Money, Credit, Capital and the State

On the evolution of money and institutions

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Money

All human societies with a developed political economy are monetary economies. The very existence of interplay of production and consumption activities of a society's members implies that periodically reappearing habits, of relations between activities become visible and are memorized. At a certain point of development the repetitions – using days and years as time units – are externalized as signs on physical carriers. Written language starts to serve as a special device to adjust and to regulate activities according to processes going on in the natural environment of society. The immediate importance of the new device is evident: advantageous behavior can be transmitted across generations without relying on interpersonally used spoken language only. Sign systems on physical carrier systems thus acquire an important social role, a metaphysical (i.e. more than physical) status, which stabilizes social evolution.

In economic theory the three basic functions of money usually mentioned in standard macroeconomics - 'store of value', 'unit of accounting', and 'medium of exchange'– all refer to this specific role. As for growing societies production is split up in time and space, so are its services and products. To bridge different time and different space a memory of the performed activity is materialized as a sign on a physical carrier. This unity of physical matter and its relation to the members of society stores what is called 'social value'; its more mundane name is 'money'. Since contributions to social evolution are so different in kind – and even more so the more developed and complicated the society becomes – intra-social organization calls for the measurement of relative social value. Again the sign system of money can help by adding a scalar size, the units of social value accounting, to the material carrier. If these two prerequisites are given,

(1) The commitment of the members of society to accept a system of social value relations expressed on a physical carrier system.
(2) The acceptance of its specific quantitative expression as a set of certain relative money amounts.

then exchange of social value via money as the medium of exchange is possible. The existence of money thus coincides with the existence of social organization already at a very early and primitive level.

But even at this lowest level several implicit features of a monetary economy become visible, features usually not explicitly articulated in standard economic theory. Acceptance of a certain money system can be either voluntary or forced upon the members of society – or something in between. In any case acceptance thus reflects the ***power relations*** within a society. If power is concentrated in the hands of a small group of members of society it is evident that the portrait of the leader of this small group on the coins used in this society should keep authority of the powerful alive. In more democratically organized systems with power only temporarily transferred to institutions, and recurrently checked by feedback mechanisms involving all members of society, in all these cases the monetary system carries the marks of the specific institutional setting prevailing in that society. The borders between voluntary and forced participation in the prevailing monetary system increasingly get blurred if one considers the next long-run trend.

In ancient Greece the hegemony of Athena's coin, the famous silver owl, needed the rich silver mines close to the city as well as the mighty fleet of Athens, the threat of punishment in case of disobedience was very visible. This obvious backup for the power of Athena's monetary system gave it a very concrete character, a metallic taste. Since then money experienced a ***process of ever increasing abstraction***. With the establishment of more sophisticated exertion of power, banknotes could free the availability of the monetary carrier medium from the pressures of production of precious metal. Abstraction thus proved the primacy of the social sources of money's force as compared to the inherent social value of the carrier medium. The social sources of voluntary subordination under a monetary system became manifold and more binding as the next best alternative – voluntary disobedience – was losing ground quickly when the growth of monetary economies took off. Nowadays money is just a rapid change of patterns on a computer screen, the mission of the abstraction process starting with the original problem has been completed. The overwhelming majority of human individuals has no choice but to voluntarily join monetary rules; on the way the content of the concept 'voluntary' has lost its meaning.

Nevertheless - and despite the highly complicated setting of institutions and democratic feedback loops – contemporary money still is a sign system, which refers to abstract social value. For a single individual, one out of 7 billion humans worldwide, the evaluation of relative social value of all the activities and products with which it is concerned, certainly cannot be derived by insight in this complicated, global production structure. This difficulty, the deficiency not to grasp the complexity of the global production, lies at the root of subjective value theory, of microeconomic theory as it is taught since Walras, Menger and Jevons, since 1874. This theory thus is not just an ideological vehicle to fight the macroeconomic exploitation theories of the intellectuals flirting with the labor movement of the 19th century. Subjective value theory addresses a real problem of households: How to

order purchases if a given amount of monetary income can be spent – the starting point for axiomatic utility theory[1]. But as this set of decisions falls apart from an understanding of production and reproduction of the overall political economy, the human individual is separated into an economic, utility maximizing entity and a political entity engaging in the multi-layered processes of more or less democratic feedback control. Production units, the other micro-unit covered by microeconomics, is the archetype of the decision-making entity put in the centre of analysis. It is their (hypothesized) stylized decision problem, which is grafted on household behavior to describe it as utility maximization, the analogue to profit maximization. Again entrepreneurs are schizophrenic: On the one hand there is the input cost minimizing (and in the sequel profit maximizing) entity that is completely ignorant to the political evolution of its environment, and on the other hand there is the legal institution with special status in the law system and vested interest political evolution[2]. For both microeconomic types of agent money (i.e. social value) is the exogenous constraint, which makes needs and profit possibilities appear scarce. The arrangement of social activities and their guiding institutions seems to be out of range of the microeconomic discourse, but if money is interpreted as a first form of a regulating device shaping the evolution of the former then the old tenets of classical political economy appear on the theoretical horizon again. The sign system of money still refers to the arrangement of human activities, to the setup of time spent at an enormous variety of occupations worldwide. To see how a crisis of social evolution is translated into, and amplified by a crisis of money forms the renaissance of political economy in the form of Keynesian macroeconomics has to be briefly reviewed.

I will leave this argument on the role of money at this point, and take it up as a loose end in the last chapter.

Credit

At first glance, credit seems to be just another face of money: Accepting a coin instead of a certain amount of a commodity – usually in exchanges at markets – can be understood as giving credit, to literally believe (credo) in the validity of a sign on a carrier medium. The point, of course, is that it is not the partner in the exchange transaction to whom this believing refers. It rather is belief in the enduring trustworthiness of the social system which provides the environment for the exchange act. Money interpreted as credit enlarges its original function of bridging space and time for a species which has developed a common consciousness of mutual commitment. When towards the end of the Middle Ages merchants in Venice received credit from the wealthy local banks this credit always came in the form of

[1] A faint memory of the link to the overall social process can be seen in J.M. Keynes'emphasis on the concept of effective demand. In denouncing needs, which cannot be translated in money terms, as less important he intuitively subscribes to classical political economy.

[2] The classics saw this dichotomy very clearly and dubbed it the double existence of the citoyen (the politically emancipated member of society) and the bourgeois (the owner of a factory engaged in profit maximization).

money. But not all the money can be considered to be credit in the more narrow sense introduced by these early global merchants and explorers.

To some extent the distinction is merely based on the temporal scale that is relevant. The coin in the pocket is only short-run property, easily exchanged at the next opportunity, whereas the money taken as credit by the above mentioned merchant was used up during a journey which often took years. But this notion of difference in physical time just is the appearance of a more substantial difference, which is based on the emergence of an economic time scale. The coin in the pocket remains inactive; its sole function is to preserve a certain amount of social value by freezing it as a sign on a piece of metal. The money given as credit to the merchant not only remains property for a longer physical time span, during the journey it indeed changes its form as well as its social value. By the actions of the merchant, a new social archetype, money as credit becomes a process. And this process, due to the ongoing change of money and commodity forms representing different systems of social value in different countries, produces its own type of time: economic time. Economic time runs parallel but not synchronous to physical time. Consider two journeys of merchants, the first taking three years of physical time, the second taking six years. Assume that at the end of the first journey, when the merchant comes back to Venice and sells all the commodities he has brought that he owns an amount of money, which is five times as high as the one with which he started. Assume further that after the second journey the analogue amount of money owned by the merchant is ten times the original credit. In that case the speed of economic time of the two journeys would be equal since the (fictitious) growth rate of credit-money per physical time unit is the same. It is the growth rate of the amount of credit-money, which serves as measure the economic activity; if it falls to zero, then credit-money collapses and remains just money[3].

While this view of credit emphasizes its role in stimulating economic activity of merchants it nevertheless is linked to a specific perspective on its relation to savings. For the classical political economists the progressive role of those who use credit-money to transform it into economic activity was evident. Consumption was basically understood as the consumption of the feudal class, and the heroes of the new economic era were economic agents, which – contrary to the consuming feudal parasites – transformed money into economic growth[4]. Credit for the purpose of consumption was thus of no economic significance; if rich merchant families provided money for 'il principe', then no economic growth process was expected[5]. On the other hand the working class was considered to be involved in the process of accumulation only as a passive element, using money as medium of exchange for immediate physical reproduction, and never as credit-money. Credit for consumption thus was thought to be insignificant to explain the essence of credit-money. Savings of non-feudal

[3] In modern economic jargon this is often expressed as ‚money being a security with an interest rate of zero'.

[4] From Adam Smith's arguments for the source of wealth to Keynes' revival of the idea of the 'euthanasia of the rentier' progress was identified as the advance from feudal (over-) consumption to productivity-increasing re-investment of entrepreneurs.

[5] What actually was expected from the feudal sovereign was a guarantee for political stability, compare [Machiavelli, 1988 (1532)].

households played either the same role as inventories for production units: a tool to smoothen the stream of income. Or, if they became more systematically growing as in the rich city-states of northern Italy, they were collected in banks financing merchants. This latter process thus clearly represents emergence of a new division of labor within the class of non-feudal rich families: one group provides credit-money while the other one uses it for exploration and trade. Note that this emergence needed at least two elements, (i) a certain vacuum within feudal power structures and (ii) a certain level of money hoardings[6]. It might well be that there is a more general - and acute – lesson to be learned for emergence of institutions in the current situation.

Only when the labor movement gained significance towards the end of the 19th century savings of worker households started to play a macroeconomic role. Again the concurrent ideological turn to microeconomic reasoning prevented mainstream economic theory to recognize the importance of this development. It needed the Great Depression and in the sequel Keynes, Schumpeter and their followers to reshape classical political economic theory to grasp some of the elements of the new era. Keynes rediscovered the importance of circular macroeconomic money flows, while Schumpeter - drawing to a considerable extent on Marx' ideas – highlighted and sharpened the implications of the historical mission of entrepreneurs and innovation. But when that happened, the form of credit-money had already developed into a new dominating process, into capital. Credit-money as money for consumption thus only appears when the next metamorphosis of money forms has taken place.

Return now to the original add-on, which makes credit-money a historical and logical bridge between money and capital. While the existence of money is just a reflection of the generally recognized unity of a prevailing social setting the emergence of credit-money is a partial negation of money's universality: With the credit given by a specific member of society to a specific other member the concerned money amount is not simply secured by the states monetary authority. It is additionally secured by a private contract between the two agents involved, a contract, which itself is correctly called a security. Note that with this new development of a specific kind of credit-money there does emerge the concept of private economic agents – as opposed to the physical individuals inhabiting the world of simple commodity producing societies[7]. Note further that the use of contracts implies the emergence of a corresponding specific law system[8], which in turn is built up by a host of emerging institutions. These institutions become necessary to assure that the procedures agreed upon by the involved parties in advance (as content of the contract) are actually

[6] The first globally hegemonic country of merchant capitalism, the Netherlands, is another good example for the importance of these preconditions.

[7] It is remarkable how mainstream microeconomics from 1870 onwards (starting with [Walras L., 1874], [Jevons S., 1871], and [Menger C., 1871]) systematically confuses private economic agents and biological individuals. The major reason for that deficiency is the complete neglect of the evolution of money forms.

[8] Laws thus are man-made and not innate economic properties of human individuals. Note the sharp contrast of this perspective of explaining the emergence and evolution of laws rather than ***discovering*** them. Even the approach of experimental economics falls prey to this misconception of microeconomic ideology when it simply tries to discover innate economic laws differing from the ones stipulated by neoclassical doctrine, e.g. altruism.

executed as economic time proceeds; i.e. that commitment in the credit market becomes feasible.

Evolution of new institutions for new private economic agents evidently coincides with the use of credit-money – and this, of course, challenges the intellectual commentators of the time anticipating a clash with the already existing political institutions of feudalism. When Montesquieu designed his famous idea of a division of power within the modern state, he does so, on the basis of a careful comparison of empirically observed systems in different times and countries [Montesquieu, 1748]. Credit-money as a bridge to capital, i.e. the next form of money, also paves the way to an understanding of the form of political organization accompanying capital: the nation state. This newly emerging political organization freed itself successively from its feudal bonds to provide an adequate structure of power relations for capitalism. It did so by monopolizing coercive power and institutionalizing the links between private economic agents. Again this argument will be taken up in the concluding chapter.

Finally, one side-effect of the credit mechanism used by merchants has to be highlighted, since it unconsciously prepared the next step of social evolution: With their successful trading activities merchants were indeed starting to increase global, average labor productivity. By buying, transporting and selling commodities (and sometimes slaves) to increase their working credit-money some pre-existing specialization in the different parts of the world they explored entered global consumption, opened up new utility dimensions or reduced average necessary labor inputs. Of course, such global effects were not recognized by the merchants themselves, and were additionally obscured by the fact that most advances were absorbed by the still powerful feudal elite. Nevertheless, ex post an increase in global technological abilities as well as a widening of consumption spaces due to merchants (credit financed) activities is evident. With the next step of monetary evolution this aspect of accommodating technological evolution proved to be one of the dominant elements of social progress.

Capital

If money not only is used as credit but assumes the form of a generally applicable program of accumulation, then it is called capital. Capital has all the features of credit-money but additionally in the form of a mandatory algorithm subordinates all strata of social organization. Credit-capital had explored and conquered society's environment, capital also turns inside the more and more global society and its program takes hold of all humans and institutions to transform them into economic agents, into drivers of its abstract algorithm. Still the appearance of the money involved in this process has not changed all of the properties related to the lower forms (general acceptance, importance of contracts and private economic agents, etc.) still apply. There just is the metamorphosis into a general principle guiding the carrier systems instead of being guided by the latter.

The program of the capital process in its most general form is rather simple and consists of the following commands:

Capital Algorithm

For each member of the set of currently possible visions do ('vision loop')
    Produce a vision of specific entrepreneurial activity
    Check expected wage cost
    Check expected interest on credit-money (vulgo 'capital cost')
    Check expected effective demand
    Compute expected growth rate of capital
    Estimate the probability to achieve that growth rate
End of vision loop
Choose the vision yielding the highest utility of a mean-variance utility function
Check if the selected vision's utility exceeds the expected utility of a supplier of credit-money
If the lender's utility is higher, then perform the chosen project,
    else become a supplier of credit-money.

This innocent algorithmic prescription generalizes what merchants and their bankers already did with credit-money at the end of the 13th century[9]. But what makes the difference is the fact that in the course of the historic development of capitalism from merchant capitalism to industrial capitalism[10] the abstract form of this algorithm proved to be universally applicable for all kinds of activities of economic agents. A look around in contemporary OECD countries reveals: There is almost no aspect of life that is not permeated by the workings of the capitalist program[11]. In a sense, the monetary core of the activities of certain groups in early merchant capitalism[12] has turned from outside trade to all types of inside activity of private economic agents. In the end – in [Hanappi, 1989] this stage is called 'integrated capitalism' – not only production units but every household, and every institution has become a private economic agent following the abstract algorithm of capital accumulation. Concepts like human capital and competence capital show that the higher degree of abstraction that money did arise to, enables and opens up an incredibly wide field of possible application. It is thus not surprising that in the history of economic thought a sharp turnaround took place: ***the mirror image of the real course of economic development observed in its contemporary state started to be taken as its actual origin***.

[9] Venice and Genoa had started to mint their own coins to support their conquest of world trade (compare [Braudel, 1986, pp.111-116]). The less abstract forms of money are thus not simply substituted by a new form, they are only adjusted to accommodate the new hegemonic form of money. This could also be a lesson to be learnt for the current crisis.

[10] For a detailed discussion of the stages of capitalism compare [Hanappi, 1989].

[11] The somewhat forgotten German social scientist Alfred Sohn-Rethel introduced an interesting hypothesis: Even the logical structure of humans' mental models is framed by the evolution of commodity producing societies [Sohn-Rethel, 1978, pp. 103-133].

[12] Distinction by function seperates bankers from merchants, distinction by location(following [Braudel, 1986]) seperates Brügge, Hanse cities, Northern Italian cities, the Champagne, Antwerpen – and later Amsterdam.

Transplanted into physical human individuals, from Robinson Crusoe to the more abstract homo oeconomicus, the private economic agent was considered to be the atom of 'social physics'[13]. From that perspective the true state of nature only had been obscured in the past and only in full-fledged capitalism the true and final character of social relations reveals itself. There has been an economic history but once this final state is reached, history has ended – only some safeguarding from external disturbances (modern economics calls them 'shocks') is needed.

It is interesting to see that with such a radical conceptual turn – mistaking a frozen mirror image as a parable of origin - not only evolutionary political economy becomes impossible; also money in its highest form of abstraction vanishes since it becomes an innate feature of private economic agents. The current indecisiveness of mainstream economic advisers drastically shows the impasse, which has been taken already a long time ago.

But the methodological turn of economic theory towards the crude atomistic perspective had several other severe consequences too. Since the formalism adopted originally was a description of energy transformations of non-living, smallest elements of matter[14], any description including the build-up of structures and clusters is simply impossible! The final issue emerging from that formalism in the natural sciences is the second law of thermodynamics, which states that in the long-run the stochastic trend towards an increase in entropy will prevail, i.e. a certain equilibrium state of (computable) maximum entropy will be approximated. The re-interpretation in microeconomic terms postulates this process as the working of market forces relating the owners of ('scarce') resources and in the long-run leading to a vector of relative prices – the correlate of maximum entropy in general equilibrium theory. Note that 'prices' in this context are exchange relations of quantities of commodities[15] and ***not*** a monetary expression of the social value of a unit of a certain commodity. To bridge – or, more ideologically interpreted: to disguise – this strange role of prices had to be complemented by the adoption of the so-called quantity theory of money. If maximum entropy is reached, vulgo 'in general equilibrium', the vector of relative exchange quantities can be translated in a vector of money prices by simply assuming proportionality to the amount of money signs (on carrier systems) in circulation as well as to an exogenously assumed speed of circulation. Evidently the money form used in the quantity theory of money is ***not*** credit-money or capital. In the pure form of general equilibrium theory (GET)

[13] This expression was used by Auguste Comte to make clear that his vision of a future social science follows the example of the natural sciences [Comte, 1979 (1844)].

[14] Compare [Smith E. & Foley D., 2002] for a detailed treatment of that isomorphism.

[15] It is surprising to see how in 1871 one of the founding fathers of GET, Stanley Jevons, already spelled out its methodological break: "I have attempted to treat Economy as a calculus of pleasure and pain, and have sketched out, almost irrespective of previous opinions, the form which the science, as it seems to me, must ultimately take. I have long thought that as it deals throughout with quantities, it must be a mathematical science in matter if not in language. … The Theory of Economy thus treated presents a close analogy to the science of Statistical Mechanics, and the Laws of Exchange are found to resemble the Laws of Equilibrium of a lever as determined by the principle of virtual velocities. The nature of Wealth and Value is explained by the consideration of indefinitely small amounts of pleasure and pain, just as the Theory of Statics is made to rest upon the equality of indefinitely small amounts of energy." [Jevons, 1871, p. viii]. Pleasure and pain are inborn features of a material smallest entity, just like properties of atoms in physics.

there is thus no endogenously developed theory of money, money and prices are just like a veil thrown by a monetary authority over true and natural exchange ratios.

A further dramatic consequence follows: If there is no theory of credit and capital, if the theory of social values is dissolved into predetermined preferences of a set of biological atoms moving towards its natural equilibrium via markets – then ***there is no room for an understanding of the growth of structure***, of exactly those processes which constitute the emergence of life forms (of all evolutionary forms) living as temporary contradictions to the law of entropy[16]. The neglect of the evolution of money forms therefore is just the tip of the iceberg of the methodological sins of the atomistic turn. Growth, the central concept around which all types of biological theories are built, is explicitly excluded by assumption.

And as a final, but pivotal, side effect growth in life forms tends to produce ***species*** and at the same time the ***exploitative relations*** linking these species[17]. While the rate of growth of one species might be advanced by slowing down growth of the exploited species, feedback enhancing the growth of both eventually is possible. In other words, exploitation is a dynamic concept measurable over well-defined historic time spans[18]. Recaptured from this perspective the most advanced form of money, the universally applicable algorithm of capital, is just the abstract claim of social value to grow. The ways that such a growth of social value can take are not limited to the development of new forms of exploitation across and within species[19]. To explore in which sense omnipresent capital processes can be superseded, which features might survive and which elements will have to be replaced rather rapidly goes a bit beyond the scope of this paper - though the concluding chapter will come back to this issue.

With all these deficiencies the new microeconomic view at the turn of the century – though an apt ideological vehicle to attract a considerable part of the intellectual elite - was unable to grasp the two most important processes going on in actual economic development: ***technical progress and institutional evolution***.

To understand the former it would have been necessary to treat capitalist production units as exploitation maximizing enterprises, and not just traders of resources they own, forced to low prices by competitive markets. And with the same argument it would have become clear that the emergence of new institutions – of the bourgeois class as well as of the newly

[16] While the Second Law certainly has the aspiration of an eternal truth, the stochastic character of that truth implies that temporary counter-movements can occur. This in turn implies that such a build-up of neg-entropy has a beginning and an end - carriers of life necessarily are born at a point in time and die after a finite amount of physical time.

[17] As with the simultaneous emergence of bankers and merchants on the one hand, and their relationship (credit-money) on the other hand, emergence of different species and their relations to each other are one and the same process.

[18] For a more detailed treatment of this idea compare [Hanappi, 2006].

[19] For the human species forms of exploitation of nature are usually combined with forms of the exploitation of one class of society by another class of society, of man by man. As borderlines between species are not merely genetically determined, borderlines within classes of society are co-determined by class relations. But note that exploitation, and thus class, is a dynamic concept, subjected to evolution.

emerging labor class[20] - was enforced by the contradictions between the different groups, the different classes[21]. The endogenous emergence of institutions stays out of reach for any theory that insists on the notions of representative household and representative firm. But both developments - technical advance as well as institutional evolution - actually were extremely strong and had profoundest feedback influence on the path of economic evolution.

But inadequate theory is bound to be faltering – at least in the long-run. When the Great Depression proved the assumption of the effortless final arrival at the paradise of free market interaction to be definitely wrong, critics of the received doctrine – which necessarily remained mute – became a say[22]. Schumpeter attacked common wisdom of the economist profession by substituting the equilibrium of traders of resources by a diversity of active entrepreneurs eager to push markets out of equilibrium[23]. Keynes added the political institution of the nation state and an independent influence of money oriented behavioral traits, e.g. an independent investment function, to replace the scanty models of his teacher Alfred Marshall[24]. Rudolf Hilferding, creatively extending some of Marx' insights, went even further and tried to incorporate the latest development of capitalism – he insisted that on the way towards more oligopolistic market structures a new form of capital was emerging: finance capital[25]. And the only Austrian Nobel prize laureate, Friedrich Hayek, critically and lucidly remarked: '*What I complain of is not that this theory [the quantity theory of money] in its various forms has unduly usurped the central place in monetary theory, but that the point of view from which it springs is a positive hindrance to further progress. Not the least harmful effect of this particular theory is the present isolation of the theory of money from the main body of general economic theory.*' [Hayek, 1931, p.4].

These and other criticisms lead to a revival of ideas closer to classical political economy, and as a new departure within economic theory it came with a new brand name: macroeconomics. In hindsight it seems to be rather obvious that it never really developed into a common, generally accepted view synthesizing all essential aspects of 20th century capitalism[26]. Despite the amazing theoretical progress in many specialized areas no coherent set of theories able to describe the essential characteristics of the development of the world economy emerged. One reason might have been the extremely shaky course, which global political economy took in the 20th century[27]. An overarching theoretical construct would

[20] The strongest growth of labor union membership occurred just in the three decades before World War 1.
[21] Institutions therefore typically can either be a vehicle serving as a focal point for one of the involved groups, or they can be constituted for a (temporary) freeze of a compromise reached.
[22] In this respect the current crisis shows the same characteristic.
[23] See e.g. [Schumpeter, 1939].
[24] See [Keynes, 1936].
[25] Compare [Hilferding R., 1910].
[26] Paul Samuelson's idea of a ‚neoclassical synthesis' remained a fragment in that respect – and later collapsed completely when the so-called 'microfoundation of macroeconomics' failed.
[27] There are good reasons why the eminent historian Eric Hobsbawm has dubbed this century the "Age of Extremes", see [Hobsbawm E., 1996].

have needed much more effort with respect to the two formerly blind spots of mainstream economic theory: technological progress and institutional evolution.

At least macroeconomics as part of economics was firmly established and culminated in a widely accepted formalization of Keynes' central ideas provided by John Hicks: the IS-LM framework. There the idea of the importance of state intervention degenerated to shifts of both schedules (IS and LM) in an output-interest rate diagram due to government action (fiscal or monetary policy). The idea that money processes should be intrinsically included in any model of a monetary economy was reduced to two theoretical innovations. (1) A money demand function, which not only included the traditional transaction cash motive but also demand for 'speculative purposes'; (2) an independent investment demand which compared an expected internal rate of return with a prevailing market interest rate. Both arguments refer to the process of using credit-money to achieve growth and thus comply with the stage of capital.

An additional feature of Keynes' model – perhaps its most important property[28] - was that it revived an old idea going back to the school of Physiocrats in the 18th century[29]. In each year, within a closed geographical region, the total amount of money is bound to stay constant, but has to follow a certain circular flow mirroring the needs of different social classes in the course of this year. When in agricultural societies seed and harvest set the rhythm the year was a natural beat for the whole economy. Keynes, as long as he looked only at flows, could suggest a similar scheme: If new systematic build-up of inventories occurs, then total output during a year has to be identical with total demand (both in money terms), and since the different uses that this demand is channeled to can be neatly structured, there emerges an additional modeling constraint.

It is remarkable how this simple amendment that linked aggregate supply and aggregate demand (both in monetary terms) together with Schumpeter's suggestion of disequilibrium dynamics was able to stimulate a first wave of non-linear macrodynamics[30]. But unfortunately Keynes attitude to state behavioral rules always with variables in real money terms, i.e. postulating that economic agents are always fully aware of inflation, prevented the early model-builders to take Schumpeter's warning that a well-developed banking system is pivotal for innovation, serious. Macrodynamics of the 40-ties and 50-ties became a disappearing fashion.

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[28] One of the most important side-effects was the establishment of statistical offices, which in most advanced countries started to collect data along the lines of Keynes' circular flow variables. Economically relevant relationships were suddenly assumed to be found in the data collected rather than as innate properties of human brains.

[29] The leading figure of this school producing the famous Tableau éonomique was Francois Quesnay [Quesnay, 1758].

[30] As Paul Krugman later correctly noted Richard Goodwin, [Goodwin, 1955] was the champion of that movement, see [Krugman, 1996, p. 63]. Goodwin in his later work explicitly hinted at his intention to combine Marx' ideas with Keynesian modeling, and insights of Schumpeter to contribute to what he called the MKS-tradition.

Nevertheless a more adequate picture of what essentially was happening in the long-run of capitalist development was in the air. Schumpeter, inspired by Nikolai Kondratiev[31], proposed to single out innovations - and in the sequel their drivers, the economic agents he called entrepreneurs – as the central elements of capitalist progress. The mechanics proposed by Schumpeter and Keynes in principle was quite clear and not too far away from the actual working of the system. It could be sketched as follows:

In repeated cycles households save part of the money they earn, transfer it to banks, which in turn provide credit-money for entrepreneurs. Competitive markets force entrepreneurs not only to invest, but also to increase labor productivity of existing production processes[32] and to introduce new products and services. The increased output emerging that way could either be added to the stocks of exploited profit in banks (hence the banks central role to search for promising entrepreneurs) or could be given to the ever more organized labor class to secure political stability as well as effective demand. Since these rather sophisticated dynamics surely look unstable, the capitalist state is necessarily intervening – either politically (Schumpeter's view) or economically (Keynes' view). This vision of the process flirts with Hegel's "List der Vernunft" as well as with Mandeville's "private vices to public virtues"[33]. As entrepreneurs strive for maximum profit the structural constraint of competition forces them to do something beneficial for the whole society, they drive innovation – and they usually are not aware of that fact. Above all this view seems to be close to what Karl Marx seemed to have envisaged as the historical mission of capitalism in his manifesto [Marx, 1848].

Though not adequately formalized yet, the success of the system described in the Keynes-Schumpeter perspective would clearly be supported by empirical observation. The social contract implicit in this working of 20th centuries advanced countries was extremely successful in increasing GDP per capita. Diagram 1 shows the data for six Western European countries collected by Angus Maddison [Maddison, 2006]. This is the explosion of technical progress, which has to be explained by economic theory. Note that GDP is measured in real terms and that per capita is based on total population, not on employment. Labor productivity would be based on employment and thus would show the more production process oriented development, whereas the line shown in diagram 1 concerns the average welfare effect of technological advance.

[31] Compare [Kondratiev N., 1926]
[32] A particularly interesting and recent empirical study of this link is [Ilyina and Samaniego, 2009].
[33] See [Hegel, 1807] and [Mandeville, 1714].

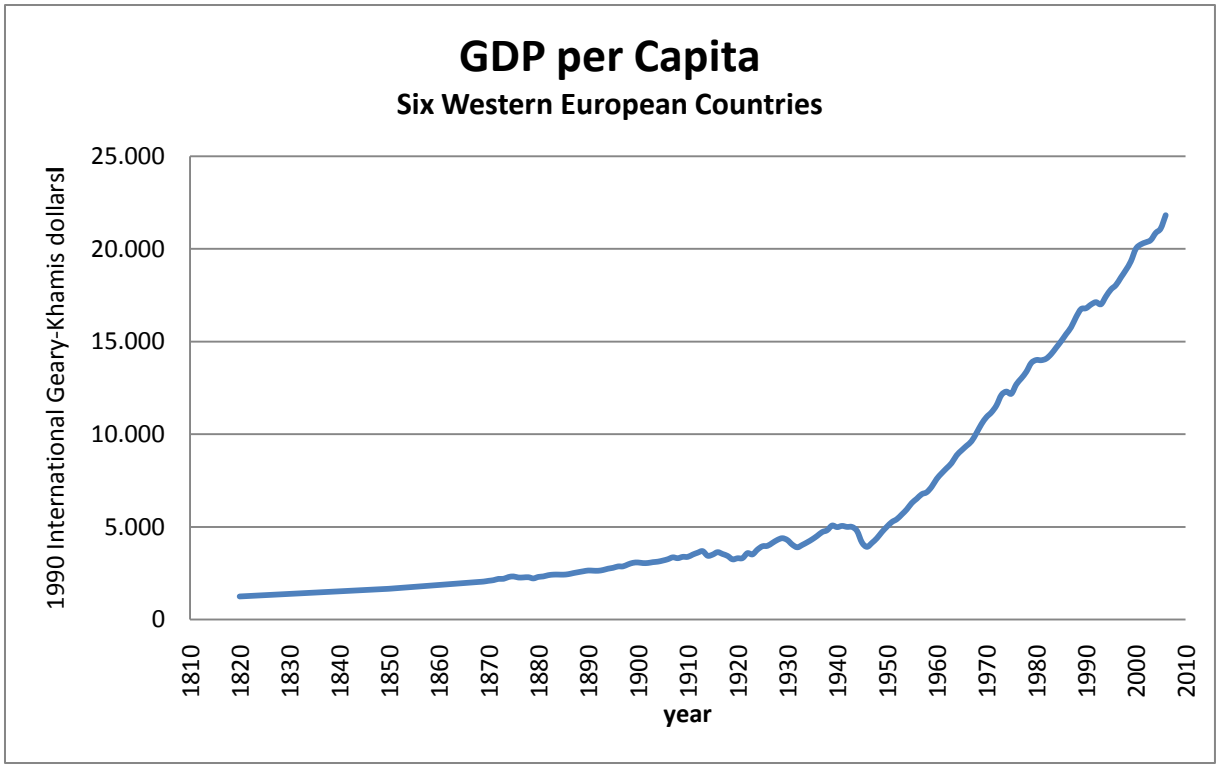

Diagram 1: Growth of GDP per Capita

But Keynes reintroduction of the cyclical character of economic activity, despite its merits had crucial, even devastating short-comings. Instead of modeling accumulation and exploitation his concentration on circular flows falls back on the counterfactual assumption of equilibrium. Keynes' bon mot that 'in the long-run we are all dead' hides the fact that his basic setup necessarily is restricted to short-run considerations – without any references to empirically observed analogies. As soon as medium-term developments appear interesting this setup collapses. The simplest case was taken care of by early growth models, e.g. the first one constructed by Keynes colleague Roy Harrod[34]. The simple extension mainly concerned a definition: Capital is defined as the stock of accumulated net investment.

From the point of view of evolution of money forms argued so far this is a serious misconception. While the amount of money signs in a given area certainly can be measured at well specified points in time, and an increase of that amount over time might be computed, this still remains measurement of money in its first form and cannot explain the role of credit and capital as a program. Even 19th century classical political economy knew better when it coined the phrase 'madame la terre et monsieur le capital'. Land clearly was seen to be the passive factor of production; possible output was usually thought to be a little bit less than proportional to its extension. This is a far cry of the confusion occurring later when land – now called 'capital' – was assumed to have decreasing marginal returns. On the other hand the active role of the classical 'monsieur le capital' vanished from the production function until Schumpeter let him in again as magically shifting functions due to his 'entrepreneurial spirits'. One of the most exciting tasks of evolutionary economics still

[34] Compare [Harrod R., 1939].

remains to put more flesh on Schumpeter's sometimes rather naïve view of this innovation process. Above all, little has been achieved to further our understanding of capital as a process of the most developed ***monetary*** form. How important that is can again be grasped by a glance at diagram 2 showing the long-run evolution of the Dow Jones index.

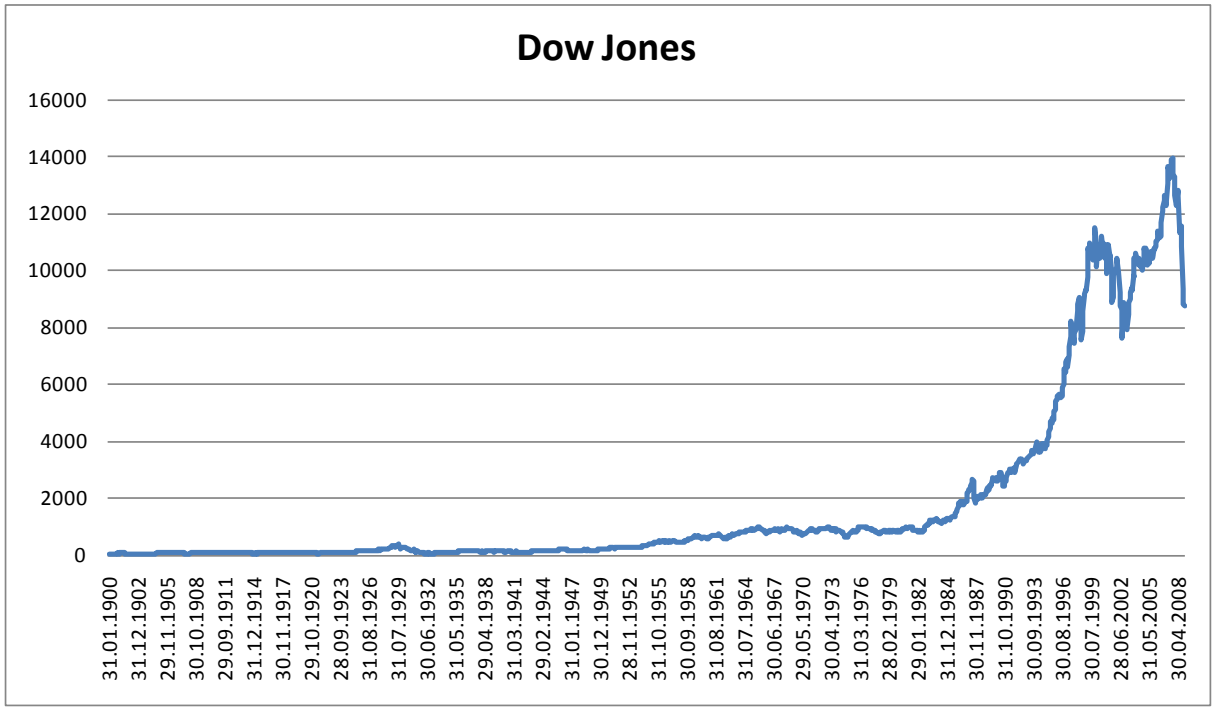

Diagram 2: Dow Jones Index (yearly) as a description of the success of capital

Since this index provides an evaluation of the most important corporations in the world performing the capital program, it reflects how successful capital works. Noteworthy the great take-off here appears after 1982, and not immediately after World War 2 as in the previous diagram 1. This highlights the two phases of accelerated accumulation: one immediately after the war basically enhancing welfare, and a second phase from 1982 on, which left welfare on its old track but added substantial accumulation to the Dow Jones measure. The economic interpretation of the two phases is straight forward: While Western Europe over the whole after-war-period till 2007 experienced a strong increase in economic power (power of population to produce GDP) and general welfare (GDP distributed citizen) – everything on average – there is an additional upward push in the evaluation of the globally most relevant corporations since the beginning of the 80-ties. This second phase thus evidently coincides with the broad political roll-back to conservative economic policies in most OECD countries, Reagan in the USA, Thatcher in the UK, Kohl in Germany, and others[35]. Seen from the international perspective this political switch, after a long-period of a catch-up race of Europe and Japan, it heralded the somewhat surprising second wave of even

[35] In a recent paper this second phase also is characterized as a worldwide inflow of capital to US capital markets, compare [Mendoza et al., 2009]. It is accompanied by a relative shift of the US portfolio (as compared to other countries) towards more risky capital algorithms. Probably the stronger military stance of US policy compensated and enabled this shift.

stronger unchallenged US hegemony culminating in the break-down of the Soviet Union in the early 90-ties.

Obviously the working of capital on a global scale became even more linked to political evolutions in this second phase than before. In the vision of most of mainstream economics even today the discipline of economics concerns specific mechanisms (mostly market mechanisms) working in a vacuum of direct coercive power. All such power is thought to be monopolized in an anonymously governing political entity securing economic rules - and the study of this entity falls out of economists' concern since it is covered by political science. As argued above, this political entity never has been anonymous, but rather resides at the core of economics providing its indispensable monetary authority. This monetary authority mainly comes in two forms: A guarantee of the ***validity of the sign system representing social value***, and the ***provision and adaption of the rules of the economic games*** played in the jurisdiction of this entity. In particular the second element neatly fits to the definition of capital put forward in this paper: It is the ensemble of the change of rules in nation states, the reframing of the program environment of the capital algorithms, which is responsible for the boom after 1982.

In other words, the long-run enhancement in labor productivity became superimposed by institutional evolutions initiating a new spurt of capital increasingly centered on the USA. Institutional settings became incredibly important for capital[36]; in short, an old player in classical political economy reentered the center of the stage: the state.

The State

Nation states in their new, non-feudal form are the institutional correlate to the evolution from credit-money to capital. Though in most countries the feudal class officially remained in power till World War 1, the underground erosion of its influence started much earlier. When its rule finally broke the world slipped into the deep troubles of the 20th century[37], which in retrospect can be understood as a search for new institutional solutions. The two remaining regimes, which – contrary to the fascist model - survived after WW2, were the new integrated capitalist state and the Stalinist production system[38].

The development of institutional settings, as already mentioned in the previous section, is the second blind spot of mainstream economics today. It has received even less attention than technical progress. Of course, there is a fast growing literature discussing and

[36] A good example is telecom firms for whom the national regulations of a country are the most important influence on profits. More generally, transnational corporations' success critically hinges on using different national regulations for labor market regimes and tax regimes.

[37] A second look at diagram 1 reveals that these troubles also materialized as welfare losses: World War 1, Great Depression, and World War 2.

[38] Compare [Hanappi, 1994, pp.103-162] for a more detailed description of the latter.

describing the diversity of contemporary capitalism[39], and even the implications of cultural and institutional diversity on decisions of transnational corporations are extensively empirically studied[40].

Nevertheless ***the evolution of this diversity*** has not been conceptualized particularly convincing. There has been some effort to collect different perspectives from heterodox economics, see e.g. [Hodgsen G. et al., 2001], but a synthesizing approach still seems to be out of reach.

It is not surprising that attempts to conceptual institutional evolution along the lines of Darwin's ideas on biological evolution of the human species emerged early on, with Herbert Spencer readily introducing the analogy between biological selection and survival in competitive economic markets[41]. A thorough discussion of the issues surrounding 'Social Darwinism' and the role it played for fascism would go beyond the scope of this paper, it is nevertheless evident that after WW2 the misuse of Darwin's concepts by fascist propaganda let social scientists shy away from direct applications of biological concepts to social developments. In retrospect, not much has been lost by the neglect of these early developments. The evolution of institutional settings was not in the focus of social Darwinism anyway, Spencer's atomistic view (19th century market liberalism) had been substituted by archaic, hierarchical systems with little or no explanatory force.

What actually happened in institutional structures since 1945 is above all ***a strong trend towards more continental political entities***, the emergence of continental units. Though there is considerable change in the list of nation states too[42], the social innovation of the last sixty years clearly has been 'continental units in a common global context'. The most remarkable institutional social innovations date back to early years of that era: the Worldbank, the IMF, WTO (former GATTS), and the UN. Note that one important international rule system did not survive the early 70-ties and thus is a good candidate for the explanation of the following discontinuity in 1982: The Bretton Woods system of fixed exchange rates[43].

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[39] An interesting comparative study of five types of contemporary capitalism was presented by Bruno Amable [Amable, 2003]. For a survey of issues related to that variety see [Elsner W. & Hanappi H., 2008].

[40] Some of the most promising contributions come from a group of Dutch economists, which originally tried to nail down the theoretical framework of New Economic Geography to answer empirical questions of spatial economic policy, see [Brakman et al., 2007, pp. 267-405]. Another good example of empirically interesting conclusions with respect to firm evolution is [Lechevalier, 2007].

[41] See [Spencer H., 1862], a contemporary and rival of Darwin, who combines his evolutionism with the strict market liberalism (against any state intervention, [Spencer H., 1884]) so typical for aristocratic scientists of the 19th century.

[42] Compare [Radax W. et al., 2009].

[43] It is tempting to interpret the second phase, which is so dominant in diagram 2, as being based on 'exploitation via flexible exchange rates in a globalizing world of TNCs'. The success of capital on a global scale in this second phase contrasted by only continuous growth in diagram 1 (average GDP per capita) translates into an opening spread of incomes: Those derived from these global successes explode while those (in Western Europe) which were not had to grow slower than before 1982 to arrive at the continuity shown in diagram 1.

After the turbulent institutional attempts in the war and peace periods of the first half of the 20th century the second half saw the fading away of the Stalinist production system of the Soviet Union till the 90-ties, and more recently the flourishing of a modified variant of this system in China. These basic breaks in global political economy set the frame for the institutional variants accommodating capital in the Western world since 1992. In particular the evolution of financial institutions since that point in time can reveal interesting insights.

From an evolutionary perspective such an investigation should beware of a two simplistic analogy, a mistake to be found in the concluding chapter of the economic historian Niall Ferguson's recent book [Ferguson N., 2008, pp. 341-358]:

"*Financial history is essentially the result of institutional mutation and natural selection. Random 'drift' (innovations/mutations that are not promoted by natural selection, but just happen) and 'flow' (innovations/mutations that are caused when, say, American practices are adopted by Chinese banks) play a part. There can also be 'co-evolution', when different financial species work and adapt together (like hedge funds and their prime brokers). But market selection is the main driver. Financial organisms are in competition with one another for finite resources. At certain times and in certain places, certain species may become dominant. But innovations by competitor species, or the emergence of altogether new species, prevent any permanent hierarchy or monoculture from emerging. Broadly speaking, the law of the survival of the fittest applies. Institutions with a 'selfish gene' that is good at self-replication and self-perpetuation will tend to proliferate and endure.*" [Ferguson N., 2008, pp. 350-351]

Though it might be a kind of excuse that the text was written in May 2008, when the full extent of the looming crisis of finance institutions what not yet visible, it nevertheless is a timeless example of undue transplantation of biological metaphors. Financial institutions are not born by simple 'innovation/mutation'; they are strongly linked to the regulatory rule system of the nation states and thus are shaped in a way that reflects the surrounding political entity. The death of these finance institutions usually is not caused by competitive rivals on markets for 'scarce resources'. It rather needs a complex procedure – including several political entities sometimes from state agencies to unions - to allow a large financial intermediary to go bankrupt. Finally, Richard Dawkins' suggestion[44] to re-introduce a moral concept, selfishness (remember Mandeville's 'vices'), does not lead to a better understanding of the performance of financial institutions – to say the least.

As argued in this paper, instead of unwise direct use of concepts of evolutionary biology, the evolution from money to capital is a process, which evolutionary economics has to explain as an indispensable part of the economic evolution in general, of monetary political economy. The two important trajectories shaping the last two hundred years of capital were technological progress and institutional evolution, in the light of their development steps

[44] Compare [Dawkins R., 1989], and see [Lewontin et al., 1984] for a critique of Dawkins' attempt to extend biological metaphors to the social sciences.

financial institutions have to be understood. The evolution of the state, again, is a rather big topic; only a selected range of issue can be mentioned here.

The 'state' today comes mainly in three formats[45]: As nation state, as continental unit, and as a globally governing political unit. In the USA and in most parts of the EU the elementary money form (US Dollar, Euro) is provided at the continental level, in Asia such a unit is still in the making. The most developed form, the capital algorithm, in principle works on the global level though the level of regulations for most rules is the national level. Financial institutions carrying and executing the regulations are to be found on all three levels, and there is a trend to move power to the upper levels, leaving smaller tasks to subsidiary lower levels.

With respect to the existence of respective political bodies their evolution on all three levels, and in particular towards the highest level has just entered a hot phase since 1982. The emergence of the EU is a very recent development, a similar entity uniting China, Japan, and India has not even started – not to speak of the global level. In each of these institutional evolutions specific history and culture of the concerned area – formally spoken: foregone path dependency – play a crucial role. As a consequence evolutionary economics has to revive its history component to better understand current options and possible future trajectories of institutional evolution. In a sense the currently starting general crisis is just a symptom of the mismatch of the available institutional carrier systems and the capital program of large scale private carriers. Given this interpretation the depth of the crisis is not surprising – hopefully it ***gives birth to a new global institutional design***.

What has to fit to this institutional setting is a worldwide ***structure of production units***, a structure, which builds on (and partly transforms) the existing structure[46]. The separation of functions between globally acting TNCs and local SMEs, the main providers of employment, is already taking place[47]. The original role of the banking system in the 20th century - namely to discover the most profitable routes for further capital expansion and to channel credit towards these investments – has stagnated in the last two decades. Profitable intrusion of new spaces for investment became difficult. Indeed the financial hype after the IT bubble in 2001 was built with the help of self-fulfilling prophecies, which needed ***not*** to be grounded on actually existing expectations concerning profitable real investment[48] – simply because such possibilities became extremely rare. It is thus a logical consequence that the mismatch between the most advanced money form (the capital program) and its welfare enhancing

[45] The focus on these three formats is due to the emphasis on the state's role as a monetary authority. A broader approach centering on the many ideological tasks the state takes care of, can be found in [Althusser L., 1970].

[46] The contemporary interaction between TNCs and nation states concentrates on choice of capital structure of the former given 'political risks' set by the latter, as empirically studied by e.g. [Kesternich and Schnitzer, 2009].

[47] In a recent contribution this development of global firm structure and its connection to global mega-cities is discussed in more detail [Hanappi, 2009].

[48] A more theoretical companion paper to this paper discusses four reasons for the financial crisis in much detail [Hanappi H. and Rengs B., 2008]. The appendix to this paper provides some agent based simulations showing how to combine the four elements to mimic actual developments at the NYSE. Since these simulations are still work in progress they are yet not made available on my website – but we hope to do so in September 2009.

'historical mission' first made its appearance as the fall of a carrier system of that mission, the fall of a large financial institution, the fall of Lehman Brothers on September 15, 2008.

Immediately after this pivotal turn the role of state intervention - on all three levels and in content contrary to almost all policy discussion since 1982 - was suddenly on the agenda again[49]. Since then the debate more and more concentrated on the question of where and how the state should intervene, and if it should intervene at all was discussed less and less. But if the necessity for the states active role is taken for granted, then the next questions are for the type of intervention and for quality and democratic control of the state' s decision makers (again at all three levels). But these question are nothing else than the above mentioned call for the design of a desirable institutional setting.

Some Policy Conclusions

Any policy conclusion – in particular in critical situations – rests on a vision of possible future developments, in a less mundane language: on forecasts. Forecasts in times of deep crisis need a far reaching interpretation of the past (e.g. the one given in the previous sections of this paper) as well as some empirical evaluation of what was just happening in the immediate past. There exists an impressive flood of descriptions concerning the latter[50], diagram 3 just shows the recent development of the Dow Jones Index.

[49] As a recent contribution compare [Auerback, 2009].

[50] One of the most informative papers is [Calomiris, 2008], a more recent survey of events is [Furceri and Mourougane, 2009].

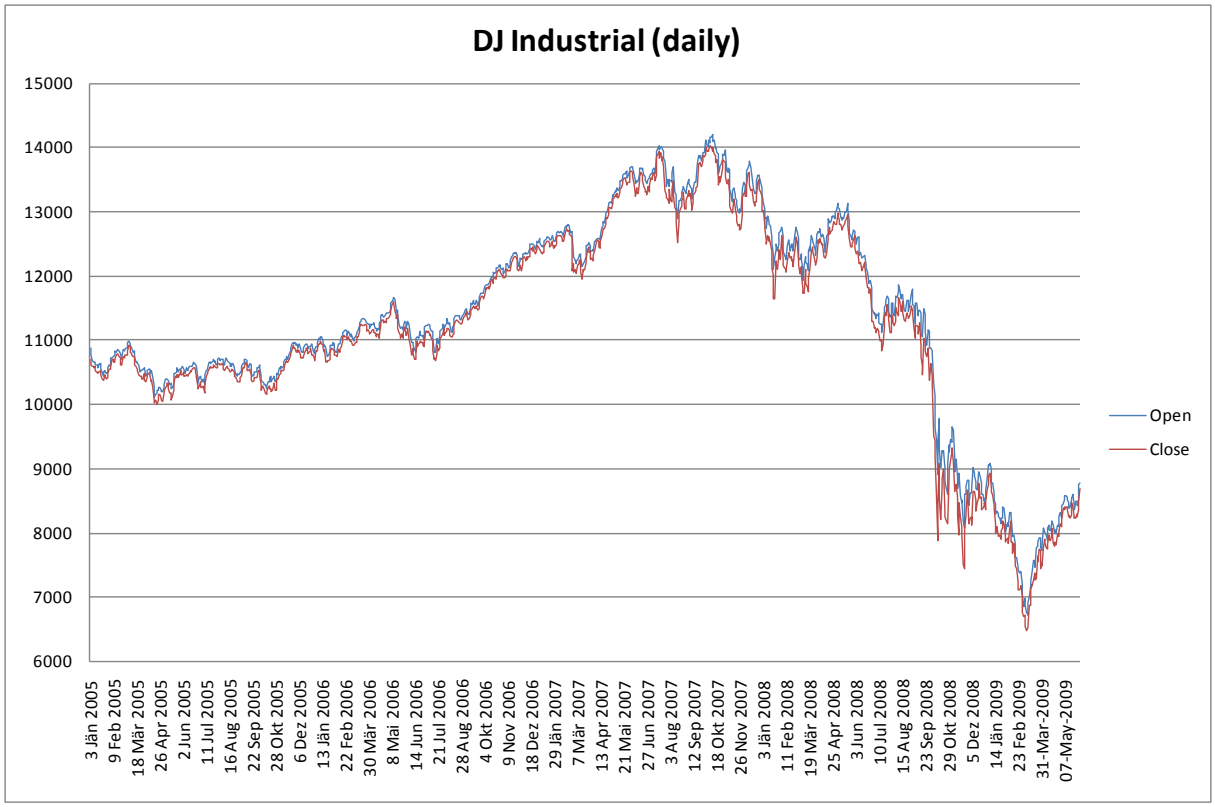

Diagram 3: Dow Jones Index (daily) as a description of recent description of recent events

To make sure that this rather dramatic short-run development at the world's stock exchanges is not just the usual working of these markets necessary to clean it from unsound expectations, take a look at the long-run, real GDP growth rates of the USA, Germany and Austria in diagram 4 (the year 2009 is the last OECD forecast).

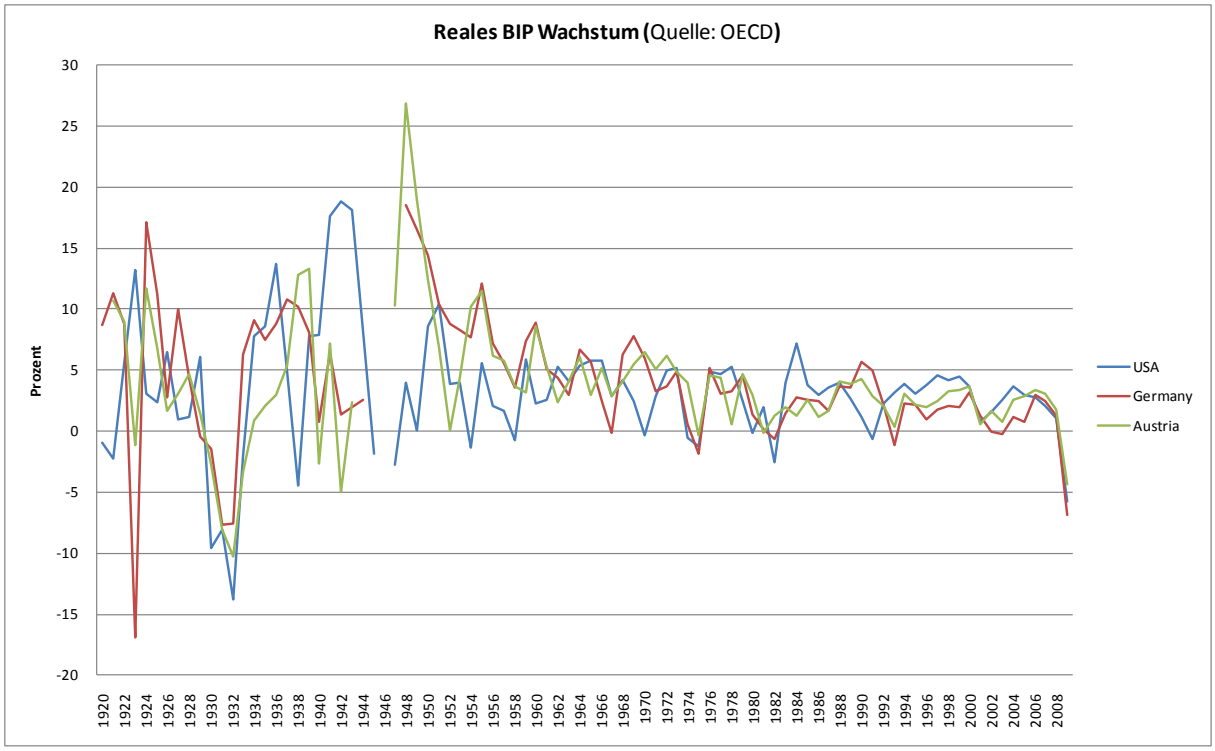

Diagram 4: Growth rates of real GDP

As the diagram shows, there can be no doubt that this will be the worst crisis for output and employment in the world since the Great Depression. According to our (continuously improved but always preliminary) forecasts the worst is still to come: The fall in employment will actually set in full scale next autumn and winter[51], leading to a drop in household income. For some time households will be able to keep consumption at only slowly decreasing levels using up their savings. Since there is no reason to believe that firms have recovered at that point in time, the breakdown of demand will begin when household savings reach a critically low level, which probably will be in the fall of 2010. Only then, in 2011, the disastrous consequences and repercussions of a severely decreasing effective demand will start to spread. One has to take into account that for almost all people in OECD countries this will be the first time in their life that their consumption levels will significantly fall in real terms; we would dare to predict a total decrease around 10%.

In that situation social and political pressure will be enormous. This might enhance the efforts to develop and to implement a new institutional setting on a global level. But it also is an extremely dangerous transition period – comparable in some respect to the thirties of the last century – since the history-dependent national responses to such a crisis easily can lead to locally dangerous phenomena, to governments based on direct coercive power instead of

[51] See [Wray, 2009] for an appraisal of the importance of avoiding high mass unemployment. Martin Shubik, in a similar vein, suggests social innovation in the form of a 'Federal Employment Reserve Authority', compare [Shubik, 2009].

democracy[52]. The availability of highly efficient military means makes such a threat indeed more threatening than ever.

But even if it is possible to avoid the worst[53], there will be no return to a smooth working of the old capital algorithm with high profit rates. Indeed the two big bubbles (ITC and finance) at the beginning of the century showed that the recent surge of five boom years has been built on thin air already. Of course, the omnipresent capital program will not vanish – but it will lose its dominant role, and will have to be content with low accumulation rates between 1and 2 percent. No contemporary TNC can be imagined that can keep its organizational structure and culture with such a low profit rate. So the setup of firms, of production units, will have to change profoundly. The lower turning point leading to this mild recovery might be reached in 2015, so reorganization should start within the mid-term planning horizon of large firms. But there will be winning firms, at least in terms of market shares of the shrinking market, and they will be hard to convince.

In several other aspects a return to direct political measures can be expected too. To secure a sustainable level of employment labor time regimes will e adjusted rather quickly – short time work will be here to stay and solutions tailored to the needs of production units and households hopefully will be found. Direct employment as state employees will start to play the important role of an immediate remedy. Since all this increases government expenditure, the question of who is lending to the government will rapidly become virulent. If the crisis is global the traditional banking sector will not be able to step in and a partial return to measures reminding on command economies will be inevitable. As in wartimes, a war against unemployment lead and 'financed' by governments might be a preferable solution.

With respect to money this speculative outlook strongly points to a new metamorphosis of the money form. As was the case with previous form changes, the new form will ***not*** replace the current one; it rather will superimpose new and dominant features[54]. And these features will have to be able to solve the most pressing problems of the global human species in the new century. The global character of these bottlenecks clearly calls for a large scale political decision procedure - democracy at work – carried out and executed by highly professional and committed agencies.

The major three problem areas to be solved - the new 'historical mission' of the new money form following the capital algorithm - could be:

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[52] Therefore a sophisticated regulatory response of institutions on the national level, tailored to the respective situation, is particularly important. This, of course, includes financial institutions; see [Nier, 2009].

[53] Olivier Blanchard suggests a set of Keynes-style, demand-oriented measures to fight the crisis; Barry Eichengreen concentrates on regulatory remedies engineered by a reformed IMF, see [Blanchard, 2008] and [Eichengreen, 2009]. An alternative (even more 'Keynesian') interpretation and proposal for a policy recipe is provided by Jan Kregel [Kregel, 2009].

[54] This, of course, is also true for technical innovation proper, for new products and processes. Technical innovation will go on, but the newly dominating form of innovation – out of need - will be more and more social innovation.

(1) Solving the questions of increasing income and wealth inequality in the world
(2) Solving the questions of sustainable environmental conditions
(3) Solving the question of avoiding a fallback to regimes of direct coercive power

Channeling economic and political activity towards work solving these problems will again be a program rather than a simple sign system of social values. It will even be a more complicated program than the capital algorithm residing in business plans and psychological traits of humans today. It will need not only conscious planning but even planning of consciousness of the society as a whole. It thus will be a new experience for mankind. Money, the materialized expression of social value, on its long journey to ever greater abstraction, will start to become intention on a global, social scale. Technical progress has already produced the preconditions[55]; institutional evolution – indeed the implementation of adequate mechanisms of democracy – is knocking at the door of scientists, of evolutionary economists.

[55] In a large research project for the Austrian National Bank the technological impact on money forms has been studied [Hanappi, 1999].

Bibliography

Althusser L.,1970 , ***Idéologie et appareils idéologiques d'Etat***, La Pensée, no 151, juin 1970.

Amable B., 2003, ***The diversity of modern capitalism***, Oxford University Press.

Auerback M., 2009, ***The Return of the State: The New Investment Paradigm***, The Levy Economics Institute Working Paper No. 561.

Blanchard O. et al., 2008, ***Fiscal Policy for the Crisis***, IMF Staff Position Note, December 2008.

Brakman H. et al., 2007, ***Nations and Firms in the Global Economy***, Cambridge University Press, Cambridge (UK).

Braudel F., 1986, ***Sozialgeschichte des 15.-18. Jahrhunderts, Aufbruch zur Weltwirtschaft*** (Civilization matérielle, économie et capitalisme. XV^{e} – XVIII^{e} siècle, Paris, 1979), Kindler Verlag, München.

Calomiris Ch., 2008, ***The Subprime Turmoil: What's Old, What's New, and What's Next***, paper prepared for presentation at the Federal Reserve Bank of Kansas City's Symposium, "Maintaining Stability in a Changing Financial System," August 21-22, 2008, in Jackson Hole, Wyoming (USA).

Comte A., 1979 (1844), ***Rede über den Geist des Positivismus*** (französisch-deutsch), Felix Meixner Verlag, Hamburg.

Dawkins R., 1989, ***The Selfish Gene***, Oxford University Press.

Eichengreen B., 2009, ***Out of the Box Thoughts about the International Financial Architecture***, IMF Working Paper 116, May 2009.

Elsner W. & Hanappi H. (eds.), 2008, ***Varieties of Capitalism and New Institutional Deals***, Edward Elgar, Cheltenham (UK).

Ferguson N., 2008, ***The Ascent of Money. A Financial History of the World***, Penguin Group (Australia).

Furceri D. and Mourougane A., 2009, ***Financial crises: past lessons and policy implications***, OECD Economics Department Working Papers no. 668, Feb. 2009.

Goodwin R., 1955, ***A Model of Cyclical Growth***, in: Lundberg (editor) Business Cycle in the Postwar World.

Hanappi G., 1989, ***Die Entwicklung des Kapitalismus***, Peter Lang Verlag, Bern.

Hanappi H., 1994, ***Evolutionary Economics. The Evolutionary Revolution in the Social Sciences***, Avebury Press, Aldershot.

Hanappi H. (ed.), 1999, ***Die Zukunft des Geldes***, Wiener Studien zur politischen Ökonomie, Band 13, Wien.

Hanappi H., 2006, ***Endogenous Needs, Values and Technology***. Evolutionary economic modelling to replace microeconomics and macroeconomics, proceedings of the European Association for Evolutionary Political Economy (EAEPE) Conference 2006 in Istanbul (Turkey), November 2-4, Istanbul, 2006.

Hanappi H. and Rengs B., 2008, ***On the Eve of Global Financial Collapse. Explanations, necessity, and policy conclusions***, proceedings of the International Conference of EAEPE in Rome (Italy), November 6-8, 2008.

Hanappi H., 2009, ***Global Cities and Global Firms? On the links between trends in urbanization structures and production structures***. Global Business & Economics Anthology, vol. 1, March 2009, pp. 41-48.

Harrod R., 1939, ***An Essay in Dynamic Theory***, Economic Journal.

Hayek F., 1931, ***Prices and Production***, A. M. Kelley Publishers, New York.

Hegel G.W.F., 1807, ***Phänomenologie des Geistes***, Jena.

Hilferding R., 1910, ***Das Finanzkapital***, Europäische Verlagsanstalt, Wien.

Hobsbawm E., 1996, ***The Age of Extremes: A History of the World, 1914-1991***, Vintage Books, London.

Hodgson G. et al., 2001, ***Capitalism in Evolution***, Edward Elgar, Cheltenham (UK).

Ilyina A. and Samaniego R., 2009, ***A Multi-industry Model of Growth with Financing Constraints***, IMF Working Paper 119, May 2009.

Jevons S., 1871, ***The Theory of Political Economy***, MacMillan, London.

Kesternich I.and Schnitzer M., 2009, ***Who is afraid of political risk? Multinational firms and their choice of capital structure***, Discussion Papers of the Deutsche Bundesbank no. 02/2009.

Keynes J., 1936, ***The General Theory of Employment, Interest and Money***, MacMillan, London.

Kondratiev N., 1926, ***The Long Waves in Economic Life***, Archiv für Sozialwissenschaft und Sozialpolitik (transl. 1935, REStat).

Kregel J., 2009, ***Managing the Impact of Volatility in International Capital Markets in an Uncertain World***, The Levy Economics Institute, working paper no. 558, April 2009.

Krugman P., 1996, ***The Self-organizing Economy***, Blackwell Publishers.

Lechevalier S., 2007, ***The Diversity of Capitalism and Heterogeneity of Firms—A Case Study of Japan during the Lost Decade***, Evol. Inst. Econ. Rev. 4(1), pp. 113–142.

Lewontin R. et al., ***Not in our Genes. Biology, Ideology, and Human Nature***, Pantheon Books, New York.

Machiavelli N., 1988 (1532), ***The Prince***, Cambridge Texts in the History of Political Thought, Cambridge University Press.

Maddison A., 2006, ***Contours of the World Economy, 1 – 2030 AD***, Oxford University Press.

Mandeville B., 1714, ***Fable of the Bees: Private Vice, Public Virtue***.

Marx K., 1848, ***Das kommunistische Manifest***.

Mendoza E., Quadrini V., and Rio-Rull J., 2009, ***Financial Integration, Financial Development, and Global Imbalances***, Journal of Political Economy, vol. 117, no.3 (June 2009).

Menger C., 1871, ***Principles of Economics***, Vienna.

Montesquieu Baron de, 1748, ***On the Spirit of Laws***, Paris.

Nier E., 2009, ***Financial Stability Frameworks and the Role of Central Banks: Lessons From the Crisis***, IMF Working Paper 70, April 2009.

Quesnay F., 1758, ***Le Tableau Économique***, Paris.

Radax W., Wäckerle M., and Hanappi H., 2009, ***From Agents to Large Actors and back. Formalized story-telling of emergence and exit in political economy***, paper contributed to the 11th conference of the Association for Heterodox Economics, London, June 2009; forthcoming in the proceedings.

Schumpeter J., 1939, ***Business Cycles: A theoretical, historical and statistical analysis of the Capitalist process,*** McGraw Hill, New York.

Shubik M., 2009, ***A Proposal for a Federal Employment Reserve Authority***, The Levy Economics Institute of Bard College, Policy Note 2009/5.

Smith E. & Foley D., 2002, ***Classical thermodynamics and economic general equilibrium theory***, Santa Fe Institute, New Mexico (USA).

Sohn-Rethel A., 1978, ***Warenform un Denkform***, edition suhrkamp, Frankfurt a. M.

Spencer H., 1862, ***First Principles***, Williams & Norgate, London.

Spencer H., 1884, ***The Man versus the State***, Williams & Norgate, London.

Walras L., 1874, ***Elements of Pure Economics, or the theory of social wealth***, Paris.

Wray L., 2009, ***The Social and Economic Importance of Full Employment***, The Levy Economics Institute, working paper no. 560, April 2009.