Stockholm I

Revised
October 2011

Economics of the Crisis and the Crisis of Economics[1]

Axel Leijonhufvud
UCLA and University of Trento

Balance sheet troubles

This is not an ordinary recession. The problems unleashed by he financial crisis are far more serious and intractable than that.

The United States and the Eurozone countries are in the midst of a *balance sheet recession.* The concept is due to Richard Koo[2] who used the term to summarize his diagnosis of Japan's economic troubles in the wake of its 1992-93 crisis. A balance sheet recession is fundamentally different from the garden variety and the usual countercyclical policies are not adequate to cope with it.

The questions I want to discuss in these lectures all pertain to the extra-ordinary nature of balance sheet recessions in general and, of course, the present one in particular: What makes them different from ordinary cyclical recessions? How do they come about? What makes them peculiarly intractable? What policies are effective or less effective in dealing with them?

Apart from these substantive questions, there is one further question worth considering, namely, what kind of economic theory helps us understand these matters better? And what kinds do not?

---

[1] Lecture given at the Stockholm School of Economics, September 20, 2011
[2] Richard C. Koo, **Balance Sheet Recession: Japan's Struggle with Unchartered Economics and Its Global Implications**, Singapore: John Wiley & Sons, 2003 and idem, **The Holy Grail of Macroeconomics: Lessons from Japan's Great Recession**, Rev. edn., Singapore: John Wiley & Sons, 2009.

Stability and Instability

How did we end up in our present unpredicted predicament? A short answer would be: By not being alert to the symptoms of instability. Almost all bankers, regulators, policy-makers and (of course) economists disregarded the possibility of serious systemic instability. But the widespread assumption that a system of "free markets" is stable needs reexamination.

Markets for produced goods

The beginning student's first introduction to economics tends to be the supply-and-demand model for a produced good. Two negative feedback loops are supposed to guarantee that the equilibrium is reached (*ceteris paribus).* If supply exceeds demand, price will rise so as to reduce the discrepancy in quantities. If marginal cost exceeds the demand price, output will decline so as to decrease the discrepancy in values. Both feedbacks *reduce the deviation* from the market equilibrium which is why they are termed "negative feedbacks."

In principle, it is possible that the interaction between the two feedback controls will generate persistent fluctuations in both output and price but theoretical reasons and practical experience both tell us that this possibility can most often be disregarded. So the conclusion is that we are safe in presuming that the market for any particular produced good will home in towards its equilibrium neighborhood, which is to say, that the market is stable.

This presumption has been carried over to general equilibrium systems with an arbitrarily large number of goods. This is the case even though theoretical proofs of the stability of general equilibrium exist only for some special cases of limited interest. But as far as I know – and my knowledge is limited – the economists who in the last 20 or so years have based their macroeconomics on GE constructions have shown little interest in investigating their stability properties. Stability has been taken "on faith."

This faith may have some merit as long as what is being discussed are (1) *Non-monetary* GE models lacking fractional reserve banks and

in which lending and borrowing are intertemporal barter transactions; and (2) budget constraints are always binding and never violated. These conditions are assumed in Real Business Cycle theory, for example, which pretty much dominated high brow macrotheory just a few years ago. But obviously these assumptions remove us altogether from the world of our experience.

Suppose we take stability on faith and trust that "market forces" will always tend to make output and consumption move towards a coordinated equilibrium state. How then explain recessions? Well, there might be conditions that interfere with markets and prevent them from doing their beneficial work. The "wage rigidity" postulated in conventional Keynesian theory as an explanation of unemployment would be an example. The recently dominant DSGE (dynamic stochastic general equilibrium) theory has pursued this logic. But a single "rigidity" does not take us very far in making the models "fit" the data. So we now have large-scale DSGE models with more than a dozen "frictions" and "market imperfections" – with more to be added, you can be sure, when the models do not fit outside the original sample.

It is my belief that *this stability-with-impediments approach is quite wrong, that it does not explain recent events, and that it fails to suggest the right policies*.

Financial markets

For more than a hundred years the instability of fractional reserve banking was the dominant topic in what came later to be called macroeconomics. Traditional banks had (1) large liabilities in relation to own capital (high leverage) and (2) liabilities of very short maturities relative to their assets (maturity mismatch). High leverage and maturity mismatch remain the keys to financial instability today.[3]

The Great Depression of the 1930s provided the ultimate lesson that taught us how to control traditional banks. Deposit insurance

[3] Many observers would add *fraud* to the causes of recent instability. They are not without reasons. Cf., for example, L. Randall Wray, "Lessons We Should Have Learned from the Global Financial Crisis but Didn't," Levy Economics Institute Working Paper, August 2011.

removed the incentives for depositors to run on banks and thereby also the "contagion" that had characterized the banking panics of the past. Reserve requirements served to limit the leverage ratios of banks. The limits on leverage meant that banks by and large were earning the same rate of return on own capital as other industries.[4]

Leverage Dynamics: The build-up

In the last twenty years, financial institutions have not been satisfied to earn a rate of return no higher than that of other industries. The big investment banks, in particular, have learned to set themselves rate of return targets two or three times what is earned in the "real economy" – and the markets have learned to expect that such returns are actually achieved. The only way in which such returns can be achieved is by operating at high leverage.

In retrospect, the piling up of leverage not just by financial institutions but also by other firms and notably by households has been the key to American prosperity since the early 1990s. It was an oft-repeated cliché among American economists that the American economy performed better than Europe in the 1990s because of its "flexibility." The simpler truth is that when more or less everybody spends more than he earns this will keep the "good times rolling." But it leaves a legacy of debt,

The arithmetic of leverage is simple enough. A bank with a leverage ratio of 30, which can invest in assets earning just ½ of a percent more than its liabilities, will earn a rate of return of 15%.[5] (And if the central bank supplies funds at a rate hardly different from zero, it might be able to do a lot better than that!)

---

[4] Note that this stands in dramatic contrast to recent years when large banks have aimed for – and often achieved – rates of return above 20% while returns in manufacturing, for example, have remained in the single digits.

[5] A leverage ratio of 30 is quite high, of course, but in 2007 all the big American investment banks had ratios hovering around that number. Some European big banks have operated with higher ratios than that.

Such a handsome return, however, will attract competitors and competition will narrow the margin between rates earned on assets and rates paid on liabilities. To keep its rate of return up as the margin shrinks, the individual bank can pursue one or more of several strategies. First, it can increase its leverage further. Secondly, it can move parts of its portfolio into riskier asset-classes where the rates earned are a bit higher. Third, it can acquire assets too risky for its own portfolio, securitize them in bundles, and sell them off to investors that know no better. Fourth, it may be able to issue shorter-term liabilities on which it pays less, such as overnight repo loans.

Competition will push all the major financial institutions in this same direction even as the risks they take on keep growing and their margins keep shrinking. As Charles Price, former CEO of Citigroup, famously quipped: "As long as the music is playing, you've got to get up and dance. We're still dancing." *So the boom ended in 2007 with leverage ratios at historic highs, risk premia at historic lows and maturity mismatches all around.*

Instability and Economic Logic

The economic analysis taught in universities everywhere tends to presume that markets are stable. Leverage dynamics exemplify instability – *positive feedback* processes. Instability often turns economic logic on its head. *Much that is true when the economy is stable ceases to be true when it is not.*

The analysis that I just went through provides an example. Normally, we approve of competition. The more the better. It produces socially desirable results. But the competition that drives leverage dynamics, pushes the competing firms into positions that will suddenly prove untenable – and the crisis that results has severe and adverse social consequences. Moreover, it also has the undesirable result that an already oligopolistic industry sees some of its member firms go under so that industry concentration increases. In the United States, financial institutions that were "too big to fail" to begin with are now "*much to big to fail"* – although they may not yet be quite in the novel category of "too big to save" that we have seen examples of in Iceland

and Ireland and which at one time posed a looming threat in Switzerland.

Similarly, macroeconomic policies that ordinarily are prudent become dysfunctional, even reckless, in conditions of severe instability. Conversely, unconventional policies become necessary. (But policy issues will have to be postponed to my second lecture).

Leverage Dynamics: Unravelling

In a process analyzed by Hyman Minsky many years before the recent crisis, high leverage builds up slowly in an economy. Those tend to be years of prosperity. Eventually, the system ends up in a highly fragile state such that some relatively small shock will have enormous consequences.

To lend this statement some concreteness, consider that losses on US subprime and AltA mortgages were at one time estimated[6] at about $235 billion. Not pocket money, to be sure! But the loss of income in the United States over the first two years of the recession was on the order of $6 trillion. A very strong endogenous *amplification!* The corresponding (approximate) figures for the United Kingdom and for the Eurozone added together would amount to somewhat more than 6 trillion in dollar terms.

This striking disproportion between "cause" and "effect" is to be explained by several interacting *positive* (deviation-amplifying) feedback loops. High leverage means small losses will render an institution technically insolvent. To avoid failure it will then try to shorten its balance sheet. The knowledge among banks that their counterparties are in the same position freezes interbank markets. The institutions will then find themselves unable to roll over their short liabilities so as to refinance their positions. The ensuing scramble to meet short liabilities and to reduce leverage puts pressure on asset prices and strangles lending. When some banks are forced into "fire

[6] The figures I am giving here are about 2 years old and may not be accurate. But the point I am trying to make concerns *relative*, not absolute magntitudes.

sales" of assets, the balance sheets of all are impaired. Growing unemployment and falling incomes undermine the ability of non-bank sectors to service their debt. The quality of bank assets deteriorate. If the general price level begins to fall, the economy is threatened with a true debt-deflation.

Network structures and instability

This deleveraging dynamic is today even more dangerous than it used to be. The reason is that the structure of the financial industry, nationally and internationally, has evolved into a network of much higher connectivity than it had in the past. The United States provides the most clear-cut example.

The (second) Glass-Steagall Act (1933) embodied the lessons drawn from the Great Depression. One particular aspect of its strategy for curbing financial instability is especially noteworthy. It partitioned the American financial sector into a number of industries and industry segments. Each industry branch was defined by the liabilities that the financial institutions within it could issue and the assets they were allowed to acquire. A firm in one branch could not trespass into another. In some vital respects, the industries were similarly segmented geographically by the states in which the institutions in question were located and licensed.[7]

My metaphor for this Glass-Stegall architecture is that it sought to turn the financial system into an "unsinkable ship" by dividing it into numerous "watertight compartments." In this it was successful. In the late 1970s and early '80s, the United States went through the crisis of the Savings & Loan industry. The assets of the S & L's were basically 30-year mortgages which were financed by short-term deposits. It was ruined by the inflation in the 1970s which raised the rates it had to pay

[7] Financial regulation in the United States was formed on the template of this organization of the financial sector. Each "box" in the organization chart has its own regulatory agency (although overlapping responsibilities were common). This regulatory structure has *not* kept pace with the changing structure of the financial sector. The crazy-quilt of regulatory agencies is utterly ill-suited to deal with present day conglomerate finance.

on deposits high above what it was earning on old mortgages. (This is a *very* abbreviated version of the story).

The point of this historical episode is the following. The losses in the collapse of the S & Ls were of roughly the same magnitude as the losses on subprime mortgages a quarter century later (and the US economy was significantly smaller, of course). Yet, only this compartment of the financial ship was flooded. The disaster did not engulf the other segments of the American financial sector, nor did it spread to the rest of the world.

We are now in an era of *conglomerate banking* in which few watertight compartments of any significance remain. The giant banks are engaged in virtually every financial market and not just in their home country but around the world. Also ordinary banks are trading in many more types of assets and liabilities than they used to. The financial system is now a *very highly connected network*.

It seemed at one time a safe assumption that allowing financial institutions to diversity both their assets and their liabilities would surely make them safer. As it turned out, the highly connected network in which they thus became embedded exposed them to risks that they could not assess and some of which they did not even recognize. Financial economists believed – or so I believe! – that letting individual institutions diversify risk would make the system of such institutions more robust. But this was a fallacy of composition. The opposite turned out to be true.

High connectivity of a network means that a disturbance arising somewhere in the system will not be confined to some small part of it. Instead it will percolate through the entirety of it. The questions is whether in so doing it will dissipate more or less harmlessly or cumulate, perhaps disastrously. The answer depends on several properties of the network. It will depend on whether agents in general carry high or low leverage. It will depend on the volume and distribution of "toxic" assets in the economy. It will depend on whether the network has critical nodes the failure of which would make large segments of the net collapse.

The properties of our modern financial system with its interdependent *conglomerate institutions* have proved to be unfavorable in all these respects.

Corridor stability and bifurcation

My only "Swedish contribution" to economics is a bit dated. It appeared in what was then still the Swedish Journal of Economics in 1973.[8] It advanced what I called the "Corridor Hypothesis" – the idea that the dynamic properties of the macroeconomy depended on the extent of its displacement from a (hypothetically) perfectly coordinated state. In particular, the ability of "market forces" to bring the economy back towards "equilibrium" without the aid of policy interventions would be very much weaker, if not entirely absent, outside the Corridor.

The early 1970s were a period of much heated contention between quite simple versions of Keynesianism and of Monetarism and my paper was argued at a correspondingly simple level. But the general idea was right. Allow me to modernize it a bit.

A Complex dynamical System

The economy is a complex dynamical system. In tranquil times, economic agents may make coherent plans up to some fairly distant horizon. In times of financial distress or of high inflation, decision-making becomes for the most part very short-term in both the private and the public sector. Short-sighted adaptive behavior leads easily into complex system dynamics. The resulting volatility reinforces the tendency for agents to make frequent, short-term decisions. Another positive feedback loop![9]

In the present context we are interested in the balance between deviation-counteracting and deviation-amplifying (unstable) processes. The former are the familiar market processes that keep departures from

---

[8] "Effective Demand Failures," **Swedish Economic Journal**, March 1973, reprinted in my **Information and Coodination**, Oxford: Oxford University Press, 1981.

[9] I like to think of this endogeneity of decision horizons as the "accordion effect." It is of considerable importance in understanding credit crises and high inflations. As far as I know, it is missing from intertemporal general equilibrium models.

equilibrium prices and outputs within more or less stringent bounds. Unstable processes are cumulative but, in the cases of interest here, do eventually converge even if at a great distance from the original position of the system. So these deviation-amplifying, positive feedbacks are *bounded*. It is possible to make some conjectures about the qualitative dynamics of the complex system.

Imagine first a state space representation of its private sector divided into three regions. Over the *first region* of the space the market sector would show "normal" behavior. Equilibrating market tendencies dominate and "stabilization policies" in the conventional sense are not useful. In the *second region,* destabilizing adaptive feedbacks occur but are fairly tightly bounded. Keynesian multiplier and accelerator processes are examples. The economy goes through more-or-less normal "business cycles". Monetary and fiscal policies may be useful to change liquidity or directly affect aggregate demand. In the *third region*, we find dangerous instabilities such as default avalanches. In this region we find the interacting positive feedback loops discussed above. The worst outcome in this region of dangerous instability is the "black hole" of a Fisherian debt-deflation catastrophe.[10]

In this Region Three, balance sheet disequilibria tend to dominate the dynamics of the economy. Analysis must correspondingly concentrate on balance sheet magnitudes and not get trapped into conventional income-expenditure theory. The policy recommendations drawn from income-expenditure analysis tend to mislead -- as I think Japan's experience with almost two decades of deficit spending illustrates. But policy issues have to be postponed until tomorrow.

Financial bifurcation

[10] I have a similar schema for inflation theory but it has to be left aside here. Major stylized facts drawn from high inflation experiences have to be regarded as anomalies from the standpoint of general equilibrium theory. Cf. Daniel Heymann and Axel Leijonhufvud, **High Inflation**, Oxford: Clarendon Press, 1995 and for a brief summary of the anomalies, A. Leijonhufvud, "Macroeconomics and Complexity: Inflation Theory," in W. Brian Arthur, Steven Durlauf and David A. Lane, **The Economy as an Evolving Complex System II**, Reading, Mass.: Santa Fe Institute and Wesley Addison. 1997.

In the previously mentioned "Corridor" paper of forty years ago, I also had a section on financial bifurcation. A financial crisis tends to divide the economy into one set of safe, solvent and liquid agents and another set of illiquid agents that are more or less threatened by insolvency and some of which are already bankrupt. Agents in the solvent set will avoid lending to agents in the insolvent set.

Looking (40 years ago) on the 1930s through Quantity Theory glasses, the solvent economic units would have a low propensity to spend out of money balances while the units in the second set would have a very high propensity. (Think of the unemployed in the 1930s or American state governments, like California's, in this decade!) The money stock would drain out of the second set and pile up in the first and aggregate velocity would then be observed to fall. Monetary injections would go into the first set and never reach the second.[11] So monetary policy would be unusually ineffective.

This reasoning will sound even more simplistic today than it did 40 years ago and the two situations are dissimilar in various respects. Central banks no longer attempt to control the stock of money. American agriculture and large U.S. corporations are in far better health now than in the 'thirties. The federal government, unfortunately, is in much worse fiscal health than during the Great Depression and most American states have become "drags" on the economy through their self-imposed balanced budget amendments. And so on.

But it is still true that monetary stimulus on the whole does not reach the parts of the economy that are in trouble. In the United States solvent households get the privilege of refinancing mortgages at never before seen low interest rates, while households with mortgages "under water" do not get that opportunity even when they are able to keep up their payments. The ineffectiveness of monetary policy in present circumstances has just about nothing to do with the "zero lower bound"

[11] I recall Karl Brunner waxing contemptuous of economists who thought that the Fed was "pushing on a string" in the 1930s, but I believe something of the sort *was* going on.

to interest rates that so many economists have agonized about.[12] The reason lies rather in the ages-old maxim of bankers: "Never lend money to people who need it!"

Macroeconomics and Financial Economics: In Crisis?

There are so-called "heterodox economists" of many stripes about some of which have useful things to say about our present predicaments (while others do not). But when people debate the question of whether economics is or is not in crisis it is the dominant orthodoxy they have in mind. Dynamic Stochastic General Equilibrium (DSGE) theory is that orthodoxy today. It comes in several blends it is true – Real Business Cycle Theory, New Keynesian economics, etc. – but such distinctions would take us too far afield. I will confine myself to some comments about DSGE in general.

(1) *Unemployment in DSGE: An example*

Unemployment will, of course, fit into GE models only if interpreted as an equilibrium phenomenon. As such it has not attracted any particular interest in this literature. But some recent papers have introduced unemployment in DSGE models.

Two alternative hypotheses to explain it have suggested themselves to DSGE practitioners, namely, either unemployment is due to "labor market frictions" or else to "market power in labor markets."[13] So the issue seen in this context becomes: *Are changes in unemployment*

---

[12] Note also that "liquidity trap" is a rather inadequate characterization of this state of an economy. It refers at best to only that half of the bifurcated system that has a very low propensity to spend out of cash balances and neglects the half with a very high such propensity.

[13] My arguments in this section are largely taken from "Axel in Wonderland" a comment on Jordi Gali, Frank Smets and Rafael Wouters, "Unemployment in an Estimated New Keynesian Model" at Research Workshop on "Analyzing the Macroeconomy: DSGE versus Agent-based Modelling", Central Bank of Austria, June 15-16, 2011.

due to shocks to the labor market mark-up or to "preference shocks that shift the marginal disutility of labor."

When I was a student (half a century ago, alas!) GE constructions were often referred to as models of "general interdependence". What is striking about these two hypotheses is that both treat unemployment as a *partial equilibrium* problem confined to the labor market. Moreover, this literature excludes any alternative hypotheses.

It was one of the lessons of an older brand of Keynesian economics that a disequilibrium arising in one part of the economy will disequilibrate also markets where *ruling prices are exactly at the levels that would obtain if the economy were in general equilibrium.* In particular, if the rate of interest were above its GE level, one result would be unemployment even at the "right" (GE) level of real wages.[14]

Note that downward wage flexibility is unlikely to help in this situation. As long as intertemporal prices are wrong, lower wages will not clear the labor market. If wages were to be *very* flexible, it would make matters worse. Falling wages and prices would disequilibrate balance sheets in Fisherian debt-deflation fashion.

The point applies with multiplied force if intertemporal markets are not just disequilibrated by a market rate higher than the natural rate of interest but are thoroughly disrupted by a financial crisis.

Now, if you are willing to believe that the recent financial crisis *either* increased the market power of labor *or* made workers in general lazy, please feel free to stick with GE as the way to interpret the world around you. General interdependence of equilibria is a lot easier to analyze than general interdependence of disequilibria!

(2) *Representative agent models, fallacies of composition and instabilities.*

[14] This old piece of analysis might be of particular interest to people preoccupied with the *zero lower bound* to the interest rate as a serious problem in our current situation. (But interest targeters had better think twice about assuming the natural rate to be negative).

Representative agent models will not admit fallacies of composition. Keynes taught the Paradox of Saving: if households try to save more than the business sector invests, they will not succeed; instead income will fall. Milton Friedman had his own favorite version of the fallacy: if everyone tries to add to their money balances when the money supply is held constant, most will not succeed; instead, incomes will fall. The fallacy of composition for our times might be called the Fallacy of Deleveraging: if everyone tries to deleverage, most will not succeed; instead asset prices and incomes will fall all around.

"The representative agent will not be puzzled by paradoxes of saving; he will not suffer involuntary unemployment; and he is not likely to be gripped by financial panic or to get caught in the maelstrom of debt deflation."[15] *Models that do not admit fallacies of composition leave us blind to the major sources of instability in the economy.*[16]

(3) Stable GE with "frictions" vs. instability.

It is true, of course, that the DSGE literature has moved beyond single agent models. In so doing, has it reintroduced the most relevant fallacies of composition? I do not know. But I believe it is true to say that the DSGE school has paid little attention to unstable processes. The diagnoses of our current problems that we get from DSGE practitioners tend all to run in terms of *stable GE systems beset with "frictions."*

A somewhat more plausible argument in favor of DSGE is that these models can accommodate multiple equilibria and that, when this is the case, some of these will be unstable. So, it is argued, the criticism

---

[15] Quoting my "Keynes as a Marshallian," in Roger E. Backhouse and Bradley W. Bateman, **The Cambridge Companion to Keynes,** Cambridge: The University Press, 2006.

[16] One reaction to the charge of ignoring instabilities that I have heard from one distinguished DSGE practitioner is that the system "cannot be unstable" because then it would either have already exploded or imploded. This argument is supposed to justify ignoring the possibility of instabilities. As pointed out by Willem Buiter, however, this mistaken view of the matter seems to be due to the practice of assuming linearity around the solution point as a supposedly harmless way of making DSGE models easier to solve

that DSGE theory generically ignores instabilities is false. But this defense is not without problems.

One such problem, of course, is to determine which of the multiple equilibria the system will settle on. Here, theorists have often resorted to coordination by "sunspots." In astronomy, sunspots are empirically observable apart from their consequences. In macroeconomics, that is not so and the scientific status of the sunspot literature, therefore, dwells in a darkness where no sunshine ever penetrates.

But the basic stability problem with GE models is rather different. Recall Walras' problem with the possibility of "false trading." The simplest illustration assumes pure exchange in an Edgeworth-Bowley box. If some trade were to occur at a price different from the equilibrium price, the exchange process will not terminate at the solution point determined by the Walrasian equilibrum conditions. The disequilibrium trade shifts the initial endowment.

In a financial crisis, this problem becomes *infinitely worse*. Not only do defaults shift the endowments about, but they keep changing the dimensions of the box. Furthermore, a great many agents will suffer Knightian uncertainty about what their endowments may be and what they may end up being. The probability that the system would settle in *any one* of its multiple initial equilibria is basically zero.

Macromodels that ignore problems of instability are dangerous to the health and welfare of untold millions of people.

(4) Violations of budget constraints and their consequences

Intertemporal general equilibrium models have solutions that coordinate saving and investment decisions over an infinity of future periods. They do so without fail because they assume the trading plans of all its members to be tied together by a *transversality condition* way out there at the end of time. This kind of model has figured prominently in recent monetary policy debates .

A brief attempt at perspective: One or two centuries ago, the price level was supposed to be governed by the demand and supply of gold while central banks used Bank rate to manage the volume of credit. Today central banks use the repo rate to manage the price level and trust in the transversality condition to control credit.

If reliance on the gold standard meant putting your faith in a "barbarous relic", trusting in the transversality condition is surely nothing but pure and utter superstition. *This figment of economic imagination simply has no counterpart in the world of experience*. Every bubble that ever burst is proof of this fact. It should be removed from our models.

From the standpoint of the DSGE tradition, the consequences would of course be drastic. If you remove the capstone from a Roman arch, everything crumbles. Remove the transversality condition from DSGE models and everything unravels. Without it, there is nothing to guarantee that individual intertemporal plans are consistent with one another. The system lacking an empirical counterpart to the mathematical economist's transversality condition is likely to experience periodic credit crises. Such crises reveal widespread, interlocking *violations of intertemporal budget constraints*. Walrasian constructions, even those of recent vintage, take for granted that budget constraints are binding. To do GE without binding budget constraints is not easy!

My personal conclusion is that *Walrasian equilibrium models are hopelessly inadequate for dealing with financial crises and their aftermaths.*[17]

The more important conclusion, however, is that our conventional macroeconomic policies are not adequate to deal with the aftermath of a financial crisis. They do not fit the problem. It is true of course that we have seen a plethora of quite *unconventional* measures by Central Banks and by Treasuries. But being unconventional, when conventional will not do, does not guarantee being right.

[17] You should know however, that this conclusion does not command widespread assent in the economics profession.

(5) An external critique: Ontology

So far I have attempted an *immanent critique* (as Gunnar Myrdal might have said) of the presently dominant theory. An immanent critique uses the terms and concepts of the theory itself to show that it harbors contradictions or is otherwise inadequate. But we should recognize that our problems may lie deeper and affect not just the class of economic models that happen to be in fashion today but also the broader tradition of economic theorizing of which DSGE is just one branch.

More than a decade ago I read a book by Tony Lawson, *Economics and Reality*. I found it intelligent and interesting at the time but did not realize how often I would recall some of Lawson's arguments and how they would grow on me.

Lawson looks at economics from an ontological perspective. His main message is that one must understand the nature of the subject matter to be addressed and adapt one's methods of investigation to it. If that makes sense – as I think it does – *economics has gotten it backwards.* We insist on forcing our subject matter into the frame set by our preconceived methods of analysis, mainly optimizing behavior and equilibrium analysis. By so doing we create for ourselves – and our students – an utterly distorted image of economic reality. Thus, for example, we treat the evolution of an economy as if were a fully determined (albeit stochastic) process accurately foreseen by all inhabitants.

The main distortion, Lawson maintains, stems from treating an "open" system as if were "closed." For concreteness, think of a controlled experiment in a natural science as an example of a closed system. The conditions of an experiment controlled in this sense are *never* met or approximated in macroeconomics. (Adding more variables to the right handside of our regression equations will never get us there). But in constructing intertemporal models – such as in DSGE – we insist on the make-believe that the macroeconomy is a closed system in Lawson's sense.

The case that Lawson makes has important implications for how we should and should not do economics. From my thumbnail sketch of his position, you will realize that to follow his lead requires us to give up much of the technical equipment that economists have invested so heavily in. So it is not popular. But I cannot go further in arguing Lawson's case in this lecture. I can only recommend his work as worth your time and effort to understand it, at least in outline.