

PRELIMINARY AND INCOMPLETE

## CRISES: PRINCIPLES AND POLICIES<sup>1</sup>

### *With an Application to the Eurozone Crisis*

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#### **Abstract**

The euro crisis and the Great Recession which led to it present several puzzles for traditional economic theories. In the last 30 years crises have become more frequent and expensive than ever – at the same time that many economists believe markets are better and there is more widespread understanding of how to manage economies. Moreover, there are seldom changes in the state variables (capital, human capital, etc.) describing an economy that can account for the dramatic changes in outcomes.

In this paper, after providing a general theory of crises, in which multiple short run and steady state equilibria and discontinuities in expectations play critical roles, we focus on the role of adjustment, the reasons that requisite adjustments sometimes don't occur, and why natural decentralized "adjustment" processes may be disequilibrating.

The role of excess indebtedness, often associated with crises, poses a particular puzzle, since standard theories argue that whatever the level of indebtedness, there is a full employment equilibrium. We explain why indebtedness may have persistent adverse effects.

Finally, we discuss the implications of these findings for Europe, providing an explanation for why the downturn has been especially persistent there.

#### **Keywords**

macroeconomic models and their deficiencies, economic crises, adjustment processes, macroeconomic policies, the Euro crisis.

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Economies around the world have faced repeated crises—more frequently in the past 30 years.<sup>3</sup> The fact that they have become more frequent and pervasive at the same time that we believe we have learned more about the management of the economy and as markets have seemingly improved poses a puzzle: shouldn't rational markets avoid these catastrophes, the costs of which outweigh by an enormous amount any benefit that might have accrued to the economy from the actions prior to the crisis that might have contributed to it. This is especially true of the large fraction of crises that can be called "debt crises," precipitated by a country's difficulty in repaying what it owes. The benefits of income smoothing (arising from the difference in the marginal utility of income in periods when income is low and when income is high) are overwhelmed by the social and economic costs of the ensuing crisis.

For economic theory, crises pose another puzzle: typically the state variables that describe an economy change slowly. But what distinguishes a crisis is that the State of the Economy seems to change dramatically, in a relatively short time. This should be even more puzzling to those who believe in some version of rational expectations, for shouldn't markets have anticipated the untoward change of events? And if they had done so, wouldn't the problems have appeared earlier? There is seldom any single item of "news" that leads to the kind of radical revision of expectations that often seem to be associated with crises.<sup>4</sup>

For those who believe in well-functioning markets, there is still another puzzle. The assets—the human, physical, and natural capital—of a country are essentially the same after the crisis as they were before. A misallocation of capital before the crisis—say as a result of a housing bubble—should imply that incomes after the crisis would be lower than they otherwise would be. But there is nothing in standard theory to suggest that there should be a high level of unemployment, or a dramatically lower level of output. Indeed, properly measured, GDP might even increase. This is true even if there is a legacy of debt. Debt should affect the claims on society's resources, i.e. how the national pie is divided; but that's all.<sup>5</sup>

Keynesian economics provides some insights into these puzzles—certainly more than neoclassical models that assume that the economy is always at full employment. But standard Keynesian economics had little to say about dynamics: it was an equilibrium theory, attempting to explain the persistence of unemployment. It didn't attempt to explain why the breaking of a bubble should have such adverse effects. Although modern variants of New Keynesian economics (originating with the work of Fisher<sup>6</sup>

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<sup>3</sup> Reinhart and Rogoff (2009).

<sup>4</sup> There is, of course, by now ample evidence against the rational expectations hypothesis. See Akerlof (2002); Fuster, Laibson, and Mendel (2010); and Stiglitz (2011).

<sup>5</sup> There is a slight caveat to these claims: a dramatic change in expectations (for instance, the realization that there was a real estate that just burst) changes the composition of demand, and the capital stock that was appropriate for the previous output mix may be less so for the new demand structure. In addition, there are measurement problems: measured output before the crisis was inflated by the bubble real estate prices and by the seeming associated profits in the financial and real estate sectors. See, e.g. Stiglitz *et al* 2010.

Moreover, the real puzzle is the slow recovery of employment: even if the capital stock were partially "destroyed," standard theory says that labor should be fully utilized. Much of the loss of output—the difference between actual output and potential output—arises from the persistence of high levels of unemployment.

<sup>6</sup> See Fisher (1933).

that was contemporaneous with Keynes, and updated in the work of Greenwald and Stiglitz [1988a, 1988b, 1990, 1993a, 1993b) help explain why shocks to the economy that have significant effects on balance sheets would have persistent and long lasting effects<sup>7</sup>, they don't really explain crises—why (for the most part) there should be events with large balance sheet effects—at least within a theory disciplined by some variant of rational expectations. (Of course, if we are willing simply to posit large changes in expectations and/or a change in asset prices unrelated to any change in underlying fundamentals, then it is easy to generate crises, especially of a kind associated with large changes in balance sheet.)

The euro-crisis and the Great Recession which led to it provide dramatic instances of these puzzles. And a study of the unfolding euro crisis provides hints as to the plausibility of alternative explanations, the strengths and deficiencies of different theories.

After providing a general theory of crises, in which multiple equilibrium and discontinuities in expectations play a critical role, we focus on the role of adjustments (and the reasons that requisite adjustments sometimes don't occur.)

## II. A Theoretical Taxonomy of Crises

Not all economic downturns are crises, but economic crises almost always become severe downturns, of varying durations. Broadly speaking, we can identify three categories of economic fluctuations:

- (a) Short term fluctuations, brought on by, for instance, excess inventory accumulations or central banks stepping on the brakes too hard in an overzealous fight against inflation. (Occasionally, short term fluctuations can be brought on by a supply shock, such as a drought.)
- (b) Somewhat deeper and longer lasting downturns, the balance sheet recessions described earlier, often associated with the breaking of a bubble or the sudden realization that an important price (or set of prices) in the economy (such as the exchange rate) has been set “incorrectly,” with consequences of a persistent, and evidently unsustainable, departure from “equilibrium.” Prior to the 2008 crisis, many economists had, for instance, argued that out of equilibrium exchange rates (sustained in part by government interventions) had led to global imbalances, and that a disorderly unwinding of these global imbalances would result in a crisis.<sup>8</sup> As it turned out, it was the breaking of the housing bubble in the United States, not global unwinding of global imbalances, that led to the crisis.<sup>9</sup> Those crises associated with credit excesses (leading to bubbles) have become dubbed Minsky cycles. But while Minsky (e.g. 1982) and Kindleberger

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<sup>7</sup> That is, it takes time to rebuild balance sheets, and because of important information imperfections and asymmetries, there is, in effect, equity rationing (Greenwald, Weiss, and Stiglitz, 1984), so that firms (including banks) cannot instantaneously raise additional equity on the capital market to replace capital that has been lost as a result of an adverse shock. For an overview, see Greenwald and Stiglitz, 2003. For a more recent discussion of balance sheet recessions, see Richard Koo (2008 and 2010).

<sup>8</sup> Roubini (2008) and Wolf (2008).

<sup>9</sup> Though some economists have seen a connection between the two: the recycling of Chinese surpluses, some argued, helped fuel the bubble. But as Stiglitz (2010) argues, there was no necessity either that these surpluses lead to low US interest rates (the Fed still had a role in setting interest rates) or that the ready supply of finance be allocated so poorly (in part a result of inadequate regulation.)

(1978) have identified repeated patterns of credit excesses—often fueled by collateral based lending, where, as real estate prices increases, the value of collateral on which lending is based increases—it is hard to reconcile such excesses with rational expectations.<sup>10</sup>

- (c) Deep structural crises, such as the Great Depression, which seem to last far longer than can be accounted for by the slow process of repairing balance sheets. These arise out of the difficulties that market economies have in making large structural changes, that typically require significant investments on the part of those whose human and other capital has been eviscerated by the economic change; because of imperfections in capital markets (explicable in terms of information asymmetries) those who need to make these investments are constrained from doing so, and thus labor, which needs to be reallocated to reflect the structural change, is impeded from doing so. The breakdown of financial institutions in the midst of these long-term downturns only serves to prolong them.

Identifying the nature of the crisis (or downturn) is not always easy, partially because a crisis of one type may morph into one of the other type, partly because any long lived crisis will have real balance sheet effects and will be associated with problems in the financial sector—even when the financial sector was not the original *cause* of the crisis.<sup>11</sup> There are strong reasons to believe that the downturn that began in 2008, the Great and Long Recession, is structural. The fact that output went down in many countries in which there was not a financial crisis (manufacturing economies like China) shows that it was more than just finance. The continuing weakness in the economy in the US, in the aftermath of the 2008 crisis, where bank and corporate balance sheets have been largely restored (at least to the point that investment outside of real estate has returned to near-normal levels<sup>12</sup>) suggests too that it is more than a balance sheet recession.<sup>13 14</sup>

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<sup>10</sup> In a more probabilistic context, it may be rational for countries to incur sufficiently high debt such that, with a non-zero probability, there are events that result in a credit constraint will be binding, i.e. countries will not be able to borrow further, or may not even be able to roll over their debt (Eaton and Gersovitz, 1982, and Eaton, Gersovitz, and Stiglitz, 1986). But the frequency of debt crises and the costs that they impose suggest that this “rational theory of excess indebtedness” cannot explain what is going on. An alternative explanation, not pursued in this paper, focuses on political economy considerations: the benefits of higher levels of indebtedness accrue to politicians at one time, the costs (e.g. associated with the subsequent crisis) occur at a later date, and will therefore likely be borne by other politicians. In effect, the political process leads to discounting the future costs of the crisis at a high rate. This theory suggests that there are severe limits to democratic accountability, e.g. that voters too are myopic or that the political process gives weight to those that are myopic.

<sup>11</sup> Thus, as Delli Gatti *et al.* (2012a and 2012b) emphasize, the association noted by Reinhart and Rogoff, between long crisis and financial crises tells us little—much less than they suggest. The collapse of America’s banking system in the Great Depression, for instance, occurred well after the onset of the downturn; it was consequence more than cause.

<sup>12</sup> As of April 2013, real private nonresidential fixed investment in the United States was just 1.3 percent below its pre-crisis high. Real gross domestic private investment was still 8.4 percent below the pre-crisis high. Source: St. Louis Fed.

<sup>13</sup> See Delli Gatti *et al.* (2012a and 2012b).

<sup>14</sup> Weak balance sheets on the part of some local banks and low real estate prices may, however, continue to impair lending to small and medium sized enterprises. Excessive household leverage may lead to lower levels of consumption, but it is not likely (or plausible, at least with rational markets) that savings rates will fall much below

This paper focuses on the latter two—and especially the third—kind of downturns, which are often deep and long lasting.

### *A general theoretical framework*

A crisis is a sudden change in the (perceived) state of the economy, one which is often associated with the collapse of a currency, the banking system, or the real economy. It is a sudden change in the performance of the economy. Standard models of the economy model the flow variables (consumption, investment, etc.)  $\mathbf{x}$  as a function of a set of variables that describe the state of the economy,  $\mathbf{S}$  and a set of decision variables,  $\mathbf{d}$ , which themselves are typically a function of an expanded set of state variables, which include expectations of the future. For simplicity, we write  $\mathbf{d} = \mathbf{d}(\mathbf{S})$ , so that the flow variables can be expressed simply as a function of the state of the economy. The state variables change according to a law of motion,

$$d\mathbf{S}/dt = \phi(\mathbf{x}(\mathbf{S}), \mathbf{d}(\mathbf{S}), \mathbf{S}) = \phi^*(\mathbf{S})$$

Because  $\mathbf{S}$  changes slowly,  $\mathbf{x}$  and  $\mathbf{d}$  change slowly. There should be no crises.

Occasionally, there are what may be viewed as *exogenous* changes that can lead to a sudden large change in the relevant variables. The above formulation should be generalized to include uncertainty; there can be an “outlier” realization of a random variable (a drought), and particularly in the presence of non-linearities, this can have a large impact on the state and behavior of the economy.

But most crises are not related to the realization of a 3-standard deviation in an exogenous random variable. The 2008 crisis was related to the real estate crash, the 2001 recession to the bursting of the tech bubble. Both were *endogenous* disturbances. There were no large exogenous events that could have accounted for these crises.

Looking over past crises, there are four possible models that can describe the observed dynamics.

- A. **Multiple momentary equilibrium.** Many economic models are characterized by multiple momentary equilibria. That is, a given set of state variables maps into not a single set of flow variables, but a multiplicity of possible equilibria. We may (and typically do not) have a complete theory of determination of equilibrium: how one or the other members of the set happens to occur. For instance, if the “market” believes that a firm (an economy) is not likely to go bankrupt, interest rates will be low, and at the low interest rate, the probability of bankruptcy will be low. But if the market believes that the probability of bankruptcy is high, then there will be a high interest rate, and a correspondingly high probability of bankruptcy. Both of these can be rational expectations equilibria. (See Greenwald and Stiglitz, 2003).<sup>15</sup> The

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their current level. The low savings rates observed prior to the crisis entailed the bottom 80% of Americans spending 110% of their incomes, on average.

<sup>15</sup> Such multiple equilibria arise often in game theoretic models: if everyone believes that there will not be a run on the bank, there won't be; but if they do, there will be. See Diamond and Dybvig (1983). Early examples arose in standard growth theory where capitalists had a relative preference to the capital intensive good. They arise too naturally in simple overlapping generations models: if individuals believe the interest rate next period will be low,

defining characteristic of such models is “positive feedbacks.” With multiple momentary equilibria, the economy can suddenly move from one configuration into another—with the latter, for instance, having disastrous consequences for the economy or some group within the economy. To take up the example just given: if, suddenly, the market believes that there is a high probability of bankruptcy and interest rates (rationally) adjust to reflect this, then not only will the behavior of the economy change suddenly, but so will the evolution. In short, there can be discontinuous changes in  $\mathbf{x}$  even if  $\mathbf{S}$  (now understood to include only the “real” physical variables, like capital stock) changes slowly, and these discontinuous changes in  $\mathbf{x}$  can lead to discontinuities in the pattern of changes in  $\mathbf{S}$ . ( $\mathbf{S}$  may still be a continuous variable, but  $\mathbf{S}(t)$  is not differentiable.)

- B. **Expectations as State Variables.** While physical objects (like the capital stock) typically change continuously, beliefs need not. And this includes beliefs about the future value of state variables. Since  $d\mathbf{S}/dt$  is not continuous when the economy changes from one momentary equilibrium to another, it is clearly conceivable that individuals (even rationally) could suddenly change their beliefs about the future course of the economy. For instance, if there are multiple momentary equilibria corresponding to every  $\mathbf{S}(t)$ , then as the economy “chooses” one or the other, the future course of the economy changes dramatically. This uncertainty can be rationally incorporated into beliefs *ex ante*.<sup>16</sup> Changes in the future course of the economy get reflected, of course, in the *values* of assets, so that though the physical assets themselves change in a way which is continuous, the valuations themselves may change in ways which are discontinuous, leading to and reinforcing discontinuities in behavior.

The fact that in these and related models of dynamics expectations can play such a central role is consistent with the financial sector’s emphasis on the role of confidence. If the market has confidence (e.g. that there is a low probability of default), then interest rates will be low, as we have noted, and the probability of a default will be low. But such assertions do little to help explain (or affect) expectations, though sometimes they can be thought of as helping to construct sunspot equilibria<sup>17</sup>, where certain government actions (like raising interest rates) serve as a coordinating mechanism on expectations (e.g. that inflation will be low.)

- C. **Multiple long run equilibrium.** Even if there is a unique momentary equilibrium, there can be multiple steady states, and the steady state to which the economy converges can (and will typically) depend on the initial conditions,  $S_0$ . Slight changes in these can lead to the convergence to a different equilibrium. Again, while  $\mathbf{S}$  is continuous,  $d\mathbf{S}/dt$  is not, and there can be sudden changes in the prospects of the economy as a result of a shock that moves the

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they may save a great deal to ensure that they have an adequate amount for retirement; and if they do that, there will be a low interest rate the following period. But if they think the interest rate is going to be high, they will save little; and the interest rate will be high. See Stiglitz [2008]. See also the extensive literature on sunspot equilibria.

<sup>16</sup> Though as we have already noted (and we will comment on further below) in any model providing a good description of the actual behavior of the economy, the assumption of rationality and rational expectations plays a less central role in the paradigm that has dominated macro-economics for the past quarter century.

<sup>17</sup> References to sunspot literature

economy across a boundary. Debt can, for instance, go from being “sustainable” to being “unsustainable”.

Behaviors are likely to change discontinuously across these boundaries, so that  $\mathbf{x}(S)$  is not itself continuous.

- D. **History matters: threshold effects and adjustment rigidities.** The analysis so far has followed the standard macro-economic tradition of treating the economy as described by a set of variables that described the physical state of the economy, say the amount of real and human capital. But in more general models, there is a richer set of state variables, including, for instance, the wealth (asset holdings) of each individual and each of their beliefs. Moreover, history matters. Their beliefs and actions are affected by the past in a way that is not adequately summarized by say current asset holdings. Formally, we can expand the set of state variables to include the values of asset holdings in prior periods, so that, say  $\mathbf{x}_t = \phi(\mathbf{S}_t, \mathbf{S}_{t-1}, \mathbf{S}_{t-2}, \dots)$ . History dependent models include those in which individuals do not adjust behavior for small changes in  $\mathbf{S}$ , e.g. because of adjustment costs. Only when there are large disparities between the value of  $\mathbf{x}$  that would be chosen if there were no adjustment costs and the current value is large enough does  $\mathbf{x}$  change. The implication is that there can be discontinuities in  $\mathbf{x}$  even if, between this period and the last, there is a small change in  $\mathbf{S}$ . The large change in  $\mathbf{x}$  can, of course, have large consequences for the future evolution of the economy: there can be a “crisis.”

In this theory, then, crises are caused, in part, by rigidities in adjustment. If adjustment costs were lower, adjustments would be made smoothly, and the large discontinuities associated with crises would not occur. This was one of the arguments used for moving from fixed to flexible exchange rate systems: fixed exchange rate systems result in cumulative disparities between the official exchange rate and the “shadow” exchange rate, what the exchange rate would have been in a free market; adjustment must eventually occur, but the large adjustment that then occurs has far greater consequences than those that would have emerged from a series of smaller adjustments. (Interestingly, moving to a flexible exchange rate system has not eliminated currency crises; if anything, they have become even more frequent. The destabilizing effects of untethered expectations, generating volatile short term capital flows, seems to overwhelm the adverse effects of discrete adjustment.)

Similar discontinuities in behavior arise when markets or government suddenly realize that some constraint (the ability to borrow, the ability to repay, the ability to support the currency, the ability to continue to grow without hitting some resource limitation) will be binding, unless some large change in behavior occurs.

The discussion above focuses on large discontinuities in behavior that can arise even in the presence of the continuous movement in (physical) state variables *even in the presence of rational expectations*.<sup>18</sup> But there is overwhelming evidence that expectations are often not rational; it is hard to reconcile, for instance, behavior in the run up to the Great Recession with rational expectations. To be sure, as one would have expected, some market participants (e.g. investment bankers and hedge fund speculators) profitably exploited some of the irrationalities evidenced by other market participants, but hardly to the point of “correcting” the market.<sup>19</sup> Still, large numbers of individuals bought houses on the irrational belief that the housing bubble would continue, investors bought mortgages on the irrational belief that borrowers would and could repay the mortgages—in part because they too believed that the bubble would continue; and regulators lowered lending standards, even as the bubble’s momentum gained force, again on the irrational belief that there was no bubble (because efficient markets would not tolerate a bubble) and/or that one couldn’t tell that there was a bubble until after it broke (all policy is made under uncertainty, and as housing prices soared, surely a rational regulator would have realized that there was a higher probability that there was a bubble.)<sup>20</sup>

Once one admits the possibility of “irrational” expectations, then of course, it is easy to generate crises, as market participants, acting in a herd like manner, suddenly change their assessments of the future. Often, these reassessments are linked with the limited foresight of market participants—they can see perhaps one or two or at most three years down the road, but have a hard time tracing out longer term dynamics. Thus, the Greek debt had been accumulating gradually. It did not go from suddenly becoming sustainable to being unsustainable (the revelation that it was slightly greater than had previously been thought may have helped precipitate the crisis, but the hidden debt was small, and was undertaken by a previous government, and so said nothing about the likely misbehavior of the government then in power.<sup>21</sup>

There are many other instances in which market participants suddenly realize that a posited path is not dynamically consistent, when it should have been obvious earlier that that was at least likely the case. In the US housing bubble, prices were rising far faster than incomes, so that the share of income that

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<sup>18</sup> Indeed, shocks to trend variables can lead to defaults in models with rational expectations. Even small shocks to trends can generate large changes in the present discounted value of future income. See Aguiar and Gopinath (2006).

<sup>19</sup> It is also true that some of the “bad” behavior was rationally exploiting institutional flaws (e.g. too big to fail banks have an incentive to engage in excessive risk taking), and some was a result of inherent market flaws arising out of imperfect and asymmetric information (e.g. deficiencies in corporate governance leading to “incentive” structures designed to encourage excessive risk taking.) Because most crises involve a combination of irrational expectations and rational exploitation of institutional flaws, it is not possible (or even meaningful) to parse out the relative contribution of each. In principle, we could have a crisis fed solely, say, by rational expectations exploiting institutional deficiencies.

<sup>20</sup> Irrationalities were evidence not only in the size of the mortgages, but also in their form, in the rating agencies’ ignoring the risk of correlated defaults and that the new forms of mortgages might have significantly higher default rates than traditional mortgages, in investors ignoring the perverse incentives of those originating mortgages, those packaging them, and the rating agencies, etc. See Stiglitz 2010.

<sup>21</sup> If anything, the fact that the government was willing to be so transparent should have been reassuring to the market.

would have to be spent on housing would almost surely increase, and would have to continue to increase if the bubble was to be sustained. But the demand for housing was sustained because of the high expected capital gains. Once it became clear that housing prices couldn't continue to grow at the high rate that they had, the demand for housing would fall, and housing prices risked coming down. The moment that this was commonly recognized, the bubble would break. Even acknowledging this fact says nothing about when the bubble would break. If large numbers believed that they were smarter than others, then they could believe that they could stay in the market until just before the bubble broke, earning excess returns in the interim. It was, of course, irrational for most market participants to believe that they were smarter than "average."

Many of the circumstances in which bubbles have burst or in which a seeming persistent "disequilibrium" has finally unraveled are associated with large market participants suddenly realizing that a constraint to which they had paid insufficient attention is about to bind in the not too distant future—for instance, an overvalued exchange rate cannot be sustained, once foreign exchange reserves are exhausted, growth cannot continue at a rate greater than the increase in potential output (supply), once resources are fully utilized.

To be sure that one is not on an unsustainable path, one actually has to foresee *infinitely* far into the future. There can be paths that are dynamically efficient over any finite span of time but do not converge to the steady state equilibrium. (Hahn, 1966, Shell-Stiglitz, 1967) Standard equilibrium theory assumes markets exist infinitely far into the future—or that individuals behave as if there were such markets.

In short, there are a number of circumstances in which the dynamics of the economy appear to change discretely. There can be crises. But these models are typically markedly different from the models that have dominated macro-economic analysis in recent years (the DSGE models).

#### *Stable and unstable adjustments*

When an economy is disturbed from (say its full employment) equilibrium, there is a further question, are the underlying economic forces such that it will (quickly) return. Standard economic analysis focuses on equilibrium. It is assumed that somehow, all individuals can figure out precisely what needs to be done to restore the economy to the presumed equilibrium path. Of course, if there were a Central Planner calling off prices, he could iterate until he found the equilibrium, at which point the economy could proceed. But there is no central planner, price adjustments occur in real time, are made separately by millions of price setters in the economy, and there is little theory to suggest that the way they set prices will converge quickly to the equilibrium. Out of equilibrium trades have balance sheet effects, and themselves affect the future evolution of the economy.

A closer look at the behavior of market processes suggests that often, the dynamics are disequilibrating, that is, the initial response to some disturbances is to move the economy further away from equilibrium. Thus, consider what happens when an adverse shock to aggregate demand leads to unemployment. Higher unemployment puts downward pressure on real wages, shifts the distribution of income towards

profits, and if the share of profits that are consumed is lower than that of wages, this lowers aggregate demand further.<sup>22</sup> Accelerator effects (on investment) reinforce these consequences. Unemployment increases still further. Thus, the decentralized market response to the deficiency in aggregate demand is to increase it further.

Interestingly, making markets more flexible may exacerbate the disequilibrating dynamics. If wages fall faster, then the distribution of income changes more adversely against workers, and aggregate demand falls further. Thus “improvements” in markets that have led to more labor market flexibility may have exacerbated market instability.

Many of the other so-called market reforms have both exposed countries to more shocks and weakened the automatic stabilizers—capital and financial market liberalization and tariffication have enhanced the potential for external shocks to disturb domestic markets; and the move from defined benefit to defined contribution pension programs, the greater reliance on capital adequacy standards, rigidly enforced, and on simplistic rules, like balanced budget frameworks for governments, have weakened automatic stabilizers and sometimes replaced them with automatic destabilizers.

Regimes for exchange rate adjustments reflect an ongoing debate on the relationship between market flexibility and dynamic stability. As we noted, the fixed exchange rate systems of the past were viewed as introducing a rigidity in adjustment, which led to crises: they made adjustment costly, so that adjustments occurred only when the official exchange rate differed markedly from that which would have prevailed in the absence of government intervention would an adjustment occur. The resulting adjustments, when they occurred, were large, precipitating a “crisis.” The hope was that moving to flexible exchange rates would enable adjustments to occur smoothly, so there would be no crisis. What has happened in the forty years since the abandonment of the fixed exchange rate system (especially the last thirty years) has shown that that hope was misplaced. There continue to be crises, marked by sudden changes in exchange rates and/or changes in prices in financial markets with concomitant large changes in the level of economic activity.

In response to some of the earlier crises, advocates of flexible exchange rates blamed governments from interfering in markets, trying to maintain a quasi-peg. It was government, again, not markets, that were the problem. But there were two things wrong with that conclusion. First, and most importantly, crises (or at least sudden and marked changes in exchange rates or the prices of assets) occurred in countries where governments did not intervene. Secondly, it was clear that markets before the crises had underestimated the risk of these crises, and the resulting mispricing (e.g. of risk) had contributed to the magnitude of the crisis. The fact that, say, in the run-up to the euro crisis, markets had lent so much money on such favorable terms to Spanish borrowers (including Spanish banks) simply because it was

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<sup>22</sup> The standard objection to the investment accelerator is that if rational individuals had anticipated the decline in output, they would not have made the investments in earlier periods. The investment accelerator, in this view, depends on irrational expectations. But the discussion above should have made it clear that if there is uncertainty in the growth path of the economy (either because of exogenous shock or endogenous) then it is possible that firms could have rationally over-invested, that is, there were other possible trajectories (conceivable, even plausible at the time at which the investments were made, which would have justified these investments.)

part of the euro and on the presumption that therefore the debts could and would be repaid contributed to the real estate bubble in that country. There was no way of absolving markets of their failed judgments in helping create many of the crises around the world.<sup>23</sup>

Let me relate the discussion of the past few paragraphs to the earlier discussion, which focused on a typology of equilibrium models. That discussion was couched in terms of the usual non-stochastic dynamics. I didn't discuss, say, within the context of a model with a unique equilibrium whether the convergence to that equilibrium would be monotonic or fast. In some cases, it may not be. There can even be limit cycles, where the economy does not converge to a stationary state.

With stochastic processes, it should be clear that when there are multiple equilibria without stochastic elements, then the stochastic shocks could move the economy from an orbit of attraction from one equilibrium to that of another. Even small shocks could have large consequences, both in the short run and the long.<sup>24</sup>

Moreover, large disturbances in more complex dynamic processes may entail complex processes of restoration of the original equilibrium—or a move to a new equilibrium. Thus, consider the proposition made earlier that consistent with any level of leverage, there is a full employment equilibrium. Leverage only affects the distribution of income. But at a given set of wages and prices, high leverage does depress consumption, lowering aggregate demand—including demand for housing. If that happens, the adverse real balance sheet affects weaken consumption (and aggregate demand) further. Since the cost of housing includes the capital loss (gain), expectations of further losses (smaller gains) lowers demand further. That there may be a configuration of prices and wages at which full employment is attained even with the existing level of debt is irrelevant: the short run dynamics of the economy has the economy in a downward spiral.<sup>25</sup>

#### *An important exception*

As I have noted, standard competitive equilibrium theory says that corresponding to any initial set of endowments there exists a sets of wages and prices (extending infinitely far into the future) such that all markets clear, i.e. the demand for labor equals the supply of labor every period. There is full employment. So far, our attention has been focused on adjustment—on the possibility that the decentralized dynamics of a market economy do not lead to that equilibrium, or at least don't do so quickly. But there is another possibility.<sup>26</sup> There do not exist markets today for goods and labor at future dates (in a variety of states of nature). Behavior today is affected by expectations of the prices (wages, interest rates) that will prevail in the future. Those expectations themselves may not be market

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<sup>23</sup> In *Globalization and Its Discontents* (2002), I describe similar irrationalities at play in the East Asia crisis.

<sup>24</sup> Thus, as noted earlier in footnote 7, a shock could move the economy from a situation where a credit constraint was not binding to one where it was, from a situation where it could roll over its debt (and therefore did not face a credit crisis), to one where it cannot roll over its debt.

<sup>25</sup> That dynamics of adjustment could be disequilibrating has long been recognized. See, e.g. Neary and Stiglitz 1982

<sup>26</sup> Beyond that which arises from other market imperfections, such as those associated with imperfect and asymmetric information, which can give rise to non-market clearing equilibrium.

clearing. That is, even if there existed a future path of actual prices (including wages) at which markets would clear at all dates, there can also exist a path of expected prices (which may or may not be realized) at which markets don't clear. And the way that individuals form their beliefs may be such that the path of expectations which would have resulted in markets clearing (i.e. full employment in every period) cannot be attained.

(It should be obvious that it would not have been rational for individuals to have assumed that the economy, in 2008, would quickly be restored to full employment. So, in a sense, it should be obvious that strictures of rational expectations cannot rule out these non-market clearing equilibrium. (See also Neary and Stiglitz, 1983). )

Thus, if individuals, seeing a fall in prices, anticipate that there will be further declines, and on the basis of that decide to postpone buying durables (including housing), price declines will not result in the hoped for increase in consumption and aggregate demand. Again, the natural dynamics could lead the economy further away from the full employment equilibrium.

#### *Asset prices, divergent expectations, and crises*

The fact that there can be sudden changes in expectations (whether rational or not) about the future means that there can be sudden changes in asset values, and that itself can lead to (reinforcing) sudden changes in behavior. This is especially so in the presence of financial constraints, where the envelope theorem no longer holds. That is, in the absence of such constraints, an individual optimizes, given his endowment, and a small change in endowment leads to a small change in behavior. But with binding financial constraints, a small change in asset values (say in the value that an individual can put up as collateral against a loan) leads to a first order change in behavior.

In fact, history is replete with examples of credit and other bubbles that were almost surely irrational. Behavior was based on the belief that these bubbles would continue, in a way that was surely virtually impossible. So too, market participants did not well understand the implications of certain financial products or rules of the game<sup>27</sup>, and while "rationality" might not entail perfect understandings, the disparity between the world as they saw it, and the world as they should have seen it, makes clear that it is incredulous to dignify such beliefs as "rational."

For instance, consider the variable-rate mortgages that became fashionable in the run up to the subprime mortgage crisis. A supposed financial expert, Alan Greenspan, seemingly advised borrowers on the advantages of these mortgages, noting that had they taken out these mortgages say a decade earlier, they would have fared far better than they would have with fixed rate mortgages.<sup>28</sup> There were two things that were striking by this advice (cautioned, as it was by the observation that what happened in the past is not assured about the future.) First, if markets were based on rational expectations (and

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<sup>27</sup> That is certainly the case for many of the mortgage products and structured financial products that were sold in the years prior to the 2008 crisis. See, e.g. Stiglitz [2010].

<sup>28</sup> See Alan Greenspan, "Understanding Household Debt Obligations," remarks at the Credit Union National Association 2004 Governmental Affairs Conference, Washington, DC, February 23, 2004, available at <http://www.federalreserve.gov/boarddocs/speeches/2004/20040223/default.htm>.

ironically, Greenspan was among those who believed markets functioned well), then the expected cost of a variable and fixed rate mortgage should differ little; the only difference was the pattern of risk, and that was much worse (for the typical homeowner) with a variable rate mortgage. Secondly, the main reason that variable rate mortgages had done better during the previous decade was that Greenspan had lowered rates in an unprecedented manner, in a way that could not have been built into expectations and market prices at the time the mortgages would have been taken out. With interest rates at record lows, the likelihood of them falling further was small, the risk that they might rise (as they did) considerable.

I dwell on this example not to berate the chairman of the Fed, but to emphasize that if seemingly sophisticated financial experts could get things so wrong, what should we expect from ordinary mortals? We should not be surprised if they have beliefs that are suddenly disproved by a turn of events, and that, when that happens, they suddenly change behavior. And sometimes that sudden change in behavior induces a crisis. That is the story of the euro crisis, which is the focus of the second part of this essay.

#### *Debt, debt restructuring, and equilibrium dynamics*

But before turning to the euro crisis, there is one general application of the principles laid out in the previous sections that needs to be discussed, related to the problem of debt overhang. As we noted, debt simply represents a claim on resources; it should affect the distribution of the “pie,” not the size of the pie. Well-functioning markets should enable the economy to continue to operate at full employment.

It is worth asking, then, what the putative equilibrium might look like. Ignoring, for the moment, the relatively small changes in aggregate demand that might result from changes in labor supply as a result of changes in wages and prices, the question then is, how can aggregate demand be restored to the level of aggregate supply. One possible answer is that there be a redistribution from those with low marginal propensities to consume to those with a higher marginal propensity to consume. That might be accomplished by a marked increase in wages, a movement in wages the opposite of what normally happens in an economic downturn, and hard to reconcile with an “equilibrium” theory in which real wages are equal to the marginal productivity of labor; for so long as output is approximately the same (as before the crisis), the marginal productivity of labor will be (approximately) the same. (Of course, if the distribution of income is affected by the extent of successful rent seeking, then the distribution of income can be changed, but that will require political action.)

Another possible answer is an increase in wages and prices, for with debt contracts not being indexed, large increases in prices reduce the value of the debt owed by the (mostly poor) debtors to the (mostly rich) creditors. The redistribution (of wealth) should result in an increase in current consumption. It would amount to the deleveraging that is often called in the current economic downturn. But achieving this may not be easy. Standard equilibrium theory identifies the set of wages and prices such that all markets (include that for labor) clears; but typically, no reference is made to *past* prices. History matters only with respect to the stocks of inherited assets. But to go from the pre-crisis equilibrium,

where demand was supported by a (possibly irrational) bubble, to the post-crisis equilibrium requires a large and dramatic change in price levels.

There are two problems: First, it is hard for this to be achieved in a setting of decentralized price and wage setting. Indeed, in that context, economic forces move the economy in the opposite direction: there is a tendency for prices and wages to fall, increasing the debt burden, and decreasing aggregate demand.

Secondly, government (and especially monetary authorities) won't allow it. If prices should somehow jump in the way that would be required, they would worry that inflationary expectations would be set into play. Moreover, there is the question of whether prices could increase to the requisite level without accommodating monetary policy.

The issue of inflationary expectations is more complicated than sometimes put. For expectations are always conditional, that is, dependent on circumstances. Crises happen rarely. Even if individuals believed that, on the basis of this one experience in which in a crisis government allowed a sudden increase in the level of prices, that in the future it might do so again, it would neither mean that there would be inflationary expectations going forward (they could and should rationally expect that this was a one-time adjustment in the price level, to obliterate the debt that was holding down the economy) or that there would be inflation in non-crises periods. And given the rarity of crises, it would not mean that individuals' willingness to hold money would be significantly affected. (There are a host of experiences in which such one-time adjustments have occurred without affecting future behavior, at least in out-of-crisis periods. It is not even necessarily rational for them to believe that in future crises, the economy would respond in a similar way. Not only is the economic structure likely to be markedly different—normally, long time spans separate crises—but the government is likely to have changed, and even thinking about how the government should respond to crises is likely to have changed.)

By the same token, the fact that the once-and-for-all increase in the price level will have largely obliterated the value of the debts implies that individuals would not be willing to lend. For all lenders recognize that there is a risk of loss, a greater risk of loss with some loans than others (reflected in different risk premia.) After crises in which significant capital losses have been incurred, individuals return to lending—and indeed, even countries which have defaulted on their debts typically return to the capital market in a relatively short period of time.<sup>29</sup>

In a sense, after any crisis *someone* risks a major loss in the value of a key asset. The question is who, and how the loss occurs. In the current process, in which the economy remains in a severe downturn for a prolonged period, it is owners of human capital that experience large losses. In the East Asia crisis, in Korea, for instance, there were large numbers of bankruptcies. Equity values got wiped out, and creditors took considerable losses. The large change in expectations necessarily leads, as we noted, to large changes in capital values. But the failure either to adjust prices or to restructure debts imposes *additional* dead weight losses resulting from the underutilization of resources, as a consequence of deficiencies in adequate demand.

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<sup>29</sup> See e.g. Borensztein and Panizza (2008).

There is an alternative way of restoring the economy to full employment, one not well-discussed in the context of the conventional competitive general equilibrium model, where bankruptcy plays no role. At different prices (and wages) some individuals are unable to meet their debt obligations, and there is, under bankruptcy law, a change in debt obligations and ownership claims. Different legal frameworks have different distributive consequences—and therefore different consequences for aggregate demand at a particular moment in time. Thus, if I can fully discharge my debt if my current income is less than my current debt obligations, there can be a large transfer of wealth from my creditors to myself, allowing me to increase my consumption today, and leading them by the same token to reduce their consumption.<sup>30</sup> But if my marginal propensity to consume is much larger than theirs, aggregate consumption will increase. Clearly, consumption today (and aggregate demand) will be different with a different legal frame, for instance, one in which student debt can never be discharged.<sup>31</sup>

#### *Further mitigation of the adverse effects of debt crises*

We argued earlier that the real costs of a crisis often occur after the event (after the breaking of the bubble, or after the adjustment of the exchange rate), in the persistent underutilization of resources. Thus, policies directed at returning the economy to full employment are likely to greatly mitigate the cost of the crisis. The previous paragraph described how a well-designed bankruptcy law, quickly enforced, could help do so.

But crises eviscerate bank balance sheets, which impair lending, thereby weakening the economy. (This is true both when a credit bubble bursts, or when exchange rates fall, and debtors have foreign denominated liabilities.) As Greenwald and Stiglitz [2003] have emphasized, there is specialized information, e.g. about particular borrowers, embedded in banks. When banks go bankrupt, there can be large costs associated with the resulting loss of institutional knowledge; but even short of bankruptcy, if banks' balance sheets are weakened, lending will be constricted, in a way that cannot easily be compensated for, either by expanded lending by healthy banks or through capital markets (because of the important, pervasive information asymmetries.)

What is required then is the recapitalization of the banking system. Unfortunately, in the midst of a crisis, banks may neither be willing or able to do so. If they can get access to finance, especially equity, it may be at such disadvantageous terms that the owners of the banks are reluctant to take it. Access to liquidity—government lending—helps only a little; the problem is that with a shrunken balance sheet (equity), they are unwilling to undertake risky lending. Preferred shares are little different.

Typically, governments have succeeded in recapitalizing banks through a variety of non-transparent mechanisms. Regulations suppressing deposit rates allows them to earn a spread between the lending rate and the artificially low deposit rate. Government (reserve bank) lending at low interest rates (close to zero in the recent crisis), while allowing or encouraging banks to take that money and invest it in

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<sup>30</sup> The two may not be fully offsetting: without the bankruptcy, the creditor might in the end have been paid at most a fraction of what was owed. Indeed, because of the macro-economic benefits, these redistributions may even be Pareto improving.

<sup>31</sup> In the midst of a crisis, there may be a need for an expedited debt restructuring, on a scale beyond that envisaged in normal bankruptcy law, though a “super chapter 11.” See Miller and Stiglitz 2010 and Stiglitz 2000.

higher yielding (government) assets is nothing more than a gift: it takes no genius to borrow at ¼%, lend to the government at 3% to 7%, and make a tidy profit.

It is understandable that there are strong political objections to these non-transparent redistributions to the banks, especially in the current context, where they are widely believed to have played a central role in causing the crisis and in exploitation. “Forced” recapitalization—a form of partial nationalization, where the banks are forced to take government equity—may be an effective way of inducing more lending, even if the banks managers continue to act in the interest of the private shareholders. For the risks that they face (include the risk of bankruptcy) has been reduced.<sup>32</sup>

For a sovereign facing a debt crisis, a major problem is the deficiency of aggregate demand that arises from the transfer of funds to service the debt. While (again), there should be some configuration of wages and prices (and/or other policies) that would succeed in sustaining full employment, achieving that may not be easy. Debt restructuring (partially reneging on the debt) is an alternative, just as it is with private debt. But unfortunately, there is no sovereign debt bankruptcy “law,” no sovereign debt restructuring mechanism. The result is that such restructuring, even when the discharge of the debt provides room for more expansionary policies to restore the economy to full employment, often appear highly risky.

There has been an extensive debate about the costs of such restructuring. Traditional models (Eaton and Gersovitz, 1981; Eaton, Gersovitz, and Stiglitz, 1986) have emphasized the cost of losing access to credit. But more recent literature has questioned both theoretically and empirically whether that actually occurs, and if so, the costs.<sup>33</sup> Rather, it appears that the costs are often associated with the failure to adequately insulate domestic institutions from the consequences of the debt default, i.e. domestic banks that have large holdings of government debt may become bankrupt, or sufficiently weakened that they are forced to curtail lending. But much of these costs are avoidable, if the government anticipates them and takes countervailing actions, such as by recapitalizing the banks, as described above.

Of course, creditors have every reason to scare debtor countries into believing that there will be strong adverse effects, effects which will be greater the greater the magnitude of the debt restructuring. This is true even if prior to the crisis they had earned large excess returns, reflecting a risk that such a default might occur.

Argentina has shown that there can be “life after debt,” life after a large economic crisis, associated with a significant financial and currency crisis and a large debt restructuring. The debt and high exchange rate had imposed a huge cost on the economy in the years before the crisis. The dramatic adjustment in prices (exchange rates) and debt restructuring enabled the economy to return to robust growth, with much lower unemployment than in the years preceding the crisis, with the government in a much

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<sup>32</sup> There are other mechanisms, such as partial insurance of new lending, or even better, the sale of macro-indexed Arrow Debreu securities, where the bank is indemnified if the overall economy’s economic performance is weak, resulting in a default rate that is higher than it otherwise would have been.

<sup>33</sup> See, e.g. Stiglitz (2010b) and the other papers in this volume.

stronger fiscal position, the current account restored to a sustainable position. No government—and especially a newly installed government—can fully plan for a crisis of the magnitude of that in Argentina. But what is clear is that they managed to “solve” in a reasonable way the host of distributional and other issues that had to be addressed in the process of the devaluation and debt restructuring.

One might argue that the overall costs would have been reduced had Argentine restructured and devalued earlier.<sup>34</sup> It is understandable why governments—fearful of the consequences including the political consequences for their own fortunes—hesitate. A more orderly restructuring process, through a sovereign debt restructuring mechanism, would reduce those fears, and hence the overall costs.

Those in the financial market, by contrast, often seem to want to increase those costs. They worry that if default (bankruptcy, sovereign debt restructuring) is too easy, there will be an increase in defaults. That would necessitate an increase in interest rates. And that would reduce borrowing. But as Jeanne and Korinek have shown (2012), there are macro-economic externalities that arise from borrowing in foreign exchange. Markets by themselves are likely to lead to excessive borrowing. Surely the benefits to Argentina of its excessive borrowing in the 90s was overshadowed by the costs it subsequently bore. Similarly for Latin America in the 70s. Arguably, then, the new equilibrium which would emerge—less borrowing, fewer debt crises, greater economic stability, would be preferable to the current system marked by repeated crises and a high level of instability.

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<sup>34</sup> Orzag and Stiglitz [ 2002 ] discuss the optimal time to call the fire department—that is, the optimal time to ask for assistance (a bailout) or to restructure.

## II. The Fundamental Flaws in the Eurozone Framework

The euro was a political project, conceived to help bring the countries of Europe together. It was widely recognized at the time that Europe was not an optimal currency area.<sup>35</sup> Labor mobility was limited, the countries' economies experienced different shocks, and there were different long term productivity trends. While it was a political project, the politics was not strong enough to create the economic institutions that might have given the euro a fair chance of success. The hope was that over time, that would happen. But of course, when things were going well, there was little impetus to "complete" the project, and when a crisis finally occurred (with the global Recession that began in the United States in 2008) it was hard to think through carefully what should be done to ensure the success of the euro.

I and others who supported the concept of European integration hoped that when Greece went into crisis, in January, 2010, decisive measures would be taken that would demonstrate that the European leaders at least understood that further actions would be needed to enable the euro to survive. That did not happen, and quickly, a project designed to bring Europe together became a source of divisiveness. Germans talked about Europe not being a transfer union—a euphemistic and seemingly principled way of saying that they were uninterested in helping their partners, as they reminded everyone of how they had paid so much for the reunification of Germany. Not surprisingly, others talked about the high price they had paid in World War II. Selective memories played out, as Germans talked about the dangers of high inflation; but was it inflation or high unemployment that had brought on the political events that followed?

Greece was castigated for its high debts and deficits, and it was natural to blame the crisis on excessive profligacy, but again there was selective memory: Spain and Ireland had low debt to GDP ratios and a fiscal surplus in the years before the crisis. No one could blame the crisis that these countries faced on fiscal profligacy. It was thus clear that Germany's prescription, that what was required were stronger and more effectively enforced fiscal constraints, would not prevent a recurrence of crisis, and there was good reason to believe that stronger constraints—*austerity*-- would make the current crisis worse. Indeed, by so manifestly showing that Europe's leaders did not understand the fundamentals underlying the crisis--or if they did, by manifesting such enormous resistance to undertaking the necessary reforms *in the European framework*--they almost surely contributed to the markets' lack of confidence, helping to explain why each of the so called rescue measures were only temporary palliatives.

In the remainder of this section, I describe several of the underlying *structural* properties of the euro zone that, if they do not make crises inevitable, certainly make them likely. (What is required is not so much the structural adjustment of the individual countries, but the structural adjustment of the euro framework.) Many of these were rules that reflected the neo-classical model, with the associated neo-liberal policy prescriptions, that were fashionable (in some circles) at the time of the creation of the euro. Europe made two fundamental mistakes: first, it enshrined in its "constitution" these fads and fashions, the concerns of the time, without providing enough flexibility in responding to changing

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<sup>35</sup> See Mundell (1961).

circumstances and understandings. And secondly, even at the time, the limits of the neoclassical model had been widely exposed—the problems posed, for instance, by imperfect competition, information, and markets to which I alluded earlier. The neoclassical model failed to recognize the many market failures that require government intervention, or in which government intervention would improve the performance of the economy. Thus, most importantly from a macro-economic perspective, there was the belief that so long as the government maintained a stable macro-economy—typically interpreted as maintaining price stability—overall economic performance would be assured. By the same token, if the government kept budgets in line (kept deficits and debts within the limit set by Maastricht Convention) the economies would “converge,” so that the single currency system would work. The founders of the euro-zone seemed to think that these budgetary/macro-conditions were necessary and essentially sufficient for the countries to converge, i.e. to have sufficient “similarity” that a common currency would work. They were wrong. The founders of the euro zone were also focused on government failure, not market failure, and thus they circumscribed governments, setting the stage for the market failures that would bring on the euro-crisis.

Much of the framework built into the eurozone would have enhanced efficiency, *if Europe had gotten the details right and if the neoclassical model were correct*. But the devil is in the detail, and some of the provisions, even within the neo-liberal framework, led to inefficiency and instability.

*Free mobility of factors without a common debt leads to inefficient and unstable allocation of factors.* The principle of free mobility is to ensure that factors move to where (marginal) returns are highest, and if factor prices are equal to marginal productivity, that should happen. But what individuals care about, for instance, is the after tax returns to labor, and this depends not only on the marginal productivity of labor (in the neoclassical model) but also on taxes and the provision of public goods. Taxes, in turn, depend in part on the burden imposed by *inherited debt*. Thus, with Ireland, Greece, and Spain facing high levels of inherited debt (and especially so, because that debt did not increase to its current levels as a result of investments in education, technology, or infrastructure, i.e. through the acquisition of assets, but as a result of financial and macro-economic mismanagement (in the case of Greece and Ireland) or as a result of a crisis that was not of their own making (in the case of Spain.) This implies migration away from these highly indebted countries to those with less indebtedness, even when marginal productivities are the same; and the more individuals move out, the greater the “equilibrium” tax burden on the remainder, accelerating the movement of labor away from an efficient allocation.<sup>36</sup> (Of course, in the short run, migration may have positive benefits to the crisis country, both because it reduces the burden of unemployment insurance, and as the remittances back home provide enhanced domestic purchasing power. Whether in the short run these “benefits” to migration outweigh the adverse effects noted above is an empirical question. The migration also hides the severity of the

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<sup>36</sup> Interestingly, this problem has long been recognized in the theory of fiscal federalism/local public goods. See, e.g. Stiglitz [1977, 1983a, 1983b]

underlying downturn, since it means that the unemployment rate is less, possibly far less, than it otherwise would be.)<sup>37</sup>

*Free mobility of capital and goods without tax harmonization can lead to an inefficient allocation of capital and/or reduce the potential for redistributive taxation, leading to high levels of after-tax and transfer inequality.* Competition among jurisdictions can be healthy, but there can also be a race to the bottom. Capital goes to the jurisdiction which taxes it at the lowest rate, not where its marginal productivity is the highest. To compete, other jurisdictions must lower the taxes they impose on capital, and since capital is more unequally distributed than labor, this reduces the scope for redistributive taxation. (A similar argument goes for the allocation of skilled labor.) Inequality, it is increasingly recognized, is not just a moral issue: it affects the performance of the economy in numerous ways. (Stiglitz, 2012)

*Free migration might result in politically unacceptable patterns of location of economic activity.* The general theory of migration/local public goods has shown that decentralized patterns of migration may well result in inefficient and socially desirable patterns of location of economic activity and concentrations of population. There can be congestion and agglomeration externalities (both positive and negative) that arise from free migration. That is why many countries have an explicit policy for regional development, attempting to offset the inefficient and/or socially unacceptable patterns emerging from unfettered markets.

In the context of Europe, free migration (especially that arising from debt obligations inherited from the past) may result in a depopulation not only of certain regions within countries but of certain countries. One of the important adjustment mechanisms in the United States (which shares a common currency) is migration; and if such migration leads to the depopulation of an entire state, there is limited concern.<sup>38</sup> But Greece or Ireland are, and should be, concerned about the depopulation of their countries.

*The single market principle for financial institutions and capital too can lead to a regulatory race to the bottom, with at least some of the costs of the failures borne by other jurisdictions.* The failure of a financial institution imposes costs on others (evidenced so clearly in the crisis of 2008), and governments will not typically take into account these cross-border costs. That is why either there has to be regulation by the host country (Stiglitz *et al* 2010), or there has to be strong regulation at the European level.

*Worse still, confidence in any country's banking system rests partially in the confidence of the ability and willingness of the bank's government to bail it out (and/or to the existence of institutional frameworks that reduce the likelihood that a bail out will be necessary, that there are funds set aside should a bailout be necessary, and that there are procedures in place to ensure that depositors will be made whole.)* Typically, there is an implicit subsidy, from which banks in jurisdictions with governments with greater bail-out capacity benefit. Thus, money flowed into the United States after the 2008 global crisis, which

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<sup>37</sup> By the same token, if some of the burden of taxation is imposed on capital, it will induce capital to move out of the country.

<sup>38</sup> Some see an advantage: buying influence over that country's senators because less expensive.

failures in the United States had brought about, simply because there was more confidence that the United States had the willingness and ability to bail-out its banks. Similarly, today in Europe: what Spaniard or Greek would rationally keep his money in a local bank, when there is (almost) equal convenience and greater safety in putting it in a German bank?<sup>39</sup> Only by paying much higher interest rates can banks in those countries compete, but that puts them at a competitive disadvantage; and the increase in interest rate required may be too great—the bank would quickly appear to be non-viable. What happens typically is capital flight (or, in the current case, what has been described as a capital jog: the surprise is not that capital is leaving, but that it is not leaving faster.) But that sets in motion a downward spiral: as capital leaves, the country's banks restrict lending, the economy weakens, the perceived ability of the country to bail out its banks weakens, and capital is further incentivized to leave.

There are two more fallacies that are related to the current (and inevitable) failures of the Eurozone. The first is the belief that there are natural forces for convergence in productivity, without government intervention. There can be increasing returns (reflected in clustering), the consequence of which is that countries with technological advantages maintain those advantages, unless there are countervailing forces brought about by government (industrial) policies. But European competition laws prevented, or at least inhibited, such policies.<sup>40</sup>

The second is the belief that necessary, and almost sufficient, for good macro-economic performance is that the monetary authorities maintain low and stable inflation. This led to the mandate of the European Central Bank to focus on inflation, in contrast to that of the Federal Reserve, whose mandate includes growth, employment, and (now) financial stability. The contrasting mandates can lead to an especially counterproductive response to a crisis, especially one which is accompanied by cost-push inflation arising from high energy or food prices. While the Fed lowered interest rates in response to the crisis, the continuing inflationary concerns in Europe did not lead to matching reductions there. The consequence was an appreciating euro, with adverse effects on European output. Had the ECB taken actions to lower the euro, it would have stimulated the economy, partially offsetting the effects of austerity. As it was, it allowed the US to engage in competitive devaluation against it.

It also meant that the ECB (and central banks within each of the member countries) studiously avoided doing anything about the real estate bubbles that were mounting in several of the countries. This was in spite of the fact that the East Asia crisis had shown that private sector misconduct—not that of government—could lead to an economic crisis. Europe similarly paid no attention to mounting current account balances in several of the countries.

Ex post, many policy makers admit that it was a mistake to ignore these current account imbalances or financial market excesses. But the underlying ideology then (and still) provides no framework for

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<sup>39</sup> The exit from Spanish banks while significant—and leading to a credit crunch—has been slower than some had anticipated. This in turn is a consequence of institutional and market imperfections (e.g. rules about knowing your customer, designed to limit money laundering), which interestingly the neo-classical model underlying much of Europe's policy agenda ignored. There is far less of a single market than it is widely thought.

<sup>40</sup> Even the World Bank has changed its views on industrial policies; yet views about industrial policies are to a large extent enshrined in the Eurozone's basic economic framework. See Lin (2012), Stiglitz and Lin (2013), and Stiglitz, Lin, and Patel (2013).

identifying good “imbalances,” when capital is flowing into the country because markets have rationally identified good investment opportunities, and those that are attributable to market excesses.

### *The immediate problem*

The most immediate problem facing the Eurozone is that creating a single currency took away two of the critical adjustment mechanisms (interest rates and exchange rates) and didn't put anything in their place. The United States has an economic framework that deals with most of the problems described earlier: two thirds of all government expenditures occur at the national level, and the states are restricted (by their own constitutions) from incurring debt, other than for capital projects.<sup>41</sup> Most banks rely on federal deposit insurance. States are not restricted from engaging in “industrial policies,” and poorer states have actively recruited firms to locate in their jurisdictions.<sup>42</sup>

Some hoped that internal devaluation would serve as an effective substitute, i.e. domestic wages and prices would fall. But there are three fundamental problems with this solution: (a) it is hard to coordinate such decreases, and in the absence of such coordination, there can be large and costly changes in relative prices; (b) because debt is denominated in euros, and is not contingent on domestic wages and prices, debt burdens increase—with adverse consequences for bankruptcy and disruption of the domestic financial system; (c) the decrease in collateral values and incomes (especially relative to debts) would have tightened financial constraints, with first order adverse effects on the economy. Most importantly, if internal devaluation were an effective substitute for nominal devaluations, then the gold standard would not have been an impediment to adjusting to the disturbances surrounding the Great Depression; it would not have been the case that those countries that abandoned the gold standard earlier would have done better. In the case of Argentina, prices did fall, but not enough—again, an internal devaluation is not substitute for exchange rate adjustment.

Europe has responded to the crisis by refusing to recognize that there were any fundamental problems structural problems to the EU arrangements. Like the IMF and the US Treasury in so many other crises (including the 2008 crisis), it initially saw the problem as a liquidity crisis, a temporary loss of confidence; if the IMF, ECB and the Commission showed that they stood behind each of the countries, confidence would be restored, and the crisis resolved. All that was required was a temporary injection of funds (a loan to the bank or the country.) But of course, such loans don't improve the balance sheet of the country (or the bank), and if the problems are more fundamental, then they can have adverse effects on other claimants, especially if the bailouts are senior to other creditors and even more so if a high interest rate is charged. That's why the East Asian bailouts and the Argentinean bailouts had little discernible effect. It is not surprising that neither did the European bailouts; it is only surprising that Europe's leaders too so long to recognize this.

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<sup>41</sup> These constitutional requirements have, in recent years, been subverted by the creation of unfunded pension liabilities, which may create within the States some of the same adverse dynamics described earlier for Europe.

<sup>42</sup> Though this has created, to some extent, the race to the bottom, the adverse dynamic that we described as characterizing Europe.

Later, the ECB lent money to the banks, to lend to the governments, to help support bond prices (lower sovereign yields), in the LTRO program. Because the money lent to the banks was lent at close to zero interest rate, and the banks could on lend the money at much higher interest rates, this program was in effect a massive gift to European banks. The fact that European officials looked at the take-up of the program as a measure of “success” (as well as the *temporary* reduction in sovereign risk premiums) was perhaps symptomatic of a lack of understanding of the underlying problems. To be sure, there were real effects from the hidden recapitalization of the banks. But the effects on sovereign risk premiums were temporary: only coercion would induce them to permanently put a disproportionately large fraction of their balance sheet in these highly risky assets.

Indeed, there was something especially peculiar about Europe’s attempt at a bootstrap operation, whereby lending to the government would help bail out the banks, and lending to the banks would help bail out the governments.

But at least this bootstrap attempt didn’t have the adverse effects of austerity: predictably, austerity brought growth down, and as austerity spread throughout Europe, it helped bring on a European wide recession, weakening the banks at the same time that it had disappointing fiscal benefits. As growth slowed and the ranks of the unemployed increased, revenues declined (from what they otherwise would have been) and expenditures (e.g. for unemployment) increased.

European officials who prescribed austerity suggested, when these programs were first adopted,<sup>43</sup> that by now those who adopted their programs would be on the way to restored prosperity.<sup>44</sup> They have been wrong, and repeatedly so. They have repeatedly underestimated the magnitude of the downturn that their policies would bring about, and as a result, they have consistently underestimated the fiscal benefit that would be derived: deeper downturns inevitably result in lower revenues and more expenditures for unemployment and social programs. Though they then try to shift the blame back on to the crisis countries for missing the fiscal targets, the fact is that it is their misdiagnosis of the problem and the resulting wrong prescription that should be held accountable. Spain and Greece are in Depression—there is no other way to describe the situation—and that depression is largely a result of misguided policies foisted on these countries (though their own leaders are to blame, for having acquiesced, but only as seeing, perhaps wrongly, that the proposed “solution” was better than the alternative.)

Today, the problem in Europe is inadequate overall demand. As the downturn continues, banks are less willing to lend, housing prices decline, and households become poorer and poorer, and more uncertain of the future, depressing consumption further. Europe’s problem today is lack of aggregate demand, and austerity exacerbates that problem.

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<sup>43</sup> For example, British Conservative David Cameron in his April 2009 speech, “The Age of Austerity,” expounded on austerity not just as a short-term strategy but as a philosophical shift that would restore the vibrancy of Britain’s economy. Without it, he said, “[W]e risk becoming once again the sick man of Europe. Our recovery will be held back, and our children will be weighed down, by a millstone of debt.” The actual results of austerity in Britain have not lived up to his promises, to say the least.

<sup>44</sup> This section is a revised version of the preface to Stiglitz (2012).

No large economy—and Europe is a large economy—has ever emerge from a crisis at the same time that it has imposed austerity. Austerity always, inevitably, and predictably makes matters worse. The only examples where fiscal stringency has been associated with recovery are in countries where reductions in government spending are offset by increases in exports. These are generally small countries, typically with flexible exchange rates, and where trading partners are growing robustly. But that is hardly the situation confronting Europe’s crisis countries today: their major trading partners are in recession, and each has no control over its exchange rate.<sup>45</sup>

European leaders have recognized that its problems will not be solved without growth. But they have failed to explain how growth can be achieved with austerity. So too they assert that what is needed is a restoration of confidence. Austerity will not bring about either growth or confidence. The failed policies on the part of Europe as it has tried, repeatedly, patchwork solutions, misdiagnosing Europe’s problems, have undermined confidence. Because austerity has destroyed growth, it has also destroyed confidence, and will continue to do so, no matter how many speeches are given about the importance of confidence and growth.

The austerity measures have been particularly ineffective, because the market understood that they would bring with them recessions, political turmoil, and disappointing improvements in the fiscal position, as tax revenues declined. Rating agencies downgraded countries undertaking austerity measures, and rightly so. Spain was downgraded as the first austerity measures were passed: the rating agency believed that Spain would do what it promised, and it knew that that meant low growth and an increase in its economic problems.

By the same token, while structural reforms will be important for future growth and standards of living of many of the European countries, including those currently afflicted with crisis, structural reforms take time. They affect long term standards of living, but structural rigidities did not precipitate the crisis. It was a financial and real estate crisis that did that.<sup>46</sup> Most of the structural reforms are supply side measures, but as I noted, the problem today is an inadequacy of demand; worse, many of the structural reforms will exacerbate that problem, especially those which lead to lower wages and have adverse distributional effects.

### *Responding to the crisis*

This analysis of the fundamental flaws underlying the Eurozone suggests a set of policies which *might* help resolve the crisis. I say *might*: these reforms are necessary to make the Euro work, but they are not necessarily sufficient. The divergence between an optimal currency area and the Eurozone—the divergences, for instance, in economic structures which can give rise to desired changes in exchange rates, either in the short run, in response to shocks or in the long run in response to systemic differs in productivity and inflation trends—may be too large to make a system of a single currency work.

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<sup>45</sup> Alesina and his co-authors have tried to propagate the idea that there can be expansionary contractions. But there is a growing consensus that their analyses are badly flawed, and that that is not the case. See, e.g. IMF (2010), Baker (2010), and Jayadev and Konczal (2010).

<sup>46</sup> As is the case in the United States, there may be deeper problems: structural transformation that is required by the decline in manufacturing employment and globalization.

### *Mutualization of debt*

The first necessary reform is a common fiscal framework—more than and fundamentally different from an austerity pact, or a strengthened version of the growth and stability pact. As I noted, it was not overspending that brought on Spain or Ireland’s problems.

One of the fundamental problems confronting the Eurozone is that current arrangements effectively meant that countries were borrowing in a currency over which they had no control—much like developing and emerging markets who borrowed in dollars or euros. The fact that it was their *own* currency was of some, but limited, help. There is no risk that the US will ever default on its debt, owed in dollars, simply because it controls the printing presses (a fact that at least one of the rating agencies seems unaware of). The value of those dollars might diminish were it to resort to such measures, but (politics aside) there is unlikely to be any event of sufficient moment to change expectations of inflation so dramatically as to bring on a crisis.

What is required then is “mutualization” of debt--European wide debt, owed in euros. This would make Europe’s debt similar to America’s debt, and with Europe’s overall debt to GDP lower than that of the US, presumably interest rates would be comparable. Such mutualization would lower interest rates, allowing more spending to stimulate the economy and restore growth.

Mutualization of debt could be accomplished through a number of institutional mechanisms (Eurobonds, ECB borrowing and on lending to nations). How to design such a system (in a way that did not lead to excessive borrowing) would take me beyond this paper. For now, I simply note: The position of some in Europe against such mutualization-- that Europe is a transfer union—is wrong on two counts. (a) It exaggerates the risk of default, at least the risks of default *if* debt is mutualized. At low interest rates, most of the crisis countries should have no trouble servicing their debts.<sup>47</sup>

Of course, in the absence of debt mutualization, there is a serious risk of partial default (which has already happened in the case of Greece.) The irony is that existing arrangements may actually lead to larger losses on the part of creditor countries than a system of well-designed mutualization.

(b) Any system of successful economic integration must involve some assistance from the stronger countries to the weaker. (The desirability of such transfers, even in the absence of economic integration, was evidenced by the Marshall Plan after World War II. Europe itself has provided substantial funds to new entrants, to enable their economies to converge.)

### *A common financial system*

The second necessary reform is a common banking system—with deposits insured by a European wide deposit insurance fund, and with common regulations and a common approach to resolution of insolvent banks. I have already explained why a common deposit insurance fund is required: without that, funds will flow from the banking system of “weak” countries to the banks in strong countries,

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<sup>47</sup> The exception is Greece, for which there has already been debt restructuring.

weakening further those already having problems. But without a common regulatory system, a system with a common deposit insurance scheme could be open to abuse.

But a common regulatory system should have scope for taking different macro-prudential stances in different countries, or even regions within a country. We described earlier how having a single central bank took away an important instrument of adjustment—the interest rate. But there are a host of other regulatory provisions (such as capital adequacy requirements) which can be adjusted depending on the macro-economic circumstances.<sup>48</sup> Lending standards for mortgages should, for instance, be tightened at a place or time where there appears to be a risk of a bubble forming.<sup>49</sup>

Further reforms that are desirable and perhaps even necessary if the euro is to survive entail a move towards tax harmonization, restricting the race to the bottom in capital taxation, and distortions caused by tax competition among countries. Industrial policies that would allow those behind to catch up are necessary to prevent further divergences within the countries of Europe.

#### *Towards debt restructuring*

For most Euro-zone economies, these reforms would, for now, suffice. But there may be some (like Greece) where the cumulative impact of past mistakes (not only their own past budgetary mistakes, but also those that were foisted upon them in the early responses to the crisis) are such that more is needed. They will have to restructure their debts.

Debt restructuring (as I argued in the first section of this essay) is an essential part of capitalism. Every country has a bankruptcy law that facilitates the restructuring of debts in an orderly way. Though after the Argentine crisis, there were calls for the creation of sovereign debt restructuring mechanisms, one of President Bush's many sins was to veto that initiative. In the subsequent years, when there were no sovereign debt crises, there was little concern for the issue. Elsewhere, I have described what such a mechanism might look like. (Stiglitz, 2010b. See also Stiglitz and Zandi, 2012). But in the absence of such a mechanism, countries have to act on their own—as Argentine showed is possible.

But if some country needs debt restructuring to enhance growth, it should be done quickly and deeply. And one shouldn't feel too sorry for the creditors: Lenders have been receiving high interest rates reflecting such risks.<sup>50</sup> There is some evidence that on average, they are more than compensated for such risks. By the same token, as we noted earlier, the costs to the economies doing the restructuring may be less than this is widely suspected. Both theory and evidence suggests that countries that do such restructuring can regain access to global financial markets; but even if, going forward, countries

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<sup>48</sup> One of the lessons of the crisis was that monetary authorities relied excessively on interest rates.

<sup>49</sup> Evidenced, for instance, by a rapid increase in housing prices relative to income, or by an abnormally rapid expansion of credit.

<sup>50</sup> Or they should have done so, had they done their due diligence.

have to rely on their own savings, the adverse consequences may be far less than the benefits they receive from the debt restructuring.<sup>51</sup>

Argentina has also shown that there is life after debt and the reform of monetary arrangements. Indeed, there are good reasons to believe that a deep debt restructuring will have positive benefits—providing more fiscal space for expansionary policies, so long as the government does not have a primary deficit. It is important that the debt write-down be deep—otherwise the lingering uncertainty about the possibility of another debt restructuring will cast a pale over the recovery. And because of the uncertainty about future growth, and therefore of debt sustainability, GDP-indexed bonds may represent an effective form of risk-sharing (which can be thought of, at the sovereign level, as the equivalent of the conversion of debt into equity, at the corporate level.) (See Miller and Zhang (c2013 ), Griffith-Jones (2013))

### *The end of the euro?*

The analysis of this paper has suggested that prospects that the 17 national euro-zone will survive, in its current form, are bleak. Its end, as its creation, is as much a matter of politics as economics. European leaders continually affirm their commitment to do what is required to sustain it; but at the same time, key European leaders have shown that they do not seem to understand what is required to sustain it, and have ruled out many of the necessary measures. They have continually repeated a mantra—that one has to restore confidence and grow the economy—as they have undertaken measures that have undermined long term confidence and have put the economy into recession.

Even when most European leaders seem to gradually grasp what is required, there are two fundamental problems: can they achieve the unanimity required, given differences in the perspectives and interests and politics in the different countries; and can they achieve the requisite agreements fast enough? The incongruence between the pace of markets and that of the politics could present a problem for the survival of the euro. Indeed, the slow pace at which the fundamental problems are being addressed is already causing problems: the financial sector of the crisis countries continues to be weakened, both as austerity exerts its toll on the economy and as capital leaves the country. This means that the magnitude of the assistance that eventually may be required is likely to be far greater than it would have been had the reforms been undertaken earlier.<sup>52</sup>

Many European leaders have recognized that *eventually* that a single banking framework, with common regulations, deposit insurance, and resolution, is necessary. But some European leaders argue that such a dramatic reform must be done carefully, in a step by step process. First, there must be common regulations, and when the regulatory system has been “proven,” Europe can go on to the next stage(s).

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<sup>51</sup> As the paper by Sanderlis [2013] points out, the costs may be less related to those imposed externally, and more related to failures of the government to deal effectively with the internal disturbances associated with debt restructuring, e.g. to the financial system (banking, insurance, and pensions).

<sup>52</sup> The slow pace of reforms has led to other problems: Ireland, one of the first countries to receive assistance, is concerned that later countries will get a better “deal.”

Were there not an ongoing crisis, such an argument would have some merit. But those with capital in, say, the Spanish banks will not wait: the benefits of waiting are nil, the risks are substantial. And so, while European leaders dither, the banking system may be effectively destroyed.

ECB lending (in the unlimited amounts promised, provided that the country requests it and subjects itself to conditionality) may delay the day of reckoning. But one should be clear that the issue facing, say, the Spanish banks is not just one of liquidity. If the funds are accompanied by the kinds of austerity conditionality that has marked earlier programs, unaccompanied by any program that would lead to growth, then the banks will continue to get weaker; and even the anticipation that this might be so will contribute to funds leaving the bank. What is necessary for a return of “confidence” in the banking system is (a) a belief that further losses will be limited; and (b) the government has the resources and willingness to rescue the bank, should it run its problems. But under country policies, not only are the banks losses likely to continue to mount, the government’s ability to rescue the banks will continue to deteriorate.

Alternatively, those with funds in Spanish banks might be willing to keep their funds there, were they confident that Europe will step into the breach. But Europe’s equivocation has not helped, as Northern Europe has attempted to limit its exposure, responding to domestic political pressures. After recognizing in the summer of 2012 that the “bootstrap” approach would not work, and that Europe’s support would have to go directly to the banks, there appears (as this paper goes to press) to be some backtracking—perhaps the legacy “debts” will not be covered. After recognizing that there needs to be a common financial framework, again there appears to be some backtracking: perhaps only the large banks should be included. (While the failure of a single small bank would not itself cause large systemic effects throughout Europe, the failure of a number of small banks could; and what is at stake is not just “systemic risk” of Europe’s financial system, but the capacity of the Spanish banking system to provide credit, especially to SME’s, and this credit may be even more dependent on the strength of the smaller banks than on that of the larger banks.)

There is likely to be turmoil in the process of the restructuring of the Eurozone, and the resulting downturn could be significant. But under the current regime, the prospects for crisis countries are truly bleak: For some, depression as far as the eye can see. Europe has offered no alternative vision.

The current regime is also undermining the legitimacy of democratic economic institutions. The European project was a top-down initiative. There was a *very* short period of prosperity<sup>53</sup>—based in some countries on access to credit at irrationally low interest rates. The promises of *sustained* prosperity were not delivered upon. The rules of the game not only failed to deliver on sustained macro-economic growth, that have led to increasing inequality, with governments restrained in their ability to redress growing inequities. Evidently, the elites created a system that seems to have done well for those at the top.

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<sup>53</sup> Monetary arrangements often have a short life span—witness the ERM. Even the Bretton Woods system (fixed exchange rates) lasted less than three decades.

In many quarters, there is concern about ceding of effective economic power—originally to Brussels’ bureaucrats, but increasingly to German politicians, undermining national democracies.

There are a variety of ways by which the current form of the euro-zone might end. There was, of course, in its creation the assumption that it would never end (though monetary arrangements have frequently had to be changed), and so there was no provision for contingencies similar to that which the Eurozone is now facing. It might end by the ECB refusing to discount the bills of the banks of a member country—in effect, ceasing to act as a Central Bank for that country, and forcing the country’s old Central Bank to resume that role. It might end in a popular uprising against the continued depression forced on the crisis countries by Europe’s leaders.

While however the breakup of the euro occurs is likely to be costly, there are some ways of reducing those costs. There is growing agreement among economists that the least costly form of break-up would entail Germany leaving the Euro. The New Euro (so defined) would almost surely depreciate relative to the Mark, correcting current account imbalances within Europe, strengthening growth in crisis countries, and enabling those countries to more easily meet their debt obligations.

At the same time, the stronger Mark would enable Germany to easily meet its debt obligations. Some creditors might feel that they were cheated, being paid back in the depreciated (New) euro; but credit contracts are typically unindexed, and there are a host of contingencies which affect the real value of what is repaid. Creditors receive a risk premium for bearing those risks. Whatever happens has distributive consequences; other ways of having the Eurozone dissolved entail adverse effects on borrowers.

### **Concluding comments**

Most crises are manmade. They are not caused by famines or other natural disasters. They are often the result of unstable market processes—not a sudden change in government policies. On the other hand, government policies can affect the likelihood of the occurrence of crises and their consequences. Government policies can affect countries’ exposure to risk, the structural stability of the system and impede or facilitate adjustments. The elimination of automatic stabilizers, and their replacement in some cases by automatic destabilizers, has introduced new instabilities into the economic system. Deregulation and financial and capital market liberalization has provided new opportunities for destabilizing market processes and opened up new channels by which the instabilities in one country can affect others. (Stiglitz *et al* 2006).

We have seen how institutional changes surrounding the Eurozone—intended to create a more stable and prosperous economy—played out in ways that were, at the time of the founding of the euro, largely unanticipated, but which—at least in hindsight— were totally understandable given the structural flaws in the Eurozone institutional arrangement. We have seen too how the policy responses to the crisis, as it unfolded, have, in many cases, only made matters worse

There are alternative policies which would enhance stability, and, once a crisis has occurred, would be more likely to restore the economy to prosperity. But adopting these policies one has to break out of the straight jacket of market fundamentalism/neo-liberalism and much of conventional economics.

There was no sudden change in the underlying state variables describing the European economy: no war that wiped out large fractions of its physical and human capital stock, not even an innovation or an economic transformation that would have led to rapid obsolescence. There have been sudden changes in expectations, and in our understandings: we know (or at least we *should* now know) that markets are not necessarily quickly self-correcting, that underregulated markets can give rise to bubbles and credit excesses, that Greece or Spain having the same currency as Germany does not mean that Greek or Spanish debt is as safe as that of Germany, and it may not even fully eliminate exchange rate risk and, in ways that we have explained, may actually increase default risk.

Crises are complex events, and it is inevitably overly simplistic to find a single-causal explanation. Still, it should be clear that the euro-crisis, like so many other crises, is more attributable to market excesses than to government profligacy. If government is to be blamed, it is for a failure to tame the (repeated) market excesses. (And even when there is government profligacy, the market is almost always a co-conspirator—lending excessively at easy terms, in its irrational optimism about the prospects of repayment.) Prevention entails understanding how to curb the excesses, and how to design institutional arrangements that limit the opportunity for such excesses. Resolution entails understanding how to ensure that, after a crisis, resources are put back to use as quickly as possible.

With or without such excesses, economies are exposed to shocks: different institutional arrangements increase the exposure to such shocks, amplify the effects, make the effects more persistent, and impede adjustment, thereby increasing too the risk of a crisis. Market forces by themselves may not only lead to endogenous disturbances (like bubbles), but may respond to shocks in a destabilizing way. Government intervention (e.g. through debt restructuring, countercyclical macro-policies, and well designed bank recapitalizations) can reduce the enormous costs that have traditionally been associated with crises.

Crises are perhaps an inherent feature of capitalism. But they do not have to be as frequent, as deep, and as costly as they have been.

The standard macro-economic models ignored history—which had shown that capitalism had been marked by large fluctuations, with great suffering, since the start. The models ignored key market failures that help explain persistent inefficiencies and instabilities. In doing so, they may have violated the central principle of Hippocrates: do no harm. For the policies and institutional arrangements based on these simplistic models and theories created the pre-conditions for these crises and have contributed to the slow recovery from this Great Recession—a downturn which, while not as deep as the Great Depression, may begin to rival it in duration.

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