

Instabilities

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Introduction

Since the time of Adam Smith, his Invisible Hand has become the cliché metaphor for the *stability* of markets. The Hand “guides” prices and outputs into equilibrium. When markets are stable, errors in pricing or in production decisions trigger negative (deviation counteracting) feedbacks and thus are automatically corrected. Bad decisions lead to losses and good ones to profit.

Market fundamentalist (or laissez faire) doctrines presume that the economy is structured in such manner that this is always true. But the structure within which market interactions work themselves out is a creation of lawyers and politicians and, as all human creations, comes with no guarantee of serving us well for all time.

In a crisis, such as the recent one, we observe *instability*. It is not a simple instability. It has involved several interlinked deviation-amplifying processes simultaneously at work.

When unstable processes take hold, many old economic verities cease to apply and some are turned on their heads.

Some data on the crisis

A few data will suffice to illustrate how dramatic were the instabilities unleashed in the recent crisis.

The losses incurred on US subprime mortgages as of March of this year are estimated at roughly \$160 billion. We might add to that a similar estimate of \$73 billion for losses on AltA mortgages.

These losses have been widely cited as the proximate *cause* of the deep recession. Note that treating them as such implies the belief that none of them was rationally expected -- and thus already discounted -- by the markets. That may not be altogether true but the point in the present context is that it sets an upper limit to the “shock” impinging on the global financial system. (Adding losses on AltA mortgages would make the shock \$233 billion)

¹ This paper originated in discussions with Andrew Haldane who has been of great help in completing it. I am obliged to him for the data cited below and the associated figures. However, the views and opinions contained within are not to be attributed to the Bank of England or any other responsible body.

Amplification variously measured

There are several ways to show the *amplification* of this shock. The loss of income in the United States over the last two years has been \$6 trillion. The corresponding figures for the United Kingdom and for the Eurozone have been £670 billion (or \$1 trillion) and €4 trillion (or \$5.5 trillion) respectively. These numbers are about one order of magnitude larger than the shock.

By some estimates the loss in asset-values at the low point of the stock markets was on the order of 9.8 trillion in the United States. For the United Kingdom the corresponding figure was approximately £1 trillion and for the European Union €3.9 trillion.

The threatening collapse into Great Depression was halted by government interventions of unprecedented magnitude. The scale of these policy measures have also been out of proportion to the mortgage losses cited as the cause of the crisis. The fiscal deficits of the United States and United Kingdom have increased by \$1.1 trillion and £133 billion respectively. Some sizeable portion of these changes in deficits is of course endogenous and due to the fall in taxable incomes but it is nonetheless obvious that discretionary “bail-outs” have been substantially larger than the presumed cause of the crisis. (see *Fig 1: Excess Bail-outs*).

In addition, we may cite the growth in the balance sheets of the three central banks as well as the size of government or central bank loss-guarantees to the respective private sectors (See *Fig 2: Excess Credit Creation*).

Leverage

A number of destabilizing feedback mechanisms interacted in the amplification of the crisis but the core of the problem was leverage, particularly of financial institutions. This has increased enormously over recent decades. In the United States, financial sector liabilities were less than 20% of GDP back in the 1970's. Today the figure is close to 120%. In the United Kingdom, the ratio has also more than quintupled.

High leverage means high risk of insolvency but it also means high returns as long as the going is good. The rate of return in UK banking since the 1970s is illustrated in *Fig. 3: Excess Returns in Banking*. This golden age came to a horrific end – or was at least interrupted – in 2007-08.

The Policy Debate

The financial crisis has triggered much discussion about how to regulate the mortgage markets, securitization in general and credit derivatives in particular, and so on.

These are secondary issues. The primary problem has been relatively neglected. We might make the mortgage market perfectly transparent and render all its participants financially responsible for their actions – only to find that the *unstable* system will crash for an entirely different reason the next time.

The instability of the financial system as presently constituted is the problem that *must* be solved.

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 is 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.

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 equilibrium prices and outputs within more or less stringent bounds. Unstable processes are cumulative but, in the cases of interest here, do converge so that the deviation-amplifying movements are nonetheless bounded. It is possible to make some conjectures about the qualitative dynamics of the complex system.

The market sector

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 “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 financial crises, several positive feedback processes will interact. High leverage means that small losses will make an institution technically insolvent. The knowledge among banks that their counterparties are in the same position freezes interbank markets. The scramble to meet short liabilities and to reduce leverage puts pressure on asset prices and strangles lending. Attempts by some banks to realize their assets damage the balance sheets of all. Growing unemployment and falling incomes undermine the ability of non-bank sectors to service their debts. The worst outcome in this region of dangerous instability is the “black hole” of a Fisherian debt-deflation catastrophe.

The public sector

The state space for the public sector would give us a *first region* with budget surpluses or credibly sustainable deficits. A *second region* has deficits that engender expected inflation with a corresponding Fisher premium on the interest rate. In this region, however, the government retains some substantial measure of control of the situation. The *third region* on the public side is one of high inflation where control has been lost. Short-term inflation expectations respond with great alacrity to government actions while longer-term expectations are too ill-defined to support

intertemporal markets of any kind. The “black hole” on this side is, of course, true hyperinflation.²

Interactions

Obviously, the two sectors interact³ in various ways. One such interaction is particularly germane at this time.

Hyman Minsky believed that private sector finance has an endogenous tendency to generate instability and eventually crises. Tranquil periods would cause the markets to reduce their estimates of risk and adaptations to these revised estimates would make the system increasingly fragile until some small shock made it crash.

William White, George Soros and Andrew Haldane⁴ have all separately argued that central bank policies over recent decades have played a large role in generating the catastrophic fragility revealed by the crisis. By repeatedly intervening to counteract significant declines of the market (the “Greenspan put”) policy removed downside risk causing the system to take on higher and higher leverage. This “doom-loop” (Alessandri & Haldane) has caused the build-up of the “super bubble” (Soros) the downside of which governments and central banks are so desperately trying to contain.

Some Region 3 Economics

Theory for Region 1 assumes that balance sheets are consistent with the economy’s equilibrium growth path and also that expectations are such as to be more or less adequately represented as rational expectations. For Region 2, it is also assumed that balance sheets are evolving “on track” but that investment expectations may cause difficulties. For both these regions, it is now generally conceded that “frictions” in price adjustment may give rise to some problems but most economists apparently believe that these would be only temporary.

Region 3 is different in that widespread *violations of intertemporal budget constraints* are at bottom of the troubles. General equilibrium theory has to assume that budget constraints are binding⁵ which is the reason it is not of much use in Region 3 cases. A financial crisis reveals budget constraint violations in the private sector. In a high inflation, it is the government that violates the rule of equal value in exchange on which the functioning of a market system fundamentally depends.

In a financial crisis, these budget constraint violations cause large and widespread dislocations of balance sheets. These are not rectified by the equilibration of markets. Instead, very time-consuming legal and political processes will eventually determine the incidence of the losses. The eventual outcomes of these processes are often uncertain in the extreme.

² Cf. Daniel Heymann and Axel Leijonhufvud (1995) and a summary in Leijonhufvud (1998).

³ Ambitions to include a “rest of the world” sector must be postponed (at best).

⁴ White (2009), Soros (2009), Alessandri and Haldane (2009)

⁵ ...;or, at least, binding with objectively known probabilities.

As the damage to balance sheets become more evident, a second time-consuming process sets in motion, namely, the attempts to restore balance sheets by paying down debts and rebuilding wealth.

The balance sheet structures resulting from a financial crisis come to dominate system dynamics.

Inflexibilities versus instabilities

One piece of conventional economic wisdom that obviously does not hold in Region 3 is that the more flexible are prices the better the economy will function. This is not just a matter of events moving too fast for comfort so that central bankers and treasury officials find themselves working on Sundays. It is rather that high price and wage velocities will send the economy down Irving Fisher's black hole.

But the matter goes further. Standard macrotheory attributes short-run problems to "sticky wages" or other "frictions" that by their nature give way in the medium to long run. I would conjecture that this is exactly backwards. The really serious short-run problems stem from instabilities and tend to be aggravated rather than helped by very flexible prices. Over the longer run, on the other hand, inflexibilities of one sort or another are at the root of imbalances that eventually will destabilize the system. Some of these result from short-sighted government policies. But not all. Three examples:

- 1) market rates of interest fail to rise so as to curb the build-up of leverage in time
- 2) exchange rates do not prevent the build-up of country capital account imbalances
- 3) taxation and expenditure commitments are not adjusted to assure sustainable budgets

Lasting Damage: Notes on Policy

In the regions of serious instabilities, many conventional economic verities cease to hold and some turn into dangerous falsehoods. Constitutional balanced budget provisions or internationally agreed capital requirements on banks, for example, may seem to be prudential guarantees of continued stability in normal times. But in Region 3 they turn into powerful amplifiers of recession..

In the wake of a financial crash, policy must focus on stocks rather than flows – on balance sheets rather than the national income accounts. Conventional stabilization policies concentrate on the latter – on the flows.

In Region 3, stocks of physical and human capital remain more or less the same as before the instability manifested itself. The economy's productive potential is unchanged. But large financial losses have been incurred and the dangers of high leverage have become clear to everyone. The attempts to rebuild balance sheets and to reduce leverage mean that the economy

is trying to save more than it is willing to invest. As long as this is the case, it will be under unrelenting deflationary pressure.

The immediate effects can be offset by fiscal stimulus but, if losses in the crisis have been large, the deficit spending will go down the “sinkholes”⁶ in private sector balance sheets and not have lasting effects. The stimuli will not return the economy to “normal” functioning. The time-integral of these expenditures will first have to build up until balance sheets are once again seen as healthy. After a major crash, this could take a *long* time.⁷ The damage to balance sheets that ushered in the Great Depression in the United States was only repaired, finally, by war time spending (Lesson # 1). In Japan, damage still lingers after almost twenty years of deficit spending that has run up the debt/GDP ratio to about 200% (Lesson # 2).

The alternative to conventional (flow) policies is to undertake major balance sheet operations. Sweden’s handling of its 1992 crisis is an oft-cited example. The insolvent banks were closed and the bad assets quarantined in a special fund, eventually to be sold back to the private sector. Stockholders in these banks lost all their equity but the final loss to tax-payers was minimal. This clean-cut way of dealing with the problem certainly ameliorated rather than aggravated moral hazard in banking (Lesson # 3). However, Sweden’s recovery from the crisis must in large part be attributed to the large devaluation of the krona which corrected a long-lasting lack of competitiveness in international markets.

The ability of a government to forestall depression by nationalizing the bad debts in the financial sector will depend on the soundness of its⁸ own finances. In some Latin American episodes the fiscal position of governments was not solid enough with the result that they were thrown into high inflation (Lesson # 4).

A government may be tempted to relieve the drag on the economy of high levels of debt by inflating. If much outstanding debt is of reasonably long maturity, inflation would do it. The incidence would fall heavily on older age-groups (a sizeable tax base given the demographics of the older industrialized countries). However, turning strong deflationary pressure around so as to inflate is not necessarily such an easy matter as Japan has demonstrated. Moreover, it would be a very risky policy were it to succeed. In countries where the central bank is supposed to control the rate of inflation solely by manipulating Bank rate, the authorities might easily lose control and end up in high inflation.

Regulation

The policy responses to the crisis have committed resources on such a scale that *we cannot afford another crisis of anything approaching this magnitude*. This means that regulation must pursue a fail-safe or minimax strategy, that is, one that minimizes the risk of the worst

⁶ Leijonhufvud (2009a)

⁷ An IMF calculation reported by John Lipsky (2010) illustrates the point: “As a gauge of the potential magnitude of effort that will be required . . . bringing general government debt ratios in advanced economies back to the pre-crisis average of 60 percent by 2030 would require steadily raising the structural primary balance from a deficit of about 4 percent of GDP in 2010 to a surplus of about 4 percent in 2020 – and 8 percentage point swing – and keeping it at that level for the following decade.”

⁸ Cf. Daniel Vaz (1999)

outcome. The pressing need to avoid a recurrence must override the costs that regulation might impose on the financial sector.

The core problems of the crisis were (1) the build-up over time of excessive leverage in the system, particularly but not exclusively among financial institutions; (2) the basic maturity mismatch in the financial system as a whole whereby billions of dollars worth of mortgages were ultimately supported by overnight repo liabilities; and (3) the increased connectivity⁹ among financial institutions in general.

Two basic approaches to regulation:

- 1) recognize incentives as they exist and impose regulatory constraints to prevent decision-makers from acting on them to the extent they otherwise would. This creates incentives to find ways to circumvent the rules. The Basel capital ratio rules were of this type, for example, and gave rise to the off-shore SIVs and Lehman's Repo 105.

The general problem with this approach is that it is difficult to keep abreast of new ways to circumvent the regulations.

- 2) The second type of regulations operates on the incentives that decision-makers face. The various proposals to create resolution regimes that will reduce the moral hazard of "too big to fail" are in this category. These proposals generally assume that the incentives of managers are already aligned with share holders.

Another proposal impinges more directly on the incentives of higher level managers. It is to dictate that a certain proportion of their remuneration be in the form of special E-shares which have to be retained for a certain period and that these shares be subject to double liability in case of insolvency of the financial institution in question.¹⁰

Economics of Social and Political Stability

In the unstable region, income distribution goes awry and it does so in a manner that poses a danger to social and political stability. All of a sudden, the incidence of economic gains and losses no longer bears any relation to the beliefs and values by which ordinary people have lived their entire lives. People are disoriented, resentful and angry.

The basic rule of the market system is *equal value in exchange* as agreed to by the parties directly involved. It is this social, legal, ethical rule that we build into our models as the *budget constraint*: you must pay for what you get and you can expect to be paid for what you deliver. The efficiency properties that competitive markets are supposed to possess depend on this rule being *binding*. More importantly, so does the ethical value of markets as a system under which people *voluntarily* cooperate to provide for their economic needs.

⁹ Leijonhufvud (2009b)

¹⁰ Leijonhufvud (2010)

When the rule is broken, the back-up rule which goes into effect replaces voluntary cooperation with compulsion. The courts punish the debtor and the creditor unable to recover his entire claim has to pay for his own mistake in extending credit.

When a highly leveraged and interconnected system crashes, the back-up rule will not work. Waiting on the courts to sort out debts and claims invites total disaster. Once markets freeze and an avalanche of defaults starts to gather momentum, conventional fiscal and monetary measures will not suffice to stop the process. The authorities are forced to break another set of rules, namely, the rules of how stabilization policies are normally conducted. So they improvise.¹¹ The “bail-outs” by governments and the enormous “unconventional” measures by central banks in the recent crisis are examples.

To the man on the street all this severs the link between honest effort and reward. Bail-outs and banker bonuses stand in stark contrast to loss of jobs and loss of homes. The tax payer end up liable for the depredations of Wall Street. The necessity of jettisoning the prudential norms normally constraining the operations of Central Banks and Treasuries in order to prevent the collapse of the financial system is not easily explained. It is not self-evident, although it is true, that ordinary people would be still worse off were it not for all the costly emergency measures. *None of it makes sense*. Ordinary citizens know that they are made to pay for mistakes not of their own making. No wonder they are angry. Because events make no sense to them, their wrath cannot be very selective or well-targeted. Demagogues feed on their anger and resentment and gain influence by it. Politicians who ought to show restraint exploit it for short-term political gain.

The social cohesion that has grown out of widely shared values suffers grave damage when those values are seen to be violated by events. Some crises strengthen social solidarity but this kind erodes it. The widespread sense that a commonality of values has been lost makes it extremely difficult to reach political agreement on concerted action to solve the formidable economic problems that the crisis has left behind.

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