions or a new gold strike. Kondratieff countered that they were confusing cause and effect. No, wars did not initially influence the long economic cycle but, because (economic) power shifts occurred at times of “high tension in economic growth”, wars were mainly fought shortly before the peak of a long-term upswing (also for scarcer resources) – for example the Napoleonic Wars in the first (so designated by Schumpeter) Kondratieff cycle, the American Civil War and the European Wars of Unification in the second Kondratieff cycle, the First World War in the third Kondratieff cycle, and the Second World War and Cold War in the fourth Kondratieff cycle.

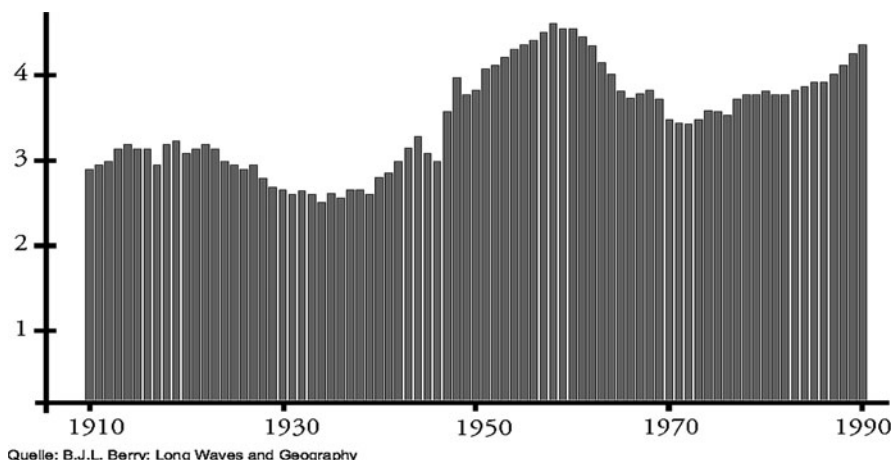
Social upheavals, or revolutions, also occurred “most easily under the pressure of new economic forces”.⁶ His thesis can be verified by history: steam power enabled the French bourgeoisie to escape the domination of an incompetent aristocracy. In 1789 they swept the king away and finally used parliament and the free press to determine how tax money was to be invested – the populace, for whom only a scrap of bread was involved, tagged along. The European Revolution of 1848 was also a revolution by bourgeois and tradesmen, but it failed because the upper classes were afraid of the increasingly radical demands of the emerging working class. They therefore horse traded with their monarchs: no more revolution, in return for which the way was finally cleared for railways and cross-border liberal economies. Even the student unrest of 1968 took place during the most dynamic spread of the motorcar.

To critics who asserted that new gold fields would stimulate a long wave, he replied that on the contrary, a booming upswing strengthened demand for gold and increased its price, thus making it once again economically viable to open up new mines.

Fluctuations in gold mining, wars and revolutions, the integration of additional countries in the world economy and changes of technology after lean growth years were not, therefore, random new circumstances and events coming from outside; they were not the forces initiating movement. But they were characteristic features of the long-term upswing – which, once they had become reality, exerted a strong influence on the rhythm and direction of the economic dynamic. From the beginning Kondratieff embedded his theory in the interrelationships of society as a whole and wrote that the long wave was a fact “the impact of which is felt in all the principal areas of social and economic life”.⁷ This is confirmed by a look at real history: the *Zeitgeist* also predominantly follows long cyclical waves in its conservative (downturn) and liberal trends (upturn) – in the history of art, religiosity, electoral behaviour, even in the birth rate (at least in the industrialised First World).

⁶Kondratieff, *Lange Wellen*, p. 594.

⁷Kondratieff, *Lange Wellen* p. 599.



Berry (1997; Figure X)⁸ shows the number of live births in the USA in the twentieth century. The curve follows the long-wave dynamic: it was not even upset to any appreciable extent by two world wars. It stands to reason that anyone having to go through life on 6-month contracts is not so ready to marry and have three or four children. If, on the other hand, it seems obvious that there is always the choice of several well paid jobs, then people are more willing to marry and start a family – like those who became parents in the 50s and 60s. Long waves are therefore not only a process of economic reorganisation but one which affects the whole of society: reality is an entity. It is inconceivable that technical development should stand still while the economy booms and that at the same time a cautious penny-pinching lifestyle should prevail in art and politics. Increasing prosperity affects behaviour. In the long upswing there tends to be widespread optimism in art and politics, but more pessimism in the long downswing. If you think your job is secure you are readier to take out a long-term loan for the house or the car. The easier it is to earn an income, the less need there is to struggle and the easier-going the attitude to life as reflected in every sphere.

Biedermeier and Romanticism held sway in the recession of the 1820s, historicism in the 1880s – houses were built like castles, poems written about powerful princes from earlier epochs. Art Nouveau, on the other hand, with its flowery ornamentation and liberal ideas – as in Frank Wedekind’s play “Spring Awakening” – took place in the vigorous upswing during electrification. Even the period of the Beatles with its laid-back music was associated with the car boom: you could wear your hair as long as you wanted because it did not matter what teachers or instructors said, because everyone got a job and in any event the economy was growing by 8% every year – not because people were so efficient, but because the technology network surrounding the car was expanding so strongly. Trade unions

⁸Brian J.L. Berry: Long Waves and Geography in the 21st Century. In: *Futures*, Vol. 29, No. 4/5, pp. 301–310, (1997).

have always had their way in a long upturn; in a long downturn, on the other hand, workers have been stripped of their rights. And ecclesiastical history too can be traced along Kondratieff waves: the optimistic spirit of the second Vatican Council when the Catholic Church was reformed could only happen against the background of the car boom, which first permitted individualism with its critical reflection.

The causes of long-term economic movements are more deep-seated, wrote Kondratieff. Although revolutionary new technologies carried long waves, even they were not random. On the one hand, discoveries and inventions were made in a direction and with an intensity corresponding to the requirements of practical reality⁹ – after all, the same discoveries were often made simultaneously in different places (later on, for example, the computer). On the other hand, if the economic prerequisites are not there it is not enough for the scientific and technical conditions for a new production technology to be present – Leonardo da Vinci's inventions of 1500 had no chance of being taken up in their socio-economic environment. An innovation can only have an impact when it provides greater benefit and can be afforded by an increasing number of people. No, long waves sprang from “the essence of the capitalist economy”, as Kondratieff put it in another essay in (1928).¹⁰ Money flowed in the direction where it could earn the most, where “production costs in their real-physical expression” fell because that was where a new “fund of long-term capital goods” increased productivity and provided work and new prosperity.

But one thing at a time: all branches of the economy are linked, each one is directly or indirectly a sales market for the others. Wages and profits earned in one sector are spent again in others. Now, although Kondratieff established that different price ranges fluctuate in a similar way, they rise at different angles, turn out to be weaker or stronger, many experience a time lag. “This means that changes in individual branches and elements of the national economy are not totally consistent.”¹¹ There are changes not only in the general economic climate, but also in the extent and price relationship of different sectors of the economy to one other.

The number of goods a sector produces and the strength of its growth depends upon how many factors of production are available to it, which in turn depends on the possible profit. If the costs in one line of business fall further than in other sectors of the economy, it will become more profitable for investors. The result will be “that (this sector) attracts a relatively greater amount of capital and its production increases in absolute and relative terms”.¹² Capital will flow into this sector until the rate of profit in all the economic sectors balances out again, but the

⁹Kondratieff, Lange Welle, p. 593.

¹⁰Kondratieff, N.D.: Die Preisdynamik der industriellen und landwirtschaftlichen Waren (Zum Problem der relativen Dynamik und Konjunktur). In: Archiv für Sozialwissenschaft und Sozialpolitik, 60 (1928), pp. 1–85.

¹¹Kondratieff, Preisdynamik, p. 7.

¹²Kondratieff, Preisdynamik, p. 8.

additional capital ensures higher production in this one sector. This would apply equally to trade.

The actual profitability of a sector, however, depends on how much more productive it becomes – for profits then increase correspondingly due to better production methods, means of communication and organisational procedures. The steady rise in the productivity of labour – “a worldwide process” – was the most important factor in reducing real production and transport costs and changing structures. One business implementing an innovation forces others to adapt – not only competing businesses but the environment as well, for example by pulling in workers to whose needs other sectors of the economy adjust. With innovations the same labour creates more output and reduces costs in domestic and foreign competition. This is ultimately expressed in falling cash prices for goods, which helps market a greater quantity.

Kondratieff’s Concept of the “Real Cost Limit”

Productivity grows, not uniformly but dynamically, i.e. with an accelerating or decelerating rhythm. And at some point that is it: productivity stagnates, entrepreneurs compete away each other’s profits and have less and less room to manoeuvre during price negotiations. According to Kondratieff the reason is that factors of production are indeed duplicable in the long term, but are limited in the short term, especially real capital. By this Kondratieff means not “the monetary expression of production”, but “the real-physical expression of production costs”,¹³ in brief the real cost limit which throttles further growth. A graphic example of this is the shortage of means of conveyance which restricted continuing economic growth in the early nineteenth century. Nor could this bottleneck be removed by additional coaches (in real terms too expensive by comparison with the return; the time and resources, for example horses, were in competition with use in other sectors, for instance in agriculture, where they were generally of greater utility). The bottleneck could only be removed by a seminal invention like the railways (subsequently called basic innovations by Schumpeter) with the associated infrastructure to solve the problem with higher quality.

But these “goods of long-term utility”¹⁴ are not produced from 1 day to the next. In order to produce them society needs relatively long periods extending beyond the scope of the usual commercial and industrial cycles. It takes decades for a technology to mature, for the general public to be persuaded by it, for sufficient investment in the infrastructure and for enough trained specialists in the new basic technology to become gradually available. Once established it generates associated innovations which fuel the economy still further. That is why the cycles described by

¹³Kondratieff, *Preisynamik*, p. 20.

¹⁴Kondratieff, *Preisynamik*, p. 36.

Kondratieff last for between 40 and 60 years. The pattern of long waves is determined by the rhythm and volume at which the new technology network penetrates society, makes individual sectors more productive and hence creates income, thus stimulating economic growth in other sectors as well. They therefore stem from investment in the infrastructure surrounding a new “fund of long-lasting capital goods”. This does not grow steadily or uniformly, noted Kondratieff – essentially why the economy fluctuates even within the long cycle and sometimes even falters at the time of most explosive growth (as during the 1844 railway boom, electrification in 1904, the computer boom of 1987 and 1993).

Producing this kind of capital goods calls for “a huge expenditure of capital” in the very long term – one only has to think of the great investment necessary for the building of railways across the country. Even the computer was not just developed and made accessible to working people, but a lot of money and a long learning curve was needed so that they could handle the new technology. In the upswing the long wave therefore needs enough sufficiently cheap loan capital and a low price level in order to stimulate long-term investment. So long periods of crisis with almost zero interest rates and minimal profits also have their positive side: this pressure forces society to pull itself together and change its structures. In this situation, says Kondratieff, more and more will “sooner or later” be invested in the basic new capital goods, giving rise to a long upward cyclical wave. During its course capital becomes capital increasingly scarce and more expensive. This trend intensifies whenever domestic or foreign policy conflict erupts, resources are unproductively consumed, economic potential is destroyed. All this combined brings the wave to a standstill and puts it into reverse: interest rates fall, the rhythm of production and trade slows down, prices drop. In the ensuing period of economic stagnation foreign policy and domestic social relations would be pacified. At the same time savings activity would rise, the preconditions for a new long-term upswing would be recreated.¹⁵

Even in Kondratieff’s time critics denied the regularity of long waves, thus banishing them to the realm of coincidence. Today the same objection is put forward by those who have never read Kondratieff in the original. His starting point was not 50-year regularity, as critics assert. “If repetition at regular intervals of time is meant by regularity, long waves can be denied just as little as medium ones. There is absolutely no strict periodicity in social and economic phenomena – not even in medium waves. Their length varies at least between 7 and 11 years, i.e. by 57%. The duration of the major cycles observed varies between 48 and 60 years, i.e. by only 25%.

If homogeneity and contemporaneity of fluctuation in the different elements of economic life is meant by regularity, then it is present in long waves to the same degree as in medium waves. Finally, if regularity means the fact that medium waves occur internationally, then long waves are no different.”¹⁶

¹⁵Kondratieff, *Preisynamik*, p. 38.

¹⁶Kondratieff, *Lange Wellen*, p. 592.

A new upturn after the ebbing of a wave was not inevitable, however. When a new cycle began it did not represent an exact repetition of the previous one, for the national economy had already scaled a new level. The mechanism, however, remained essentially the same in the new cycle.¹⁷ Ultimately the duration of a cycle, particularly the depth and length of the following recession, depends on how quickly a society taps the next structural cycle – an unpredictable human and political factor.

If what he had developed was correct, he wrote at the end on the essay on Price Dynamics in 1928, then “the sources of the depressed condition . . . prevailing in the global economy are not by any means exhausted”. The following decade was to show how right he was.

Why the Most Tragic of all Economists Was Killed

By contrast with his Marxist critics like Leon Trotzky or Eugen Varga, Kondratieff did not therefore assume that the economic slump following the First World War had initiated the “period of general decadence and the demise of capitalism”, but was the result of a cyclical long wave drawing to a close. He was to pay for this with his life. For while in the post-1929 world economic crisis the Marxists believed that the predicted collapse of capitalism had arrived, Kondratieff disagreed: no, they were only experiencing a deep dip between two long structural cycles. For Stalin a concept according to which capitalism could have prosperity following depression was a priori counter-revolutionary. Pity about the great career which had started so promisingly. Perhaps the world would have been spared many economic mistakes had Nikolai Kondratieff survived the Stalinist period.

Nikolai Kondratieff, the son of a simple peasant, was born on 17 March 1892¹⁸ in the village of Galuevskaja in the central Russian province of Kostroma, about 320 km north-east of Moscow. After primary school there was no money for higher education – so he read up the material himself and in 1911 passed the secondary school leaving examination without ever having been to class. While still a teenager he campaigned for democracy and the socialist party, was arrested by the Imperial police in 1905 and 1906. As a student at the University of St. Petersburg Faculty of Law he taught workers in his spare time so that they too could be politically emancipated. When in 1913 the princely house of Romanov celebrated the 300th anniversary of its accession to the throne he demonstrated against the monarchy – and was arrested again.

After successfully completing his studies in 1915 Kondratieff worked in the administrative department of a St. Petersburg district. As a 25 year-old he was involved in the 1917 February Revolution which deposed the tsars, he wrote articles analysing the food situation, was elected as a member of the Constituent Assembly and served in the Kerenski government as deputy Minister for Food. In the October

¹⁷Kondratieff, *Preisynamik*, p. 38.

¹⁸4 March in the Gregorian calendar is 21 February in the Julian calendar, but the complete English edition of “The Works of Nikolai D. Kondratiev” gives his date of birth as 17 March.

Revolution this was forcibly dissolved by the Bolsheviks – Kondratieff again briefly landed in jail. He then went to Moscow, where in 1920 he set up his Institute of Conjuncture and drew up the Five Year Plan for Agriculture.

He argued the case for market structures and for only collectivising agriculture later, when sufficient capital would be available for machinery. He said that until then the state should permit individual farmers to work for their own economic advantage. Although his ideas were increasingly rejected by the party's Central Committee, he continued to express criticism of government policy. In 1928, when Lenin's rather market economy-oriented "New Economic Policy" (NEP) was again replaced by a planned economy, Kondratieff had to resign his post as Director of the Moscow Institute of Conjuncture and the Institute was closed.

Because the Communists could not tolerate his interpretative competition, they arrested him in 1930. Kondratieff was held in solitary confinement in Suzdal, 180 km east of Moscow. Cut off from academic life and condemned to suffocating monotony, he disintegrated intellectually and physically. In the silence he became almost deaf, steadily lost his eyesight, and was tormented by insomnia and headaches. The books which he still wanted to write, the theories he still wanted to develop were never to be. His work, which he knew was something substantially new, seemed lost. Letters to his wife Evgeniya, published in the two volume *Collected Works*,¹⁹ record his despair. "All the new and objectively potentially not uninteresting ideas which I had and which were dawning on me are bit by bit being consigned to the grave," Kondratieff wrote to his wife on 28 March 1938. During the Stalinist "Purge", after 8 years in prison, he was sentenced to death and shot on 17 September 1938.

The History of an Economic Theory

All that is known of Kondratieff in the West are translations of incomplete partial versions of the original text, while his extensive complete oeuvre has been ignored for 6 decades. "That is why Kondratieff waves have since been discussed by authors who were totally unfamiliar with the most important aspects of Kondratieff's texts", say Kondratieff economists Francisco Louca and Christopher Freeman.²⁰

The "Great Soviet Encyclopaedia" subsequently called the long-wave theory an "ordinary bourgeois theory of crises and economic cycles": "The concept of long waves contradicts the fundamental Marxist thesis on the inevitability of economic crises in capitalism, and conceals the irreconcilable contradictions of the capitalist society".²¹ Approximately one Kondratieff wave after his death, in October

¹⁹"The Works of Nikolai D. Kondratiev", two volumes, London (1998), Pickering & Chatto, 650 pages.

²⁰Freeman, Christopher; Louca, Francisco: *As Time goes by*. Oxford University Press, New York (2001), p. 70.

²¹Quoted in Brian J.L. Berry: *Long-Wave Rhythms in economic Development and political Behavior*. Johns Hopkins University Press. Baltimore, Maryland and London (1991), p. 37.

1987, the Soviet Union finally publicly rehabilitated the economic researcher. He would probably have been long forgotten in the West had the economist Joseph Schumpeter not named the long cycles after Kondratieff in 1936.²² Even Schumpeter did not look at reality through macroeconomic statistics. He thought that competition in quality and production methods was more important than the price competition debated by economists.

Almost never, wrote Schumpeter, were changes in production or goods forced by consumers, for example because their taste or requirements had changed. Innovation happened because of creative and dynamic entrepreneurs – by which he meant not the purely administrative “proprietors” of established run-in sectors, but innovative personalities.²³ These “entrepreneurs” in the true sense of the word competed down less innovative firms. Changes were therefore triggered on the production side – where Kondratieff saw a change in the price relationships between different factors of production.²⁴ Although Schumpeter praised the “silver-very clear reasoning” of the mathematical methods propounded in economics by Leon Walras, he thought they were only a skeleton, a basis for economic analysis. They did not account for the causes of growth and cyclical fluctuations.

Although Schumpeter gained recognition, he lost the competition with his contemporary Keynes. When the latter published his “General Theory” in 1936, Schumpeter responded to his concept of demand management with the story of the French king Louis XV, who asked his mistress Madame Pompadour to spend as much money as possible in order to increase effective demand and prevent a depression. Sarcasm did not help against the Keynesians’ promising though false message. They declared that they had abolished long cyclical waves, that economic conditions could after all be “designed” as technocratically as building a car using demand policy and money supply. So Kondratieff’s theory – more radical than all the others – vanished with the triumph of Keynesianism. The victor carries the day. In reality Keynesian economic policy was only a good while the car cycle was in boom.

The mainstream of neoclassical synthesis also eliminated most of the alternatives and spread the belief that the economy could continue to grow exponentially and limitlessly providing there were shrewd enough econometricians to organise the flow of money in the national economy. Kondratieff cycles or structural change were thus considered to be a touch esoteric and as not making much sense. After the 1974 oil crisis, when Kondratieff’s theory again appeared to be of interest as an explanatory model, a large number of young postgraduate students (today they are professors or political advisers) set out enthusiastically to prove the long wave theory. They found to their dismay that a long wave which slides sinusoidally through world history is not so easy to see in monetary indicators. So Kondratieff’s theory, which nobody read in the original any more, turned into a neat marginal school of thought from which most scientists distanced

²²Schumpeter, Joseph A.: *Business Cycles*. New York (1939). German translation: *Konjunkturzyklen*. Two volumes. Göttingen 1961.

²³Schumpeter, *Business Cycles*, pp. 93–101.

²⁴Schumpeter, J.A.: *Theorie der wirtschaftlichen Entwicklung*. 6th Edition, Berlin (1964), p. 100 f.

themselves. Like the Loch Ness monster it was talked about, but could not be proven. This was because long waves were looked for in places where they could not be found: complicated mathematical procedures were used to try and find them in macroeconomic numerical price series, interest rates or social product, something which was not entirely successful.²⁵

Yet these methods are ultimately an exaggeration of current economics reduced to the mathematical small-scale. They are as laborious and productive as learning the telephone directory off by heart: if annual turnover in the building sector is 30 billion euros less, but 30 billion euros more in the health sector, this cannot be inferred from the gross national product. Some years ago a PC with a Pentium processor might have cost 1,000 euros or dollars, today you can get much more powerful computers for 400 euros in a food discount store. Established macroeconomics are in an outstanding position to give a realistic description of models of a national economy in which a VW Beetle is bolted together for decades with no great changes, but there are no structural or qualitative variables for today's multi-dimensional dynamic trends over time. An economic science which views the world primarily from the perspective of macroeconomic "watering can" variables will only develop formulae for politicians which stick on the macro level alone – and fizzle out there. More realistic is Kondratieff's theory's view of the innovation level – of the real trends in society and the economy, with their productivity trends and shifts in cost limits. This does not simply mean adding up the number of patents in individual years – studies trying to identify the Kondratieff cycle in this way were also bound to lead up a blind alley because the number of innovations does not necessarily say anything about the economic potential for savings and growth.²⁶ And not every idea, not every invention becomes an innovation: it must also actually translate into a product on the market.

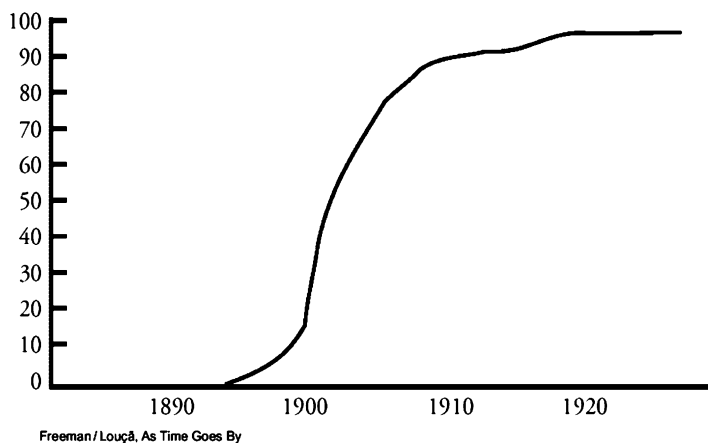
The innovation researcher Christopher Freeman of Sussex University acquired international recognition when he said goodbye to the search for long waves in numerical sequences – these were not comparable over the longer term. Nothing in the British national product could be inferred from mass unemployment at the end of long waves, for example in the 1830s, whereas the mass misery of the time has been passed on vividly in literary material. Freeman linked up with Schumpeter and the concept of basic innovation. At the time, in the early 1980s, he accused the western industrial countries of failing to recognise the true nature of the challenges: with information technology it was becoming extremely cheap to store, process and transfer information. This was expressed not only in new machines, but in a completely new technico-economic paradigm. So Kondratieff's perspective of

²⁵I.a. Metz, R.: Ansätze, Begriffe und Verfahren der Analyse ökonomischer Zeitreihen. In: *Historical Social Research – Historische Sozialforschung*, 13, (1988), 3, pp.103. And: Metz, R.: Kondratieff and The Theory of Linear-Filters. In: Vasko, T. (Ed.): *Konjunktur*, pp. 343–376.

²⁶Mensch, G.: *Das technologische Patt. Innovationen überwinden die Depression*. Frankfurt/Main, (1975). And: Mensch, G., and Schnopp, R.: *Stalemate in Technology, 1925–1935: The Interplay of Stagnation and Innovation*. In: Schröder und Spree (Ed.): *Historische Konjunkturforschung*, pp. 60–74.

socio-economic reality was disinterred and translated to the present, particularly by Carlota Perez of Caracas.²⁷ Long cycles are a process in society as a whole. Reality is indeed a whole, but its subsystems change at different rates. New, problem-solving technology is developed faster than the structures of society can adjust to them: this “mismatch”, the disharmony between the technico-economic and the socio-institutional system accordingly causes the congestion of productivity which keeps economic growth low for years until a social consensus has formed on where the journey is leading.

Kondratieff had already described this too in other words: long cycles cannot be comprehensively measured by historical statistical series, but on the level of innovation. Basic innovation, which carries advances in productivity and hence the economy, and turns social structures upside down, can be tracked on the market. It develops over the decades in the form we know from the usual product life cycles. Its life cycle also assumes a long drawn-out S-shaped curve on market launch, strong then slower growth, and saturation. The crisis years began whenever growth rates weakened. Cesare Marchetti and other researchers at the International Institute for Applied Systems Analysis (IIASA) in Laxenburg/Austria have demonstrated this in numerous examples, for example the S-shaped expansion of the motorcar in Italy in the fourth Kondratieff cycle.²⁸ When a society has decided to use a new technology or a new product, the market opens up along the S-shaped curve – which makes further trends at least assessable. In their work “As time goes by” Freeman and Louca demonstrated the history of the previous five Kondratieff cycles along the S-shaped expansion of the relevant basic innovation.

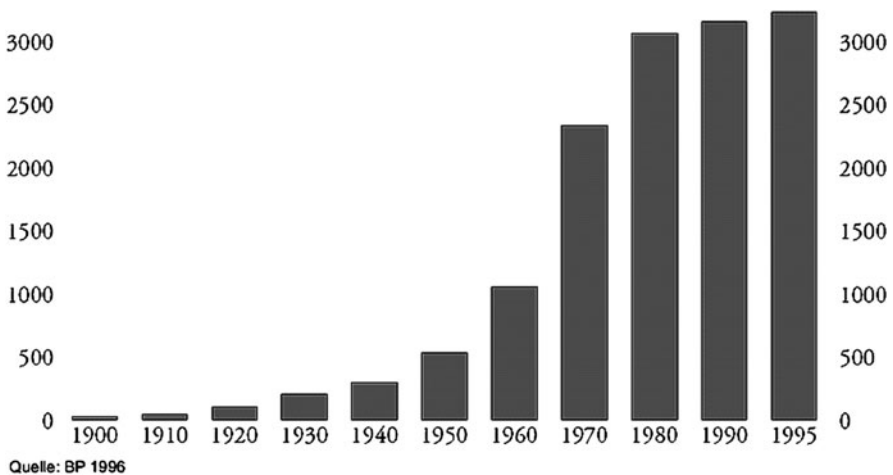


This graph shows how electrification spread in US industry (Y axis: percentage of firms with electricity). The first electric motors were installed in factories over

²⁷Perez, Carlota: Structural change and assimilation of new technologies in the economic and social systems. In: *Futures* October (1983), pp. 357–375.

²⁸I.a.: Marchetti, Cesare: The Automobile in a System Context. The past 80 Years and the next 20 Years. *Technological Forecasting and Social Change* (1983). Vol. 23, pp. 3–23.

20 years after Werner von Siemens developed the electrodynamic principle. The pioneers were derided, until around 1900 it became clear that this was the technology of the future. Within a few years, by roughly 1920, every factory had electric power, by the end of the 1920s almost every household was connected to the electric grid. Over time the savings achieved in time and resources used for innovation petered out. There were virtually no profitable investment opportunities left, so interest rates plummeted towards zero, reckless lending took place. In particular tangible assets such as shares, raw materials and real estate experienced a price bubble, while thanks to low interest rates the consumer markets were opened up at a flying pace and were soon saturated – the background to the 1929 economic crisis and stock market crash.



World crude oil extraction in millions of tonnes also illustrates the S-shaped expansion of the automobile in industrial countries – an indicator of the fourth Kondratieff cycle. At first it was only a millionaires' plaything, after the First World War the car made an increasingly frequent appearance on the roads and in cinema films, until during the Second World War so much was invested in tank factories, hydrogenation plant and the production of synthetic rubber for tyres, soldiers in transit learned to tinker with their vehicles and prisoners of war built more roads, that after the war an economic miracle was sparked off because the car was now efficient enough to spread throughout society.

So Kondratieff cycles really do occur – where businesses and society are restructured in order to tap the potential utility of a new basic innovation; where they determine the rhythm and direction of innovations for decades, where they save enough resources or facilitate new ones to unleash a volume of sales in all markets combined which is strong enough to carry the whole economy. Whenever a society decides to use a new technology or product, the market opens up along the S-shaped curve of basic innovation (in real unit numbers or railway kilometres but

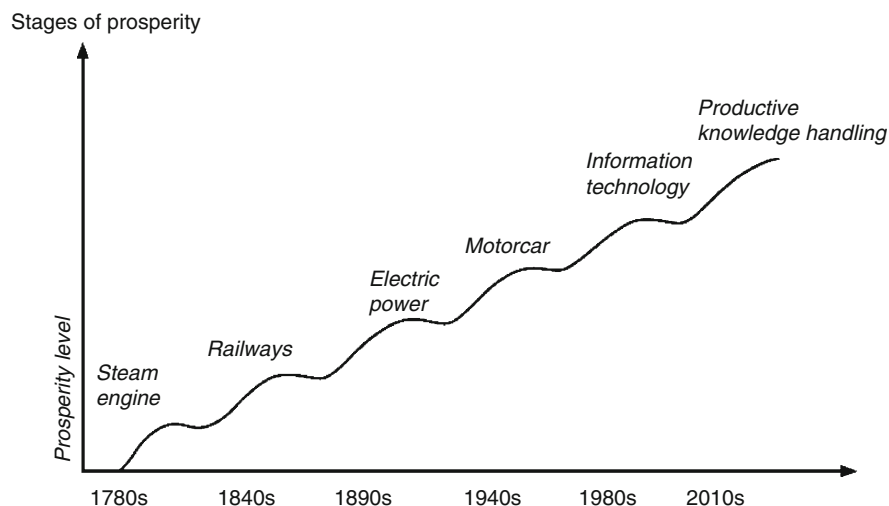


Fig. 2 An aid to understanding Kondratieff cycles – as stages of prosperity. From: Erik Händeler, “Die Geschichte der Zukunft”

not in turnover, firstly because over time this falls in proportion to performance, and secondly because it says nothing about the turnover triggered in other sectors). The crisis years always begin whenever growth rates falter. The first extrapolation of the data of an S-curve produces a bell-shaped curve which maps the growth rates of the sector supporting the cycle. Anyone again extrapolating this bell curve, i.e. making the second extrapolation of the original data, gets a sine curve, which represents the rhythm of the spread of a basic innovation and the dynamic triggered by it in the economy as a whole, i.e. the growth of the growth rates.²⁹ Kondratieff cycles can therefore be cast as a scientific graph – the schematic sine curve running through world history is ultimately a sequence of individual sine curves to each of which belongs an expanding S-shaped basic innovation together with its associated structures. This can be traced in detail throughout world history. And it helps to analyse and shape the economic situation (Fig. 2).

Historians and economists have parted company since the triumph of “more scientific economic history” and the mathematical econometrists. History used to be the story of kings, statesmen, generals and institutions; it still falls short of being the story of real people, their living and working conditions, the technical changes implemented by bold entrepreneurs and how that changed the world. In Kondratieff’s theory both have the opportunity of combining and thereby benefiting society, for they illuminate each other: no schoolboy should leave history lessons, no historian should leave university without having understood basic economic

²⁹Leo A. Nefiodow: *Der Sechste Kondratieff*. Rhein-Sieg-Verlag, Sankt Augustin 2000, 4th edition, p. 221, although here as turnover and not a real variable.

relationships; but first and foremost no economist should be let loose on humanity in future without having learnt the lessons of history.

The Significance of Kondratieff Cycles for Power Politics

The political debate would alter radically if economics were viewed in this way. Each cycle has its own pattern of success, with matching company structures, management methods and curricula. This gives rise to a ground-breaking thesis: it is always the countries and regions which are best at developing and applying the relevant basic innovation of a Kondratieff cycle and the associated social rules of the game which have the most resources to solve their problems, live in prosperity, are economically viable and therefore both militarily and politically successful. Peter Bairoch (1982)³⁰ confirms this thesis with his study on how the relative share of global industrial production in certain countries and regions changed in the nineteenth and twentieth century.

	1750	1800	1830	1880	1900	1913	1953	1980
Great Britain	1.9	4.3	9.5	22.9	18.5	13.6	8.4	4.0
Hapsburg Empire	2.9	3.2	3.2	4.4	4.7	4.4	–	–
France	4.0	4.2	5.2	7.8	6.8	6.1	3.2	3.3
Germany	2.9	3.5	3.5	8.5	13.2	14.8	5.9	5.3
Italy	2.4	2.5	2.3	2.5	2.5	2.4	2.3	2.9
Russia	5.0	5.6	5.6	7.6	8.8	8.2	10.7	14.8
Europe	23.2	28.1	34.2	61.3	62.0	56.6	26.1	22.9
USA	0.1	0.8	2.4	14.7	23.6	32.0	44.7	31.5
Japan	3.8	3.5	2.8	2.4	2.4	2.7	2.9	9.1
Third World	73.0	67.7	60.5	20.9	11.0	7.0	6.5	12.0
China	32.8	33.3	29.8	12.5	6.2	3.6	2.3	5.0
India (Pakistan)	24.5	19.7	17.6	2.8	1.7	1.4	1.7	2.3

Peter Bairoch: "International Industrialization Levels from 1750 to 1980", pp. 292–304.

Around 1750, when industrialisation had not yet begun, Great Britain was just a lump of rock in the North Sea. At the time the British did not even account for 2% of world industrial production – matching the rest of the world relative to its population. But then something happened to upset the global equilibrium: James Watt, the steam engine, its use in the textile and iron industry. The English were at their most productive with this system, their economy showed the strongest growth. After the first long wave in about 1830 they were manufacturing approximately 10% of the world's industrial production. And then they were the first to build the railways from 1825 onwards, allowing them to expand trade and commerce far

³⁰Bairoch: "International Industrialization Levels from 1750 to 1980", pp. 292–304.

afield. After the second Kondratieff cycle in 1880 the British suddenly had almost a quarter of world industrial production to distribute. At the time, of course, they could afford to be saddled with a costly, economically absurd colonial empire, to kit their army out with state-of-the art equipment and send their ships to sail the seven seas. But we must remember that in the nineteenth century the English were not rich and powerful because the issue bank cut interest rates, or because wages were so high or low, or because tax reform was brought forward – the abundantly irrelevant themes of our economic debate – but because they were best at applying and implementing the seminal invention of that period and its associated social structures. The English aristocracy of 1800 was ready to embark on entrepreneurship at a time when the German aristocracy was still dreaming of chivalry and looked down on people who made their money from trade. In other words, the ideas of what we consider to be important and desirable in our lives influence our actions, and hence also our economic dealings.

After these two structural cycles the English adhered to their accustomed patterns of success. In 1880 a young British businessman would have said to himself that his father and grandfather had always made money from steam engines and railways, so he would do exactly the same. That is human: everything we learn is an expensive investment and none of us wants our hard-won learning to be devalued, so we would rather adapt our perceptions than revise our opinions. People are generally not willing to change for the sake of change, especially if they have previously been successful in a specific way. The Germans, on the other hand, the industrial later developers who in previous decades had only produced 3% or so of the world's industrial goods, backed electricity, the new basic innovation in the third Kondratieff cycle. That is why we have names like AEG, Siemens, IG Farben, and that is why the Germans caught up. In 1913, with almost 15% of world industrial production, they overtook England, which still only manufactured 13% of goods worldwide. Although the English tried to fight back against German export goods with the “Made in Germany” seal, it did not help them because a German entrepreneur who ran his factory using electric motors was much more productive than an Englishman, no matter how refined or high-performance his steam engine.

Russia, which despite its size and population numbers had previously never managed more than 5% of world industrial production, was able to become a world power after the Second World War and in 1980 accounted for almost 15% of world industrial production. Why? Because the fourth Kondratieff cycle was about using cheap energy from oil. At the time the old Soviet Union still had huge energy reserves, a large part of which were very near the surface and were cheap to extract. This is why the Russians were able to conquer space, support Cuba and lead the arms race with conventional weapons. But at the instant when this paradigm was exhausted after the oil crisis and economic growth no longer depended on the continued consumption of yet more oil and natural gas, when prosperity was dependent on more efficient handling of explosive amounts of data as implemented in machines and information processing by the computer, then the Soviet Union together with the Eastern Block and former GDR was bound to collapse because the rigid structures of communist society were unable to exploit this paradigm.

Japan, on the other hand, previously responsible for only between 2 and 3% of world industrial production, took off in the 1970s and 1980s and around 1980 was already producing approximately 10% of all industrial goods worldwide. The deciding factor here was neither working time (they spent more time together, but chatted) nor wages nor capital costs. From the perspective of Kondratieff theory the Japanese took off in this period because they made the best use of the basic innovation in the fifth Kondratieff cycle: they took the lead in refining, manufacturing, exporting and applying information technology, used computers to manufacture cars more cheaply and with fewer defects than those still putting cars together manually on an assembly line. In Germany and Europe, on the other hand, the computer met social resistance: “job killer computers”, “the wired society”, “George Orwell’s 1984”. Because at first they hesitated to use computers, Europeans fell behind in productivity and suddenly had an unemployment problem because they were not productive enough.

It could have been a different story. A German, Konrad Zuse, invented the computer in 1944; it was mainly the US military which pressed ahead with its development – for defence and space travel. Back in 1969, however, the Japanese decided to moderate computer development among its companies and forged ahead until 1980. At the time a German engineer was better educated and more creative than a Japanese engineer. But ten Japanese engineers together were much more productive than ten German engineers, who failed to keep each other informed, were bad at listening and cooperating, whose differences of opinion degenerated into power struggles which were still unreconciled by the time they retired. Europeans worked too slowly at the time. In the 1980s, when the Japanese brought a new generation of chips to market, they could ask for 32 dollars; when Siemens came on the market 2 years later with the same generation all they fetched on the world market was eight dollars and they were unable to recoup their development costs.

This was not due to prices, interest rates or wages, but to a social attitude characterised by different ethical roots: in Japanese society Confucianism, Buddhism and Shintoism created a group ethic which encouraged collaboration as a group, while those outside were fought mercilessly. The West, on the other hand, developed an ethical system which always saw things from a more individual perspective. At a time when it was completely normal to buy and own other men as slaves, the Old Testament Jews suddenly arrived and said that man was created in God’s image. Every individual had a very special, inalienable dignity, whether young or senile, ugly or beautiful, rich or poor. Although Christianity is a universal ethical approach (“Love thy neighbour as thyself”), it brought a sense of individual worth into the world in order to make a universal ethic possible at all. Individualism continued to spread, particularly after the Enlightenment. This forced ideas of group ethics into the background, but also drew on elements of universal ethics.

Individual liberties and rights took centre stage, leading to the trend experienced on motorways today: foot to the floor in the outside lane, freedom of the road for free citizens. Brilliant individual achievements can occur in a culture like this, but individualistic cultures are bound to decline as soon as survival depends on bringing

several individual jobs together. Even cultures centred around a group ethic fall behind in the race for productivity, for with a closed hierarchical task force of loyal feudal subjects it is impossible to collaborate with constantly changing partners, customers and suppliers. That is one of the reasons why countries like Japan and other Asiatic Tiger States suddenly found themselves with economic problems after the wave of computer hardware success.

The prediction made by Leo Nefiodow³¹ back in the mid 1990s came true: after the millenium the time of its steepest S-curve rise on the market was behind the computer. As far as over-the-counter PCs were concerned, existing older computers were mostly being replaced and there was hardly any additional productivity. Economic growth in the fifth Kondratieff cycle was not ensured by information technology sales, for example purchase turnover and call charges in the case of the mobile phone, but the fact that someone moving around with a mobile could use time more productively for work, arrange appointments more efficiently at shorter notice. The growth effect for the economy in Kondratieff's theory was the time saved, the extra work made possible.

After the resources saved as a result of information technology declined, however, it meant that we were entering a period of falling profit margins, falling real wages and vigorous distribution battles. Of course it is fun to be a politician at a time when a new technological skills network is expanding and the economy seems to be perpetually growing – you can then persuade voters that prosperity is linked to your brilliant achievements. In a long downturn, on the other hand, we have to solve an increasing number of problems with a steadily decreasing number of resources at our disposal – and nobody is keen to accept responsibility, like after the third Kondratieff cycle when power simply fell into Hitler's lap (so much for the "coup d'état"). In the 1920s the unions became almost impotent, not because businessmen were suddenly so wicked, but because they themselves hardly made any profit. The great coalition of the Weimar Republic collapsed in the dispute over higher contributions to unemployment insurance; the social-liberal coalition in Bonn was overthrown after the fourth Kondratieff cycle in 1982 on the issue of new debt. And even we are now facing increasing distribution battles, particularly in social security, pensions and health insurance.

These distribution battles arise not only within societies, but also between them. In a long upturn there has always been globalisation (old hat), world trade expands and we all love one another. In a long downturn, on the other hand, politics come under pressure from economics, please erect trade barriers and tariffs so that the others cannot take away our market share. In the 1880s corn tariffs isolated the German Reich, in the 1920s world trade almost came to a standstill; in the 1970s technical standards were invented so that the French could no longer sell to us (and vice versa). And today these distribution battles are staged between the major

³¹Then with the Gesellschaft für Mathematik und Datenverarbeitung GMD [Association of Mathematics and Data Processing], St. Augustin, in his book "Der 6. Kondratieff", Rhein-Sieg-Verlag, St. Augustin 1996.

economic blocks: the USA has a sudden protectionist reaction to Europe or China (and vice versa).

We ought to save ourselves the resources lost in trade wars – the Kondratieff view forwards allows for alternatives, instead of as previously in each long Kondratieff downturn getting bogged down in structural conservatism with company mergers, high unemployment and the flight to discount wars and mass production (which nobody needs any more). For we are not at the mercy of an oscillating sine curve, as the Kondratieff cycles are diagrammatically represented. If we can manage to identify Kondratieff's current "real cost limit" which is throttling growth, then there is no need for long and deep crisis. What company structures, what management methods can overcome the next scarcity barrier, what education do we need, what investment has to be made? We can only focus on such questions when the economic sciences accept that economics is first and foremost a cultural achievement. However this contradicts the majority view of economists whose basic assumptions on many points have proved ivory-towered and unrealistic.

Farewell to "Homo Oeconomicus"

The economist's belief system would have it that the market out there is inhabited by rational economic players pursuing their own interest and thereby optimising their benefit – to wit, in accordance with the incentives set by the underlying system. Once these basic assumptions were accepted unquestioningly by "Homo Oeconomicus" it became possible to encapsulate economic activities, i.e. human dealings, in mathematical equations: changes in gross national product when health insurance contributions are increased again (all other influences remaining the same), when businesses enforce longer working hours or the issuing bank cuts interest rates. This mechanistic thought process originated in the eighteenth century: economic science transferred the laws of natural science to economic events since they were so successful with mathematical laws, for example in the case of complex machinery such as clocks and even mostly in the case of rocket flight paths.³²

Independently thinking people were therefore turned into dumb physical mass particles who obeyed mathematical formulae and could be understood by simple equations, whose economic movements could be calculated on paper to several decimal places. When market theorists talk of human freedom what they really mean is the freedom of movement of a human pendulum at liberty to follow its natural laws.

³²This follows the arguments of Karl-Heinz Brodbeck: *Die fragwürdigen Grundlagen der Ökonomie. Eine philosophische Kritik der modernen Wirtschaftswissenschaften*. Wissenschaftliche Buchgesellschaft; Darmstadt (1998).

The problem is that human actions cannot be equated to apples which fall from the tree in their inability to defy gravity. When two billiard balls ricochet off each other you can calculate the energy released and the continuing direction of movement because they obey the laws of nature. But what would happen if billiard balls could discuss the situation and decide the direction they wanted to take?

Everything we undertake or fail to undertake is connected with the goal towards which our actions are directed. Our actions are determined by the idea of what we consider important and desirable in life. Different people consider that different things worth striving for. This means that calculations based on the popular basic assumption that human beings act in their own interest are not worth the paper they are written on, because it is not at all clear, let alone impartially scientifically ascertainable, what actually is in my own interest. When a warder thinks it in his own interest to guard a prisoner, whereas Maximilian Kolbe defines self-interest as going into the “hunger bunker” for another man, it is clear that self-interest is only a subjective value judgement. The same is true of people who smoke 20 cigarettes a day – by contrast with non-smokers. The way in which market liberals define self-interest is a default value: purely self-involved individualists, calculating in monetary units, rooted purely in this materialistic world are unproven dogmas of faith. There is no rational explanation for what we consider to be our aims in life. Only the actions they inspire can be rational.

Reality shows that we make emotional decisions, that our perception of reality is limited and is even clouded by our preconceived notions, wrote Karl-Heinz Brodbeck, the Würzburg Economics Professor in a book casting doubt on the “questionable foundations of economics”. What people think is to their benefit depends on the information reaching them. Advertising is responsible for the fact that the hiking trails in the Alps are populated with people in red socks: when colour photography arrived on the scene it was promoted by panoramic colour views. Vivid red is a colour rarely found in nature, so the publicity people had walkers wearing red socks below their knickerbockers. Reality in the mountains has since been geared to its depiction in advertising. On the other hand, there is a strong faction in media impact research for whom the life worlds represented in the media bear hardly any relationship to reality. But if this were the case why does industry spend so much money on television advertising?

Whether someone finds something good or beneficial is a question of interpretation. In the 1980s there was a time when grappa, the Italian spirit, was the “in” thing to drink in the smart Munich set. Once the *Süddeutsche Zeitung* had clarified the fact that grappa was a revolting brew made from the waste products of the wine harvest, the big stores cut the price per bottle from 80 to a no less outrageous 50 marks. Demand continued to fall despite the drop in price. Demand is less a function of money, more one of information. And human freedom underlies even the information I do or do not read – a fundamentalist grappa drinker will simply not read a negative article on grappa. Human beings are free – however much they question themselves or follow their current whims or hormone levels.

Economics is formed by human behaviour, by creativity, irrationality, clouded perceptions, individual aims in life, ultimately by human freedom – in the final

analysis it is a function of our chaotic intellectual world, and hence mathematically indescribable. The downfall of the rationality postulate reduces almost the whole of traditional economics to ashes and with it the reason for the existence of economics as a physico-mathematical science which has slept through the change to the knowledge society: calculations are spurious in which labour is increasingly replaced by capital and machines make workers unnecessary. In the information society this is already nonsense, because there are no machines which can replace human thought, i.e. work on fuzzy information and accept responsibility. Productivity in intellectual space will in future follow other patterns of success to be developed in the sixth Kondratieff cycle. It will render obsolete the foundations of economic thought patterns from the mechanistic industrial society: social stability and prosperity will be achieved by the very opposite of the egoistical competition which economists assert is the mainspring of the economy. If it wants to show politics the way to more prosperity, economic science must address itself to the historical and cultural conditions of economic action in a very concrete, unique situation instead of continuing to refine mathematically exact instruments which have a only rudimentary grasp of reality.

With Kondratieff's theory, on the other hand, economic development and structural change can be looked at comprehensively. Economics then becomes a realistic science of real life, of an evolutionary, irrevocable and complex process. The political and legal organisation of a society cannot be gleaned from monetary statistics. It is not enough to have a lot of monetary capital and a theoretical knowledge of steam engines, as in Russia under the tsars. As long as peasants were answerable to their landlords as serfs, they were unable to become more productive by migrating to the cities and becoming workers. To say nothing of religious value judgements and their effect on material prosperity: the pressing need for reform in economics is underlined by the fact that diploma dissertations which in addition to interest rates and gross national product take account of human behaviour, historically unique situations and social conflict (to do with technical changes affecting the economy) are shunted to sociology, psychology and – from an economics professor's point of view – other esoteric airy-fairy subjects. With its overspecialisation the science of the future ceases to depict the specialisation of the assembly-line worker because it prevents the solving of problems which increasingly refuse to stay within academic subject limits. The whole is never the sum of its parts but their interaction. If economic science fails to incorporate Kondratieff's global theory it will not be in a position to explain long periods of crisis or to help the real economy get back on its feet. Nothing will help in the long downturn: neither government spending programmes, low interest rates, bullying the unemployed and social welfare recipients, dressing down the central bank nor feigned optimism.

So far Kondratieff's theory has not appeared in mainstream economics, although it is sometimes mentioned in passing – like an exotic, practically extinct animal. Perhaps it features in the odd lecture. But the long cycle theory is not included in existing schools of thought, for it would turn established theories – neoclassicism, monetarism and Keynesianism – upside down in equal measure. According to it the

strength or weakness of a country's economic prosperity is determined by the degree to which its inhabitants put into effect the new means – technical, as well as social, institutional and intellectual – of overcoming scarcity. This a different perspective from the classical notion that full employment is levelled out by market price. And harsh reality has long ago dissipated even the Keynesian feasibility idea according to which the economy can be globally controlled by macroeconomic “watering can” variables such as money supply and government expenditure.

Politics of the Real Economy

When the West German government under Chancellor Helmut Schmidt reacted to the oil crisis with big government spending programmes, this simply led to inflation in sectors which were overheated in any case, while other sectors made employees redundant and Germans simply saved more – the monetary measures came to nothing because the real economy was stagnating. When Helmut Kohl came to government in 1982 he cut back state spending and social security benefits and increased both social security contributions and taxes on consumption. According to prevailing doctrine this was the fast track to recession. Instead the economy sprang to life – just because in real life the computer was conserving resources, increasing profits and hence making new investment and jobs profitable again. Monetary theories cannot account for or shape the deeper causes of economic development: these are to be found in real working conditions, i.e. in future in the overall state of health – including psychological and social – of the knowledge workers in project work.

Instead public debate revolves around issue bank interest rates and money supply or bank bonuses and lending regulations. In times of an expanding technology network like that of the computer in the 1980s it would have been irrelevant for the issue bank to raise interest rates by one quarter of a percent because that would have hardly throttled the business climate – the economic cycle is not causally dependent on the interest rate but on the rhythm of the overall economic trend in productivity (by contrast with a purely operational productivity increase when people who are laid off remain unemployed and have to be taken care of by social security benefits, a boost to productivity leads to more prosperity, particularly if the redundant workers can be employed elsewhere).

Monetary policy therefore remains powerless, even if borrowing costs hardly anything: in 2010 the American Federal Reserve is lending money for virtually nothing – its way of expressing the gravity of its concerns for the future. The cost is lower than inflation – in theory investment is now more profitable than before, house buyers and small consumers should have more money to spend. But that is pure theory. Whether anyone invests depends on the real economic circumstances, whether there is anything worth borrowing money for. Monetary policy alone can only endeavour to keep the money supply as suitable as possible for stabilising monetary value; it cannot help the economy to grow. With monetary control issue

banks can only marginally decelerate or accelerate a new technological system like the motorcar or electrification. They will only ride along their Kondratieff wave, indeed conversely they will tend to be driven by it – but they cannot trigger it.

At the end of the dynamic of an outworn invention monetary policy makers are therefore left with nothing: they cannot nominally take interest rates lower than zero. This situation is visualised in neoclassical synthesis (from classical and Keynesian ideas) by the so-called IS-LM model, said to represent the equilibrium of saving, investment, money demand and money supply. Here lower interest rates automatically trigger higher investment. When interest rates approach zero and still nobody invests more, their jargon for this is the “liquidity trap”, which translated means much the same as a shrugged “shame, but there it is”. Again the model is saying roughly that there is no investment because no investment is being made. The phenomena which this science purports to explain – namely why nobody wants to invest and what should be done in the real economy to change the situation – are excluded as indeterminate nebulous external factors.

The methods long ago took on a life of their own and come between econometricians and reality. In their forecasts they have to exclude so many factors, make so many assumptions and define so many facts that it seems ridiculous to attempt to work out any mathematically exact data. Many economists get out of this within the neoclassical synthesis by conducting costly research into totally irrelevant specialist issues, the social utility of which is roughly equivalent to attempts to further refine the understanding of ancient Egyptian dialects.

It is no fun being a politician in a long Kondratieff downturn. Mounting problems have to be solved with dwindling resources, you get bogged down in more or less unsuccessful distribution battles, or in the end abandon all responsibility like the democratic parties at the end of the Weimar Republic. In order to shake off the justified feeling of economic uncertainty during persistent stagnation it is essential to visit the past. Let us suppose, therefore, that we are a group of economists travelling back in time to visit the Habsburg Prince von Metternich in 1830, Reich Chancellor Otto von Bismarck in 1880, Reich Chancellor Brüning in 1930 and Helmut Schmidt in 1980. All four have seen better times but are now struggling with unemployment, scarce resources and distribution wrangles. Let us review the different schools of thought to see whether and how effectively their economic policy prescriptions help, and let us then head for the present-day Federal Chancellery in Berlin.

What the Next Election Campaign Should Be About

Let us suppose that in 1830 Prince von Metternich let himself be persuaded by Keynesian thinkers to get into debt and increase government spending indiscriminately across all sectors and classes to jump-start the economy as a result of the demand created. After a brief flash in the pan during which the many peasants repaid their debts, put up monuments to Metternich and visits to the circus boomed,

the debt-driven economy would collapse again. But if he had listened to a Kondratieff economist he would have been told that his economy was stagnating because transport was so expensive. Metternich should intervene selectively and build railways; if farmers and businessmen could sell their goods more cheaply over a greater radius the economy would pick up; greater unit numbers would also become worth-while, bringing prices down. It mattered not a whit whether he financed the new technology network with debt, surplus private capital (shares, bonds) or raised taxes and cut consumption (pensions, personal luxuries, superfluous government spending); whether the economy started moving depended only on whether and to what extent he took care of the next structural cycle, in other words built railways and supported associated education, infrastructure, thought patterns and market-ready end products.

This means that the same old debate of German Bundestag election campaigns as to whether or not we should cut taxes and take on debt is totally irrelevant. It is all the same whether we finance infrastructure and training for the sixth Kondratieff cycle with private capital which citizens save thanks to lower taxes, or whether we fund it with government debt or higher taxes. The only thing which counts is whether and how much a society invests in the next structural cycle.

The lower taxes always demanded by the liberals, on the other hand, are only rarely suitable for building up a new technology network. The theory behind this is that anyone spending other people's money on things for other people finds it easy to behave like a spendthrift, money is most effectively spent when you spend your own money on things of importance to you. Total utility is therefore greater when the public spends its own money. Yet it is more likely that the well-to-do would prefer to invest in a second car, a holiday home in the south of France or a yacht in Kiel (which does not make the economy more effective in terms of Kondratieff's theory) than in biotech research, the quality of education or social structures.

Rich people only can afford a poor state. The fact that the USA has a much lower rate of tax than Germany is a dubious example: in the USA citizens are going for higher taxes on the roads because they are fed up of driving on wrecked roads and having to send their children to poor schools. Tax reduction is nothing more a temporary redistribution to subsequent years' costs. Politics on tick is always immoral, save when the borrowed money is profitably invested in the medium-term future.

The neo-classicist in our group therefore proposed creating incentives for more investment. The German chancellor Helmut Schmidt of 1980 was familiar with this from his government's vain appeals to businessmen to please invest more. The only trouble is that if there is nothing worth spending money on and investing in, nobody will borrow money and invest, even if the money is to be had for nothing. When there is sufficient capacity, no-one needs to set up another steel works or car factory – investment per se does not stimulate the economy. In 1980 the proponent of Kondratieff's theory argued that it was the type of investment, not the amount of money, which destroyed or created jobs: if government wanted to encourage investment it had to help open up the new structural cycle around the computer by training, infrastructure and its own good example. Anyone changing tax laws or

underlying conditions for investment per se is only redistributing between state and business profits but is not creating a higher level of productivity.

A couple of pieces of monetary advice would be inevitable in this heavyweight round: the heads of government should see to increasing the money supply. No good, warns the Kondratieff economist, money is only a transmission belt between different sectors which become productive at different rates and utilise capital with different degrees of efficiency. More money would not therefore make the economy more productive, only Brüning overdid it somewhat with the money squeeze of 1930, so that prices failed to level off quickly enough.

One of the classicists among the economists would advise German Reich Chancellor Brüning to devalue the Reichsmark in 1930 so that he could export more. The Kondratieff expert would counter that the effects would only be short-term due to the international reaction; in the long term the only successful exporting country is the one to make better use than others of the motorcar, the upcoming basic innovation. This would probably then also attract capital from outside because there are more worthwhile things to invest in. His foreign currency would therefore increase instead of falling – as wanted – and he would still become a world export champion (like Germany in the 1950s and 1960s).

Those who were politically socialised under the zeitgeist conditions of the 1970s would advise Messrs Metternich, Bismarck, Brüning and Schmid to increase wages dramatically in order to kick-start the economy. This is an economic measure which we should investigate more precisely from the perspective of Kondratieff theory as an example of many other established economic schools of thought.

Effect? That Depends!

In the 1999 pay round the then German Finance Minister Oskar Lafontaine (SPD) spurred the unions on to high wage increases – in his belief system the employed would then have more money in their pockets, would spend more, so the economy would grow. From the perspective of Kondratieff theory enforced higher wages can have several possible effects, depending: initially production costs increase. The entrepreneur's profit melts away.

Then it depends on his and the market's reaction: he passes the higher costs on to customers in higher prices. At a time of expansion like the early 1960s customers would not mind, they would buy the product at a higher price – after all their prosperity has also increased in real terms thanks to better production methods. In this case, with the higher wage rates they went on strike for, the employed would have mopped up the additional income that other sectors had created through productivity increases. In this way professions whose productivity probably does not change much, for instance taxi drivers and teachers, also profit from the rising productivity of other sectors (a primary school teacher earns more in real terms in 2013 than in 1973, but pupils learn to read and write just as well as they did 40 years before).

Things are different in a long downturn, when society stops becoming more productive: then products suddenly cost more and fewer are bought. Entrepreneurs not only have higher costs, their turnover falls as well. So they will discontinue unprofitable production and make workers redundant, or leave the price as it is because the market will not tolerate a higher price. They then forego profit more or less voluntarily, have less money for investment in the long term, take longer to pay back what they owe, scale back production. The outcome is the same: fewer employees.

Another possibility is that higher wages cause them to invest in labour-saving machinery to boost productivity. This was the case at an SPD party conference in the 1970s when high wage demands were wanted to test the efficiency of the German economy. The outcome depends. In a booming market like the car industry in the 1960s the use of more machinery did not lead to unemployment, but to the ability to meet the desire for individual mobility more quickly. But when a need is satisfied, or when in a long downturn more and more people share a car and the existing cars run until they are beyond repair and have to be taken off the road, then using more machinery only results in fewer employees being needed and some being made redundant.

Does this lead to mass unemployment in a national economy? It depends. In the 1950s and 1960s technical improvements to coal mining meant that fewer and fewer miners were needed. This was not a problem providing they could be employed in booming sectors like road building and the car industry. Once the fourth structural cycle had run down there was nobody to take them on – if a miner was unemployed he was very likely to remain so, and when the fifth Kondratieff upturn needed a new type of specialist workforce they were difficult to retrain.

Then there is also the possibility of wages and prices rising but no more being produced in the economy as a whole. The only consequence is that money is worth less and people buy the same thing at higher prices, as was the case in the stagflation of the 1970s.

In brief, no conclusive relationship can be construed between the implementation of higher wages and a welfare gain for society, as Lafontaine and others thought they believed. Whether this increases demand, as the Keynesians assert, or damages the economy because prices rise, as supply-oriented economists see it, depends on the phase of the relevant Kondratieff cycle. If one therefore cannot be on the safe side with either of the two schools of economic thought, it is equally ineffective to try both at the same time. Kondratieff's theory ends the decades-long economic debate as to whether policy should be supply-oriented or demand-oriented: it is above such things, for a basic innovation has a positive impact on both sides.

Anyone implementing the new technology together with organisational patterns and behaviours can produce more cheaply and produce more – the adherents of classical theory who explain growth by capital accumulation and lower prices then feel themselves validated. On the other hand, basic innovation also stimulates the demand side: if the improved product is cheaper, I have more money in my wallet to buy more of the same or spend the saved money elsewhere. And if the sector which can produce things better and more cheaply thanks to innovation also employs more

people, this likewise produces new income which increases the level of demand in the national economy as a whole. But both supply-oriented and demand-oriented theories bypass the causes of further economic development and well and truly deserve to be mothballed.

The New Rules of Success in the Knowledge Society

So in which sector is the next scarcity to be overcome in the work process, will it be uphill all the way? Many think energy and raw materials. Yet the less oil is available, for example, the more profitable renewable energy sources become – coal from sewage sludge, solar power installations in North Africa, improved energy efficiency, higher performance, from solar cells for instance. This will balance out the losses incurred by more expensive oil and gas, but is not really a higher phase of prosperity, only the same in another guise. Those allowed to consume energy will ultimately be decided on the market by those who use it most efficiently – and that depends on the quality of knowledge work: analysing a situation in order to make the right decision; in the deluge of information promptly finding the knowledge which someone needs to solve a problem; understanding what the customer actually thinks. But there will not be any new steam engines to make our ideas more productive. The only scarcity will be educated people and their problem-solving added value, their health and productive working life, their ability to work together (Fig. 3).

This is the first time we are facing an intangible scarcity barrier in an increasingly intangible economy. A lot of indicators such as mental resignation and communications problems testify to the fact that information services are not efficient enough – those in work are under pressure to change their social behaviour in particular, to cooperate more efficiently, to make better use of knowledge.

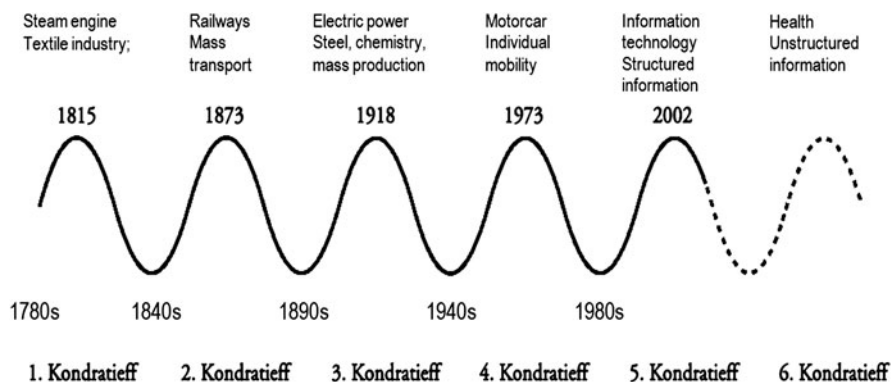


Fig. 3 Schematic diagram of Kondratieff waves projected into the future. From: Erik Händler, *Die Geschichte der Zukunft*

And because education is becoming an expensive, decades-long investment it also has to be written off over a longer period – the demand for maintaining good health is becoming so strong that it can support an upswing. Yet from an economics point of view current health policy is only once again distributing money from one pocket to the other. If politics were to discover Kondratieff's global perspective, in real life it would concern itself with a better work culture and keeping even the healthy in good health. Over 70 years after his death Kondratieff's theory would then have proved something: that in the long term ideas are mightier than bayonets and repression.

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