Banks, Risk and Expectations: A New Interpretation of Leijonhufvud's Corridor in a Neo-Austrian Perspective

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Introduction

Axel Leijonhufvud takes since the beginning of his studies, together with Clower, a different position both from the Neoclassical Keynesians and the post-Keynesians, though placing himself among Keynes' heirs. In his first publications, in fact, a particular view of the market economy distinguished from the mainstream emerges, with a special attention revolted to the disequilibrium features of the economic system. To characterize Leijonhufvud's first analysis, particularly regarding the Neoclassical Keynesians, is the little trust in price adjustments. He emphasizes the mechanisms of deviation amplifying: the system is subject to the prevalence of quantity adjustments over equilibrating adjustments of price. Subsequently, in the seventies of the past century, Leijonhufvud lives a phase of change of mind. Over those years the attention for the non-coordinated nature of the market economy is reappraised and with the work of 1973, "Effective Demand Failure", Leijonhufvud begins to modify his opinions on the features of capitalism: conditions of intertemporal coordination among individual plans and tendencies to stability seem more likely events in market economies than situations of disequilibria. In the real working of economies, spontaneous and equilibrating forces act in such a way to reduce at exceptional cases the situations of instability and persistent disequilibrium. Keynes' cumulative processes are therefore subject, in the new ideas of Leijonhufvud, to a progressive weakening, in favour of equilibrium mechanisms, that is of deviation counteracting, which prevail in the ordinary course of economic activity.

So he builds a theoretical unitary view of these intuitions on the base of the saving-investment approach instead of aggregate demand and supply, recovering the equilibrating function of the market rate of interest, that plays a key role of adjustment for the whole economic system, highlighting the self regulatory features of capitalism. He provides in this way another Keynes, more Wicksellian, rejecting the Liquidity Preference Theory of General Theory (1936), where interest rate is determined on the monetary market and therefore deprived of its fundamental equilibrating nature, and linking what remains of General Theory (that is, quantity adjustments) with price adjustments of Keynes' Treatise on Money (1930). This is the so-called *Z-Theory* where - in a context of uncertainty and incomplete information - the emergence of inconsistent beliefs among different agents about the future economic events leads to the maladjustment of the interest rate, that is a gap between market rate and natural rate, and so to the consequent instability. But until the shock is not of great dimension, the system can react with equilibrium adjustments. Just this interest rate gap and this trust in the mechanisms of counteracting, which lead to phenomena of temporary disequilibria bound to be reabsorbed, represent an interesting link to the Austrian business cycle theory.

The object of this work is therefore to try to tell the story of Leijonhufvud's disequilibria, based on the Wicksellian maladjustment of the interest rate, using the Austrian arguments about the cyclical phenomena, in order to verify the possible existence of a theoretical area of meeting. The crucial divergence of beliefs at the base of the maladjustment of the interest rate is in fact re-examined in the light of the Austrian arguments about the role played by the monetary and fiscal authorities in injecting liquidity or in creating expectations of future injections of liquidity.

For favouring the approach between the two theories, the Austrian business cycle model is softened through the reduction of some rigidities, emphasizing some positive aspects related to the monetary expansions and to the fractional reserve.

Inconsistent beliefs and the maladjustment of the interest rate

It's possible to explain the Z-Theory using the Leijonhufvud's metaphor of the corridor. Inside this corridor the Swedish economist draws an ideal growth path, useful like benchmark and place of perfect flexible prices, full information for the agents and full intertemporal coordination. Any disequilibrium, in this "not place", is absorbed instantaneously thanks to adjustments of the interest rate that occur at infinite velocity. Moving from the abstraction of an equilibrium model to the

reality, we go away from the ideal path. This is the place where the real economy follows paths of growth in disequilibrium. Here equilibrating price adjustments prevail, and mechanisms of deviation counteracting lead any disequilibrium towards its natural values, and so towards the path chosen like benchmark. But crossing the boundaries of the corridor, we arrive at the outside area where Keynes' cumulative processes, based on quantity adjustments, get the upper hand, bringing the system in a marsh of wide and persistent disequilibrium. Here the mechanisms of deviation counteracting lose their stabilizing force and they are overcome by the mechanisms of deviation amplifying. Inside the corridor we have the Treatise on Money, outside the General Theory that, without its Liquidity Preference, seems a more general model.

The study of the events is based on a Wicksellian analysis of the save-investments market and in particular on the movements of the interest rate that allow the matching between savers and investors plans, leading to the emergence of an intertemporal coordination. In fact, savings are equivalent to the demand for future good and express, from a financial point of view, a demand for securities, and therefore a supply of loanable funds (genuine saving, in Austrian terms). Investments are instead equivalent to a supply of goods and express, at the same time, a supply of securities, and therefore a demand for loanable funds. The natural rate of interest balances savings and investments and therefore the market of current and futures goods. In this sense, for Leijonhufvud the rate of interest is a real variable of the system, because it represents the price of current goods in terms of future goods. But in a monetary economy interest rate is not fixed directly by providers and borrowers of funds, but in particular places, like the credit market for Wicksell (and Austrians) or the Exchange for Keynes of Treatise. So the problem concerns the eventual emergence of a discrepancy between the natural and the market value of this special equilibrating variable for the interposition of other agents between providers and demanders of saving, that obstructs the tendency of the market rate of interest towards its natural level. This means that the maladjustment of the interest rate can appear, influencing the economy on the whole since it slows or hinders a return to equilibrium. But what is the source of this maladjustment? The interest rate, for hypothesis, is flexible, but agents acting in the real world have limited rationality and, above all, incomplete and incorrect information, and with these knowledge limits they face a fundamental ignorance on the future that lead them to react to events on the base of *inconsistent beliefs about the future course of the economy* (profit opportunities and price level). This leads to divergent behaviours of savers, banks, speculators and entrepreneurs in front of the same events that involve an incomplete adjustment of the market rate of interest, and a failure of the intertemporal coordination, that is disequilibria.

Suppose, at this point, a real shock of a Keynesian kind, that is a decline of marginal efficiency of capital. This recessive shock reduces the level of investments, making an excess supply of commodities to emerge. The latter corresponds to an excess supply of saving (demand for future goods), and therefore to an excess demand for securities. The market rate of interest decreases. But the problem is that such a decrease is incomplete, insufficient to equilibrate the intertemporal market of goods. Financial markets, in fact, present inelastic expectations: speculators consider the rate of interest preceding the shock as normal, and the present level as destined to be absorbed. On the base of their passed observations, they are still optimists on the course of the economy, but they are wrong. Incorrect expectations persuade the speculative agents, holders of securities, to sell them to constitute stock of cash. So speculative sales match the excess demand for securities of savers, counteracting it and preventing the market rate of interest to decrease to its natural level. The market rate does not drop enough. The decrease of the market rate of interest to its natural level would allow to discourage the demand for securities (increasing their market prices) and therefore to reduce the excess supply of saving (loanable funds) relative to the investments. In this way it would be achieved an increase of current consumptions that would go to balance the fall in investments, restoring the system towards an intertemporal equilibrium among the individual plans. Finally, the system could grow in a more equilibrated manner, to a rate of capital accumulation lower than the former. But speculators hinder this sequence of positive events and the excess

demand for securities is transformed, in the hands of speculators, in excess demand for money, while the security market clears. Both the excess supply of commodities and the excess demand for money remain in the system, with the consequent deflationary pressures. This process in fact influences the nominal income that drops to the place of the market rate of interest. This fall leads subsequently to a decline of the price level, but this decline is wrong and it occurs just for the comparison of the maladjustment of the interest rate.

We are still inside the corridor, where the mechanisms of deviation counteracting prevail: so this disequilibrium is bound to be reabsorbed thanks to the processes of learning that lead speculators on the right way, towards a better and more realistic view about the future course of the economy. The demand for money returns to its former levels, while the demand for securities re-emerges driving the market rate of interest to its natural level. The price level will rise again thanks to the increase of the nominal income. Consumptions will compensate the previous reduction of investments. These equilibrium mechanisms, inspired to Keynes's Treatise on Money, occur only within the corridor.

But if the system has driven outside the corridor from a recessive shock of a certain dimension, these spontaneous equilibrating mechanisms weaken. We enter in fact in the swampy territory of the General Theory, where the disequilibria are inclined to be persistent. Here price adjustments are reappraised in favour of quantity adjustments. Also in this case the recessive shock produces a decline of the expectations about the economic prospects, with a drop of investments and an excess supply of commodities. Also in this case a consequent excess supply of saving emerges, which corresponds to an excess demand for securities. But now nature and dimension of the negative shock drive the system on the ground favourite by Keynes. Now the decrease of the nominal income leads to quantity adjustments of Keynesian type, which induce a fall in the real income. This decrease of real income occurs instead of the drop of the price level, producing a reduction of real savings that, in such a way, are passively adapted to the new lower level of investments. The security market clears, but to a wrong rate, too high. The situation could even worsen in presence of speculators with their usual blunders on the future of the economy: the consequence could be an increase of the market rate of interest determined by the excess supply of securities that matches with a security market already in equilibrium (there is no more the excess demand for securities because of the reduction of real saving). The fall in the real income (a quantity adjustment) makes the markets of goods, securities and money clear, but the market rate of interest is too high with respect to its natural level, and all this affects the labour market where an excess supply of labour appears. Even the processes of learning, which would reduce the speculative transactions on securities, become powerless facing this situation. This is an intertemporal effective demand failure: the system is outside the corridor where adjustment mechanisms can't do very much to bring back the market rate to its natural value, and the economy stabilizes in conditions of persistent unemployment and low real income. Here the fall in nominal wages could worsen the situation, determining a deterioration of expectations.

For Leijonhufvud the system is able to keep inside the corridor or not depending on the nature and the dimension of the shock. A shock of wide and serious dimensions can carry the economy outside the corridor, with the risk that processes of learning and price signals don't work effectively. General and widespread uncertainty, lack of intertemporal coordination and wrong level of the market rate become permanent conditions: quantity adjustments determine the emergence of a marshy situation.

The key role played by interest rate and expectations in conditions of uncertainty and the realistic assumption of the presence of incorrect information make the Z-Theory a Keynesian theory directed to recover the crucial Wicksell's lesson on the power of intermediaries in the market of loanable funds in creating serious disturbances for the economy. The divergence of beliefs about the future course of economic events between banks (speculators) and entrepreneurs is the base on which the maladjustment of the interest rate appears with all its disrupting effects. But what is there at the base of this divergence? Is it possible a different reading of this story using the Austrian arguments about the cycle to explain the crucial hypothesis of the inconsistent beliefs? Before trying to introduce the

Austrian Business Cycle Theory inside the Keynesian boundaries of the Leijonhufvud's corridor, it's necessary to face some matters that can make more open and more malleable the cycle model of the Austrian school. The object is to soften some rigidities of the latter in order to better approach the Leijonhufvud's Z-Theory.

Cycle, technology and growth: a lightly Robertsonish variant of the Abct

The market economy, like the Austrian school teaches, is an endless process of research and discovery of information and profit opportunities, with accumulation of capital, improvement of knowledge and technical progress. This process has a discontinuous nature, being subject to mistakes of evaluation about the future perspectives. This means that the continuous emergence of disequilibria in market economies must be considered an ordinary condition. Disequilibria express both a lack of intertemporal coordination among the plans of the economic agents, and the existence of individual plans - either complementary or divergent - based on *wrong expectations*, and therefore bound to fail, totally or partially. Entrepreneurial choices are, moreover, in part irreversible, so there is a serious difficulty, if choices turn out to be wrong, in the reallocation of capital goods and human resources. Capital goods have, in fact, a durable and specific nature, and human resources are characterized by inelastic expectations and specialization of their professional formation and acquired skills[1].

It's then necessary to consider the discontinuous feature of the *technological progress*, both as improvement of productivity and introduction of process or product innovations. Such a technological progress is sometimes characterized by unsuccessful changes or improvements detached from specific investments; other times the same progress is subject to slow and difficult applications, or to unexpectedly rapid and successful ones. All these elements, in the real world, are source of disequilibria, and give to the economic growth a particular unstable nature[2]. Though recognizing the decisive role of the entrepreneur in playing an equilibrating function in the system, through the research and discovery of profit opportunity and the diffusion of information, it must be realistically considered intense the extent of disequilibrium in a capitalistic economy. The negative correlation between successful plans and plans that fail is yet to demonstrate. Not the only one.

Recovering Robertson's lesson, monetary factors can temporarily generate or amplify phenomena of disequilibrium that should be considered partially positive, as stimulus to the growth of production and productivity, and as support to the research and application of innovations. The interaction, as recognized by some representatives of the Austrian school, is double[3]: on the one hand, an elastic supply of bank credit is in a position to react generously to an increase of demand for funds caused from an exogenous technological shock; on the other hand, the same elasticity of the money supply leads to a lengthening of the productive structure that causes positive conditions for an increase in production and productivity. In fact, following a typical Austrian argument, the real effect of an excess supply of money (mainly in the form of credit expansion) is a lengthening of the average production period, that is to say that the new means of payment injected by banks are invested in projects characterized by longer, roundabout processes of production, and so directed to realize a greater production of consumption goods in a more distant future. Such projects benefit, in fact, by the drop of the interest rate and by the greater expected demand for their products. The investment projects directed to supply an immediate remuneration (producing consumption goods)

[1] These are problems that typically characterize recessions, amplifying their course, when an exaggerate concentration of entrepreneurial mistakes emerge, as pointed out in Yetter, Cochran (2004); but they also characterize the ordinary working of market economies.

[2] The highlighting of the discontinuous nature of growth of a capitalistic economy is a classical topic of the nihilistic wing of the Austrian school, represented by economists like Lachmann and Shakle. On the other pole of the theoretical spectrum we have instead the Ricardian wing (Rothbard, Kirzner) with its emphasis on the equilibrating forces that should prevail in a market economy.

[3] The possibility of a combined response and the relations among bank credit, productive structure and technology are well analyzed, for instance, by Cochran (2001).

are also favoured by the decrease of interest rate, but they could be hit by a reduction of demand for current consumption. Moreover, they suffer the pressure of enterprises engaged in longer-term projects, which determine a competition on prices paid for the productive factors. Therefore, the final result for the Austrian school is a lengthening of the whole productive structure.
But it's also true that a longer productive structure, with its configuration characterized by investment projects more future oriented and with a greater degree of capital utilization, and not pressured by immediate remuneration needs, favours the activities of research, innovation and application of better techniques of production. And this is a case of *endogenous technical shock* determined by injections of liquidity.
Moreover, the productive structure can react to the new purchasing power supplied by commercial banks not only in the direction of lengthening, but also with the emergence of financial transactions which favour *strategies of merger and acquisition* in different economic sectors, and therefore higher industrial and financial concentration; but it's well-known that the dimension of firms influences their potentialities about activities directed to technological progress and improvement of productivity.
Neither all the system, naturally, takes part in the technological progress, nor a lengthening of the productive structure necessarily produces increases of productivity and innovations. But the issue of fiduciary media can put into action, even if just partially, a virtuous cycle for the growth, with sustainable productive and technological developments. In this sense, just a part of the cycle, the cumulative and continuative one, can be considered a malady of the system, and it's therefore bound to be reabsorbed. So economic and social costs of recession depend on whether or not the cycle is degenerated towards situations of persistent and deep disequilibrium, and therefore on the conditions that lead to a durable maladjustment of the interest rate.

Is fractional reserve really a problem?

Austrian economists usually charge with the existence of cyclical phenomena the fractional reserve bank system and the central bank that supports that. With freedom of issue convertible money, and obligation of holding 100 percent reserves for demand deposits, and therefore a pure financial intermediation, the growth of the economy would be equilibrated, healthy and sustainable, with events of disequilibrium reduced to natural levels[4]. The capacity of the bank system to create credit, thanks to the fractional reserve, without a previous act of saving, represents for the Austrians the fact causing the cycle. The demand (checkable) deposits do not represent real, voluntary saving for most Austrian economists; they are just a different form of present goods, dividing present goods in consumption goods and money. A simple checkable deposit doesn't represent any sacrifice of immediate utility, because it's always available to the depositor for payments. So making available to entrepreneurs the resources present in such deposits, issuing fiduciary media, it's source of distortion for the intertemporal coordination of individual plans, because in such a way money not saved, but just warehoused, is supplied to investment projects. Fiduciary media are money substitutes, issued by commercial banks, fractionally baked by base money, so the difference between deposits and reserves of base money can be used for loans, in a progressive conclusion process, given the technical limit of the base money reserves[5]. But is it really possible to consider whatever injection of liquidity a danger, given the likely positive effects on productivity and innovation of a lengthening of the productive structure?
A fractional reserve free banking, like the one defended by Selgin and White[6], safes the monetary equilibrium function of the fractional reserve, recovering in part the Keynesian view of money: an

[4] Several Austrian economists argue in favor of bank money baked by 100 percent reserves. See for instance Hoppe, Hulsmann and Block (1998), de Soto (1995, 1998).
[5] The progressive conclusion of this process of bank money expansion is well described for instance in Carli (1996), p. 288.
[6] For a defense of fractional reserve free banking see Selgin and White (1996) and Selgin (2000).

increase of demand for money, expressed in form of demand deposits, that occurs for a deferment of consumptions represents a change of the temporal preferences in favour of saving, even if for an unspecified period of time, and it involves a reduction of the natural rate of interest. In this case banks can expand their supply of fiduciary media, because the demand of fiduciary means is increased, favouring a rapid and efficient allocation of the resources saved towards who want to use them for investments or consumption of durable goods. This intermediation activity for Selgin and White would not lead to an intertemporal disequilibrium since the fall in the market rate of interest, due to the expansion bank money (fiduciary media), follows the drop of the natural rate due to the change of the temporal preferences of the public towards saving. In absence of such elasticity, we could face a short run monetary disequilibrium, with conditions of scarcity of capital, and a consequent deflation would emerge. But it seems to Selgin and White that some Austrians don't care about it, or they don't care deflation as inflation, with an inconsistent theoretical position about short run disequilibria, where deflationary pressures are positive phenomena almost in every circumstance, while inflation is always destined to produce misallocation and capital destructive effects[7].

Naturally, for the same defenders of fractional reserve it would be different if we had an increase of the demand for money (demand deposits) not for a deferment of consumption, but for a new allocation of saving towards more liquid assets to the detriment of long term financial assets: an expansion of bank money supply that followed this simple portfolio reallocation would represent an Austrian type of credit creation, and would generate a cycle. Anyway, eventual mistakes of interpretation about the variations in the money demand, with consequent over-expansion of bank credit, would be subject to the classic sanctions of a free banking system: the convertibility principle would compel the banks, from a microeconomic point of view, to face increasing costs of issue, like those of circulation, liquidity and reserves holding; from a macroeconomic point of view, the same convertibility principle would compel the banks to confront a growing debt net position in the clearing house, with consequent outflows of base money reserves. This flexible behaviour, this elastic but responsible issue of bank money, would not be possible in presence of a legislative obligation to hold 100 percent reserves for demand deposits. Such a measure would compel the banks to practise a kind of intermediation in which the classic profitable maturity mismatching would result very limited, with harmful restriction of the equilibrating monetary function, especially in deflation situations. So the problem is not the fractional reserve.

The artificial trust and the divergence of beliefs

But if the problem does not strictly pertain to the fractional reserve, what does produce the Austrian cycle? The problem seems to coincide with the presence of a central bank and, in more general terms, with an institutional and legislative context that can create distortions on the evaluation of the demand for loans and, above all, cause a systematic and excessive reduction of the economic and financial risks perceived from banks and savers. The central bank has in fact the capacity to influence composition, volumes and rates of growth of banks assets, through its indirect tools of control (required reserve ratios, interest rates and, above all, open market operations[8]). The monetary authority can modify, with these different forms of liquidity injections, the availability of resources – new means of payment - that commercial banks can lend to enterprises. It needs also to consider that in a monetary regime of non-convertible legal tender (fiat money), that is to say irredeemable paper money, a central bank operating in monopolistic position can issue without facing any technical limits, besides credibility problems, and this allows the monetary authorities to manage the money supply with high dangerous potentialities.

[7] Selgin and White (1996), p. 101.

[8] On the importance of open market operations and their influence on money supply see Cochran (2004), while for the evidence of the open market operations potentiality in terms of more aggressive monetary policies in a zero-interest rate economy see the dangerous suggestions of Koenig and Dolmas (2003).

The same central bank, operating like lender of last resort, is then able to create expectations of supplementary issue in the ordinary working of interbank market and in several critical situations, like, for example, structural situations of individual bank insolvency.
Moreover, there are institutions for the protection of savings, like the public insurance of demand deposits, implicit or explicit, capable to produce further distortions, decreasing the incentives for savers to a severe selection and a continuous monitoring of banks where they decide to deposit their money[9]. These institutional elements obscure the perception of the real conditions of risk, in particular of the counterpart risk, and the consciousness of the financial fragility determined by the fractional reserve system, where mainly illiquid assets are financed by mainly liquid liabilities. And while the riskiness of the economic system tends to increase, expectations of financial assistance and rescue interventions from government and central bank lead, at the same time, to an incorrect risk evaluation and a consequent low risk pricing by creditors and investors, and especially by the banks[10]. The crucial assessment of borrowers creditworthiness is reappraised by these conditions that can lead to an over-expansion of bank credit and so boost opportunistic and speculative behaviours characterized by moral hazard. To compensate such critical elements there is naturally the prudential supervision directed to ensure that bank assets are associated to a certain capital adequacy and to the maturity structure of the liabilities issued. But this kind of measures can hardly influence in a deep and durable manner the agents' behaviours if the latter know that the system is organized to ensure ex post interventions in order to avoid individual failures (especially big financial institutions[11]), systemic crises and destructions of wealth.
It's so created an *artificial fiduciary environment* that determines a clouding over the risks and produces effects on expectations and consequent choices of different agents. The final result of this widespread artificial trust is an excessive flow of external funds towards the entrepreneurial sector. The artificial trust persuades the banks, already stimulated by ordinary competitive reasons, to be particularly generous towards the demand for finance. At the same time, the perception of real risks is reduced also for the public of savers that addresses increasing resources to investments on the financial markets, particularly equities and corporate bonds. Savers are induced to underestimate the dangers deriving from the high volatility of prices and from the uncertainty of effective business results, so they increase the direct or indirect possession of equities and bonds. In particular, on the stock market it could emerge an increase of price/earnings ratio determined by the artificial and durable reduction of the risk premium[12].
The choice of increasing the flows of capital towards enterprises is therefore determined by the *divergence of expectations about the future returns of the entrepreneurial projects relative to the consequent risks*, and not just about the generic future course of economy in aggregate terms. In particular, banks and savers are more optimistic than entrepreneurs and the latter, thanks to better information about their investment projects, are inclined to take advantage of these favourable conditions. At the base of this divergence of beliefs we have *effective liquidity injections or expectations about future liquidity injections* favoured by the monetary and fiscal authorities. The consequent risky behaviours of banks and savers influence the phase of growth causing the maladjustment of the interest rate, with the market value lower than the natural one. But this maladjustment and the credit expansion have inevitably repercussion on the recessive phase, with behaviours characterized by an excessive caution and rigid stances based on worse expectations

[9] It's certainly hard for little savers to judge the quality of bank assets. A system of deposit insurance like that of the United States – FDICIA of 1991 – transfers the charge of monitoring to a public insurance agency, with powers of intervention on management and property of the bank under control.
[10] With regard to the international context, the crucial role played by guarantees provided by governments, central banks and international financial institutions like IMF in favoring an increase of bank loans to borrowers in emerging countries, accompanied by an excessive reduction of risk premia, is also analyzed by Spadafora (2002)
[11] For the special relationship between monetary authorities and big financial institutions see also Dowd (1999).
[12] For the construction of price/earnings ratio it's usually used the Dividend Discount Model: $k/r + c - g$, where k is the payout ratio, r is the real interest rate, c is the risk premium and g the rate of growth of earnings.

than those of entrepreneurs. This time, in fact, banks and households are conditioned by excessive overload of risks and financial losses that weigh on their balance sheets.

Starting point of turn: impulses and mechanisms of propagation inside the corridor

Let's therefore enter into the Leijonhufvud's corridor, but with the Austrian arguments about the business cycle just described. For simplicity, let's hypothesize a long period equilibrium as starting point in a closed monetary economy. In this initial situation investments and savings are equal, that is there is a correspondence between consumption and investment plans. Such a correspondence means a certain intertemporal coordination. The system is a market economy with a monopolistic note-issuing bank and a fractional reserve bank system.
We can hypothesize, for the movement from the initial equilibrium of long period, two possible kinds of impulse, both of monetary nature:

- a monetary impulse determined by real factors, like an increase of productivity and widespread applications of technological innovations. This impulse corresponds to a rise of profit expectations for entrepreneurs. In this case the natural rate increases, while the elasticity of money supply allows the banks to maintain low the market rate of interest, or to make it increase at a lower pace than the natural rate;
- an autonomous monetary impulse, determined by bank credit just for competitive reasons[13], or by an expansion of money supply by the central bank for political reasons. In both cases we will see a drop of the market rate relative to its natural value. The competition among the commercial banks is based essentially on the price of loans for the private sector.

The difference between voluntary savings existing in the system and bank loans is supplied by the fractional reserve that allows banks to issue fiduciary media, or by the possibility for central bank to create additional base money. With these two kinds of impulse (the one determined by an elastic reaction of commercial banks to real factors and the one determined by an autonomous money expansion) we are, in a certain sense, more Hayekian than Misesian, and so we have a more general model in the starting point of turn[14].
After the impulse we have a mechanism of propagation given by the maladjustment of the rate of interest: a gap between natural and market rate emerges. Using the Leijonhufvud's language, we are in presence of an *excess demand for funds (saving)*, determined by a facilitated access to bank credit, with *inconsistent beliefs* on the future returns of every single entrepreneurial project and the related economic and financial risks. This excess demand for funds should push the market rate of interest higher, towards a new equilibrium. But the banks, working under the protection of a system that provides money and carries out external rescue plans against liquidity or insolvency crises, mature more optimistic perspectives than the entrepreneurial world, maintaining their market rates on low levels. A discrepancy between the two rates is a natural consequence, and it favours acceleration in capital accumulation and in the growth of investments, at least in an initial phase. The economy reacts to the introduction of monetary sap in part in a sustainable and durable way (that is, a rise of the real income), in part in an unsustainable and speculative way. In the meanwhile, a certain dynamic of relative prices occurs, favouring production goods on consumption goods, and signalling the greater dynamism of expenditure directed towards capital goods. But the partial structural disequilibrium of the economy is bound to emerge with the diffusion of well-being to broader sections of the community and the increase of nominal incomes. With the persistence of

[13] The competition among commercial banks is based essentially on the price of loans (rate of interest) for the private sector.
[14] We can find the first kind of impulse in Profit, Interest and Money (1939), the second (expansion of bank credit for competitive reasons or expansion of money supply by the central bank) in Monetary Theory and the Trade Cycle (1929) and in Prices and Production (1931), respectively.

maladjustment between natural and market rate of interest, in fact, an increase of consumptions follows the boom of investments. This means that temporal preferences instead of changing in direction of equilibrium relative to a lengthened productive structure, producing more saving, take on, very likely, an opposite direction, with modifications in favour of immediate consumptions and a consequent reduction of savings.

It was, for example, the case of the new economy boom. We saw, in the United States and in the euro area, an increase of spending in gross fixed capital by the private area of economy on the whole (firms and households), boosted by low rates; moreover, the same low rates supplied a speculative push on the prices of stock markets and other non financial assets, as houses. First these general conditions persuaded enterprises to increase the expenditures in capital goods towards the areas with the best expectations of profit (at the time, information technology and telecommunications), worsening in the meantime their financing gap, with increases of the indebtedness indicators. These greater indebtedness levels have accompanied with reductions of gross savings (not distributed profits plus depreciation allowances). It then happened that even the indicators of indebtedness of households rose, signalling a worsening of their financing gap and a consequent decrease of households gross savings. The whole society has progressively gotten into debt, while both investments and consumptions increased[15].

In more general terms, we can therefore see savings that, instead of increasing together with investments, drop in absolute terms. The natural rate still increases. The maladjustment of the market rate of interest - with the prices of bank loans and financial assets that don't incorporate increasing risks of a social structure getting more and more into debt - induces a more widespread rise of monetary incomes, with wealth-effect deriving from the investments in capital goods, from the rise of stock market and house prices. Banks and savers expectations of a permanent improvement of individual and social economic conditions consolidate, together with an increasing degree of opaqueness about real conditions of risk. The less the prices of financial and not financial assets and the less the indebtedness costs include the increasing economic and financial risks, the more the maladjustment of interest rate persists, the more the situation worsens, pushing the system, with the its cumulative processes, towards the boundaries of the corridor, where the spontaneous mechanisms of equilibrium cannot have many effects.

The inevitable return of consumptions with the illusory, partial and temporary diffusion of well-being makes two movements of price emerge: a rise of the prices of consumption goods with respect to production goods (and not necessary a rise of consumption goods in absolute terms), and a rise of the prices of productive factors, in particular labour costs. Just these movements in the structure of relative prices and in the costs of labour signal the real intertemporal preferences of individuals and the change on profit opportunities between investments of immediate remuneration (because nearer the consumption), and investments more future oriented that come into a phase of operative difficulty and financial suffering. Crucial problems of liquidity and insolvency begin to emerge, while commercial banks have to face some increasing difficulties relative to their assets linked to enterprises in financial suffering or to speculative transactions. A critical modification occurs in the expectations of banks and investors. The sooner these conditions emerge, the sooner an endogenous and spontaneous conclusion of the cycle arrives, maintaining the system inside the corridor, area of potential stability. The movement in the structure of prices and, above all, on the productive factors prices is therefore positive since it signals the real temporal preferences of people and the less sustainable industrial situations, and it addresses a part of liquidity introduced by banks towards the workers, with the consequent rise of nominal wages. So, on the whole, it helps to restrain the cumulative process before a deeper, structural and more pervasive disequilibrium takes over. But these price movements don't seem sufficient to invert the cycle. We need an increase of the market rate of interest. This increase of the market rate towards its natural value is not only a

[15] "*Developments in Private Sector Balance Sheets in the Euro Area and The United States"*. ECB. Monthly Bulletin, February. 2004: 57-67.

move towards equilibrium, but it has also a recessive nature, since it involves the liquidation of malinvestments and overinvestments.

The upper turning point: impulses and mechanisms of propagation inside the corridor

In order to make more general the Austrian model, we can consider the necessity of a monetary impulse, and the possibility of a real impulse.
The first kind of impulse is given by the rise of the market rates, and so by the consequent worsening of the financing conditions and the relative scarcity of capital for enterprises. The rise of the market rate can have two sources:

- on the one hand, the bank system could face the typical situations of a final phase of growth: a rise of the general level of prices; a decrease of the creditworthiness of enterprises; an increase of bad debts and accounts uncollectible; losses for a crises on financial markets; the necessity of restoring reserves. The result is an alteration of expectations in a pessimistic direction, even worse than the negative modification of perspectives that hits the entrepreneurial world.
- On the other hand the central bank could decide to adopt a restrictive monetary policy, for statutory reasons, or thanks to an independent position, or for traditions of severity in the management of money supply, and clear objectives of price stability.

All these elements naturally lead to a reduction of bank supply of money and so to an increase of the market rate of interest. For Mises, it's notorious, it's the movement of relative prices, between productive and consumption goods, that leads to an increase of the market rate; it's not an autonomous reaction of the banking system to some negative balance sheets developments (critical problems of liquidity or potential insolvency), that forces commercial banks to contract their credit supply. In the Mises' view, in fact, banks could issue fiduciary media indefinitely, without facing any technical limits. But, as pointed out from Hawtrey, this link between the relative prices ratio and the loan rate is neither clear, nor necessary[16]. It's therefore considered more plausible the Hayek's hypothesis of a banking system reaction towards a credit contraction through a rise of the market rate for precautionary reasons. In this hypothesis what seems to play the key role is therefore the crucial element of a situation for commercial banks characterized by increasing bad debts and accounts uncollectible, due to an excessive financing of enterprises and investment projects. All these conditions induce a cash drain and the necessity of reconstituting free reserves.
The second kind of impulse is instead represented by market saturation. This impulse hits enterprises already on the market but compelled to face a demand inferior than forecasts and a competition that imprints considerable rises in productive factors prices. This kind of impulse damages naturally future oriented firms and enterprises producing consumption goods. It's obviously a case of overinvestment and involves a drop in the natural rate of interest. In more general terms, the longer the initial maladjustment of the interest rate lasts, the liker the real factor of the market saturation is added to the monetary impulse.
These two recessive factors, scarcity of capital and market saturation, can emerge together hitting the economic activity and marking the upper point of turn, but with recessive effects even worse.
Also in this case the mechanism of propagation is represented by the maladjustment of the market rate of interest. We move from one gap to an other: we have an initial gap between natural and market rate, with the last one on lower levels than the natural rate and the consequent appearance of an excess demand for saving; now we face instead a new gap between natural and market rate, with the last one on higher levels than the natural rate and the consequent appearance of an *excess supply of saving.* Conditions have overturned.

[16] This Hawtrey's critical observation is remembered by Bellofiore (1998) and it can be found in Hawtrey's review "The Theory of Money and Credit by Professor Ludwig von Mises". *Economic Journal* XLV September: 509-518.

Also in this situation the divergence of expectations plays a key role. A distort perception of risks - in a context of asymmetric information and increasing uncertainty – causes the emergence of new inconsistent beliefs about future returns of investment projects. In particular, entrepreneurs are learning the lesson, and have a better perception of the costs and profits dynamic of the different economic sectors. They begin to understand the necessity to move their resources on investments nearer the consumption and to reduce the utilization of productive capacity and, above all, their indebtedness. The banks, instead, are inclined to set aside resources for the future to face worsening situations on their assets, so producing a contraction of the bank supply of money also superior to the necessary. Also the savers close their wallets, since they suffer capital losses on the stock markets and the deterioration of employment perspectives. With this worsening of general economic conditions, the stance of the public to maintain resources in liquid or monetary assets for precautionary reasons increases. The rise of the demand for money occurs to the detriment of both the consumptions and the long-term financial assets. But while the decline in the possession of long-term assets represents just a reallocation of saving in securer forms, demand deposits included, the reduction of consumptions instead represents– following the Selgin and White interpretative way - a movement of temporal preferences towards the future, that is in favour of saving. The natural rate still drops.

The banking system spends some time for readjusting its behaviours to the new conditions, and it hinders the excess supply of saving to change into a push for a decrease in the market rate of interest. The Leijonhufvud's excess demand for money of speculators transforms, in this case, in a contraction of bank supply of credit that influences the nominal income, reducing it. It's a sort of bottleneck. Bank tightening policy emerges endogenously just for the former excesses, and the market rate is reduced, but not enough because the excess supply of saving (expressed above all in liquid forms like demand deposits) doesn't directly translate in loanable funds. On the whole, the more elastic the external supply of funds was during the initial phase of the cycle, the more severe the contraction of the same supply of means of payment will be during the recession.

At this point we have a decrease of nominal income, as the result of an insufficient fall in the market rate that remains at a wrong level. This insufficient drop, in fact, hinders the reduction of savings, the increase of consumptions, and the return of the more sustainable investments, so leaving emerge some deflation pressures. This deflation means that productivity gains can finally influence the price level and, recovering a typical Robertsonish argument, it also allows a redistribution of income in favour of wages after entrepreneurs, during the inflationary phase, have benefit of cyclical profits. The consequent increase of households' expenditures can support the enterprises orientated to satisfy the immediate consumptions.

Therefore, the fall in the price level is not a wrong process (as for Leijonhufvud), waiting for an adaptation of expectations and the necessary drop in the market rate but, in a certain sense, it temporally compensates the slow reduction of the market rate with a support, even if partial, to the enterprises producing consumer goods and to those firms able to research improvements of productivity and apply new techniques to their productive processes. The recover of consumptions seems, in this case, a correct process of equilibrium because on the one hand, as the same Robertson underlined, it's difficult to understand the reason why also the enterprises nearer to consumption would have to drain the same bitter cup of the their colleagues producing capital goods[17]; on the other hand, this is a necessary phase of gradual return for the productive structure towards lower and, therefore, more natural levels of capital accumulation, and this is certainly favoured by a rise in the consumptions (and not by a rise in savings).

After a certain period of necessary deflation the processes of learning influence the expectations, and allow the excess supply of saving to go towards a new equilibrium. The modification of beliefs regards above all the banks, too pessimistic. The bank system modifies its credit policy through processes of budget balancing and the research of information on the real health of enterprises,

[17] Robertson D.H. 1933. Monetary policy and the trade slump. *The Highway*. March: 11-13.

softening the initial contraction of the bank supply of money. Moreover, the research of new and larger market shares makes the banks again interested, even if in a cautious and gradual way - with special attention to real guarantees and effective and sustainable economic results - to grant new credits. This new orientation of the bank policy is naturally favoured by particular conditions like the fractional reserve mechanism, that allows them to use also the demand deposits for lending to enterprises and households, and to vehicular in such a way the saving - typically liquid in these difficult recessive phases - towards investments and the purchase of durable goods. An increase of credit supply emerges, inverting the movement of the market rate and priming a spontaneous process of equilibrium. We can therefore see an endogenous conclusion of the cycle, even if in the new expansive bank policy there are already the seeds of the new phase of boom and successive bust.

This kind of cycle inside the corridor, therefore, carries conditions of disequilibrium, but with tendency to stability, also without particular external interventions. The economic growth generated by monetary factors is unstable, but just partially. The unsustainable conditions of the system, grown at rates of capital accumulation too high with respect to the available real resources, are the price to pay to obtain some acceleration in the productive growth and to stimulate technical innovations, increases of productivity and the supply of new products on the markets. New entrepreneurial projects are bound to persist and consolidate while the adventurers are swept away during the bust.

Outside the corridor: Keynes and the secondary depression

If the upper turning point is late to arrive, the Wicksellian cumulative process shifts the path of growth outside the corridor, and the recessive phase can become particularly long and painful, with serious destructions of capital and severe declines of demand on the labour market. The true danger would then be a passage from endogenous conditions of cycle conclusion towards a situation of *secondary depression*, where banks and households suffer grievous capital losses on financial markets and several industrial bankruptcies create particular difficulties to the banks balance sheets. All these elements generate a widespread distrust and increasing conditions of credit crunch: a spontaneous return of economic activity to more equilibrated levels is hindered.

Two factors for Hayek can invalidate an endogenous conclusion of the cycle, and they both regard the phase of boom:

- an expansive monetary policy of the central bank, dictated by political reasons; such an intervention of the monetary authority hinders the liquidation of the unsustainable projects, it maintains the wrong tendency on the relative prices to favour of production goods, and through inflation it hinders the redistribution of income, securing to entrepreneurs their cyclical profits;
- a rising elasticity of the demand for funds expressed by enterprises, being the latter caged in projects not yet finished. For entrepreneurs the value of resources to add to the capital goods on which they have already invested, in order to complete their projects, increases. The complementariness of the goods of production makes the investors inclined to pay rising prices on capital, as long as they can make operative their projects, challenging the increasing market rates with increasing elasticity.

Both these elements could make less effective the spontaneous mechanisms of deviation counteracting. The more the risky financial behaviours and fragile industrial projects are boost, the more the indicators of indebtedness for the private area worsen. *It's not the dimension of the recessive shock that counts, but the extent of the phase of boom and, therefore, the persistence of the maladjustment of interest rate during the monetary expansion.* Going out from the boundaries of the Leijonhufvud's corridor it means to meet a weakening of the "immunising system" of economy, and to see the failure of the processes of learning. Here we can face the wearing out of the elements

that ordinary reduce the dependence of current consumptions on decreasing current income, like the real stock of money and the financial and not financial wealth. Outside the corridor the adjustments of quantity prevail on the adjustments of price. Financial crises (extensive and durable decrease of the stock market prices) and industrial failures, together with the growth of uncertainty on the future, amplify the precautionary reasons that already, in recessions, favour the liquidity in the reallocation of portfolio, to the detriment of financings to enterprises and of the consumptions. Neither the private area directly, nor the banks indirectly supply funds to the entrepreneurs.

The deflation process, healthy inside the corridor, delays to arrive. Firms, in fact, lower too gradually and too slowly their prices, or they maintain them steady or, for eventual shocks on the side of costs, they could increase them, opening the doors to a consequent phase of stagflation. The main justification for this behaviour concerns the former phase of boom extended for an excessive period, which determined the emergence of high levels of indebtedness. If we consider the indebtedness of the private area, and particularly of enterprises, proportional to the extension of the phase of maladjustment of the interest rate, we can then consider reasonable the model of Grennwald and Stiglitz[18] about the increase of marginal costs of bankruptcy in recession: for an enterprise with risk aversion, high levels of indebtedness mean serious risks of failure, above all during recessions; if an increase of production involves a rising likelihood of bankruptcy, then in recession it will be more reasonable and realistic to expect an aggregate reaction of cut in the production rather than a fall in prices. The natural consequence is that the initial drop of the nominal income involves a fall in the real income rather than a typical deflation, like inside the corridor. The decline of the real income hits therefore the labour market making emerge, as for Leijonhufvud, an excess supply of labour. The decrease of income determines the fall of real saving, and eliminates the excess supply of savings and the related signals for the economic agents in direction of a lower rate of interest.

Malinvestments and overinvestment went too far, households have too many risks on their shoulders, banks have exposed themselves in an excessive way towards the enterprises with projects of investment too future oriented or too fragile, or towards financial speculation; enterprises have excessively gotten in debt. In such a phase the delayed arrival of deflation, when the fall in prices becomes a vital tool for competition, can even become counterproductive. Enterprises could in fact look at the deflation as a signal of a recession bound to last, and so they could continue to differ their investment plans and the increase in using the available productive capacity; they also suffer decreases of the sales volume and the rise of the financial burdens in real terms. Consumers could not react to the partial and late drop of prices because the perceived real gains on their stock of money are now insufficient in comparison with the impact of the capital losses suffered on financial markets, and relative to the high level of debts used for the purchase of houses or durable consumer goods. Moreover, the awaiting for furthers reductions of prices can involve a consequent deferment of the consumptions. The fall in prices, arriving too late, becomes at this point a critical element rather than an equilibrating mechanism, as it worsens the expectations and delays the processes of adaptation and learning.

The intertemporal failure of the effective demand of Leijonhufvud has transformed in an Austrian secondary depression. The system stabilizes outside the corridor, with the centripetal forces very inhibited.

Conclusions

Leijonhufvud can build a theoretical bridge between Keynes of Treatise on Money and Keynes of General Theory using the saving-investment market approach. His trust in price adjustments which prevail on quantity adjustments in the ordinary working of market economy represents an important appreciation of the self-regulatory properties of the real world, and the key role played by interest

[18] See Greenwald and Stiglitz (1993).

rate and the incomplete adjustment of its market value can be considered a crucial recognition about the fundamental equilibrating function of the interest rate for the intertemporal coordination of individual plans. These elements can represent a potential connection between Leijonhufvud's Z-Theory and the Austrian Business Cycle Theory.
At the base of the critical maladjustment of the interest rate, and the consequent phenomena of disequilibrium, there is the divergence of beliefs among economic agents.
In this paper we tried to explain the same economic events told by Leijonhufvud in his metaphor of corridor, and especially the divergence of expectations that causes the maladjustment of the interest rate, in the light of the Austrian arguments on the business cycles. In order to facilitate this Austrian rereading of Leijonhufvud's Z-Theory, a softening process of the Austrian business cycle model precedes the analysis. This process is directed to highlight two possible factors that can be useful to have a more general and malleable model:

- first, central banks and other public institutions are the real protagonist of the maladjustment, while the fractional reserve, often accused by Austrians for the existence of cycles, seems to play a possible equilibrating role, especially in condition of deflationary pressure, providing a positive contribution like mechanism of deviation counteracting during the phase of recession, and facilitating in such a way the adjustment of the market rate of interest. This is the Selgin and White argument and it seems particularly convincing and realistic.

- second, cycles don't seem to produce only a distortion of the intertemporal coordination among individuals, but they also supply a positive contribution in terms of endogenous technological progress, thanks to the new configuration of the productive structure, that is more capital intensive and more oriented to activities of research, development of innovations and improvements in factors productivity. In this way the system can live a sustainable and durable economic growth also during the cycle.

Trying to tell what can happen inside and outside the Leijonhufvud's corridor using the Austrian school perspective, it emerges that the crucial divergence of expectations between providers and demanders of funds is induced not simply by conditions of incomplete or asymmetric information, but in particular by a distort and incorrect perception of real risks concerning every single investment project or financial transaction. The institutional context and the central bank determine, with effective money injections or expectations about future money injections, an incorrect evaluation of future returns and risks by the investors (banks and savers), favouring the entrepreneurs who can ordinary count on better information about their projects. The inevitable consequence is the increase of external funds towards the enterprises and a rapid rise of capital accumulation, while the amount of risks effectively perceived by the financing providers comes down. These general conditions lead to the emergence of a maladjustment between natural and market rate of interest in the different phases of cycle. This means that the slower the equilibrating reaction of the system - with market rate that follows the direction of natural rate – the wider and more persistent the maladjustment; so the slow pace of the adjustment (and the consequent dimension of the cycle) depends on whether the institutional factors insist in spreading fog and money on banking intermediation and financial markets.
The economic system has the possibility to live a recession not so painful and therefore to reach the new equilibrium without particular external interventions, or to go out from the potentially stable path and fall in what Austrians call secondary depression. It depends on whether or not fiscal and monetary authorities have hindered too long the equilibrium movement of the market rate of interest towards its natural value during the phase of growth.
If sound opportunities really exist for an endogenous ending of business cycles, thanks to the existence of effectual mechanisms of deviation counteracting (price adjustments), and if there are also some positive results emerging from the disequilibria generated by monetary factors (technological progress), it's then possible to build, in the name of the common Wicksellian roots, a

new bridge between the Austrian school and Keynesians like Leijonhufvud; a sort of interpolation where cycles should be reduced through changes of the monetary regime in a long-term scenery, in order to eliminate the tragic eventuality of a secondary depression, but where it's also necessary to recognize the effective possibility of positive and durable effects on the economic growth during the ordinary and self equilibrating kind of disequilibria.

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