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MULTIPLE CHOICES: ECONOMIC POLICIES IN CRISIS*

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RESUMEN

Las crisis macroeconómicas frustran expectativas, amenazan en cumplimiento de promesas contractuales y se asocian a menudo con dramáticas revisiones de niveles de vida y percepciones de riqueza.
Esos acontecimientos pertenecen a una familia de episodios memorables que dejan rastros duraderos en el comportamiento de las personas y en el desempeño macroeconómico. Pero todas las crisis tienen sus rasgos idiosincráticos. En materia de políticas, las particularidades importan, y a menudo resultan esenciales. De especial relevancia son las posiciones de activos y los flujos de fondos de los principales sectores, gobiernos y bancos centrales entre ellos. En este trabajo se discuten opciones de política una vez manifestada una crisis, en función del tipo e intensidad de la perturbación. Se exploran potencialidades y limitaciones de instrumentos monetarios, fiscales y reestructuraciones de deuda dependiendo de condiciones como los niveles de deuda pública y privada, y el grado de segmentación de los mercados de crédito. También se tratan acciones de prevención, incluyendo administración macroeconómica, esquemas de regulación, y medidas para modificar incentivos, particularmente en el sistema financiero.

ABSTRACT

Macroeconomic crises frustrate expectations, threaten the fulfillment of contractual promises and force dramatic revisions of living standards and wealth perceptions. They belong to a family of memorable episodes that leave traces in economic behavior and performance for a long time. But all crises have their own idiosyncrasies. When it comes to policies, the particularities matter and are often essential. Of particular importance are the balance sheets and cash flows of the major sectors, including governments and the central bank. In this paper we review policy options after the fact, according to the types and the intensities of the disturbances. We explore possibilities and limitations of monetary instruments, fiscal policies and debt restructurings, depending on conditions such as levels of public and private indebtedness and the degree of segmentation of credit markets. It also addresses preventive policies, including macro management, regulation, and measures to modify incentives, especially in the financial sector.

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Keywords: macroeconomic crises, wealth perceptions, web of contracts,liquidity, fiscal policy, debt restructuring, policy reform

JEL Codes: E00, E32, E44, E52, E62

Introduction

Debt crises have occurred in highly developed countries at the center of the world economy with large and sophisticated financial systems and enormous volumes of transactions in complex instruments. They have equally occurred in peripheral and emerging countries where debt contracts have been plain and simple and the outstanding volume of obligations much smaller in relation to GDP. They have occurred in countries where the domestic standard of denomination of financial contracts entirely dominates and in countries largely relying on foreign currencies. In many cases, they have been preceded by large current account deficits; in others by rough external balance or even a surplus. The build-up to some crises has involved substantial budget deficits, but this has not always been the case – even if in the end the crisis itself may produce fiscal trouble.

Crises frustrate expectations, threaten the revision of contractual promises and force dramatic revisions of perceived wealth. They are memorable episodes that leave traces in economic behavior and performance for a long time. In this sense, they belong to a family of events. The ironic message of Rogoff's and Reinhart's title, *This Time is Different* (2011), is thus *plus ça change, plus c'est la même chose.*

But all crises have their own idiosyncrasies. A crisis that recurrently repeats itself seems a contradiction in terms: people would eventually learn to avoid it. When it comes to policies, the particularities matter and are often essential. There is no

uniform prescription to fit all cases. The history of the economy and the structural characteristics that result will determine the form the crisis takes. The productive structure and the position of the country in the world economy matter. Of particular importance are the balance sheets and cash flows of the major sectors, including governments and the central bank. Recent events have demonstrated that particular types of contracts, especially recently innovated ones, can play a crucial role.

All of these factors influence the effects and effectiveness of particular policy actions. A full mapping of policies to circumstances is neither feasible nor desirable. The selection of topics that follows is admittedly subjective.

The Web of Contracts

In normal times, the economy works on the basis of an intricate web of promises and understandings. Within the private sector these are contracts that have been entered into voluntarily. In a democratic society, the economic relationships linking the public and private sectors result from collective decisions defining taxes and subsidies as well as other rights, obligations and immunities.

The contracts constituting the links in the private sector web of legal promises are fulfilled and renewed at intervals that vary depending on the type of market. Isolated instances of breach of contract are dealt with by the courts. When the breach of contract is a failure to pay, the default on the part of the debtor has a certain chance

of causing also the creditor to default in turn. In normal times and when the initial default is not very large, the links in such chains of default will be few. They will not then become issues of national (or international) policy.

If the financial system has evolved into a state that is fragile as discussed by Minsky (1975), one default can trigger an avalanche of defaults. Such avalanches will differ in size, causing the collapse of a smaller or larger portion of the web, according to the size of the shock and the topology of the network (Haldane and May, 2011). How large a default avalanche has to be to qualify as a "financial crisis" is a matter that cannot be given a clear-cut definition a priori. But you know it when you live it.

Large-scale macroeconomic disturbances are associated with economy-wide difficulties in meeting budget constraints. They differ according to their intensity and also according to the sector of the economy where the trouble starts and the way in which it propagates. By action or by omission, public and private agents throughout the economy are all involved. A deflation crisis that has run its course involves a general collapse of the web of contracts between private sector parties, with a government who might have been perceived as solvent at the beginning of the process, but has been unwilling or unable to stop it. The end-state of such a debt deflation is one in which many remaining debts are unpayable and the corresponding claims uncollectable. Fiscal crises leading to default has governments caught with insufficient revenues to service their debts, and private sectors unwilling or unable to contribute to support the public finances.

In debt crises, apparently unconditional obligations are left unfulfilled. In contrast, high inflation bursts reduce previously written nominal debts to insignificance even if they are formally paid in full. When behaviors adjust to very high rates of inflation, the inability to find appropriate units of denomination of contracts restricts inter temporal transactions so that, in the limit, even routine exchanges are disrupted (cf. Heymann and Leijonhufvud, 1995).

The social and political consequences of extreme debt deflation or of hyperinflation are of a different nature and a different order from those of ordinary business cycles. They are also hard to overcome and leave a legacy of social anomie and political tension.

It is of the utmost importance, therefore, to prevent these unstable processes from gathering strength. The first lines of defense mobilize more or less standard macroeconomic policies. We explore some of these potential early responses in what follows. But when massive defaults threaten, intervening to stop a collapse midway requires non-standard measures. Intervention stops the laws ruling contracts from running their course. Doing so means picking winners and losers on a large scale – hopefully to the greater good of society as a whole.

Choosing a policy towards macroeconomic stabilization and recovery demands that politically unpalatable questions must be answered: *Who will not have to pay?*

Who must be made to pay? Who will not be paid? Who must be paid? Who will be made to pay somebody else's debt? (Perhaps, the taxpayer?)

These are essentially political questions that economic analysis cannot answer and that politicians would like not to answer – at least not in plain language. What economics can do is to chart the alternative courses of action and to outline their likely consequences. It is a huge task because the alternative possibilities are almost endless. In this paper, we try to make a start on this task.

Over determinacy and Instability

A crisis starts when the realization spreads that many outstanding contracts cannot and will not be fulfilled. The promises outstanding form, in effect, an over determined system.

General equilibrium models portray states in which all trading intentions are consistent with one another. One way to think about how an actual economy might approach such a state is to conceive of the adjustments that firms and households make, when their initial plans cannot be realized, as a couple of iterative algorithms for finding the equilibrium prices and output rates. Prices move in response to discrepancies between amounts supplied and demanded; quantities in response to differences between market prices and relevant marginal costs, etc.

If the system-solving algorithms are set to work on a problem that does not admit a proper solution, the dynamics will not find a rest point and may diverge, or, possibly, settle into some repetitive loop without end. But, of course, this is not how an actual economy operates.

Instead, in the case of a default, the offending party is carried off to "debtors' gaol" and his creditors are left to absorb the losses. (This is a somewhat old-fashioned way to describe matters but it makes the logic clear). The economy then tries to find an equilibrium with this "broken promise" removed from the conditions to be satisfied. If one or more creditors are now unable to fulfill their own commitments, the same procedure is applied to them. This mechanism of removing constraints, in effect, adds another iterative procedure to the system.

In a great number of cases, this routine arrangement performs adequately. In most instances, an avalanche does not even start. Creditors on the defaulting contracts remain solvent. When one default triggers another, the avalanches usually peter out. The instability is contained.

But in this paper (and in this volume) we are concerned with the cases where *this does not work* – at least not automatically, and short of a social and political catastrophe.

Behavior in Crisis

Up to this point we have adopted the perspective of an external and more or less all-knowing observer. None of the participants in the crisis drama has that privilege (analysts included). They have much to fear, including fear itself.

In normal times, a firm monitors its receivables and their payables on a regular basis. The risks are that customers may not pay on time and that suppliers may revoke the usual credit arrangements. On the whole these risks are controlled by reputation. As long as no rumors unfavorable to counterparties are heard, customer–supplier relationships are routinely renewed. In a credit crisis, these moderate or even negligible risks turn into matters of radical uncertainty. Current information on counterparties and trust in their probity now no longer suffices. When a default avalanche is under way, trouble may start far down the chains of the counterparties of counterparties among firms or individuals about which the decision-maker has no information whatsoever. Most agents can look only one link, or at best two links, away from themselves into the web. Moreover, the very emergence of debt-repayment problems in the economy signifies that previous expectations about macroeconomic conditions will not be satisfied. Numerous wealth positions stand to be revised unfavorably. Past experience becomes an unreliable source of information about who is solvent and who is not.

Liquidity preference increases in this kind of situation. Most firms and households hold real assets that are worth more to them than they would fetch on the

market, particularly if they had to be realized quickly. Liquidity is insurance against such eventualities.

But two other behavior reactions also occur – and they are the ones to which macroeconomists have paid less attention. Our labels for them are "segmentation" and the "accordion effect." Both have the consequence of making stabilization policy more difficult.

Segmentation: The Zipper

A general credit collapse tends to divide an economy into two sets of agents. One set contains the financially robust agents with positive cash flows, little or no short-term debts, and generally high levels of liquidity. In the second set are the agents who, if not already in default, have difficulties meeting immediate obligations and are trying very hard to maintain control of assets that would not fetch much in "fire sales." Many of those in the first set hold claims of questionable value on those in the second and most will be unwilling to extend further credit.

The extent of this bisection of the credit market depends on how far the credit collapse has proceeded. A somewhat hackneyed metaphor for the credit market conveys the logic of the analysis. Consider a zippered jacket: On its left side are the prospective borrowers, on the right (and heartless) side the lenders. A financial crisis

"unzips" the market. More and more borrowers are shut out of the market, more and more lenders find no credit-worthy counterparties.

Monetary policy will be effective in inverse proportion to the extent of this bisection of the market. In the extreme case, the economy would consist of two disjoint sets of agents, one solvent and highly liquid, the other basically insolvent and desperately illiquid. Conventional monetary policy dictates that the central bank transacts with the solvent and already liquid agents. But liquidity injected in this manner will not percolate to the parts of the economy where liquidity is strained and solvency in doubt. The central bank's ability to stimulate aggregate demand will then be very limited.[1]

The Accordion

Crises develop gradually, as the discrepancies between expectations and realizations of incomes and cash flows are revealed in various segments of the economy and propagate in the form of slower sales and delays in payment. When this process accelerates and reaches a critical point, most people become anxiously alert to high-frequency information. Interbank interest rates, stock prices and government bond

[1] The "liquidity trap" is *not* a helpful analysis of this situation. Liquidity may be "trapped" on one side of the market, but it is desperately missing from the other. Worrying about the "zero lower bound" to the interest rate in the context of representative agent models is, of course, even more misleading. Marginal rates of substitution and transformation are out of line almost everywhere and the market will not work to equalize them.

yields make headlines. Time horizons shorten and intertemporal substitution effects weaken. On the aggregate level, the result is increased volatility, particularly of asset prices. This in turn feeds back on itself by reinforcing the tendency of agents to react strongly to current events.[2]

The volatility of the public mood reflects the perception that the system is near a bifurcation: the fear is that the economy may enter into a disorganized state. Hopes may remain that the spiral might still stop and turn the crisis into a "near miss" without lasting consequences, but the threat of a breakdown is also palpable. These are not "normal" times. The relevant scenarios range from a gradual recovery without discontinuities and an utter collapse with permanent consequences for the economy -- and perhaps for the social and political environment as well. The probabilities of these diverse scenarios are frequently re-valued on the basis of new pieces of data.

This puts people in a strongly non-linear and complicated environment. The information at their disposal is far less adequate to circumstances than in more normal times. This is true, of course, also for economists and policy makers. "Things happen too fast" – and central bankers and treasury officials find themselves working long hours on weekends. They have less to go on – segmentation and the accordion effects in a system near a bifurcation mean that received econometric wisdom is of little value. Standard time-series estimates cannot be relied upon.

[2] In high inflations, the variability of relative prices rises dramatically for very similar reasons. Cf. Heymann and Leijonhufvud (1995).

In a financial crisis, economic policy has to be made more "by the seats of the pants" than by "economic science." And the outcome may be a "near miss" moving toward recovery, a cathartic, sudden breakdown leading to an economic reorganization of one type or another, or a long-drawn-out process in which the economy digests the consequences of excessive debts, as in the balance sheet recessions discussed in Koo (2003).

A Reference: Traditional Aggregate Demand Management

In a financial crisis indebted agents try very hard to run a positive cash flow in order to maintain control of assets that are worth more to them than they would fetch in fire sales. In a "segmented" environment, solvent agents are not willing to lend and thus do not offset this excess flow demand for cash.

No credit market segmentation

In order to isolate the features of a credit crisis and the policy options that it presents, it is useful first to consider a simpler and more common case where private sector solvency problems are absent, government bonds are "riskless assets", and current fiscal policies are basically unconstrained.

To that end, consider an equilibrium disturbed by an increased propensity to save on the part of households. Agents plan to lower their spending on consumption goods and raise their demand for financial assets. Since solvency perceptions are unchanged, savers will not refuse credit to firms willing to invest. If, in addition, there are some indications about how the proceeds of current savings are likely to be spent on consumption goods in the future, the expected return on the corresponding investments will be revised accordingly.[3] Provided the interest rate falls in response to the larger flow of savings, investment would then rise to compensate for the fall in consumption spending. The demand for future goods implicit in the present abstention from consumption would have been communicated to the suppliers of future goods and intertemporal relative prices changed so as to generate the appropriate incentives. If the mechanisms of intertemporal coordination were to work that smoothly, the outcome would fit the Real Business Cycle tale of a shift in "tastes" inducing the resource reallocation required. Capital accumulation rises and the aggregate volume of output does not change significantly.

Things need not go that well, however. The first obstacle to an equilibrium adjustment would arise if interest rates do not drop enough to maintain aggregate demand. Assetholders may speculate against the required change in yields. Their

[3] A common practice in the market for automobiles in Argentina, especially in periods of high inflation or financial disturbance, was to buy cars through a system of "savings for specific purposes", where the buyer pre-paid a number of installments (adjusted with the price of a new vehicle) before delivery. When signing the contract, a purchaser was both signaling the demand for the good and providing financing for production. Whatever the problems of the scheme, the transformation of savings into future productive decisions was more or less automatic.

"speculative demand for money" would clear the bond market, but leave an excess supply of goods. The expectations of bond market operators interfere with the equilibrating adjustment. Wrong intertemporal prices cause aggregate demand to fall and cause a recession. In effect, communication between desires to save and dispositions to invest has been cut.

A "counter-speculation" by the central bank might induce the necessary fall in interest rates and restore aggregate spending. If successful, this policy would direct spending into the higher investment appropriate to the change in consumer preferences.

Such an intervention would be predicated, implicitly or explicitly, on the judgment that private sector behavior was based on erroneous beliefs (in this instance, about the level of "sustainable" interest rates), and therefore calls for compensating action. The diagnosis of "too high interest rates" would call for the use of monetary policy rather than other measures to sustain aggregate demand. The effectiveness of the policy will depend on the quality of these judgments. A good policy "track record" would make market actors play along with the government (cf. Mervyn King, 2005). Obviously, policies may fail to have the desired effects if the underlying analysis, or its execution, turn out to be wrong. But it is also true that inaction implies approval of the economy´s behavior. [4]

[4]The argument could be rephrased with some changes for the opposite case of an increase in the demand for current consumption in a near-full employment economy.

When the private sector fails to adjust appropriately to rising savings, monetary policy is the first line of defense against recession. If the central bank fails to respond early enough or strongly enough, the economy will begin to contract. This changes the problem that policy makers face.

Unemployment and the multiplier

If the shock was large enough to cause a sharp downturn, and if no automatic stabilizers are in place to cushion the decline in income, newly unemployed workers will be thrown back on their own resources. Once having exhausted their liquid assets and whatever sources of finance they may have access to, they will be cash-constrained and unable to express their demand for goods. This will be so even if there is a reasonable expectation that at some moment a recovery will restore their earning capacity (Leijonhufvud, 1973). The problem has changed from the inconsistency of saving and investment decisions to constraints on consumption spending. Consumption multipliers are at play.

In this situation, the credit market has become partially segmented. The unemployed are "unzippered" from it. Conventional monetary policy is no longer the

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If asset markets keep the interest rate "too low", the planned demand for current consumption will have to compete for resources with a "too high" investment. The consequent "forced saving" would then cause misallocations and possibly lead to a dangerous expansion of indebtedness. But asset price bubbles will be discussed in what follows.

right solution. Open market operations would put money in the hands of agents who were already holding marketable bonds and have no desire to lend to counterparties of doubtful creditworthiness.[5] Private credit channels are not transferring current resources from liquid agents to cash-constrained agents, even though the prospective permanent income of the latter might well allow them (if the economy recovers soon) to afford higher levels of spending could they only borrow at market interest rates.

Segmentation causes both shadow interest rates and propensities to consume out of current income to differ widely between individuals. A policy to correct the consequent distortions would reshuffle current purchasing power over goods by transferring funds from the liquid to the illiquid groups. The government could do this if it were able to draw resources from segments of the private sector and put them in the hand of the constrained groups. In order to maintain the analytical separation between policies with macroeconomic purposes and those aimed at wealth redistribution, it helps to assume that the policy is financed by issuing bonds, the repayment of which will be met by taxing the groups receiving the transfers once their market incomes have recovered. In effect, the government would be acting as a financial intermediary borrowing from liquid and lending to illiquid agents. The implicit loan bears the interest rate of the public debt, which will be quite low as long as the government's solvency is well established. If the assumptions of this scenario

[5] We are assuming that these credit constraints are a given feature, as used to be the case in the past, and is still the case in a variety of economies. At this point, we disregard the potential flexibility, and also the potential amplification effects, brought about by changes in consumer credit.

are satisfied, the fiscal expansion is clearly welfare improving. The state can act as this sort of macroeconomic market-maker in bad times because its credit is based on its power to tax, and because it is able to recover the implicit loans generated by the counter-cyclical transfers through taxes that do not require a direct, personalized collection from each individual "borrower".

These simple examples show features of the policy problem which apply also to other scenarios, debt crises included. Macroeconomic policies are predicated on evaluations both of the nature and intensity of the shock and of the self-correcting capabilities of the economy. Non-linearities are likely to be central to the decision: the type, the size of required interventions and the choice among specific measures will vary with the strength of the disturbance and the dynamics of the economy´s response. The mix of appropriate policies depends on the particular maladjustment to be corrected, and this changes as the economy responds to the shock and to the policy actions. Deep recessions call for discretionary and often atypical policy reactions; at the same time, a history of predictable and sustainable behavior in normal times will enhance the capacity of the government to effectively implement such operations.

For analytical purposes, it is useful to separate the stabilization effects of policies from their distributive consequences. In practice, however, conflicting interests and conflicting diagnoses will embroil the choice of policies in controversy. The situation will be even more difficult when not only previous expectations of immediate prospects but also previous beliefs about how the economy works have been falsified

by events. The behavior of an economy in crisis will in large measure be shaped by the political economy of policy choice and by the social learning induced by the disturbance.

Private sector in crisis, solvent government

The "fundamentals" that determine the capability to repay debt are intrinsically prospective and therefore contingent on future conditions. However, the solvency of certain agents is often simply taken for granted. Some governments have trouble obtaining credit whatever their debt ratios and the current performance of the economy; in other cases, public credit conditions fluctuate pro-cyclically; in yet others, government debt is more or less automatically regarded as riskless (in real terms[6]) so that, in times of trouble, "flight to quality" actually increases the demand for it. In this section, we assume that, while the repayment of large volumes of private debts has become problematic, the credit of the government does not constrain the choice of current policies.

When a recession reduces the access to resources of large groups of consumers and entrepreneurs, liquidity effects will propagate and amplify the disturbance. In the

[6] The qualification matters here because of the common argument that there cannot be default by a government whose outstanding debt is denominated in its own currency. While the contractual obligation as written can always be met by producing enough money, this may be far from validating the real terms originally expected. The Central European hyperinflations after WWI were certainly considered a form of default even if these governments fully repaid the nominal values of their debts. The mere promise of monetization will not sustain the demand for bonds.

most favorable instance, "what happens in asset markets will stay in asset markets." Large fluctuations in asset prices trigger stabilizing speculation and leave few real traces.[7] But the stabilizing market forces do not always prevail.

The web of private contracts will be robust as long as liabilities are generally covered by realistic revenue expectations and leveraged positions are cushioned by adequate liquidity provisions. The economy will then be able to absorb even large shocks without ending up in crisis. But if the web is fragile so that the ability of many agents to *pay on time* depends critically on their *being paid on time*, self-reinforcing processes will transform a not very large shock into a full-fledged crisis with real activity plummeting and bankruptcies mushrooming. The fragility of the credit system will depend, roughly speaking, on three questions, namely, how high is the general level of leverage in the system?, how pronounced are the maturity mismatches on balance sheets?,[8] and how robust are the "too-big-to-fail" institutions that occupy critical nodes in the web? Here we will concentrate on the first two of these questions.

[7]The misbehavior of mechanical trading strategies on a particular day is a relevant example. Suppose it produces a sudden fall in stock prices. This noisy volatility is harmful – it causes confusion and creates random redistributions among agents who were buying or selling at the time. However, once it is known that this was an occasional, non-systematic event, perceptions of the wealth and creditworthiness of agents, who were not actually "in the market", will not be affected and real repercussions will be of little consequence.

[8] The size of buffer stocks of liquid assets held throughout the system should be understood as subsumed under this heading.

Governments have three lines of defense in a private sector debt crisis. The first is to use monetary policy to inject liquidity into the system in the hope that some easing of maturity mismatches will stabilize incomes and prices. The second is to use fiscal deficits to counteract declines in private spending. The third is to restructure debts. This not only requires deciding which claims get paid and which do not; it also involves deciding which claims get paid by the taxpayer rather than by the original debtors. "Bail-outs" belong in this third category. These three lines of defense come in increasing order of popular opposition and political difficulty.

Monetary policy

Monetary policy is the first line of defense in a crisis. The obvious reason is that something has to be done in a hurry and monetary policy can be implemented immediately. By contrast, other policies take time to put in place and still more time to have an effect. The less obvious reason is that the distributive incidence of monetary policies is ill understood by the general public. This alone would make it the first preference of politicians. But at the outset of a crisis, decision-makers will also always hope that monetary measures will turn out to suffice – and this hope dies hard.

When collateral values are falling and the lending capacity of intermediaries declining, it is imperative to sustain the supply of funds and prevent further rounds of

credit contraction.[9] Even central banks saddled with the narrow mandate just to stabilize prices have reacted with large-scale expansionary operations in this situation. But the scope for such operations is not everywhere the same. Outside the main international financial centers, capital mobility constrains the monetary authorities' ability to moderate credit crunches. As a consequence, a number of governments in the periphery have accumulated precautionary foreign exchange reserves to give themselves a margin for action in emergencies.

Injecting liquidity is not always equally effective. In the bisected credit market, monetary stimulus reaches only a subset of agents. It may nonetheless be critically important. It will enable some people who had difficulties meeting their obligations *on time* to stave off default. This reduces the risk and the potential size of default avalanches in the same way as vaccinating part of a population reduces the risk of a large-scale epidemic.

In contrast to vaccination, the immunity achieved is just temporary, however. Moreover, risk-taking incentives will become distorted if the belief becomes widespread that the liquidity assistance "will always be there." Several critics have pointed out that the repeated application of the "Greenspan put" reduced the downside risks in the securities markets. Most dramatically (and effectively) this

[9]Kiyotaki and Moore (1997), Bernanke and Gertler (1989), Brunnermeier and Pedersen (2009), Allen, Carletti and Gale (2009),AQ – date in references is 2009. Please clarify Shin (2010), Mehrling (2011), Geanakoplos (2010) are contributions to the large literature on these issues.

policy was used to offset the macroeconomic consequences of the bursting of the dot-com bubble. The perceived reduction of downside risks distorted risk-taking incentives and induced the investment banks to build up increasingly leveraged positions.[10]

Monetary policy and distribution

The bisection of the credit market in the wake of a crash limits the effect of conventional monetary policy. Pushed beyond conventional bounds, monetary stimulus has odd and undesirable distributional effects, even if it lacks immediate inflationary consequences. A near-zero repo rate plus quantitative easing deprives ordinary people of a return on their savings while it subsidizes bank profits and bankers' bonuses. Solvent households can acquire real estate at unprecedented low mortgage rates, but those with problematic solvency are not helped. Banks obtain funds from the central bank at a near-zero rate with which to buy bonds yielding 4, later 3, later still 2 percent or so. In this manner, banks are able to "repay" earlier "bail-outs" with income from taxpayer liabilities that they have acquired for free (cf. Leijonhufvud, 2011).

[10] The most prominent critics of the Greenspan put have been George Soros and the former chief economist of the BIS, William White. But the role of monetary easing in the build-up of the housing bubble in the US remains a matter of controversy. Cf. for example, Bernanke (2011) and Mees (2011).

Monetary policy "à outrance"[11]

The recent extreme policies of major central banks which have doubled and tripled their balance sheets carry longer-term risks that have not been much discussed. Their repo rates are near zero and the Fed, in particular, went further by engaging in repeated rounds of "quantitative easing" and in promising to maintain the rate at rock bottom for some time. The bisection of credit markets limited the effect of these policies on real activity. The stimulus to aggregate demand was not that strong.

Suppose, however, that a real recovery were to get under way. Growing revenues would "zip up" the markets and the bisection would fade away. A more normal relationship between the monetary base and nominal GDP would begin to emerge. But the balance sheets of the central bank would be stacked high with inflationary fuel. To cut their liabilities by one-half or two-thirds, the banks would have to sell correspondingly large volumes of assets. Interest rates would have to rise and return at least to historically normal levels. But they might tend to go even higher.

This would create a dilemma. Forcing interest rates to levels required to forestall inflation would recreate the problems that sank the Savings & Loan (S & L) industry. Banks were encouraged to lend on long-term mortgages at rates around just 3.5 percent. A vigorous recovery could require them to pay substantially more on their deposits and other short liabilities.

[11] The reference is to Keynes' *Treatise* (1930), where he discussed the possibility of the central bank using absolutely *all* its powers in an emergency.

Deficit spending

The financial measures taken in a crisis have fiscal implications. Any particular policy package will be somewhere on the continuum between pure, reversible, actions of liquidity provision against "sound guarantees" (at one extreme) and the outright purchase of unrecoverable claims (at the other). Monetary policy shades by degrees into deficit spending.

Moreover, liquidity injections can cushion the effects of wealth losses only to a limited extent. When real revenue expectations have deteriorated to such an extent that doubts about the solvency of debtors are widespread, aggregate demand will be depressed. Households will try to save as precaution against bad times, but are not prepared to finance firms (or banks) that may be in trouble. Entrepreneurs face credit constraints even as business opportunities seem scarce. As in the old-fashioned argument, the savings and investment curves do not meet at feasible interest rates.

When private sector expectations are deeply pessimistic, a monetary policy that just raises the price of low-risk bonds will do little to stimulate aggregate demand. The problem is not the zero-lower bound for the nominal interest rate. Making the real yield on safe bonds somewhat negative will not restore the willingness to spend if prudent lenders cannot identify potentially solvent borrowers, firms fear that excess capacity will persist, and workers face bleak income prospects.

But the demand gap can be filled by public expenditures as long as the government is able to finance them at reasonable rates. If the deflationary shock is not too large, counter-cyclical fiscal policy can suffice to stop a crisis. But, for this to work, insolvencies must not be so large and widespread that a true debt-deflation spiral takes hold.

Debt restructuring

A government that acts as lender and spender of last resort will not always be able to stave off the threat of depression. It may succeed for some time in maintaining current levels of output, but if large numbers of private debtors nonetheless prove unable to meet their obligations, more drastic measures will become necessary. In one way or another, financial contracts must be revised. Wealth losses must be made explicit and their distribution decided. Neither legal principles nor generally accepted ethical norms will exist to guide and to justify the political decisions that have to be made: *Who must pay? Who will be allowed not to pay? To what extent should the taxpayer be made to pay somebody else's debt?* The political choices made will redefine the ownership and the allocation of society's resources.

A hands-off policy is a possibility. But if the crisis reaches the core of the financial system it cannot be maintained. Inaction can be as costly as misplaced intervention. When imminent collapse threatens, decisions have to be made on the spot in

conditions where little is known about how the public will react and how the crisis will propagate through credit networks.

In such circumstances, bankers are in strong bargaining positions. Consequently, financial crises tend to produce massive bailouts. Even governments whose finances are already precarious will add to their debt burdens by taking over private obligations. In the early 1980s Latin America produced several examples of governments that found it exceedingly difficult to function after assuming private debts in this manner.

Cases do exist of governments proving able to design policies with broadly acceptable distributional effects. Sweden in the early 1990s managed both to protect depositors and, at the same time, to hold bank managers and shareholders responsible (cf. Jonung, 2009). But this requires a political system able to produce agreement on such matters and a civil service capable of sorting good debts from bad and minimizing fiscal losses without jeopardizing economic recovery.

If the deflationary shock is very large, such interventions may still not save the population at large from losses of wealth on a large scale. Helping the economy to absorb the disruption and facilitate a recovery while ensuring that the distribution of losses is reasonably fair requires not only weighing the costs and benefits of alternative macropolicies but also redefining masses of rights and obligations.

A clear-cut break that does away with excessive debts can bring about an economic rebound. The liquidation of what remains of the "bubble economy" will then be seen as part of a shock treatment that worked well. But entering the dark tunnel will spread fear in the general public. It is also intimidating to political incumbents, who are likely to be blamed for the turbulence caused by a large-scale debt restructuring, and may not be in office to capitalize on the recovery. It is unlikely, therefore, that "preventive" political action will be taken to deal with debt overhangs before it has become clear that insolvencies are widespread and irreversible.

Even then, there are non-trivial trade-offs to deal with. Bankruptcies and defaults will initiate negotiations and litigations with uncertain outcomes. While this lasts, the mobilization of the resources involved is curtailed. It is not just a matter of settling legal claims. In the wake of large numbers of insolvencies both the composition of demand and the structure of production have to undergo troublesome changes. A debt crisis brings to light widespread inconsistencies between the expected and the actual results of income-generating projects. Solvent demand does not suffice to cover the costs of the goods and services that can be brought to market with the capacity that has been built up. The physical resources are still present but will have to be recombined. For some it may be that no use will be found.[12] The transition can be socially very painful, as people are shocked to discover that sustainable incomes will be much lower than anticipated.

[12]One example: in an economy that has run large current account deficits and incurred excessive debts abroad, installations to produce non-traded goods may have to be scrapped even while resources are lacking in traded goods sectors.

Resources and the property rights to them have to be reallocated and masses of contracts redrawn. A finely tuned top-down resolution that would take into account the multiple repercussions and feedback effects will be well out of reach. But a piecemeal, decentralized approach to each and every insolvency in the web of interlocking claims and promises is not a reliable way to restart the economy either. The government might try to stand aside while private parties engage in bilateral negotiations to redefine debts or take bankruptcy lawsuits to court. In principle, such case-by-case resolutions could take into account the many specific conditions that determine capacities to pay and the viability of different businesses and thus make private agreements and "impartial" judicial decisions determine the outcomes. But in the absence both of generally accepted criteria to guide those judgments and of mechanisms to deal with interdependencies, the results will lack consistency and economic activity will be hampered by the delays in adjudicating claims.

Moreover, large-scale debt revisions are certain to affect the public as a whole. Consequently, they cannot be isolated from the political sphere. In some instances, the nature of the crisis can suggest criteria for how debts may be reduced. Drastic real exchange depreciation when many domestic financial contracts are denominated in foreign currencies is an example. In this case, the presumption may be justified that this "rare event" falsified the expectations that both sides of the market held before the fact. This would then provide a possible basis from which to re-denominate

("pesify") debt contracts. But actions of this type cannot avoid generating a sense of unacceptable injustice. The trouble is that so would inaction.[13]

Politically difficult distributional issues complicate macroeconomic stabilization policy at every turn. Should policies, for example, privilege unloading business firms from their debt burdens in order to facilitate production and employment in conditions where credit is likely to remain in scarce supply? Is such a policy justified even if it inflicts large losses on small savers? Alternatively, should policy protect

[13]A small scene remembered from the Argentine crisis of 2001/2002 comes to mind. Through the 1990s, Argentina operated a currency board monetary system with a one-to-one exchange rate against the dollar. Vast sums of bank loans and deposits and contracts of all kinds were denominated in dollars. This convertibility system eventually proved unsustainable and collapsed. At that juncture, the government transformed dollar-denominated bank loans and deposits (at different rates) into pesos. However, it left contracts outside the banking system to be renegotiated by the parties involved. One day two street demonstrations took place simultaneously close to the same government building. One group consisted of people who had lent dollars on mortgages and who now demanded to be repaid in full in dollars; the other group consisted of people who had borrowed in dollars and asked for debt reduction or relief of some sort. A TV reporter brought together a representative of each group. The spokesman of the lenders argued that contracts should be fulfilled -- no more, no less – and since they had delivered dollars in good faith, they deserved to get them back. The spokesman for the borrowers explained that, when the loans were entered into, the convertibility law guaranteed the parity between pesos and dollars; now wage-earners in pesos were completely unable to repay in dollars and it would be a great injustice to take away the homes of families because of an economic crisis they had had no responsibility for causing. The reporter asked the two spokesmen to comment on the each other's argument. "The lender is right", said the borrower, "a contract is a contract. Naturally, lenders want to recover their money as agreed. But we simply cannot be asked to repay out of our depreciated incomes." The lender answered: "The borrower is right. Who could force someone to make payments in dollars after the devaluation we have had? People do not earn enough for their daily expenses. But our claim is completely legal and why should we be discriminated against simply because we lent our savings to countrymen instead of hoarding them or sending them abroad? "Well, then," asked the reporter, "what should be done?" The two spokesmen agreed: "Someone should come up with the difference." But, of course, no such *deus ex machina* existed. The collapse of the Argentine convertibility system was a unique event. But the story tells a lesson that applies to all great credit crises. The responses of the two parties expressed the shared, firmly held social values of ordinary people. But those values dictated an *impossible* outcome. No feasible fair solution existed.

agents with less economic power, and try to signal that lending in the domestic market will be rewarded? Or should the public sector mediate between those groups and let the taxpayer absorb some of the losses?

Even when the public finances are not at the core of the upheaval, crises do not lend themselves to simple pre-packaged fiscal policy measures. But, of course, they often are.

Sovereign Debt Crises and Perfect Storms

High inflation

Public finances in disarray will undermine an economy. Hyperinflation is an extreme case, but it makes the logic clear. When a government is unable to fund its expenditures in a regular manner and ends up issuing massive amounts of currency that people do not want to hold, credit will vanish and even the most ordinary day-to-day business becomes difficult to transact.[14] Eventually, the printing press will no longer enable the government to ensure the continuation of essential services.

Disinflation requires reducing reliance on the inflation tax. Lasting stabilization demands a system for government financing that avoids the use of seigniorage. Ridding an economy of high inflation is an exceedingly difficult political problem. The

[14] Shops posting signs declaring "Closed for the Lack of Prices" is an example discussed in our *High Inflation* (1995).

potential payoff is very large in the aggregate, but it requires social groups to come to agreement on taxes, transfers and the provision of services.

The end of very high inflation brings real recovery. The normalization of routine transactions, the revival of credit and the elimination of the inflation tax[15] will more than offset the higher taxes on the private sector. This is one clear case where *reduced* deficit spending will *increase* real output and income.[16]

Fiscal crises erupt when "business as usual" is becoming impossible for the government while, at the same time, the private sector is quite unprepared to cope with public sector adjustments. Typically, the government will have miscalculated the strength of the private sector and based public spending on anticipations of macroeconomic conditions that are not realized. The economy may have been financing "twin deficits" at low interest rates, but when foreign credit to the government dries up, domestic agents are not ready to fill the gap in the public finances.

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[15] The inflation tax is borne particularly by low income groups that lack the means to avoid it.

[16] Fiscal stabilizations may sometimes be consistent with rising activity also in economies that are not suffering from high inflation. Although the evidence on expansionary fiscal adjustments remains under debate (cf. Giavazzi and Pagano, 1990; Alesina and Ardagna, 2010; IMF, 2011; Perotti, 2011), it is understandable that an agreement to reduce the budget deficit when the fiscal position is in doubt can reduce uncertainty and lift pressures on credit markets.

When the public has no previously built cushions to absorb the impact of higher taxes, smaller transfers or poorer services, cutting the financing needs of the government will be especially painful. Private demand will not offset the contraction of public spending, but amplify it. The prospect of a period of economic recession with an uncertain outcome frightens asset holders. The markets seek assurances that the government will not only pay "no matter what" but that it will boost growth so as to strengthen revenues. If this feat cannot be accomplished, growing distrust in financial markets will tighten the current budget constraint and generate still more pressure to adjust.

When an economy is close to a dynamic bifurcation, it is virtually impossible to know whether a recovery is still possible or a downward spiral inevitable. The costs and consequences of stopping payments and restructure debts remain a subject of much active discussion. Sovereign defaults tend to happen in extreme situations, and not without strenuous efforts to avoid them. Once the crisis has manifested itself and fear of government insolvency have become general, the path to default is typically marked by repeated attempts to redress the public finances. Interest rates on the debt tend to fluctuate widely, showing that the perceived likelihood of repayment, in whole or in part, oscillates according to the rapid flow of news. These periods are fraught with political tensions. Nonetheless, even though distributive struggles may get intense, open advocacy of payment suspension is remarkably rare – until the very end.

Default strikes fear in the public. Governments of every political stripe will struggle mightily to avoid it. The incentives are strong to postpone the irreversible move and to gamble for resurrection.[17]

In some instances, measures of fiscal retrenchment, perhaps aided by favorable external shocks, can induce a recovery in a public sector on the brink of bankruptcy. But many struggles to stop a crisis eventually fail when "adjustment fatigue" produces social unrest – or the government just runs out of funds. At some point, solvency problems must be addressed head on.

Default by the state

Default is a tricky concept. When two parties sign a formally unconditional debt contract in which the specified interest incorporates a risk premium, it is understood that in some states of the world the debt will not be paid in full.

If that set of conditions is common knowledge and one of these states materializes, a debt reduction would actually implement an implicit escape clause on which the parties had tacitly agreed. The contract is written as a fixed promise, but everyone

[17] In a related context, Alvarez and Dixit (2013) have used a calibrated model to analyze the incentives to abandon a monetary union. They suggest that, while the option value of delay may be relevant, the magnitude of the effect is probably small. But the decision to suspend payments on the public debt is hardly a cold-blooded optimization based on some postulated normal probability distribution. Decision makers are apt to put considerable weight on the possibility of a "catastrophic" outcome; but they might also cling to the hope of "good news" that would make the status quo sustainable after all.

would realize that the obligation was contingent on the realization of well-defined events. Consequently, there would be no default, in the sense of non-compliance, and no room for dispute. Debt restructuring should happen at once, without high drama.

But, of course, the common knowledge assumption is not warranted. Real or claimed inconsistencies of belief are bound to arise. Creditors will argue that the interest premium pertained to other states but not to the actual one, while debtors maintain that the realized state definitely calls for lower repayments. In private contracts, the judicial system that deals with bankruptcies is charged to determine, not without substantial social costs, what expectations are to be considered reasonable, and what amount of repayment is legally due.

In the case of sovereigns, institutions capable of enforcing debt repayment are absent. Within a country, a debt crisis is likely to create conflicts between the branches of government and particularly between the executive and the judiciary. Between countries, "commitment devices" that could guarantee acceptance of rulings by some supranational authority are lacking – and understandably so. The "incentive to belong" to formal or informal international arrangements certainly influences governments and their electorates, but it will not compel compliance with dictates from the outside.

Directly or indirectly, public sector default and debt restructuring will involve a large number of actors. Ultimately, sovereign default becomes a complicated

bargaining game, involving governments and their constituencies with various interests and attitudes, creditors as individuals and as pressure groups, foreign governments and international institutions.

When payment suspension occurs only after much pain has been suffered in trying to avoid it, the impracticality of demanding full servicing of the debt will be obvious. Even so, ample room for disagreements between debtor and creditors will remain. The bargaining strategies of the parties will depend on conditions and parameters that are both highly uncertain and bound to vary from case to case. For the debtor country, the costs of insisting on additional debt reductions will depend on its expected financing requirements and on the value it places on the resulting loss of reputation in international and business circles. Evidence suggests that the costs of default increase with the magnitude of the "haircut" involved in a restructuring (Cruces and Trebesch, 2011). But debt sustainability is also crucial. The frightening prospect of *repeated* debt crises will discourage a defaulting country from starting again from an already precarious position.[18] The uncertainties about the outcome of

[18]The chances of repayment are quite different before and after restructuring. Estimating the size of "haircuts" becomes a far from trivial problem. Which rate is the right one for discounting the repayments promised prior to restructuring? This discount rate ought to reflect the likelihood prior to the default that the debt would not be serviced in full. But this likelihood certainly fluctuated widely before and during the crisis so what date to use for reference is anything but clear. Moreover, the expectations of the parties embodied in observed market rates were not necessarily "reasonable".

Clearly, this problem does not have a solution that will command general assent. But it is also clear that, if the *same* rate is used for both pre- and post-restructuring, the loss suffered by creditors will be overestimated (cf. Sturzenegger and Zettelmeyer, 2005).

debt restructuring suggest the use of instruments with contingent payment flows like the GDP bonds issued in some episodes.

Prevention: Macro policies

Certain economic configurations seem particularly likely to generate macroeconomic debt crises: domestic or external credit booms, particularly when financial regulations are lax; excessive optimism in borrowers and lenders caused by the prospects of faster growth; macro policies that, for reasons of complacency or institutional rigidity, fail to respond to signs of mounting imbalances. Indicators do exist that may help to diagnose and prevent a crisis. But sustainability depends intrinsically on expectations of the future, and cannot be assessed mechanically: it is precisely for this reason that the inconsistent beliefs and behaviors that support macroeconomic bubbles can arise.

Policies have to be based on some judgment about macro sustainability. This requires identifying feasible trends in economic conditions and evaluating observed behavior from that perspective. Private decisions reveal the perceptions and attitudes of agents whose everyday business it is to gather and process relevant data, not all of it accessible to policymakers. Ignoring those signals may be costly and lead to policies that end up denying straightforward facts. But assuming unconditionally that the private sector acts on the basis of rational expectations can produce the opposite error: namely, that credit bubbles warrant expansionary policies to go along with the temper of the time. Macropolicies should help the economy settle on a stable growth

path, prevent oscillations that cause resources to be misused or underutilized, and minimize the risk of a breakdown. Easier said than done!

Political economy issues also have to be addressed: How should we elicit social preferences about the tradeoff between the risk of unnecessarily slowing down a fundamentally solid expansion, on the one hand, and allowing an unsustainable boom to develop, on the other? More mundanely, how should we structure the incentives for governments tempted to maximize short-run popularity by not acting to moderate periods of prosperity? However salient these may be, they are not the only issues. Another set of problems is of a perceptual type.

Trends and cycles may be distinguished ex post but, when looking at current economic performances, they are very much in the eye of the beholder (cf. Heymann and Sanguinetti, 1998; Heymann et al. 2001; Aguiar and Gopinath, 2007; Boz et al., 2011). Policies revealed as pro-cyclical after the fact may have been subjectively viewed at the time as both well-founded and prudent. A hint of these discrepancies between perceptions and eventual outcomes may be found in the often striking differences between forecasts and realizations in crisis economies. In evolving economies, growth rates are apt to fluctuate and this makes it difficult to assess future income levels and repayment capacities objectively. This means that a debt crisis can develop without much advance warning.

Self-denying constraints on policy can solve incentive or credibility problems but do so by sacrificing flexibility of action.[19] Sometimes, as in the case of exchange rate fixing, benefits can accrue rather quickly -- in the form of lower interest rates, for example -- while the costs are contingent, and will be realized over time. But policy systems which are not allowed to bend are apt to break. In deciding on "constitutional constraints" on policies it is especially important, therefore, to be aware of the possibility that the economy may be disturbed in novel and unanticipated ways, and to leave room of maneuver for such occasions. Fixity of certain variables must be compensated by the potential to vary others. Keeping options for discretionary interventions open may require investments in reputation or in resources (such as foreign exchange reserves, for instance).[20]

In the present state of knowledge, however, one conclusion remains inescapable: *We simply do not know how to eliminate the possibility of debt crises in economies with developed credit systems.*

Prevention: Regulation

[19]In what may be the worst case, the self-denying provision may even induce pro-cyclical behavior, as is the case, most notably, with balanced budget amendments that force governments to amplify fluctuations in private sector expenditures.

[20] Credibility and flexibility can be complementary. Economies where inflation expectations have been kept low and steady can afford exchange rate variability as shock absorber, because of its moderate impacts on prices and the absence of debt deflation effects as long as the credit system is not "dollarized". When the government is seen to be solvent it is also easier to expand fiscal policies in recession.

In 2008 the U.S. financial system revealed a degree of fragility such as had not been seen since the early 1930s. Among the developments that had weakened the system, two were particularly important.

Structure of the financial sector

The first of these was the deregulation that abolished the segmentation of the system that had been imposed by Glass–Steagall but parts of which were earlier in origin. American financial institutions were grouped into a number of separate industries, each one of which was defined by the assets they could acquire and the liabilities they could issue. In addition, the system was segmented also along state lines. Banks, for example, could not branch across state lines.

The resulting financial structure was one composed, in effect, of a number of "watertight compartments." The strength and resilience of this system was proven in the late 1970s and early 1980s when the S & L industry collapsed. This industry invested in mortgages, traditionally with initial maturity of 30 years, which were financed by savings deposits. This extreme maturity mismatch was predicated on the dollar maintaining stable purchasing power. The inflation of the 1970s brought deposit rates to levels exceeding the rates on previously issued mortgages and, in a few years, thoroughly undermined the S & L industry.

The collapse of the S & L industry involved losses and eventually public expenditures that were of the same order of magnitude as the recent losses on

subprime and Alt-A mortgages. But the consequences were different and the difference is instructive. The S & L collapse essentially did not affect the other segments of the U.S. financial system and engendered no international repercussions. One "watertight compartment" was flooded, but the ship was in no danger of capsizing.

In 2007–08, in contrast, the losses on U.S. mortgages suddenly revealed that the conglomeration of finance had created a highly unstable structure of global reach. Extreme public policy measures were required to halt the collapse of the U.S. banking system midway. The repercussions of the crisis that had had its beginnings in the United States continued to build abroad and by 2011 had led to the long-drawn crisis of the Eurozone.

The Volcker rule in the US (Federal Deposit Insurance Corporation, 2013) and the Vickers "ring-fencing" proposal in the UK [House of Commons Library, 2013references?] sought to separate a financial core comprising traditional commercial banking from all other financial activities. The big conglomerate banks, of course, lobbied hard to water down these reform efforts. But the reason for being skeptical of their worth is different, namely, that the recent crisis had its epicenter entirely outside commercial banking and hardly impacted it at all.

Risk-bearing and incentives

The usual approach to regulation, of which the Basel rules are an example, is to prohibit people from doing what they otherwise would want to do and to mandate that they do things they do not want to do. This is not a very promising way to deal with a system that has become exceedingly complex, that is capable if innovating and changing very fast, and that is staffed by the cleverest people money can buy. The alternative approach to regulation is to change what people will want to do and what they want to avoid doing. This means changing the incentives that the decision-makers find themselves facing.

Changing the incentive structure can be done by working either on the rewards or on the costs. Attempts have been made to reduce the bonuses that bankers earn. These attempts have met with opposition and have so far proven largely ineffectual. Even if bonuses were reduced by x percent, moreover, this might not affect the decisions that bankers are making.

Behavior can more reliably be affected by liability provisions. The negative social externalities of bank behavior have been enormous. If it were possible to make the decision-makers personally bear a cost linked to the socioeconomic consequences of their decisions, behavior would be modified in a desirable direction.

A simple example would concern the markets for securitized loans such as the bundles of mortgages of varying quality that played such a prominent role in the early stages of the recession in the US. The ability to unload loans onto the securities

markets drastically reduced the incentives for banks to devote time and resources to evaluating the creditworthiness of borrowers. The bundles were "non-transparent" to the buyers who had very unclear notions of what they were buying but tended to believe that bundling meant diversification of risk.

Of all the problems revealed by the crisis, this is probably the one most easily remedied. The ancient rule of *caveat emptor* – "buyer beware" – ruled unchallenged in the markets for securitized loans. Shifting the burden of risk in the direction of *caveat vendor* should create a far healthier market. This would not necessarily require legislation. It might suffice that the courts require stricter due diligence on the part of the institutions bundling the loans.

A more fundamental and more intractable problem has resulted from the transformation of the American investment banks from partnerships into limited liability corporations that took place in the years around 1990. As it turned out, this made the American financial system less stable. Partners were always putting their own money at stake. Corporate banking executives play with other people's money. Attitudes towards risk-taking changed accordingly. The sociological consequences are quite apparent also to the proverbial "man on the street." Bankers used to be known as dour, cautious, conservative people, loath to lend money to anyone who might actually need it. The modern banker is a jet-setting high-roller who, pursuing outsized bonuses, uses fancy models to make intricately structured bets beyond the understanding not just of ordinary people, but also occasionally of himself.

The incentive structure in those financial institutions that play with other people's money needs to be changed. This can be done by ensuring that the personal wealth of the decision-makers will also be at risk. Requiring that bank executives be remunerated in part with a form of equity subject to double liability (or some other suitable multiple) should induce more conservative behavior (Leijonhufvud 2010).[21] At present, the enormous social cost of credit crises is an irrelevant externality to the denizens of Wall Street. A well-designed liability rule would serve to internalize it.[22]

Prevention: Policy Reform

Twenty-some years ago, monetarism was the most influential central banking doctrine. It focused on central bank control of one nominal quantity, usually either M1 or some version of M2. In the 1990s, various innovations in payment practices made the relationship between monetary stocks controlled by central banks and nominal GDP increasingly variable. As a consequence, monetarism rapidly lost influence. Its place as the dominant policy doctrine was taken over by inflation-targeting.

[21] It would also create a diseconomy of scale that could be of some help with the "too big to fail" problem. Executives in one department of a bank would have a vital interest in the risks taken on in other departments and conflicts of this kind

[22] For the early history of liability in banking, see White (1995).

Inflation-targeting through interest rate management is a Wicksellian strategy for controlling the nominal price level. By raising (lowering) the central bank discount rate – or, in recent times, its repo rate – the central bank seeks to reduce (increase) the rate of inflation.

In the nineteenth and for much of the twentieth century, Bank Rate was understood as a tool for controlling the volume of credit in the economy. The price level was controlled by the convertibility of paper money into gold or silver (or a central currency) depending on the standard adopted by the country in question. Control of credit could be used to moderate the trade cycle, as it used to be called, but if the reserve of monetary metal at the central bank ran low, its ultimate function would be to defend convertibility.

In the long run up to the recent crisis, the major central banks were congratulating themselves on their success in controlling price levels by inflation targeting. Meanwhile, the credit bubble grew and grew unchecked. The tendency has been to blame the regulators for the ensuing disaster. Regulators have not been blameless, but it is also true that, in the macromodels used by the central banks, credit was not supposed to balloon out of control no matter what the regulatory regime. The transversality condition of Dynamic Stochastic General Equilibrium models postulated that, at the end of time, all bills would be paid. Unfortunately, no counterpart to this equation is to be found in the world of actual experience.

This leaves us one policy instrument short. The interest rate set by the Central Bank cannot simultaneously regulate both the price level and the volume of credit in the economy. The bubble that burst proved that the "free market" does not keep credit under control.

Fifty years ago, the influential book by John Gurley and Ed Shaw started a debate on the requirements for monetary control. The conclusion of that discussion, in which Don Patinkin played a prominent role, was that a central bank required *two* policy instruments to control a pure fiat money regime (Gurley and Shaw, 1960; Patinkin, 1961). It needed to control one nominal quantity and one interest rate. Today, this requirement could be met, for example, by controlling the monetary base and the discount rate (or the repo rate). It would be desirable also to strengthen this arrangement by tying *all* deposits in the system to the base with old-fashioned reserve requirements, the reserves to be actually deposited with the central bank. The reserve requirements would apply not just to commercial banks and savings institutions but also to money market funds and any other issuer of demand (or overnight) liabilities. This should, we think, include reserve requirements against repo contracts, at least for repo financing from the central bank. Alternatively, the central bank could impose a "haircut" on repos in addition to the repo rate charged.

This would not solve all problems. The end of monetarism was caused by the increased variability of the "velocity of money" (variously measured). Regaining

control of the quantity of money would not do much to solve that problem.[23] But having a nominal anchor is better than being entirely without one, even if the anchor cable is pretty elastic. As the credit bubble was developing it would have put increasing strain on that cable and the cost of funds would have risen.

This proposal would create a system with some family resemblance to what we were used to just a couple of decades ago. But an orderly retreat from our Brave New World will not be easy to organize. In the United States, political deadlock over fiscal policy more or less forced the authorities to try to fight recession almost altogether only with monetary policy. But monetary policy has been hampered by a bifurcated credit system and conventional measures have had little effect. The Fed's balance sheet tripled, and those of the ECB and the Bank of England doubled in size. In the U.S., the monetary base grew larger than M1, and interest was paid on bank reserves to make the banks hold them. Bank reserves became anything but scarce. To reintroduce an effective nominal anchor they had to be made once again a scarce resource.

The central banks were facing a looming disaster. The manner in which age-old rules of prudent central banking was jettisoned tells us better than anything else how serious the situation looked from the inside. The century-and-a-half-old Bagehot Rule had been that a central bank should come to the rescue of banks in trouble by *lending freely on good collateral but at a penalty rate.* In the recent crises, the central banks

[23] It might help a bit that the proposal would include some bank deposit substitutes in the nominal magnitude controlled by the central bank.

took on board enormous sums of questionable collateral did so at extremely low rates. Central bank repo rates were *subsidies*, not penalties.

Concluding remarks

Macro crises happen in economies of very different types. The eruption of accumulated inconsistencies or the impact of external shocks forces individuals and collectives to adapt to circumstances that were not foreseen and disrupt their previous plans. Debt crises have occurred – and recurred – in capitalist systems that vary in size and in wealth, in productive structure, in degree of development, and in political and economic institutions. Ironically, they tend to occur at times when the view that severe fluctuations are a thing of the past has made both policymakers and people in general complacent and careless.

Debt crises do not necessarily spell "the end of the world" for the societies in question. Recoveries do occur and can be both strong and enduring. But the economic costs of crises are often huge and their social and political legacies long-lasting. Realizing that social wealth is lower than expected can be very traumatic.

We simply do not know how to “abolish” crises in decentralized economies in which credit transactions play an important role. Nor can we accept the pleasant belief that they simply "purge" a growing economy of excesses and ensure the

"survival of the fittest" so as to leave the system stronger than ever. Economic policy should strive to prevent crises. But it must also leave room for the exploration and exploitation of novel opportunities, even though that process is certain to involve errors and failures. And policymakers must remain ready to act if and when a crisis erupts unexpectedly.

Economic analysis ought to provide criteria for that purpose. This task has a somewhat paradoxical aspect. The expectations driving the process, which eventually proves unsustainable and ends in crisis, are often based on economic theories prevailing at the time. Consequently, an economic theory of crises must contemplate what may be wrong with economic theory. Taking rational expectations literally precludes addressing this problem.

Turning from rational expectations to pure agnosticism will obviously not help, however. We need to explore how people process information in practice, how they create prospective scenarios to aid decision-making, how they behave differently in a crisis from normal times, and how disturbances propagate through the system. This would help us understand when macroeconomic bubbles are likely to form and how they grow and burst. Improved understanding of these processes, which look so collectively irrational in retrospect, should lead to better preventive regulations and policies.

The agenda for future research poses quite a challenge.


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