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**How can the robustness/resilience<sup>1</sup> of a human habitat system which relies on complex infrastructure and technologies be put under scrutiny? Several characteristics come to light, among which: the existence of reserves (positive redundancy) that help to fend off shocks;** flexibility and capacity to correct/adjust disequilibria; capacity to preserve *social cohesion*, the social tissue; this capacity depends on *social capital* (as named by Robert Putnam) and political capital, on institutions for social and politic dialogue that facilitate negotiations and the pursuit/reach of compromises (especially in democracies); economic performance that can ensure system sustainability; and last, but not the least, capacity to adapt, to self-organise and to learn, all of which allow systems to develop “antibodies” and cushion against predictable and unforeseeable shocks (this would be similar to what Ilya Prigogine called “dissipative structures”)

The assumption in the title above is related to a cluster of major crises that seem to keep the world in their grip and a multitude of ensuing events; the world seems to be caught in a **vortex of bifurcations**, that may land us in a very different environment, with much more uncertainty and perils. What may be striking is that a very deep financial and economic crisis has hit most of the industrialized countries, which are presumed to have solid institutional arrangements (though one could argue that no system is immune to the accumulation of tensions over time and that cyclicity is part and parcel of economic dynamics). We are confronting the most severe financial crisis since *the Great Depression* of the last century. Economic decline in many economies has caused enormous strain, that shows up in social life and in the political process too (e.g. stalled institutions of dialogue/negotiation/decision, extremist manifestations in the politics of mature democracies including augmented chauvinism and xenophobia).

As a matter of fact, the current financial/economic crisis deepens social dislocations and strains that were already at work in not a few industrialized countries. The crisis of the welfare state, in conjunction with rising income inequality, have weakened a social milieu that got further blows by the financial crisis. Social strain, which shows no sign of abetting, is spreading around<sup>2</sup>.

There is also the dramatic climate change of the last couple of decades, which indicates basic disorders in the human – nature relationship. Some of these disorders are rooted in societies’ disregard, or misunderstanding of ecological needs. The proliferation of extreme events questions the very perception of them being rare<sup>3</sup>.

A working hypothesis can be submitted: **even though we have ever more information and scientific and technological advance never stops, societies do not automatically have superior cognitive capacities and capabilities to respond to shocks and challenges.** This hypothesis is examined below and some avenues for strengthening robustness and resilience are outlined. The first part of the text below highlights the proliferation of conventional and unconventional shocks; the second part provides explanations for why robustness and resilience have, arguably, been declining in the industrialized world; cognitive failures are also pointed out. The third part comes up with policy recommendations.

### 1. Shocks: conventional and unconventional

<sup>1</sup> Robustness and resilience are hard to distinguish in the short run; resilience considers dynamics over the longer term and refers to adaptation and learning traits of systems. It is worthy to notice that the 2013 Davos Forum focused on climate change and systemic financial failure as major risks for mankind.

<sup>2</sup> For the interplay between the economic and the social crisis see also my paper (2011)

<sup>3</sup> Tail events, *black swans*. as Nassim Taleb named them (2007)



The multiplication of conventional and unconventional shocks makes up a very tough test for the robustness and resilience of social (economic) and technological systems. As a natural disaster tests the robustness of a basic technological infrastructure, so does a severe economic crisis when it comes to social systems.

The current financial/economic crisis has an impact equivalent to that of a war during peace time<sup>4</sup>. This crisis has substantially increased public debts around the world. In the European Union the aggregated public debt of governments has increased by around 40% after 2008. The cumulated debts of the private sector are a multiple value of the EU GDP. In the US public debt is around 90% of its GDP. In the industrialized countries, potential economic growth is estimated to have been halved by the current crisis; for the EU average potential growth has come down from 2-2.5% to probably 1-1.5%.

Complications arise when shocks find systems unprepared, or insufficiently prepared. For instance, many decision makers did not anticipate or realize the extent of the current financial crisis. It is quite striking that European leaders kept talking about the “robustness” of their economies after the crisis hit, as compared to what they could see happening across the Atlantic (in 2008); they did not realise that the same structural weaknesses were afflicting the European financial system as well. The Eurozone provides numerous lessons to be learned. Its troubles, apart from the impact of the financial crisis, originate in a wrong design and flawed policies, which have led to a monetary area lacking robustness<sup>5</sup>. It is quite obvious that what the ECB did at the end of 2011 and in 2012, as a lender of last resort, basically has saved the euro zone, so far. But it is still to be seen whether the Banking Union project is the convincing way out from the crisis in Europe.

Hurricane Katrina in the US, the gas leakages in the Gulf of Mexico that were caused by defect installations of British Petroleum, the nuclear disaster at Fukushima in Japan, and other similar events show that there is no infallible technology, that erroneous decisions together with technical vulnerabilities invite bad events. At the same time, human errors are revealed, which make us learn for the future. The more powerful shocks are and the weaker systems are, the more likely disorder is and disequilibria intensify. In the economic realm, for instance, large, unsustainable external imbalances cause balance of payments crises.

It is justified for the robustness (resilience) of systems to be a topic of high interest for social scientists and for those who study technological structures. National security experts, too, have a reason to be interested in this issue, due to new and formidable threats, like *cyberfare* (annex 1 provides a list of notorious cases of cyber attacks in recent years)

When economy loses vitality, when it is weakened, its robustness goes down. The crisis in the Eurozone and the coordination deficit in the defence area in Europe (EU) have a bearing on relations within NATO<sup>6</sup>. Or take the case of the failure to merge EADS with BAS, which mirrors the power of national interests in the European Union.

The response to threats tests the virtues of liberal democracies as against authoritarian states. Authoritarian systems, despite their capacity to mobilize large-scale resources relatively fast, feel vulnerable to free movement of information and, consequently, they try to limit the use of modern vehicles (the internet). But liberal democracies, too, may feel vulnerable when information is manipulated grossly<sup>7</sup>.

## 2. Why has robustness (resilience) been falling?

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<sup>4</sup> Admiral Michael Mullen, former Chief of Staff of the USA Military Forces, affirmed in 2012 that the size of its public debt was becoming a threat to the national security of the US (see Geoff Colvin); this remark reminds Paul Kennedy's concept of *overstretch*.

<sup>5</sup> I share the view that, as it is functioning at the moment, the Eurozone is more rigid than the Gold Standard regime of the last century's interwar period, in spite of budgetary policies that use automatic stabilizers to cushion shocks.

<sup>6</sup> Robert Gates' statement of June 2011, who was US secretary of defense at that date, is quite telling: he warned Europeans (the EU) that they need to make a more substantial contribution to NATO's resources in order to prevent the US from reconsidering its position within the Alliance, in view of new challenges in the XXI century.

<sup>7</sup> As Lee Howell puts it, the benefits of the spread of information are well documented, but “the risks of misinformation are not”



Why has social/economic systems' robustness been falling? Several explanations can be put forward.

- **A steady rise in inter-connectedness** weakens robustness (resilience) to the extent the contagion of bad phenomena intensifies, with no instruments to stop it. An example is pandemics, which spread much faster when people and merchandise travel intensively and control measures are inefficient.
- **new information and communication technology** increase the vulnerability of systems when: **control is lost** due to the new technologies and lack of capacity to manage interconnectedness and complexity; **technical failure** is generated by improper data safeguarding measures that lead to loss of key business information, *undetected glitches / bugs* (intentional or by mistake) in financial information management software, *disaster recovery center* located in a wrong place (same event can affect both locations), *outsourcing companies* for data center, critical systems, or telecom providers fail; **procedures are** outdated, improper or totally missing; internal sabotage or direct attacks from within - most attacks on security systems are of this type; **cyber threats** (massive communication infrastructure failure are brought about by *distributed denial of service (DDOS) attacks* or other coordinated *malicious actions*. *Terrorist attacks* can cause damage to critical organizational assets; **leakage of sensitive information** via **espionage or hack-tivism**; **electrical power grid hijacking**: loss of IT infrastructure (see annex 2)
- **in finance, the inter-connectedness of markets and the spread of “toxic” products, together with the rising importance of (speculative) trading operations** have increased systemic risks exponentially. As some remark, the evolution of the financial system in developed countries, during the last few decades, has reduced *the robustness of economies*” (Andrew Haldane); this is due, mainly, to waves of deregulation, to the break up of the “Chinese walls” between investment and retail banking, ex: the abolition of Glass Steagall legislation in the US, the Big Bang in Great Britain in 1986. Alexander Lamfalussy, an *eminence grise* in the world of finance, forewarned about the bad effects of the growth of derivatives years before the current crisis struck. A short term approach that ignores systemic risks, a one-sided policy conduct of major central banks which took price stability as the equivalence of overall stability as well as a pretty simplistic cosmology which was based on the “efficient markets hypothesis”, have helped the derailment of the financial system and the eruption of a crisis that is reminiscent of the Great Depression. This very dire situation has forced governments and central banks to intervene via “extraordinary”, non-conventional means, in order to avoid a meltdown, the collapse of systems – an outcome that could have entailed two-digit unemployment rates, massive production declines (NB: in Spain and Greece unemployment exceeded 25% in 2012).<sup>8</sup>
- **unmanaged globalisation** has, arguably, made systems less robust, more vulnerable even in the case of developed countries. Not even the best performing developed economies can withstand shocks effectively, over the longer term, when blows come from emerging economies that assimilate advanced technologies at a fast pace and possess cheap labour. The dynamics of comparative advantages does not make everybody a winner in a global economy where zero sum games are frequent.
- **excessive dependency** on structures that cause shocks (bad externalities). Likewise, systems whose output depends on too few sectors are less robust. The structure of inward investment is also critical – whether it is based on borrowed funds, or it is in the form of direct investment. The latter have a different impact on the recipient systems depending on the robustness and resilience of the economies they come from. For example, the presence of Scandinavian banks (primarily Swedish and Finnish) in the Baltic countries is

<sup>8</sup> Rising social strain in Spain, Greece, Portugal, Italy, etc are alarming for the EU



welcome as compared to the presence of Greek banks in Bulgaria, Romania and other Eastern-European countries<sup>9</sup>.

- geographic position matters; proximity to robust systems is helpful. The higher is the structural compatibility with a robust system, the higher are benefits.
- **under-investment in basic infrastructure and scarcity of reserves**, which afflicts mature economies too (see Michael Spence);
- **under-investment in education**;
- **income distribution**. OECD and IMF studies show that the increase of inequality in industrialised countries, during the last few decades, has worsened social cohesion. This evolution needs to be seen in conjunction with the effects of the financial and economic crisis. Income inequality, as Francis Fukuyama remarks, is part and parcel of market economy dynamics; it is essential, however, for “equal opportunities” to operate, in order to preserve the legitimacy of the system (2011, p.9).
- **a remarkable trade-off begs attention**: on the one hand, the current financial crisis as well as previous dynamics (including demographics) have eroded the resources of the social state; and this asks for adjustments, a reform of the social security system (but not its demise, as some claim!). On the other hand, if these corrections are made too abruptly and recklessly, they could perilously diminish the capacity of institutions to foster dialogue and compromise (which are badly needed in order to ensure social equilibrium, the homeostasis/resilience of systems);<sup>10</sup>
- **complexity** can diminish robustness and resilience. If systems do not adjust fast enough, if they do not have the capacity to self-organise better and to learn, they get weaker and vulnerabilities go up. Complexity can override the capacity of individuals and of organisations to face it. This has been a wide-spreading phenomenon in finance, which has turned into a sort of a *black box*, frequently for insiders, for people from this industry too. The decline of robustness is visible in many financial institutions, where “compliance rules”, internal prudential mechanisms prove to be highly inadequate. Arguably, a solution in this field would be a return to a more simple, more user-friendly system; simplicity as a virtue of a more resilient system would involve adequate regulation and surveillance.
- **demographics** can harm robustness and resilience; a massive depopulation (migration) harms the equilibrium among generations, among professional categories, and an intense brain drain deteriorates the stock of highly qualified human capital and its capacity to renew itself. Migration can ease unemployment for a while, but there are ensuing long-term costs.

## 2.1 Problems of cognition

The fall of robustness (resilience) is linked with cognitive problems and policy choices. For instance, in finance the blind trust in quantitative methods led to major failures at company level and system-wise. The collapse of the LTCM hedge fund in 1998 was a forerunner of the current crisis. At that time, the models designed by Myron Scholes and Robert Merton, Nobel prize laureates, underestimated tail events, which proved to be lethal for the adopted strategy.

<sup>9</sup> The reason for this comes from the state of mother companies (banks) and of the economies where they are headquartered.

<sup>10</sup> Dani Rodrik notes that there are institutions that have a fundamental insurance function against social risks



The intervention of the Fed was needed, even if in an indirect way, in order to save the financial system (which was threatened by contagion). One decade later it became increasingly clear that models used by central banks are inappropriate, that systemic risks have been grossly overlooked. As Richard Bookstaber stresses, conventional ways to manage risk (known as value at risk and stress models) fail to take into account interactions and feedback effects.<sup>11</sup> We are now in a period of reassessing modelling algorithms and non-linear dynamics (extreme events) are taken into account ever more.

Within the large topic of climate change it does make sense to discuss the logic of economic growth that ignores resource scarcity. The Club of Rome and other organisations were and are right in this respect. A certain life-style, especially in the industrialised world, and an economic logic that does not internalize climate change effects and resource scarcity (as powerful externalities, that should be attributed commensurate costs), make adaptation more difficult. "Steady state economics", as an approach that thinks about sustainability, is not of recent vintage and, yet, progress is very slow in producing a change of hearts and of policies that should fit the magnitude of challenges. If no consensus is reached that something must be done with the aim of preventing the worst, we might reach a *tipping point*<sup>12</sup>, which will allow no turning back. "The Day After", the movie, is not far fetched science-fiction. There are too many prisoners of day-to-day reality, of market competition, of struggle for Earth resources, who ignore the bigger picture. We have to keep in mind here trade-offs among the use of limited resources, for instance land for food versus land for energy. Numerous experts see these alternative options as sources of future major conflicts (H.W.Sinn).

Nor it is easy to strike positive compromises when the international regime does not have effective rules. The G2 (USA and China as superpowers which would "organise" the global dialogue), as compared to an ineffective G20 can be compared to a "G0", as Ian Bremmer sees as the evolution of the global system. If the EU were more cohesive and stronger (the end of the Eurozone crisis would have such an outcome), it would get more punch in international affairs, so that we could then talk about the formation of a G3 as a basis for a new *international regime*.

The current financial and economic crisis questions the dominant paradigm of recent decades. Fundamentalism in both theory and policy is disavowed. A free economy (markets) is a prerequisite of economic freedom, of democracy. This is the great lesson communism taught us. However, full faith in perfect regulation through markets is non-sense. The deregulation of financial markets, as part of a simplistic economic approach, has enhanced the current crisis. Likewise, quantitative methods are imperfect, as there is no infallibility. Moreover, economic rationality is not the only driver of human action; let's just think of "bounded rationality" as described by Herbert Simon, or Daniel Kahneman and Amos Tverski's studies. This said, though, human society remains an "economic" one *par excellence*, meaning that it is motivated primarily by advantages and disadvantages interpreted in money terms, for resources are limited as compared to people's unbounded needs and aspirations.

Public policies have favoured the growth of income inequality, as an uninspired *policy-drift* in some countries, including the US (Lieberman). This happened at the same time with rising macroeconomic imbalances in not a few industrialized countries, with the burdening of the social security system. This situation creates huge dilemmas and trade-offs for nowadays public policies.

Economy, society, need moral values as *public goods* to function well. Adam Smith and Max Weber linked ethical behaviour and the quality of economy, of life. Later on, Kenneth Arrow and Amartya Sen, among others, underlined the importance of moral values for human life. It is worthy to remind it because the financial crisis also involves the loss of the ethical compass by many in the financial and banking industry. Banks have a strong characteristic of public utility. Ironically, their focus on trading, on speculation, transforms them into an in-built destabilizer of economies – as Hyman Minsky (a disciple of John Maynard Keynes) and, more recently, Joseph Stiglitz noticed.

### 3. What to do now?

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<sup>11</sup> As quoted by Floyd Norris. Those who work for the Office of Financial Research (in the US) are looking at the origination, transmission and amplification of a threat, since all three processes are important in understanding how crises emerge.

<sup>12</sup> For an analysis of how small things can have big effects see also Gladwell (2002).



Possible ways of strengthening robustness (resilience) are mentioned below<sup>13</sup>.

a/ **Mobilisation of internal resources.** In all societies efficiency reserves exist. In a system in which micro and macro inefficiency are high, robustness and resilience can be strengthened without additional costs; the same output can be obtained with a lower intake of resources and, what may sound strange, buffers can be increased.

The mobilisation of internal resources is not automatically equivalent to a decrease of reserves. A robust system needs “reserves” that increase its flexibility, its capacity to fend off shocks. If done properly, resource mobilisation would mean a more efficient use of resources, meaning that the same output would be achieved with a lower consumption of resources. Economics students are familiar with the concept of production possibilities curve (PPC), which illustrates various production combinations under conditions of maximum efficiency and related to individuals’ preferences. However, any real system functions within its PPC borders because friction is unavoidable; less efficient systems are further inside the boundaries of the curve. Theoretically, a higher potential to mobilise resources should be in the preserve of highly inefficient systems. Nevertheless, moving towards the PPC frontier in a highly inefficient system is not easy because of the vested interests that oppose change. It is only when the pressure to change is high enough (through internal and external incentives/pressure) and when “interest coalitions” in favour of reforms are stronger than the ones betting on the status-quo (willing to continue to extract rents), breakthroughs occur. Consequently, when the mobilization of internal resources is done through capitalizing on domestic efficiency reserves (which implies a better resource and technologies management) the same quantity of goods and services (GDP) is realised with a lower consumption of resources. Thereby, a system can protect its reserves, in terms of the known resources that can be easily mobilised in order to respond to shocks<sup>14</sup>. Internal resources mobilisation should be accompanied by **setting priorities**, which can lead to a better resource use.

b/ Figuring out an optimal **relationship between government (the public sector) and market** is essential in order to enhance the robustness, resilience of systems. The **supply of “public goods” that increase the robustness of systems is critical**: education and public health; infrastructure; measures that enhance a fair income distribution; financial sector reform that diminishes systemic risks, etc. The provision of an adequate amount of public goods demands effective public governance. Market regulations are necessary in order to reduce market abuse by monopolies and the supply of products that harm consumers’ interests.

**State power is necessary in critical moments, when decisive and fast interventions are necessary; it is the only one that can mobilise large amounts of resources in fighting major threats.**

There are cases when the weakening of robustness/resilience is caused by under-investment, by public policy myopia. In order to address and redress this situation additional resources have to be brought in, sometimes on a long-term basis; this is a matter of **optimising investment inter-temporally**. This logic applies to public goods, but also to individual organisations (when companies do not invest in human capital, in security systems sufficiently)

c) **Institutional/structural reforms.** Wherever corruption is endemic, where “rent seeking” blossoms owing to the permissiveness of laws and, thereby, economic performance is damaged **deep institutional reforms** are necessary. As Daron Acemoglu and James Robinson underline, it is necessary to move from “extractive” to “inclusive institutions”, which strengthen the rule of law and enforce good practices.

**Adjustments to social security systems have to be done without going beyond a threshold that** would cripple the homeostasis of the system irretrievably –though, it is not easy to evaluate what such critical thresholds are. Societies (economies) have specific thresholds, which depend on the local configuration of the social contract, which, itself, depends on a variety of factors.

<sup>13</sup> There are processes that hardly can be counteracted. However, as in the case of the increasing entropy entailed by carbon emission, neg-entropic action should take place

<sup>14</sup> An analogy can be made with the increase of fiscal revenues in an economy where tax collection is very poor. Combating fiscal evasion and the extension of the tax base may bring considerable additional revenues.



Reforms are needed in industrialised states as well, when institutions are captured by vested interests (Italy is such a case). The current crisis highlights, arguably, the superiority of the quasi-corporatist German “model”, which relies on dialogue among partners (political parties/government/business groups, syndicates), at a company level too (through *mitbestimmung*)<sup>15</sup>, and which did not neglect national manufacturing as a base for economic strength.

d) **Fairness.** This issue becomes more acute when times are tough, when people take a closer look at inequity, at the functioning of institutions. For the very sake of preventing the spread of cynicism, of carelessness and selfishness, political leaders should promote ***justice, the rule of law, the sentiment that nobody is above law***. The social cohesion, the robustness (resilience) of the system depend on the manner in which the social contract between citizens and the state takes concrete shape.

e) **Moderation of citizens' expectations** is also key considering that we have probably entered a new Age, featuring much diminished economic growth rates (a long term quasi-stagnation is anticipated for a large part of Europe) and painful adjustments of welfare schemes. Measures that strengthen feelings of solidarity, of concern for nature are needed. Here we can also discuss about the identity aspect, the functioning of a collective ethos that can increase the robustness of a system. But patriotism, which can help preserve the social glue, should be distinguished from nationalism, strong populism, which may lead to wrong public policies and make partners hostile - which would, in turn, lead to a worse state of the regional system if partners react in a similar way. There is also the alternative of isolation of those who breach the rules/basic principles of international regime.

f) Basic **supply chains** demand back-up instruments, reserves, as an optimisation that takes into account long distance risks<sup>16</sup>. “Going back to the roots” could be a way of re-deeming proximity as an insurance policy, as a way to decrease risks. This does not mean that markets close. Also, it is good for a system (economy) to **diversify its markets** and investment funding in order to diminish vulnerabilities.

The opportunity cost of neglecting arable land increases exponentially under the conditions of the ecological crisis. The Common Agricultural Policy (in the EU) must take this aspect into account and put a premium on land of good quality.

g) **In finance, its radical overhaul is badly needed** in order to reduce systemic risks and corrects its unfair relationship vis-à-vis the rest of economy, of society. Reform that leads to more simple arrangements, to **simplicity**, would be helpful, for it would lend more robustness to both finance and economic systems. A template for reform would be<sup>17</sup>:

- **foster simplicity and a new paradigm of regulation: enforce Volcker rule and restore Glass Steagall (segregation of business activities);**
- **shape inter-connectedness (the financial system structure is not God given): modularity, diversity, size.** The **decomposability** of the system can be enhanced by returning to more simple banking (less trading), refocusing towards local markets, using regulatory incentives to promote diversity of balance sheet structures, business models and risk management systems. **The modularity of the system** can be achieved by splitting the large financial institutions in order to curtail the strength of cascades following failure and the potential for cross-contamination.
- **downsize finance and financial entities (split them; use anti-trust legislation);**
- **prohibit highly toxic products**

<sup>15</sup> Corporatist structures function in Italy as well, but the overall performance of the system (its robustness) is inferior to that in Germany. In Italy, rent extraction from the public sector and resistance to change are significant. These are the phenomena that the current government has to deal with.

<sup>16</sup> To recall the “just in time” supply chain model

<sup>17</sup> The Liikanen, Larosiere, Vickers, Tyrie reports in the EU and the Dodd-Frank legislation in the US show the road to go, but more has to be done

- **regulate and supervise all finance (including shadow banking):**
- **new supervision models that consider the multitude of links and complex interconnections; the new architecture of the system must limit the potential for spillovers. Centralize clearing and trading – counterparties<sup>18</sup>, diversification and more modularity of the system (in order to prevent contagion) could help achieve this goal.**
- **central banks: a broader stance, that includes financial stability (price stability does not guarantee financial stability);** risk-based-supervision in order to address the counter-cyclical operation of regulations (macro-prudential policy), and a new supervisory framework for complexity management.
- **try to enforce the new rules at global level (use G20 to this end)**
- **new business models in banks:** higher capital and liquidity requirements (Admati and Hellwig); back up mechanisms and more rigorous internal compliance and prudential rules.

**At the international level there is need for a regime that reduces the destabilising function of finance.** The Financial Stability Board (FSB), the Bank for International Settlements (BIS), specialised public institutions in the US and the EU can play an essential role in this respect. Those who say that we need a new Bretton Woods<sup>19</sup> are arguably right. Big players in the global space must be aware of the *externalities* that their actions produce.

g1/ **combat organizational failure**, including cyber attacks.

**Cyber-attacks can be kept under control, reducing their impact, but not eliminated.** Regulation, best practices, sharing knowledge are essential, including a national cyber counterintelligence program/*CERT* (Computer Emergency Response Team). Isolate essential network services in order to maintain mission capability, **impose rules** for proper security training of key personnel, **define a set of minimal security requirements** for the protection of sensitive sites (data centers, communication hubs, etc.), and develop a **capacity for damage mitigation and reconstitution**.

Cyber threats are both a financial system and a national security concern. For this reason, at European level, **two EU directives** are prepared: for critical infrastructure, where financial institutions are mentioned together with energy, telecom/IT, and transport infrastructures; Directive on Network and Information Security. Also, more **stress tests** are done (US, UK, Nordic countries). **International alerts**, studies and recommendations are designed to address this issue.

g2/ **How to respond to a crisis** (failure of a big financial entity)?

**Macro level:** ensure proper collaboration between public authorities toward rapidly combating the effects of SIFI (systemically important financial institutions) failures by all means necessary, including emergency legal / normative acts

- mechanisms for **bailing-out, bailing-in, closing and resolution** of the financial institutions need to be clearly defined and credible;
- a fundamental issue: who pays for a rescue? The inexistence of a strong financial backstop in the euro area is a major weakness of the current design of the banking union.
- have a national crisis management (CERT) center meant for collecting, analyzing and reacting to events. This center needs to be connected to the European CERT network

<sup>18</sup> Though, one can argue that big central counterparties pose systemic risks themselves

<sup>19</sup> Bretton Woods agreements that followed the second World War, which set the basis for the international financial system, including the creation of the IMF and the World Bank (see Daianu 2013).





- it is hard to think that a mega-financial entity will fall; can a winding down take place in an orderly fashion?

**Micro level:** qualified teams of professionals tasked with understanding, preventing (if possible) and correcting vulnerabilities should operate. They should be responsible to implement Disaster Recovery Plans and Business Continuity Plans at company or market level

h) **Unmanaged (mismanaged) globalisation causes more damages than benefits.** If globalisation is unmanaged it puts reversal forces into motion; it may backtrack as open international regimes did at the end of the XIXth century and in the interwar period of the XXth century, with spreading protectionism and the formation of rival commercial alliances

i) **Reforms of the governance structures in the EU** (of the Eurozone) that can counteract centrifugal forces. Otherwise, the very European project is under threat, which would bring back demons of the past<sup>20</sup>. The cohesion policies have to become much more efficient in order to repair “fractures” in the EU, in the Eurozone.<sup>21</sup>

j) **Proper behaviour towards Nature** should consider the whole range of harmful products human activity entails; companies have to bear the costs of the externalities they cause.

k) **The attitude of leaders, of the political elites.** Where a divorce, a disconnect between political elites and citizens occur things go wrong. Without responsibility and democratic institutions that force people to be accountable a void grows and corrodes the system, undermines its robustness. This observation is valid inside the EU also, in the relationship between European institutions and the citizens of member states.

Leaders are expected to **offer hope and a perspective** that the system can work better. **Trust** in leaders is essential in order to mobilise internal resource, to overcome difficult moments.

l) **Correct and timely information** is an essential ingredient to protect robustness and resilience. It is important that information is used adequately, that governments have the capacity to process it. **The quality of leadership** is also critical, which implies the presence in key decision positions of highly qualified people. Selection mechanism of those who make decisions is part of the process of mobilizing internal resources.

m) **Reassessment of algorithms in decision making** implies a more **holistic** approach, which should make use of as large as possible an array of information and should consider extreme events

## 5. Instead of conclusion: is a new industrial revolution the solution?

It may be that the current financial and economic crisis puts us on the downswing of a very long cycle, of a Kondratiev (Schumpeterian) type, which would overlap with a deterioration of the morals (as a sort of Spenglerian syndrome). Can the traps of such a dynamics be overcome? One could argue that this is feasible, theoretically at least. For instance, if exceptional new technological gains (a **new technological revolution**) would take place together with a revival of moral values. Some (Robert Gordon, Peter Thiel, etc) do not believe that a new industrial revolution is in the offing; Kenneth Rogoff is not so skeptical, while others bet on nanotechnology, molecular biology, neuroscience, new materials science etc to lead to major breakthroughs. **The problem is, in essence, of the time we have to overcome constraints.** If mankind manages to avoid a nuclear cataclysm and pandemics that would lead to its extinction, it may reach new technological advances that would send it to a different era – let us think of the exploration of other planets, of possibilities borne from delinking from the limited resources of the Earth. However, time is decisive considering the challenges of the present and of the foreseeable future. Actual people judge their lives, the lives of their children in concrete terms, meaning that they think of the present and the next few decades, and much less about the very long-term perspective.

<sup>20</sup> The spirit that imbued the Marshall Plan is good to remember in this regard (see Sorel and Padoan)

<sup>21</sup> Paul Krugman observed, years before the Eurozone was formed, that a single currency will accentuate the industrial differences, that a “mezzogiornification” of the South of the Eurozone will happen (p. 80)



With regard to the chance for a new industrial revolution to re-establish the competitiveness of industrialized countries globally there are several issues to consider. One is that emerging Asian economies participate ever more forcefully in capitalizing on new technologies. In addition, the US seem to be better equipped than Europe in terms of the capacity to invent and innovate; they possess an excellent, yet unsurpassed academic community.

And a final note: technology in itself does not solve social problems, conflicts among groups of people. Such as there is a distinction to make between *hard* and *soft power*, so it is reasonable to look for new policy arrangements when it comes to economic and social structures, as they relate to resources allocation, income production and distribution. In other words, ***it is good for citizens to be stimulated, even assisted to become more self-reliant. However, the optimal solution cannot be by resorting to social Darwinism; such a way would be a loop back in time, taking us back to barbarism.*** Governments must find a way that reconciles the need to re-dimension (adjust according to possibilities) the public goods offered by the state (so that the principle of “equal chances” is preserved), with a larger reliance of people on own efforts and with measures that keep “fairness” alive – in the sense of avoiding “losses being socialized” recurrently while some economic sectors (finance especially) are protected, as a matter of fact subsidized, because they pose “systemic risks”.

#### **Annex 1: notorious cases of cyber attacks**

- **April 2007** - Estonian government networks were harassed by a denial of service attack by unknown foreign intruders, following the country's spat with Russia over the removal of a war memorial. Some government online services were temporarily disrupted and online banking was halted. The attacks were more like cyber riots than crippling attacks, and the Estonians responded well, restarting some services within hours or - at most - days.
- **October 2012** - The Russian firm Kaspersky discovered a worldwide cyber-attack dubbed “Red October,” that had been operating since at least 2007. Hackers gathered information through vulnerabilities in Microsoft's Word and Excel programmes. The primary targets of the attack appear to be countries in Eastern Europe, the former USSR and Central Asia, although Western Europe and North America reported victims as well. The virus collected information from government embassies, research firms, military installations, energy providers, nuclear and other critical infrastructures.
- **January 2009** - Hackers attacked Israel's internet infrastructure during the January 2009 military offensive in the Gaza Strip. The attack, which focused on government websites, was executed by at least 5,000,000 computers.
- **January 2011** - The Canadian government reported a major cyber attack against its agencies, including Defence Research and Development Canada, a research agency for Canada's Department of National Defence. The attack forced the Finance Department and Treasury Board, Canada's main economic agencies, to disconnect from the Internet.
- **October 2010** - Stuxnet, a complex piece of malware designed to interfere with Siemens industrial control systems, was discovered in Iran, Indonesia, and elsewhere, leading to speculation that it was a government cyber weapon aimed at the Iranian nuclear programme.
- **March 2013** - South Korean financial institutions as well as the Korean broadcaster YTN had their networks infected
- **July 2011** - In a speech unveiling the Department of Defense's cyber strategy, the US Deputy Secretary of Defense mentioned that a defense contractor was hacked and 24,000 files from the Department of Defense were stolen.



## Annex 2: organizational failures

- Technical failure: Nasdaq connectivity issue (August 2013), Goldman Sachs (August 2013), Knight Capital Group (August 2012), The Flash Crash (6 May 2010)
- human error: Nasdaq temporary trading halt (October 2013), Premier Oil shares (1999), Adway shares (2006)
- rogue traders: London Whale (JPM, October 2013), Kweku Adoboli (UBS, 2011), Jerome Kerviel (SG, August 2008), Yasuo Hamanaka (Sumitomo Corporation, 1996), Nick Leeson (Barings, 1996)
- erroneous models: LTCM (September 1998), JWM Partners (July 2009),
- cyber fare: Citigroup (June 2011), Fidelity Investments, Scottrade, E\*Trade, Charles Schwab (2010)

\* text used for the presentation made at the World Policy Conference, Monte Carlo, 13 December 2013

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### References:

- Acemoglu, Daron and James Robinson (2012): "Why Nations fail? The Origins of Power, Prosperity and Poverty", New York, Random House
- Admati Adnan and Martin Hellwig (2013): "The Bankers' new clothes. What's wrong with banking and what to do about it", Princeton, Princeton University Press
- Bremmer, Ian (2012), "Every nation for itself. Winners and losers in a G-zero world", New York, Portfolio
- Colvin, Geoff (2012), interview with admiral Michael Mullen: "Debt is still biggest threat to US security", CNNmoney, 10 May
- Daianu, Daniel (2011), "When high finance cripples markets and corrodes democracy", Eurozone, 27 July; see also Daianu (2009), "Which way goes capitalism?", New York, Budapest, CEU Press
- \_\_\_\_\_ (2013), "Rediscovering the values of Bretton Woods", Europeworld, Autumn, No. 25
- Fukuyama, Francis (2011), "The Origins of Political Order", London, Profile Books
- Gladwell, Malcolm (2002), "The Tipping Point. How Little Things Can Make a Big Difference", New York, Little, Brown and Company
- Gordon, Robert (2012), "Is US economic growth over? Faltering innovation the six headwinds", NBER paper no. 85, August
- Haldane, Andrew (2009), 'Rethinking the financial network', Bank of England policy paper,
- Howell, Lee (2013), "Systems at Risk", Project-Syndicate, 8 January
- Kennedy, Paul (1992), "The Rise and Fall of Great Powers", New Haven, Yale University Press



- Krugman, Paul (1991), "Geography and Trade", Cambridge (US), MIT Press
- Kasparov, Garry si Peter Thiel (2012), "Our dangerous illusion of technological progress", Financial Times, 9 November
- Lamfalussy, Alexander (2000), "Financial crises in emerging markets", New Haven, Yale University Press
- Lieberman, Robert (2011), "Why the rich are getting richer", Foreign Affairs, January
- Minsky, Hyman (1986), "Stabilizing an unstable economy", New York, Mc Graw Hill
- National Intelligence Council, "Global Trends 2030" Washington DC, comentate de Ian Bremmer in "China is the elephant in the situation room", 24 December 2012, Reuters
- Norris, Floyd (2013), "Improving the ability to foretell crises", International Herald Tribune, 11 January, p.18
- Prigogine, Ilya (1977), "Self-Organization in Non-Equilibrium Systems" Wiley
- Rodrik, Dani, (2007), "One economics, many recipes", Princeton, Princeton University Press
- Rogoff, Kenneth (2012), "Innovation crisis or financial crisis", Voxeu, 12 November
- Sinn, Hans Werner (2012), "The Green Paradox", Cambridge, MIT Press
- Shiffrin, Anya (2012), "The tide goes out in Spain", Reuters, 27 December
- Spence Michael, (2012) "Underinvesting in resilience", Voxeu, 19 November
- Sorel, Eliot and Pier Carlo Padoan (2008), "The Marshall Plan: Lessons Learned for the 21<sup>st</sup> Century", Paris, OECD
- Stiglitz, Joseph (2010), "Risk and global economic architecture. Why full integration may be undesirable", Proceedings, American Economic Review, May, pp.388-393
- Taleb, Nassim (2007), "The Black Swan", New York, Random House
- Traynor, Jan, (2011), "US defence chief blasts Europe over NATO?", 11 June