



MULTI-DISCIPLINARY ISSUES  
INTERNATIONAL FUTURES PROGRAMME

**OECD/IFP Project on  
“Future Global Shocks”**

**“Social unrest”**

**By**

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## Preamble

This paper is a commissioned contribution to the Module 2&4 of the proposed work plan for the OECD Future Global Shocks (FGS) Project (Schieb, Radisch, Sawaya, 2010). The modules and the part on Social Unrest will provide useful inputs for Module 3 ("Tools") and Modules 6 & 7, in particular for the conclusions related to

- Socioeconomic resilience and
- Governance issues.

The considerations in this paper are compatible with the development of application-oriented tools and, in particular "Risk management toolbox" (Figure 1).

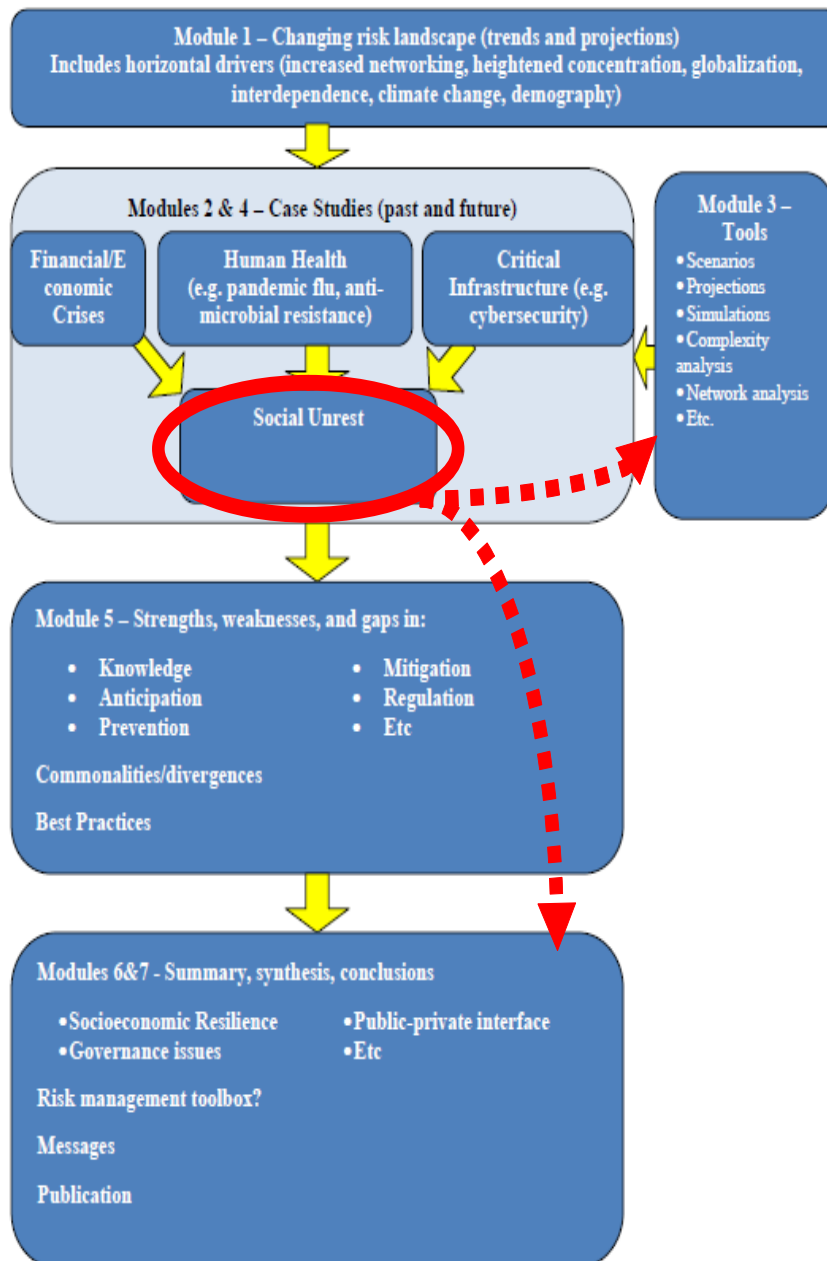


Figure 1: Overall OECD FGS Framework for the work presented in this paper

## Introduction – Scope of work

Risks can generally be understood as the potential for experiencing harm (Renn/Zwick 2008:77). More specifically it denotes the likelihood of a scenario leading to adverse effects caused by an activity, event or technology. The causal chain is not always one-directional. In ordinary terms, a risk agent (hazard) impacts on a risk object that is of value to individuals or society as a whole. The impacted risk object can then be the cause of further risks to other objects or even trigger a feed back to the source of the hazard. A good illustration of this two-way relationship can be found in technologies that pose risks to the environment. If this risk materializes and harms the environment it may pose new risks to others, for example persons who eat contaminated food. Finally, once the risk is acknowledged the technology causing that risk might be abandoned or changed. Moreover, the developer of that technology may face legal actions or other forms of social sanctions. In this way risks are part of an interaction between humans, technology and natural environment. Natural causes (such as earthquakes), technologies such as nuclear power plants but also human activities (such as clearing the rain forest) are good illustrations for this interaction (Beck 1986: 23; Luhmann 1985:18).

Damages arising from such events can generally be described as physical or psychological harm to objects that humans value. This may be the loss of property, health or even life (Renn/Zwick 2008:77). Since objects that humans value are at stake the term risk does not only denote an analytical concept of how to link hazards with potential damage to valuable objects but also a normative orientation to mitigate, reduce or avoid risks.

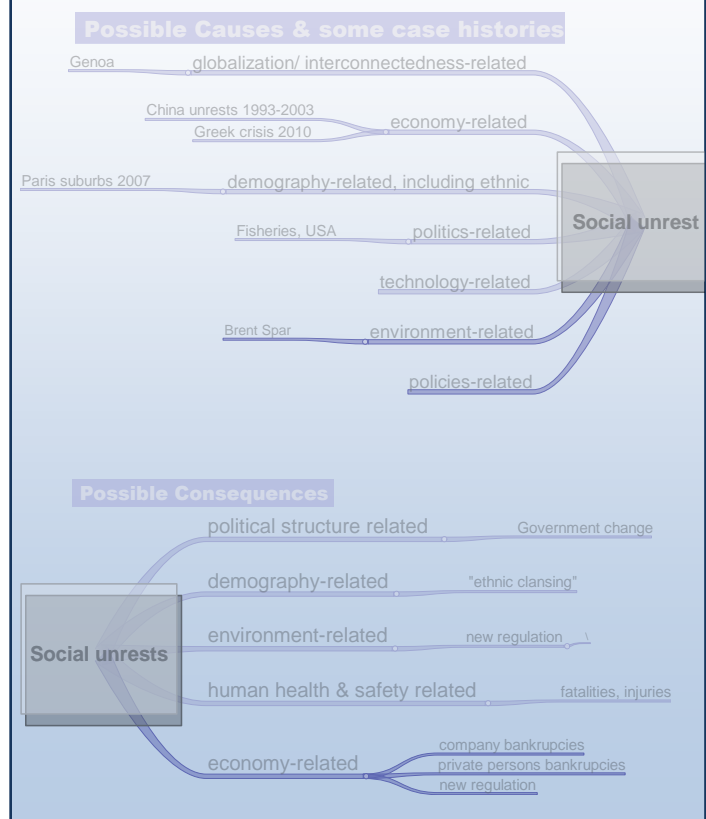
The idea of interaction between hazard and risk object and the focus on analytical as well as normative perspective are also major starting points for dealing with the connection between risks and social unrests. Social unrest can be viewed as a risk: depending on its manifestations objects that people value can be threatened by violence or other forms of social outrage. Social unrest, however, can also be the trigger or the initial hazard leading to damage in other areas, for example economic losses due to technological sabotage or boycott. Social unrest is hence cause and effect in a complex risk web that links technological, natural, social and cultural drivers. This situation is best described in the framework of systemic risks.

From a more systemic or functionalist point of view social unrest can be conceptualized as risk (posing threats to society) but also as an opportunity for positive change or development. For example those who pursue social or political goals as a means to reshape society, may turn to stimulating social unrest

### SOCIAL UNREST AND RISKS:

#### Social unrest as cause and consequence

Real or perceived risk (threat, potential harm) can cause tensions and move people to act. As many case histories show, these risks can be different in nature and origin, but may lead to similar type of social (re)action.



as an instrument for facilitating changes. Even though social unrest may trigger positive changes in society, it is associated with the risk of experiencing damage to human lives and property. It describes a complex web of triggers, immediate risks and probably remote benefits and threats which makes social unrest a typical representative of systemic risks.

The term 'systemic' describes the extent to which any risk to human health, the environment, the economy or individual well-being is embedded in the larger contexts of social and cultural aspects that shape our understanding of risk, influence our attention to causal relationships and trigger our activities for handling these risks. In late 2000, the first meeting of the OECD Steering Group on Emerging Systemic Risks concluded that such risks are located at the crossroads of three discrete and much more familiar types of perils:

- natural events (which, of course, have been partially altered and sometimes amplified by human activity, such as the emission of greenhouse gases);
- economic, social and technological developments; and
- both domestic and international policy-driven actions.

These interrelated risk fields require a new form of risk analysis and necessitate a new approach that successfully tackles the challenge of integrating data from different risk sources, either geographically or functionally, into a single analytical perspective. In other words, systemic risk analysis requires a more holistic approach to hazard identification, risk assessment, and risk management because investigating systemic risks goes beyond the usual agent-consequence analysis. Instead, the analysis must focus on interdependencies and spill-over effects that initiate impact cascades between otherwise unrelated risk clusters. The earthquake which struck ChiChi, Taiwan, in September 1999, for example, caused a global shortage of computer memory chips for a couple of weeks because it impacted severely on nearby memory chips facilities. They were a crucial part of the supply chain to the worldwide computer manufacturing industry (Hellstoem 2001).

Another well known example is BSE which had not only effects on the farming industry but also on the industry of animal feed, the economy as a whole and on politics (De Bandt/ Hartmann 2000: 11, OECD 2003:2f., Renn/ Keil 2008:350). The transmission effects were globally diffused to all areas of the world even to those who were not immediately affected by the crisis. The risks have therefore a growing potential of harm (OECD 2003: 2f.) since effects were amplified or attenuated throughout the prolongation of effects based on a complex system of interdependencies (Renn et al 2007:21).

Social unrest can be grouped into this framework of systemic risks. It can be a cause of risk to others, it can be a consequence of experiencing risk (for example a terrorist threat) or the manifestation of such a

## SOCIAL UNREST OF THE FUTURE

Relevant questions are:

- Will social unrests of the future differ from the ones we have observed in the past?
- If yes, what will be the main differences?
- Will we experience new formats of unrest (for example cyber protest)? How do we expect that social unrest will evolve in a globalised setting?
- Is social unrest a consequence of the Future Global Shocks or a driver?

These questions require a systemic framework. This paper develops such an initial framework. It proposes that social unrests of the future

- will be different from the past experiences, primarily in terms of their manifestations and global interdependencies and
- must be seen as an integral component of a complex interaction between natural, technological and social risks forming a systemic challenge since unrest will be cause and effect in a network of closely interrelated events and developments

An extension of the current 4-step framework toward a "lifecycle of unrest" might be explored in the future.

risk (the actual terrorist attack) or it can be a promoter of a risk chain that is located in other functional systems of society (for example financial crisis in the banking sector).

Our goal in this paper is to develop a framework of social unrest within a complex understanding of systemic risk. On order to reach this goal we will try to identify triggers and drivers for the emergence of social unrest and, based on this functional analysis, to design policy options telling us how to avoid, mitigate or handle unrest. The framework should enable us to improve our understanding about the circumstances that may trigger social unrest, how intensely that unrest is likely to materialize and what interventions promise to deescalate the conflict or even avoid social unrest in the first place.

In this paper we provide an outline of such a framework that can help us to identify drivers (causal roots) as well as triggers (events that lead to social unrest). Since social unrest is more a process of escalation than a finite state of the world we have conceptualized the term in from of a step-by-step escalation scheme. Each step makes social unrest more severe. It is a gradual framework that identifies different stages that make social unrest more and more probable. Before we have a closer look to the main subject -social unrest - within this paper we will explain in a short chapter in what way social unrests show characteristics of systemic risks.

In order to identify relevant drivers and cluster of drivers we will investigate three case studies with the following topics: Pandemics, cyber-related risk and financial crises. The main question is how these events did or could cause social unrests. In a second step we outline an analytic model that can be used to capture the combined effects learned from the case study analysis. In a third step we will apply the IRGC risk governance model for explaining the risk of social unrest or predicting the consequences of social unrest. Finally we will develop some guidelines for normative governance with respect to social unrest.

## Social unrest as systemic risk

The focus in this chapter will be on the connection between systemic risks and social unrest. The question is in what way social unrests can be seen as systemic risks or at least as a part a systemic risk and what analytical consequences this has. For this purpose we will use a typology of risks that has been developed by the IRGC for their framework of risk governance. The model has been explicitly designed to apply to systemic risks and seems to be one of the most articulated models within risk research (IRGC 2006 13f.; IRGC 2008:16; Renn et al 2007: 164, Renn 2008:280f.)

Within this concept risks are ordered according to their dominant characteristics. Systemic risks show the following characteristics: Complexity, uncertainty, ambiguity and spill-over effects. We will take a closer look on these characteristics in the following paragraphs:

Complexity refers to the difficulty of identifying and quantifying causal links between a multitude of potential candidates and specific adverse effects (cf.: Lewin 1992; Underdal 2009; Waldrop 1992). A crucial aspect in this respect concerns the applicability of probabilistic risk assessment techniques. If the chain of events between a cause and an effect follows a linear relationship (as for example in car accidents, or in an overdose of pharmaceutical products), simple statistical models are sufficient to calculate the probabilities of harm. Such simple relationships may still be associated with high uncertainty, for example, if only few data are available or the effect is stochastic by its own nature. Sophisticated models of probabilistic inferences are required if the relationship between cause and effects becomes more complex (Renn and Walker 2008). The nature of this difficulty may be traced back to interactive effects among these candidates (synergisms and antagonisms, positive and negative feedback loops), long delay periods between cause and effect, inter-individual variation, intervening variables, and others. It is precisely these complexities that make sophisticated scientific investigations necessary since the dose–effect relationship is neither obvious nor directly observable. Nonlinear response functions may also result from feedback loops that constitute a complex web of intervening variables. Complexity requires therefore sensitivity to non-linear transitions as well as to scale (on different levels). It also needs to take into account a multitude of exposure pathways and the composite effects of other agents that are present in the exposure situation. Examples of highly complex risk include sophisticated chemical facilities, synergistic effects of potentially toxic substances, failure risk of large interconnected infrastructures and risks of critical loads to sensitive ecosystems.

### **SOCIAL UNREST AS A SYSTEMIC RISK**

Once social unrest manifests itself it can trigger further consequences and lead to secondary risks outside of the area in which the unrest originally occurred. In a globalized society unrest can act as trigger of transboundary ramifications, small local events (e.g. the unrest in Tibet 2009/2010) can cause "snowball effects" world-wide even if such events are not misused by the media.

In reference to social unrests the following points of complexity can be problematic:

- it is unclear how different causes and combination of causes interact with each other (moderating or increasing the effect) and with the outcome of social unrest;
- it is not clear how modifying and moderating factors influence the causal relationship;
- at this point time, neither the causes nor the intervening factors or social unrest are known to science leading to social unrest;
- within such an model of unrest a distinction between factors (variables that describe the more the context that leads to social unrest) and triggers (variables that drive a situation in which the context is very likely for social unrest to it) seems to suitable.

All in all social unrests can be grouped in the category of complex events. As there are no empirical models that are capable of explain the causal chains that would lead to social unrest a multitude of



potential factors need to be considered. These factors also interact with each other and influenced by external conditions and constraints. Furthermore, it is also not clear how one can specify the dependent variable, i.e. the unit in which social unrest can be expressed.

Scientific uncertainty relates to the limitedness or even absence of scientific knowledge (data, information) that makes it difficult to exactly assess the probability and possible outcomes of undesired effects (cf.: Aven and Renn 2009; Filar and Haurie 2010; Halpern 2003; Rosa 1997). It most often results from an incomplete or inadequate reduction of complexity in modeling cause-effect chains (cf. Marti et al. 2010). Whether the world is inherently uncertain is a philosophical question that is not pursued here. It is essential to acknowledge in the context of risk assessment that human knowledge is always incomplete and selective, and, thus, contingent upon uncertain assumptions, assertions and predictions (Funtowicz and Ravetz 1992; Laudan 1996; Renn 2008: 75ff.). It is obvious that the modeled probability distributions within a numerical relational system can only represent an approximation of the empirical relational system that helps elucidate and predict uncertain events. Examples of high uncertainty include many natural disasters, such as earthquakes, possible health effects of mass pollutants below the threshold of statistical significance, acts of violence - such as terrorism and sabotage - and long-term effects of introducing genetically modified species into the natural environment.

Referring to social unrest uncertainty plays a major role in various expressions:

- It is still unclear to what degree most of the identified causal factors influence social unrest, and how various moderators impact on the causal relationships.
- Most factors interact with social unrest in a non-linear relationship.
- Many causal factors are simply unknown.
- Most factors that have been identified are highly dependent on cultural context, social situation and historical conditions.

Ambiguity indicates a situation of ambivalence in which different and sometimes divergent streams of thinking and interpretation about the same risk phenomena and their circumstances are apparent (cf. Feldman 1989; Zahariadis 2003). We distinguish between interpretative and normative ambiguity which both relate to divergent or contested perspectives on the justification, severity or wider 'meanings' associated with a given threat (Stirling 2003; Renn 2008: 77).

- *Interpretative ambiguity* denotes the variability of (legitimate) interpretations based on identical observations or data assessments results, e.g. an adverse or non-adverse effect. Variability of interpretation, however, is not restricted to expert dissent. Laypeople's perception of risk often differs from expert judgments because it is related to qualitative risk characteristics such as familiarity, personal or institutional control, assignment of blame, and others. Moreover, in contemporary pluralist societies diversity of risk perspectives within and between social groups is generally fostered by divergent value preferences, variations in interests and very few, if any universally applicable moral principles; all the more, if risk problems are complex and uncertain.
- That leads us to the aspect of *normative ambiguity*. It alludes to different concepts of what can be regarded as tolerable referring e.g. to ethics, quality of life parameters, distribution of risks and benefits, etc. A condition of ambiguity emerges where the problem lies in agreeing on the appropriate values, priorities, assumptions, or boundaries to be applied to the definition of possible outcomes. Examples for high interpretative ambiguity include low dose radiation (ionizing and non-ionizing), low concentrations of genotoxic substances, food supplements and hormone treatment of cattle. Normative ambiguities can be associated, for example, with passive smoking, nuclear power, pre-natal genetic screening and genetically modified food.

Both interpretative and normative ambiguity are associated with social unrest. Many expressions of social unrest may also be categorized as social outrage, protest, demonstration or civil disobedience. It depends on the legal traditions and cultural norms which expressions of discontent are subsumed under the concept of social unrest. Furthermore, with respect to normative ambiguity, social unrest may be

viewed as a risk or an opportunity depending on which side one stands. For example, riots against financial politics in Greece can be seen as harm (for example a possible position of the government) or as an opportunity (the chance to get perceived injustice reversed).

Social unrest is also a typical example of a systemic risks. First of all, systemic risks are characterized by high complexity, uncertainty and ambiguity. Moreover to be called systemic the potential damage is not limited to the original risk arena but spreads out to other arenas (OECD 2003a:9). The key characteristic that sets systemic risks apart from conventional perils is that their negative physical impacts (sometimes immediate and obvious, but often subtle and latent) have the potential to trigger severe ripple effects. When a systemic risk manifests into calamity, the ripple effects that result can cause a dramatic sequence of secondary and tertiary spin-off impacts. They may be felt in a wide range of seemingly divergent social systems, from the economy to the health system, inflicting harm and damage in realms far beyond their own. A commercial sector, for example, may suffer significant losses as a result of a systemic risk. Such losses occurred in the travel industry in the aftermath of the terrorist attack of September 11, 2001, when business people and holidaymakers alike were too frightened to board a plane. Similarly, the UK agricultural sector suffered for years during the crisis over Bovine Spongiform Encephalopathy (BSE), widely known as Mad Cow Disease. People did not want to eat British beef, no matter what tangible evidence they had, one way or another, about its relative danger to their health or inherent safety. Both were typical examples of the manifestation of a systemic risk. In its ultimate extent a systemic risk can cause the collapse of a system. The ripple-effects towards other areas of concern and the possibility of a system collapse are additional components of systemic risks (Renn and Keil 2008: 349f.).

Social unrest meets all the criteria for systemic risks: they are characterized by a high degree of uncertainty, complexity and ambiguity. They demonstrate a high degree of ripple-effects into other sectors of society and, in the worst case, can contribute to the collapse of a political system. For example, riots may lead to the breakdown of food supply or other basic goods. Or protest may legitimate other violent actions such a looting. On the other hand social unrest can be a systemic effect in itself. Unrests are not necessarily caused by a societal reason (e.g. dissatisfaction with any societal relations) but the reason also can be another harmful event. So it was the case during and after Hurricane Katrina as much looting occurred. The problem here was that the storm and the failure of institutions to provide help lead to self-help situations that drove people to loot. In this sense we can state that social unrest can be the cause or effect in line with harmful events.

In conclusion we can state, that social unrests are complex events that can be influenced and triggered by social causes as well as accidents and natural disasters. They are characterized by high complexity, uncertainty, and ambiguity, they can easily trigger effects onto other sectors of society and are capable of inducing a breakdown or collapse of the social or political system. Furthermore, our knowledge about the causes and triggers of social unrest is very limited due to the multitude of potential factors, non-linear relationships within the complex causal web, and the predominance of idiosyncratic context-driven elements that make generalizations extremely problematic and dubious.

As there are many gaps in scientific research on social unrest events this document can only collect some of the insights gained so far and suggest a conceptual approach that could help to better understand and ultimately model the genesis of social unrest. In this paper we therefore attempt to develop a heuristic tool that enables us to identify the main drivers of social unrest and to conceptualize some of the pathways that could lead to social unrest.

Before introducing this heuristic mode, it is necessary to have a closer look at several cases of systemic risks that either lead or could have lead to events of unrest. The next section we will discuss several case studies and identify aspects that all these cases have in common. The major objective here is to distinguish between developments that constitute typical and universal patterns and unique, idiosyncratic elements that can be applied only to the respective case and its historic context. These case studies provide the basis for delineating the outline of a model that could help us to improve our understanding of social unrest.

## Case histories

In this section we will have a closer look at four cases of risks or catastrophes that have caused or could have caused social unrest. We are interested to explore why social unrest has occurred and what secondary impacts different expressions of social unrest have produced. The four cases we selected are the outbreak of H1N1 in 2009, the unrests in Greece related to international financial crises, cyber related risks and the hurricane Katrina. First, we will describe the case histories and distill the main structural elements that characterize the dynamics of each case. Second, we will compare the cases and identify their common elements. These common elements form the building blocks for our own model.

The four case studies are very different in nature and access to data. With respect to hurricane Katrina sufficient empirical material was available to perform our analysis. In other cases such as the protests in Greece or cyber related risks reliable sources for evidence were rare. So we had to draw from newspaper articles or rely on expert interviews. Hence, the analysis of the four case studies varies in their scientific validity.

### Financial crisis: Greece 2010

In 2008 various demonstrations and strikes took place in Greece as a response to the lack of job opportunities among young people. This protest was present not only in Athens but also in almost all larger cities in Greece. The demonstrations were aggravated by the death of a young demonstrator who was shot by the police on Dec, 6th 2008 (Eckert 2008: 1). In the end, university campuses, radio stations and even the studios of the National Television were occupied by protesters for some time (Sotiris 2010: 203).

Reasons for this first outbreak of public dissatisfaction are numerous: Young people are faced with a more than 20% youth unemployment rate in Greece in the year 2007 which is one of the highest rates in Europe (Tausch w.y. 14). Challenging entrance exams, requiring hours of extra courses and expensive tutorials and limitations of access to higher education worsens this problem. Even with a university graduation it is difficult to get a decent job in Greece. In some texts the younger generation facing these problems is called the 700 Euro generation because of the low salaries that they receive upon graduation from university (Sotiris 2010: 205; Bratsis 2010: 191). This situation became even worse with the introduction of the Bologna process that caused a tendency to de-link university degrees from professional qualifications, and made the opportunities for a well-paid job even more uncertain. Furthermore it was considered to legalize private higher education in Greece that is normally excluded by the constitution. So all in all the protest movement of young people in Greece was triggered by the perception of social misbalance and inequities as well as the experience of missing reactions by the public authorities (Sotiris 2010: 207).

In contrast to similar uprisings in France or other countries, the riots in Greece seemed not to be limited to a certain group of young people such as students or socially disadvantaged youngsters but included a large cross-section of society within the younger generation. Some authors explain this breadth of the movement by referring to the fact that all young people in Greece face similarly bad employment conditions (Sotiris 2010: 207). However, some observers detect a new quality of protest in this Greek case. Most demonstrations happened in different cities during the same time employing similar strategies and means of actions. The demonstrations were obviously coordinated by using modern communication technology, in particular cellular phones. The riots in Greece calmed down in 2009 but with a further decrease of economic prosperity in the country mainly linked to the world financial crisis, experts expected a new wave of uprising in 2010. And this expectation turned out to be true

With the advent of the world economic crises and a national new debt of about 13% of the Greek national budget, the Greek economy faced a serious financial crisis. Those new debts endangered the stability of the Euro in all countries in which the Euro became the national currency. Driven by demands of the EU and the International Monetary Funds, the Greek government and parliament passed a plan on 06 May 2010 that included drastic measures for getting the national debts under control in exchange for monetary guarantees by the EU and the IMF. The Greek government promised to reduce national debts to 3 % of the gross national product in 2011 (this amounts to 25 billion Euros). To reach this goal the Greek government decided to reduce the wages for governmental employees, to lower pensions and to increase the value-added tax. Also taxes on products like tobacco or alcohol were increased. Military expenses were also reduced (Spiegel ONLINE 2010: 1f.; Spiegel ONLINE 2010b: 1f.).

Against these massive measures of reducing governmental spending, many people (this time not only the young) started protesting. The reasons for the protest are manifold: Only around 40% of the interviewees of a representative survey by „Kathimerini“, a daily press organ, believed in the ability of Greece government to resolve the financial crisis and social problems within the country (Pick 2010: 1). Many people in Greece live below the poverty line - in 2008 around 20%. During the protests mainly organized by the labor unions violent outbreaks occurred causing the death of three people. After this dramatic event the riots came to an end.

### ***What do we learn from this case?***

The death toll of four appears rather low compared to other riots of this kind. The monetary losses amounted to roughly 25 billion Euros. This includes all costs directly connected to the demonstrations and strikes. Additional monetary losses that are connected for example with loss of international confidence in the ability of the Greek government to master the crisis might increase this amount dramatically. However, the main risk is not related to human lives or assets but to the lack of trust in the institutions of government and its ability to resolve the problem. The reason for this feeling of missing confidence might be found in a long term history of social tensions and experience of injustice. According to the reports in media, social inequities have been on the agenda for a long time, and have caused protests and outbreaks in almost regular intervals. The riots of students in 2008 were only one example in a long series of public outrage vis-à-vis numerous experiences of governmental mismanagement and inaction. The firm position of the present government may have ignited the protest movement but it also had reconfirming effects to those who always questioned the efficacy of governmental action. Now almost all Greeks are convinced that the government is serious about reducing the deficits and rejuvenating the economy.

During the recent protests, people organized themselves spontaneously. Similar to the youth movement in 2008, the media such as internet and mobile phones were widely used to coordinate the demonstrations. Labor unions were important actors in organizing the movement. Their main focus was on the effects of the austerity measures on the socially disadvantaged and poor sections of the population. They claimed that the measures were unbalanced and privileged the rich on the expense of the poor. The unions were able to mobilize their members quickly and they were well prepared to organize a large street movement. This might be one of the reasons that the protest appeared well organized and orchestrated. It is interesting to note that the 2008 movement was radicalized when the police shot a young man. The public perception blamed the police for the “accidental” shooting of the demonstrator. This increased the legitimacy of the movement. In contrast, the three victims of the 2010 demonstrations were allegedly caused or at least provoked by the protesters themselves. Three employees of a bank died in a fire that was caused by demonstrators. Emergency service providers complained afterwards that they did not get access to the trapped victims because the demonstrators blocked the entrance to the bank. This time public perception blamed the demonstrators for the outbreak of violence. This de-legitimized the protest movement. It came almost to a complete stop.

## **Pandemic flue: H1N1 2009**

Swine flu is a common disease. The new outbreak in 2009 got international publicity when Magret Chan, the general director of the WHO announced on June 11th 2009 that there is a serious risk for the outbreak of a new influenza pandemic (Cohen/Carter 2010:1). The infection is known to experts since at least 1988 as the virus was found in the body of a woman that had attended an agricultural exhibition before. Antibodies were also found in people that came in regularly contact with pigs (Flynn w.y.:5; Hein 2009: 5).

The influenza in 2009 can be traced back to the 18th of March 2009 in Mexico. The first cases were reported to WHO in April. In May 5251 cases of influenza were counted worldwide by WHO. According to WHO classification (indicating the progress of an influenza pandemic) the case of H1N1 was attached to level 6. (This scheme distinguishes 7 different steps, where 7 is the most severe case). The reason for the high classification was the observation that the virus spread quickly from the infected to the non-infected population. According to Flynn, in the period between the outbreak of the influenza in 2009 until April 2010, a total of 17.919 deaths were recorded in 214 countries (Flynn w.y. 5). For comparison: In Germany on average 21.883 fatalities are caused by influenza each year (not H1N1) (Statistisches Bundesamt 2009:247). In contrast to the normal influenza, the H1N1 virus attacked predominantly younger people and fatalities were observed even among otherwise very healthy individuals. In addition, pregnant women, younger children and people with chronic lung disease were more at risk than others (Flynn w.y. 6).

The reactions to the outbreak of the swine influenza differed widely between countries. Some countries suggested to avoid travelling to Mexico, Ecuador cancelled all flights to Mexico. Around ten countries stopped importing pork from Mexico (which according to public health experts was only a symbolic gesture as the consumption of pork was not related to the infection). Many states purchased large amounts of vaccines, in particular Oseltamivir and Zanamivir (better known as Tamiflu and Relenza), spending billions of dollars. This purchase was advised by WHO executives. In nearly all cases most vaccine portions were never used and needed to be discarded. France, for example, initially ordered 94 million doses of vaccine. In the aftermath of the swine flu incident a stock of unused vaccine of 25 million doses was left over, costing the French taxpayers an amount of 365 million Euros (Flynn w.y.: 15). Many critics blamed the WHO for advising countries to buy large stocks of vaccines. In particular, the WHO experts were accused of having close ties to the pharmaceutical industry which benefitted from the expansive purchase orders. The same critics also accused other major actors such as the Council of Europe for having over-reacted to the crisis (Flynn w.y.).

The composition of the vaccines was also criticized as being not sufficiently tested and authorized. Finally, critics blamed the media for emphasizing and blowing out of proportion the threat of a pandemic. This sensational reporting had contributed in their view to the lack of credibility and confidence in public authorities (Flynn w.y.:17).

### ***What do we learn from this case?***

The potential of harm in case of the swine influenza can be rated as high, although it appears quite moderate compared with death toll of normal influenza that occurs each year. All in all, there were less than 20,000 deaths around the globe. Numbers of all affected people are not available at this time. Monetary losses are estimated to be huge given the amount of purchased vaccines and other precautionary measures undertaken by public authorities in almost all countries. The potential for social unrest (occasional protests were observed in some countries such as the Ukraine) is not related to the outbreak of influenza but associated with the perception of inadequate or disproportional responses by public authorities. Hence most of the displayed dissatisfaction stems from a feeling of lost trust in the risk regulating institutions as well as in the pharmaceutical industry (which was blamed for taking advantage of the situation).

Some people were also concerned about the restraint of freedom because they were not allowed to travel (private or business) to specific destinations (such as Mexico City) and to trade agricultural products with countries like Mexico. Such constraints are linked with economic losses that, in hindsight, appear to be unjustified since the trade restrictions had no effect.

In essence, the case seems to bear enough potential to provoke social unrest. However, little protest emerged. This may be caused by the rather mild consequences of the disease and the overreactions by the authorities. Overreacting implies a waste of public money, at worst. This is no reason to get seriously upset and start a protest movement. If the public officials had under-reacted and people had died because no vaccine was available the blame factors would be much stronger and a public expression of outrage would likely occur. Even if there was a huge waste of money public officials are well advised to buy access vaccine rather than facing the risk of having access deaths of people. Maybe just for this reason there has been no organization or group that decided to mobilize the public against the public policies of being on the safe side.

## **Cyber security**

In comparison to the other case studies introduced here, there has been no social unrest triggered by a cyber related incident. For that reason we concentrate on assessment in what ways social unrest could occur as a result of a cyber-related incident. Our data basis for this is the paper prepared by Ian Brown within this OECD project, who worked on the subject to reduce systemic cyber security risks.

According to this report events that can be classified as global shocks such as interruptions in infrastructure, finance systems and disturbances affecting the functions of political system and government are most relevant (Brown 2010:3). Our question is how cyber-related events could trigger social unrest?

### ***Infrastructure damage related to social unrest***

Infrastructures that are most sensitive to human welfare can be grouped into nine categories: These are energy services, government, communications, health, water, energy, financial services, food and transportation.

Dysfunctional behavior of infrastructure can be caused by Internet failures if the operation of infrastructure service is directly linked to commands transported by IT services. Such direct impacts on infrastructure functionality can result from technical failures, errors by operators or malicious actions such as sabotage and terrorism. Most sensitive infrastructure have sufficient devices for redundancy of input services, firewall capacity and contingency routing in place, yet there are numerous examples of technical as well as human failures that have resulted in partial or total breakdown of infrastructural services. Equally relevant are indirect impacts such as the failure of communication systems in the aftermath of an infrastructural failure, for example the loss of electricity. If energy and water supply are out of order, people face problems with securing their basic needs, communicating for assistance or help and even getting financial support (for example, one is not able to take money from automatic telling machines because of computer network failure.) (Brown 2010: 10ff.). It is our assumption that social unrest is more likely to expect when IT failures accompany infrastructural problems rather than causing them. If IT is the cause of a disrupted service social unrest will most likely be targeted against the missing service and its organizational representatives. However, if an IT failure emphasizes a given disaster, for example by blocking all means of communication, the unrest may be targeted against the providers of the communication services and those whom they believe represent these services.

### ***What do we learn from this case?***

Since this is a hypothetical case we can only speculate that many will express dissatisfaction with a situation of IT failure without providing suggestions for improving the situation. Dissatisfaction will

certainly be present in such a case but it will be diffuse and not well organized. Dissatisfaction may occur in cases in which people have to face serious damages (like the loss of relatives or friends) or in that people are dissatisfied with risk management (This might be the case if people are not supported over a longer period of time with water, energy, food and other life relevant goods). Also important in these cases might be the assumption that people believe risk regulating agencies to be incompetent and not prepared to help them improve their situation. If this is not the case unrest might occur earlier or in cases where help is not fully given or only given to few there might be the accusation for being unjust. A further important factor is media coverage. Broadcasted information that turns out to be not true destroys trust and might trigger social unrest as it was the case during hurricane Katrina (see below).

All in all if dealing with the question of unrest in cases of cyber-related risk we can conclude that outcomes of this form of risk may occur in a similar shape as a result of other risks or disturbances which have the potential for social unrest. Hence, it may not be the cyber related problem that might lead directly to social unrest but the context variables in which the cyber attack might be embedded. The cyber problem is likely to act as a promoter of conflict that will enforce its intensity.

## **Hurricane Katrina**

Information about hurricane Katrina is controversial and it is difficult if not impossible to decide between facts and fiction after the event when investigating the media coverage and scientific studies. We therefore concentrate on issues that were reported in several parallel and credible sources.

The hurricane Katrina took place on August 23th 2005 over the Atlantic as a category one storm. During its way to the Gulf coast it gradually weakened. On August 29th the storm hit the coast of Louisiana. At this time more than 1.2 million residents tried to flee the catastrophe. Also New Orleans was warned. As wide many sections of the town are below the sea level it was expected that those parts of the town are at risk to be flooded. And this was indeed the case. During the storm the flood broke down barrages on a length of over 150 meters. Parts of New Orleans were flooded with water levels exceeding 7.60 meters (Rehländer w.y.:1; Eisenmann et al 2007: 109). The storm abated in Quebec and New Brunswick (Canada) on August 31th (Comfort/Haase 2006: 328).

As category three storm Katrina was not one of the strongest storms the region had faced before but the special circumstances in New Orleans made it nevertheless one of the most destructive. The storm killed more than 1300 people and caused more than \$80 billion damages; 90,000 square kilometers were affected (Cutter at all 2006: 10).

Emergency relief was the main problem during the storm. Many people tried to get shelter from the storm in the superdome - the football stadium in New Orleans that soon was filled with more than 20,000 people. Those people were left according to Rehländer w.y. without drinking water and nutrition or adequate medical care (Rehländer w.y.:1). According to other reports they stayed without operational sanitary facilities for nearly a week, refugees coming to superdome on Tuesday (30th of August) were sent away. (s. w.a. w.y.: 10).

In addition, food supplies did not reach the people in the shelters and evacuation was poorly organized. One major reason for the chaotic situation was a lack of coordinated communication among the many emergency relief organization (in total 535) during the first three days after the landfall of Hurricane Katrina. As electronic transmission lines were not operating electronic communication was unavailable to the relief organizations. Cellular phones were also not operating since the phone stations were flooded. Even satellite communication was negatively affected by the storm. The breakdown of communication networks was one of the biggest problems that the emergency relief organizations had to face. They had hardly any opportunity to coordinate their operations. (Comfort/Haase 2006: 328ff.).

Many citizens who were not able or did not flee into one of the shelters (so as people that could not escape their houses via rooftop or were in nursing homes) drowned. Rescuers had to cope with polluted water and debris as well as with snipers using fire arms. Gunshots were reported as part of looting. The

media reported about looting emerging from New Orleans and the surrounding heavily impacted areas. Yet, these reports were not validated by officials. There is a long-standing assertion in sociological literature on disasters that looting is portrayed as a myth. According to professional observers in the city, the media displayed a biased picture of the situation in New Orleans. Reasons for this are seen in the fact that media tried to report about extraordinary events and presupposed the existence of a looting frame without checking the facts (Barsky et al 2006: 1; Tierney et al 2006: 61). Another issue was related to race. Mostly black people were among those who were not evacuated. There are several reasons for the members of the black community not to leave town before the disaster. Firstly, many of them do not have private cars or the financial means to evacuate their homes. Others who had private cars were not able to fit all members of the family inside the car and did not want to leave, for example, kids or grandparents behind. They relied on public transportation which was unavailable for my areas in town. Secondly, their homes and the belongings inside the homes is all what they have and so they tried to secure their livelihood as long as possible. Thirdly, poor neighborhoods were in fear of looting and had no confidence in police and other forces to protect their homes. Lastly, many residents of the poor black communities had little trust in the emergency warnings issued by the city government which they felt were not addressing them when recommending evacuation (Cutter et al 2006: 11).

Looting became a major issue in the aftermath of the disaster. Among the looters were those who cared for their essential needs. Much looting occurred around the Superdome where basic supply was missing. There were also cases in which people high jacked water trucks to support themselves and others. However, there were also reports about organized looting for non-essential goods such as TV-sets or electronic equipment. These looting events did not exceed the number of criminal acts that take place in New Orleans on normal days. Police statistics indicate even a decrease in arrests for looting and other similar offenses in the time after the hurricane compared to average occurrence of criminal acts in times of normality. This decrease may also be due to the fact that fewer arrests could be made because of the disaster. The amount and intensity of looting after the disaster are still contested in the literature (Barsky et al 2006: 3-5).

### ***What can we learn from this case?***

Katrina as risky event had a high potential of harm. Numerous people were killed or lost their houses or faced other material damages (sometimes they had to be resettled as some of the neighborhoods in New Orleans were not rebuilt). As Katrina was not the first hurricane that hit New Orleans and the surrounding region the institutional responses by emergency relief organizations were clearly inadequate. The failure of institutions was mainly caused by the breakdown of communication networks. This demonstrates how much modern societies depend on communication technologies to coordinate collective or joined actions. The experience of institutional failure caused a decline of trust and confidence in those organizations and institutions that were supposed to provide supply, shelter and assistance. As a result many citizens formed self-help groups to secure their existence. This also included looting for the main necessities of life. However, there was little organized organization of protest, partly because the affected citizens were not organized before the event and partly because the poorer members of the community had little agency and means to make their protest visible to the outside world.

The images of hurricane Katrina have been strongly formed by the mass media. Sensational reporting emphasized looting incidents and occasional shooting. Analysts who collected the evidence after the disaster believed that looting did not occur as frequently as the mass media portrayed it. The coverage of looting distracted from the institutional failures and served as one mechanism to blame the victims for their fate. Although media were full of human touch stories about people's suffering the images that were evoked by the stories were more associated with a strike of bad fate or personal misperception of the danger than of blame with respect to the relief efforts.

Social tensions were frequently reported, in particular feeling of outrage and anger when sheltering did not work out or supply was mismanaged. Experiencing social vulnerability can be a major cause for



social unrest or protest. However, it did not happen here. It was obvious that in the aftermath of the disaster the affected citizens expressed anger and outrage. Yet there was no organized protest movement to absorb this anger and to transform it into political action. The organizations that are involved in civil rights movements did attempt to rally against the authorities on all political levels. Yet in spite of the proven insufficiency of the public authorities, the protest did not reach the plateau of major protest or even social unrest as the affected individuals were partially traumatized and unable to react. Many found shelter in other cities and areas of the United States and could therefore not join the protest movements. Finally the vast amount of emergency relief organizations made it difficult to focus on one or a few alleged culprits so that the protest became diffused. However, the story is not over yet. Reconstruction of the flooded areas of town has given rise to many new protest movements that may become more energetic over time. So the end of the storm is not the end of the story since protest against plans of how to rebuild or redesign the flooded quarters have spread throughout the city even in recent times (Moll 2008: 1).

## Comparison of Cases

The aim of this section was to investigate the circumstances when and the reasons why social unrests occur. In this subsection we like to draw our conclusions from the analysis of case studies. First we want to discuss the triggers for social unrest. The obvious hypothesis here is to link unrest with the potential of harm or perceived damages associated with possible causes of social unrest. The cases suggest that something like a threshold or a tipping point needs to be surpassed before people become active. However, the cases do not provide clear evidence on the degree of dissatisfaction that would be needed to trigger political protest. In Greece, the threshold for protests seems to be lower than, for example, in Portugal or Ireland with similar economic problems. Moreover, the responses to the swine flu varied among different countries and the extent of public concern does not seem to be correlated with the absolute or relative number of human losses.

If we rank-order the cases with respect to the extent of damage the case of H1N1 is located on the first place since more than 17,000 died, many people were harmed and huge amounts of money were lost. Second came Hurricane Katrina which caused app. 1300 deaths and several million dollars of damage. The financial crisis in Greece occupies the third position. It caused major economic losses that are difficult to estimate. There were no direct risks to human lives, health, and the environment. The four people who were killed in Greece are the result of the unrest not of the economic crisis.

The degree of social unrest as measured in terms of mobilization follows the opposite order: the financial crisis comes first, followed by Katrina and H1N1. However, one should be aware that this comparison can provide only hints for a weak or even missing link between severity of the trigger and the extent of the social unrest. People have strong beliefs about what they normally expect from a specific trigger. The human losses of H1N1 were probably lower than what people expected while the losses of Katrina were higher than what people would normally associate with hurricanes in the United States of America. In the financial crisis the Greek population had expected that the government had grossly overspent their budget but did not anticipate that it would accept all the austerity measures that were demanded by the EU and the IWF.

The emphasis on expectation as the main yardstick for causing social unrest underlines the importance of risk perception. The main contributor to the perception and evaluation of triggers for social unrest is the coverage of the trigger in the media. The mass media shape the public image of a risk. In the case of hurricane Katrina there is still no conclusive evidence whether looting actually occurred and to what degree. Some authors claim that looting was basically a story invented by the media. This reporting triggered a lot of outrage and fueled further protest. It may even be a promoter for looting as criminals might take the media coverage as an invitation to share the alleged looting teams.

Similarly, in the case of influenza the mass media played an important role in amplifying the potential hazards or ridiculing the risk. Since the public has not immediate experience with the new virus it

relies on the news media for information. Depending on the overall impression that the media leave on the average citizen more or less concern and even outrage can be the result. As soon as people were aware that the new disease was less dramatic than they were asked to believe anxiety was replaced by anger about the alleged alarmists in politics, media and specific interest groups such as the pharmaceutical industry.

Media coverage played also a major role in the other case studies. If people have no direct experience with hazards or triggers of social unrest they rely on trustworthy sources for information (Renn 2005). Often the media are the only informants about the potential threat. However, media have only the power to set the agenda or amplify or attenuate existing signals. The crisis in New Orleans was caused by an inappropriate emergency management by the US authorities which indeed was amplified by the media. The perception of unfair treatment during the financial crisis in Greece was partly induced by a common feeling of lacking confidence in the economic and social management skills of the Greek government. People were dissatisfied with the performance of their government in Greece, they were angry about the lack of professionalism in emergency relief in New Orleans, and frustrated about the inconsistent and incoherent advice from governmental and other official institutions in the case of swine flu.

The cyber attack case is different from the others because it never occurred. It still remains a hypothetical risk that most nations never experienced – at least in its full impacts. However, one could observe a growing concern of many stakeholder and public groups and associated with this concern demands to industry and government to invest more money and resources for IT infrastructure protection.

All cases studies demonstrate that some kind of external trigger causes a collective experience of dissatisfaction. This is definitely the first step in a long process towards social unrest. The trigger could be a natural hazard, technological accidents or human failures. It might even be an idea, a common perception or experience or a hypothetical risk. Social unrest rarely occurs as a result of a positive vision. Such a vision may be developed in the aftermath of the dissatisfaction or visionaries may use the dissatisfaction to install a vision in these people. Unless people have the feeling that someone is to blame for a situation that they feel is not acceptable there will be hardly any reason for social unrest to grow. In Greece the financial crises and the problems with perceived governmental incompetence formed the background for the social tensions that emerged already in early 2008. In the case of hurricane Katrina many observers as well as affected victims were convinced that the emergency relief institutions failed to do their job efficiently and also claimed that the relief efforts were discriminating against colored people. In the case of H1N1 many observers blamed the pharmaceutical industry for dramatizing the threat as a means to make more profits. However, the risk regulating institutions, mainly the WHO, but also national public health institutions did not fail their task to protect people. They reacted quickly and professionally as soon as the risk was discovered. The problem here was that they did not act consistently over time and tended to overreact in order to avoid being blamed for risking people's lives. In most political cultures it is much easier to survive the accusation of wasting taxpayer's money than of risking human lives. Another cause of dissatisfaction in this case was the alleged unequal distribution of vaccine among potential patients. In Germany, politicians allegedly were subjected to a vaccine that was supposed to have less negative side effects than the vaccine given to the general public.

In addition to blame, the notion of fairness and social justice causes or amplifies the feeling of dissatisfaction. Blame points to the direction of the protest, perceived inequity produces the legitimization for the protest. Inequity was prevalent in the cases of Katrina (towards poor and colored people), Greece (the low income classes are the ones that have to pay for the rich) and partly swine flu (the politicians get a more effective and less dangerous vaccine than the ordinary citizens).

A third variable that has a strong impact on the feeling of dissatisfaction is trust. The Greek population has very little confidence in the ability of the government to master the crisis. The residents of New Orleans had little trust in many of the emergency relief organizations; most notably FEMA (Federal

Emergency Management Agency). The problem with the overreaction by many institutions facing H1N1 was not the waste of money. Rather the institutions were accused to stand under the influence of the pharmaceutical industry, trying to make profit by persuading the governments to buy tons of vaccine.

***Blame, perceived injustice and lack of trust seem to be the main drivers*** for a collective feeling of dissatisfaction. This collective feeling does not express itself directly in social unrest. In order for protests to be effective it is essential that the protesters organize themselves or find an existing organization that picks up the common cause. The protests in Greece were basically organized by the unions and other social associations, the protest in New Orleans was diffused because of the lack of organizations that rallied around the cause and mobilized supporters. Some mobilization occurred but it was not strong enough to gain more momentum. Only months after the disaster did civil liberty organizations mobilize the public against reconstruction plans that would have (allegedly) benefited the richer parts of town on the expense of poorer sections. The dissatisfaction about the swine flu had very little political impact as none of the existing social groups adopted the case for mobilizing its supporters. For the hypothetical case of cyber attacks there are strong organizations ready to act yet there is still not a case that creates enough outrage (based on blame, perceived injustice and lack of trust) to support a continuous protest movement.

Even if the protest movement is organized and develops a collectively visible strength it may not result in active social unrest which would include illegal actions of resistance or protest. The Greek protest almost collapsed when the first victims were reported. Since the victims were associated with the demonstrators and not (as in 2008) with the police, the legitimacy of the protest movement was seriously compromised and did not recover until today. The escalating protests of the New Orleans people were dwelled when the political system acknowledged mistakes and mismanagement, replaced some major responsible civil servants and started a new compensation scheme. Whatever protest was expressed in the H1N1 case public officials were quite responsive to most of the criticism and gave potentially protesting organization little cause for mobilizing the public. Equally responsive are governments in the case of cyber attack: there is no country in the western world that did not install expert committees to look into this risk.

Given these empirical findings one can delineate a step-by-step escalation process leading finally to social unrest.

- The first phase of the escalation process is characterized by collective feeling of dissatisfaction. Such dissatisfaction is mainly caused by the experience of mismanagement (blame), perceived injustice (unfair treatment) and lack of trust. These three triggers can be amplified by the mass media and the absence of personal agency to influence the triggers.
- The second phase in the escalation process refers to the ability of collective actors to organize the protest and to manage the logistics of an otherwise diffuse protest.
- The third phase in the escalation process is marked by the inability of the public officials to deal with the protest, engage in dialogue with the protesters or use other means (even force) to de-motivate protesters to mobilize further.

The last point deserves some more attention: What can deescalate the protest movement once it is well organized? The case studies demonstrate a wide variety of de-escalation mechanisms.

- The Greek case: Here in 2010 three people died during a fire caused by usage of Molotov cocktails. Three people suffocated in the fire because the fire department needed 15 min to come to the building. The fire squad was hindered to approach the site by the protesting mass (e.g. with burning barricades). This incident led to a de-escalation of the protests. Protest organizations as labor unions distanced themselves from the happenings. The main trigger for de-escalation was the withdrawal of legitimacy by outsiders for the protest movement.

- In New Orleans acts of violence such as looting but also a fatal shooting of a rescuer have been reported. In this incidence the blame was less on the looters and the criminals than on the public authorities for failing to secure law and order. However, the broad media attention to looting took away some of the legitimacy of the poor victims image portrayed by many local neighborhood groups. Yet the main reason for de-escalation was the lack of stringent organization by various victim groups.

The comparison of cases along their most relevant dimensions yields the result shown in Table 1.

Table 1: comparison of cases

Characteristics	Cyber risks	H1N1	Financial crisis in Greece	Hurricane Katrina
<b>Potential of harm (fatalities)</b>	At this time none officially registered	17,959	4	approx. 1,300
<b>Monetary losses</b>	Only in the US, companies pay over \$ 600 million for insurance against cyber risks (over \$ 50B in actual losses annually, tendency increasing), see <a href="http://www.darkreading.com/smb-security/security/management/showArticle.jhtml?articleID=227400093">http://www.darkreading.com/smb-security/security/management/showArticle.jhtml?articleID=227400093</a>	Up to several \$ billion per country (e.g. £72 for the UK, see <a href="http://uk.reuters.com/article/idUKTRE5AJ00V20091120">http://uk.reuters.com/article/idUKTRE5AJ00V20091120</a> )	Over \$ 2 trillion according to IMF (cf. <a href="http://news.bbc.co.uk/2/hi/8632855.stm">http://news.bbc.co.uk/2/hi/8632855.stm</a> )	Over \$ 110 billion (US) according to <a href="http://www.hurricanekatrinarelief.com/faqs.html">http://www.hurricanekatrinarelief.com/faqs.html</a>
<b>Trust in risk regulating institutions</b>	Depending on given case (no data available)	Trust in institutions might be endangered (in terms of a consciously provoked over reaction)	Trust in regulating institutions (notably the Greek Government) is low	Trust in risk regulating institutions were low as basic needs were not fulfilled (but no empirical data available)
<b>Communication infrastructure</b>	Might be target of a cyber attack	-	Communication infrastructure, especially use of cellular phones has helped demonstrators to coordinate their protests	Communication infrastructure broke down causing helping organizations and institutions not to deploy their full potential

Characteristics	Cyber risks	H1N1	Financial crisis in Greece	Hurricane Katrina
<b>Involved civic groups</b>	-	-	Several groups among them labor unions	Civic groups that try to influence the recovery plans of the local government
<b>Agenda setting referring to civic groups and the related risk</b>	Depending on given case	No, as the issue of health is involved and no group wants to save money for risking the life of people	Yes, mainly a matter of just distribution	Yes, mainly a matter of evacuation and recovery plans
<b>Socio-demographic impacts</b>	Depending on given case	Mainly referring to age	Mainly referring to age, education and income	Mainly referring to socio-economic status and age
<b>Affected values</b>	Depending on given case	None	Mainly a matter of just distribution	Mainly a matter of justice
<b>Protesting people</b>	not any , so far	not any	Several thousands	Several hundreds

### ***What did we learn?***

The cases of unrest in Greece or the case of hurricane Katrina show that unrest is linked to past history of incidents and events that heightened social tensions and were related to the perception of social injustice. So tensions and anger were present before the initiating event that triggered the actions of social unrest. It is therefore important to investigate the case history and the circumstances. In addition one needs to study the context: which social groups are involved in the issue or who is most vulnerable when the event strikes? Social unrest does not represent a binary activity that switches from 0 to 100% but a process in which social problems and tensions escalate gradually. Nevertheless, any gradual increase may lead to sudden changes in quality and severity of the conflict.

Social unrest seems to be likely in cases in which people are extremely dissatisfied with their situation and probably fear for their health, lives or livelihood. Dissatisfaction is normally linked with the feeling of blame. Someone or some institution is being blamed for the negative situation. Dissatisfaction is also highly connected with the question of perceived inequity and justice. The mass media are important amplifiers or attenuators of social dissatisfaction and bring topics into the public discourse (agenda setting). Finally the fate of the protest movements depend on the degree to which unsatisfied groups can organize themselves and translate their anger into collective action and the response of the public officials to this organized protest.

In the next sections we will try to summarize these steps in a more analytic way by developing an extended analytic framework. Before we outline this model in more detail we will take a closer look to the question how to define social unrest.

## **Basic model**

### **Definition and related fields of research**

Our literature review revealed that the term social unrest is not frequently used in scientific research. Most definitions are operational, that means the term is explained by using indicators of their measurement. Such definitions are not conceptual but empirical (Drury/Olson 1998:6; Zhang et al 2005: 138). Our own argumentation will start with these operational definitions. These will give us a hint about the activities that can be grouped under the term social unrests. In a second step we take the indicators as a heuristic tool to explore additional literature on theoretical or empirical studies dealing with activities connected to these indicators. In particular, we refer to studies on political participation, social movements, conflict and crisis, and collective violence. We will discuss the intersections and boundaries between these concepts and social unrest which will lead us to a nominal definition and a specific frame that characterizes our approach. The aim here is to make theoretical and empirical thoughts coming from other fields of research accessible to an audience primarily interested in social unrest.

Our common experience associates social unrest with protests in the form of peaceful as well as violent demonstrations, strikes and with acts of civil and political violence. This first impression is supported when we take a closer look at the indicators that are used in operational definitions by scholars. For example, Keidel (2005: 1) links social unrest with a protest that includes more than eight persons. The intensity of social unrest can be measured by the number of demonstrations, riots, armed infringements and strikes within a year (Keidel 2005:1). Beyond a simple reckoning of social protest, some authors place more emphasis on the spatial dimension. So we can find an operational concepts for social unrest based on “(...) historically documented nationwide social unrests (with more than five provinces affected at a time) (the study concentrated on China; R.S.) caused by the unanimous underlying factors (...)” (Zhang 2005: 18). Many more operational definitions of social unrest could be cited here. They all have in common that they assume some kind of numerical threshold which defines a demarcation line between protest or manifestation of dissatisfaction and the emergence of social unrest. We believe that such numerical threshold are arbitrary and not very useful since the impact as well as the potential damage of social unrest may not at all or only slightly correlate with the head count of participating individuals or the number of protest events.

### **Political participation**

Within the semantic area of activities that underlie social unrest protests, demonstrations and political violence are most frequently mentioned. These manifestations are also part of another social science tradition, i.e. the theory and concepts of political participation. That concept includes actions that are operated by citizens aiming at influencing collective decisions on several levels of the political system (Barnes et al 1979:160). Not only the active mobilization of citizens but also the political goals of influencing collective decisions constitute key elements of this tradition. Excluded here are economic or social goals for which people could get engaged. Also political violence is not mentioned as a means of political participation. In newer studies both aspects are sometimes (nowadays more frequently) mentioned as components of participation (van Deth 2009: 145f.)

Kaase distinguishes conventional and unconventional political participation. While conventional participation includes activities such as voting or writing letters to the editor, unconventional political participation includes activities such as signing petitions, demonstrations, boycotts, sit-ins, rent and tax strikes, traffic blockades and wild strikes (Kaase 2002: 352). This listing of unconventional activities seems to be close to the list we found in the literature about social unrests. Activities associated with

social unrest are often linked to unconventional political participation. Conventional political participations such as elections or the attendance of a political event are definitely not part of social unrest. Seen from a theoretical perspective it can be concluded that activities that are designed to serve a specific function within a functional system (such as politics or economics) belong to the ordinary, expected and conventional form of serving this function, while unconventional or unexpected forms of expressing a desire for change or intervention can turn into social unrest. Even those unconventional forms may be functional if the corresponding system is in urgent need of a radical reform. So in view of this line of argument social unrest is not necessarily dysfunctional but its manifestations appear as unexpected, unplanned, often spontaneous as well as unconstrained or uncontrollable within the functional system in which they occur.

## **Collective (political) violence**

The subject of political violence constitutes a research field of its own. Generally there are at least three forms of political violence: The first form refers to forms of violence performed by the political system (e.g. administrative, judicative, executive). In some studies political violence performed by the political system also means violence against citizens in form of disparity, social exclusion or persistent poverty (just to name some). The second understanding of violence refers to violence that is performed by the citizens against the political system (Sanchezem 2006:179). In this field we can find the following definition: “...political violators break with their actions basic social norms. These injuries of norms are justified on a level above the individual in difference to criminal infringements. In extreme cases they challenge the complete normative system (Kepplinger 2009: 95). Kepplinger assumes that the description of delinquent behavior reflects the view of the political establishment or that part of society against which the violence is directed. For the peers and the supporter of the violator this behavior is regarded as legitimate and morally justified given the circumstances under which they believe to suffer (Kepplinger 2009:97).

These two perspectives are integrated in the following definition: “Collective violence is personal injury by a group... Most is social control by which people define or respond to behavior as deviant” (Senchal de la Roche 1996:97). The author distinguishes four forms of violence: lynching, unrest, vigilantism and terrorism. These forms can be classified along two dimensions: The degree of accountability (it can be individual or collective) and the degree of organization. Lynching is an individual act with a high degree of organization, vigilantism is likewise individual but not well organized. Unrest and terrorism are collective forms of violence, terrorism is organized, while unrest is not (Senchal de la Roche 1996:102-105).

A different distinction is introduced in the text from Sanchezem (2006). In addition to violence executed by the political system (called structural violence), he refers to radical violence that may lead to waves of protests, strikes, demonstrations and to regional endangerment of security and criminal violence that occurs in the form of criminal youth gangs, mafia type collaborations and drug cartels (Sanchezem 2006: 179).

In reference to social unrests, violence, as long as it is collective, can be counted as one extreme from among other forms of collective expressions of dissatisfaction. Violence that is executed from the political system is different from social unrest, but may be a trigger for social unrest as Sanchezem (2006: 179f) emphasizes. Often social unrest may not be directed towards changing collective decisions but could be spontaneous expressions of dissatisfaction, frustration or experienced inequity. In this sense social unrest is only one component of unconventional political participation but, at the same time, transgresses the concept of participation as it may include collective protests that may not have a clear political goal, let alone a message of what should be done to cope with the present situation or crisis.

## **Social protest movements**

The last research tradition included in this review refers to social movements. This tradition also covers activities such as protests, demonstrations and other forms of unconventional collective activities. In his classical definition Karl W. Deutsch defines social mobilization as (...) “the process in which major clusters of old social, economic and psychological commitments are eroded or broken and people become available for new patterns of socialization and behavior” (Deutsch 1961: 494). To be successful protest activities need both organization and endurance. Organizational capacity is essential for coordinating activities, recruiting new members, sustaining motivation and building networks. Sociologists refer to the process of institutionalization, i.e. the introduction of structures, rules and procedures independent of individual preferences and decisions, as a necessary means for movements to develop momentum beyond single events and to generate collective identity (Nover 2009: 30f.).

Charles Tilly notes that social movements emerge as a synthesis of three elements. These are campaign (sustaining collective action aimed at influencing public decisions), a social movement repertoire (e.g. demonstrations and other actions similar to those mentioned in the section on political participation), and a public representation of the goals, unity and values as prerequisites for sustaining the coherence of a social movement (Tilly 2004:3/4).

We can conclude that unconventional activities of collective actors are part of both research traditions: social movement as well as political participation. The difference between the two concepts seems to be that, within the scope of social movement, the interest is more on the endurance of such activities, while political participation is more focused at the individual motivation for joining a protest group and its impacts on the political system. Political violence intersects with both the political participation as well as the social movement tradition.

It is interesting to note that over time some of the allegedly unconventional activities have become ordinary, conventional forms of expressing dissent. Strikes organized by labor unions, for example, are now seen as legitimate form of protest even by those who do not benefit from these activities. Other actions such as demonstrations or petitions are now labeled as conventional although when they were first introduced they started as unconventional forms of protest. Today most of the European citizens have at least once participated in such actions. They tend to belong to normal processes within the political system.

The analytical division between conventional or unconventional is hence contingent on time period, location and culture. What appears to be a common form of political expression in one country is seen as major deviant behavior in another country. Social unrest is hence not a term that can be defined irrespective of the context in which it is used. Any political system constructs a boundary between conventional and unconventional (often by legal prescriptions or by daily practice). That boundary is fluid, however. It changes over time and may manifest itself at very different thresholds in different political cultures. This is the basic reasons that all operational definitions of social unrest are bound to fail. It is justified to connect social unrest to unconventional activities performed by collective actors but the extent and intensity of what unconventional entails depend on time, culture and social context. Furthermore, even attributes such as violent behavior may in some contexts be seen as legitimate or conventional (for example resistance against a common aggressor). However, most cultures would classify politically motivated violence as form of unconventional activity and hence social unrest. Yet even if we had an agreement among all scholars that violent behavior constitutes one example of social unrest there is a clear understanding that social unrest cannot be confined to violence alone and that other forms of unconventional activities such as a national boycott should be grouped under this category.

Given these ambiguities, we conclude that social unrest is an expression of collective dissatisfaction with the political system and manifests itself in unconventional forms of protest behavior. The exact definition of what is regarded as unconventional (or extraordinary) and the degree and extent of collective actions that constitute the demarcation line between protest and social unrest cannot be



defined in advance but relates to the context in which social unrest is studied. Social unrest can be seen as an extreme expression of social mobilization with major impacts for society (e.g. economy or politics), with the proviso that the extent of the term “major” is subject to wide cultural, social and individual interpretations.

This definition brings us back to the concept of risk. If we see social unrest as a source of risk, we can map the major impacts in terms of losses to what people value: loss of life, injuries, property damage, loss of wealth, etc. If social unrest is the result of risk we can look for triggers and drivers that lead people to actions that, in their respective context, are regarded as unconventional and extraordinary. Both perspectives assume a continuum between a mere expression of dissatisfaction and violent civil war at each end of the continuum.

**Structure: A stepwise approach to conceptualize social unrest**

As has been outlined in the last two chapters the basic assumption of our approach is a continuum underlying a range of collective actions that may or may not meet the cultural construction of what is regarded as social unrest. Social unrest does not occur out of the blue. Our attempt is to identify steps that gradually lead to social unrest (Figure 2). For unfolding the model we come up with ideas for factors and drivers stemming from the case studies, but also we go a more deductive way and try to identify further important variables out of the body of theory. With every step taken, the probability for an escalation towards more unconventional forms of protest will rise. The model is thought to be cumulative, each steps taken is a necessary condition for the next step. At each step we want to investigate which interventions or actions are likely to escalate or de-escalate the situation. These interventions or events are then triggers for reaching the next step or going back one step. A return to the previous step does not mean that the risk is gone but that the likelihood of further escalation is reduced. Yet there is still a possibility that new events or decisions can start the escalation process again. In the following paragraphs we will first introduce each step and then provide some initial thoughts about the drivers and triggers that influenza or shape the movements upwards or downwards on our escalator.

We assume that people who will engage themselves publicly on any subject have to be dissatisfied with their situation or perceive a problem that they would like to address. Dissatisfaction can arise out of physical, social or psychological reasons. Even if people are dissatisfied nothing will happen unless that

**FRAMEWORK OF SOCIAL UNREST – REPRESENTING A COMPLEX, MULTIDIMENSIONAL DYNAMIC PROBLEM**

The proposed framework looks primarily at

- Degree of social unrest
- Type of action of its expression.
- As types of actions the model distinguishes:
  - Communication of dissatisfaction
  - Organization
  - Mobilization
  - Actions of political violence

However, this cannot be but a very simplified representation. In terms of further development the following further developments will be explored in the next version of the paper:

Developing more precise list of drivers and triggers for social unrest, possibly forming a sort of "Metrics of Unrest" (see next box),

- "Unrest Life Cycle" representation and
- "Unrest Cycle Clock" representation.

The "Unrest Life Cycle" representation specifies distinct profiles of t unrests, illustrates their development in time and enables comparisons between different profiles (see Figure 4).

dissatisfaction is displayed in some kind of public arena. Unsatisfied people have to become active. Such activity can be spontaneous without any attempt to get in touch with others with similar experiences or it can be orchestrated as part of a communication effort to assemble all people with similar attitudes (for example via Internet or mobile phone) or it can be initiated by an organized group that is already part of the society in which these activities occur (for example a labor union or a nature protection league).

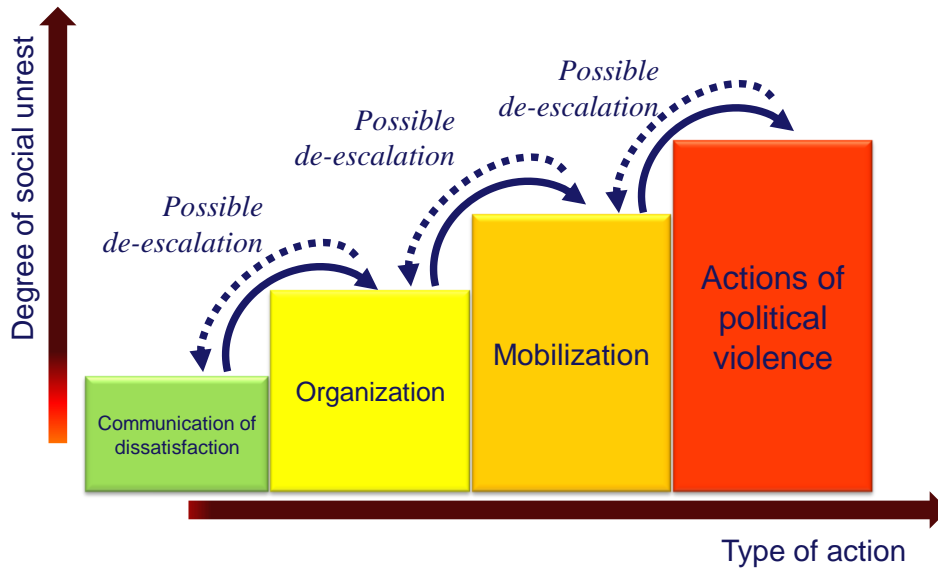
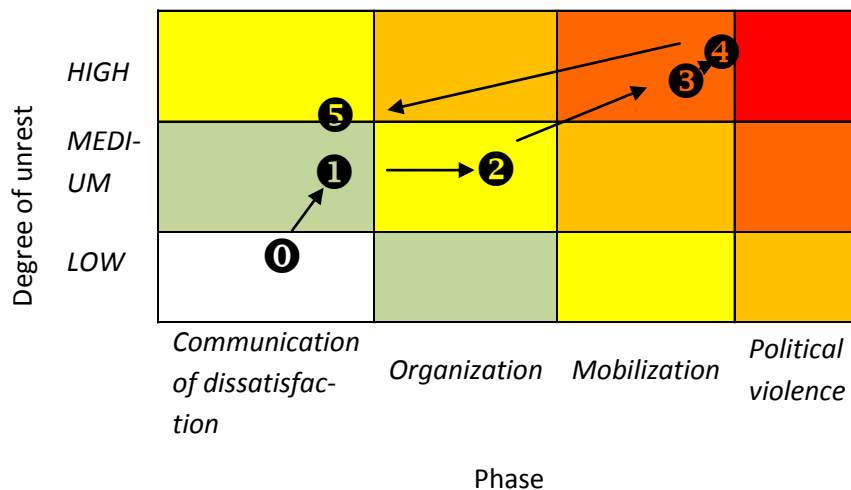


Figure 2: Ladder of social unrest

This protest is likely to disappear if the protest itself is not picked up by an existing organization or gives rise to establishing a new organization (new movement). Sometimes organized groups join the protest for different reasons than those addressed by the protest group because they see this as an opportunity to promote their own goals and aspirations. Sometimes the protesters are co-opted by other groups and they may lose their original cause for action.



(a hypothetical) **Cycle of an unrest:** ①- initiation of the crisis ①- spontaneous protests ②- trade unions involved ③- riot police involved ④- casualties ⑤- protest calmed – "resignation"

Figure 3: Combining the ladder of social unrest with unrest cycle clock for a hypothetical example of a social unrest

If public expression of dissatisfaction and the organization of protest does not help in the eyes of the protesters to improve the situation the probability for further social mobilization increases. Social mobilization goes beyond expressing dissatisfaction. It comprises all activities that require an organizational effort to concentrate forces, to develop and enact a strategy for gaining public attention and for putting pressure on those who are targeted to make changes. In the course of this process, activities may get more and more radical, in particular if these collective protest actions are ignored or even oppressed (examples may be wild strikes, regional boycotts or blockades). Then the continuum enters the next step: violent outbreak. This can ultimately lead to civil war.

At each step one can specify the conditions (described in the following chapters) that have to be met for moving on to the next step or to return to the previous step(s) – see Figure 3. This allows to introduce time into the model, and start contemplating creation of a "social unrest cycle clock" similar to the "Business Cycle Clock" of Eurostat (Figure 4).

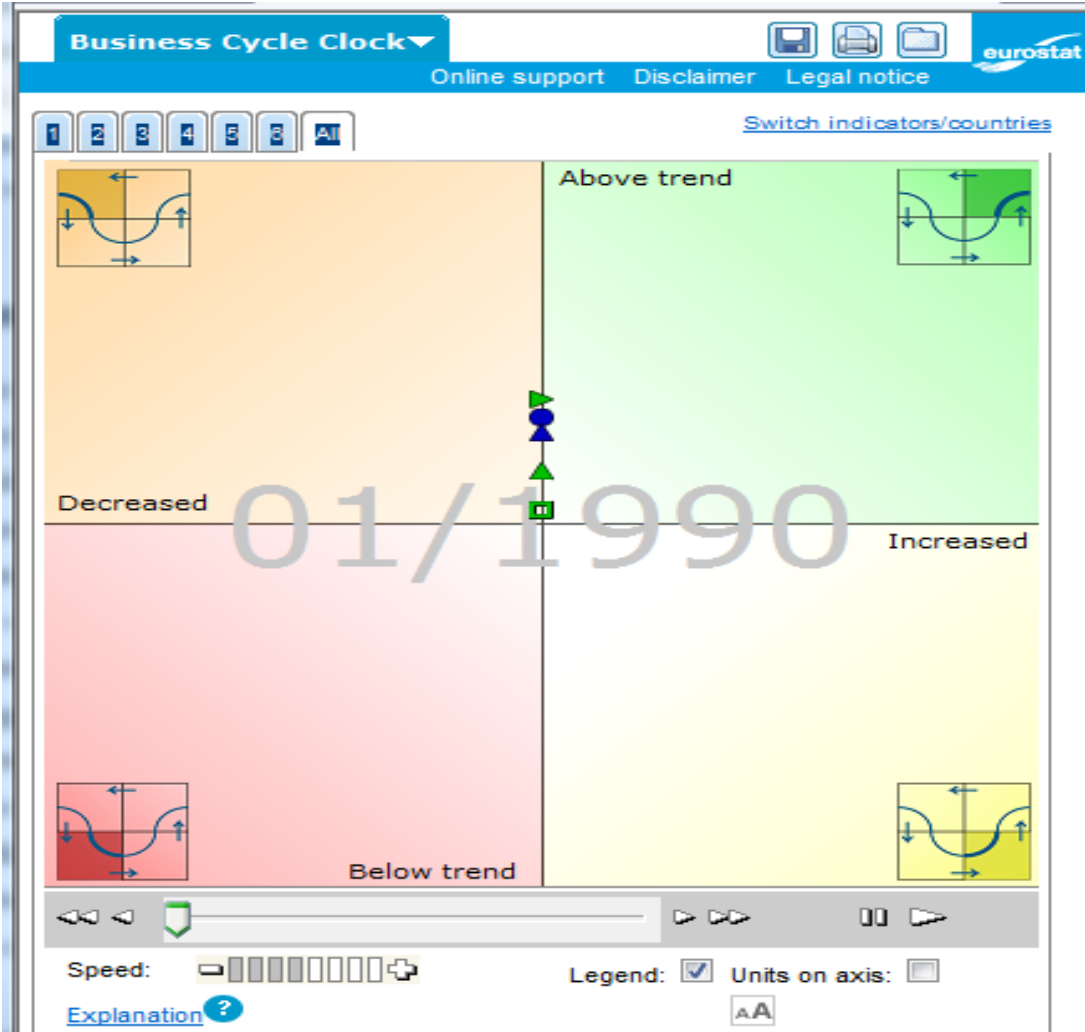


Figure 4: The Eurostat "Business Cycle Clock" used as a the model for proposed "Unrest Cycle Clock": The clock helps representing the development of business cycles of different event at the market in time (the position of different events at a given point in time is given by the markers) – see [http://epp.eurostat.ec.europa.eu/cache/BCC2/group1/xdis\\_en.html?country1=eu27&country2=us&une=true&gdp=true&con=true&ppi=true&emp=true&imp=true&exp=true&pi=true&pc=true&inv=true&si=true&to=true](http://epp.eurostat.ec.europa.eu/cache/BCC2/group1/xdis_en.html?country1=eu27&country2=us&une=true&gdp=true&con=true&ppi=true&emp=true&imp=true&exp=true&pi=true&pc=true&inv=true&si=true&to=true)

## **Step 1: Communication of dissatisfaction**

The first step deals with the communication of dissatisfaction. The question is: why are people dissatisfied? To answer this question we assume that people are dissatisfied if their needs and wants are not met or violated.

Within the body of literature the concept of social production functions emerges as an appropriate candidate for explaining dissatisfaction. "The theory states two universal goals: physical well-being and social well-being). These are accomplished through five main instrumental goals (stimulation, comfort, status, behavioral confirmation and affection)" (Ormel et al 1999: 62). We assume that individuals strive for these goals. The means to reach these goals can be deduced from the theory of rational choice. Within this school of thought it is assumed that individuals choose the most effective and efficient means for reaching a pre-determined goal. The production functions illustrate the relationship between goal attainment and personal costs (in terms of resources such as money, time, effort etc.). Risks occur if either the degree of goal attainment and/or the extent of costs are uncertain. Often it depends on the actions and decisions of others if one's expectations become true. These contingencies express themselves as risks to the individual decision maker. In terms of rational action each individual has to calculate the impacts of each decision option and assess the probability that the expected impacts will or will not materialize.

Social mobilization theory claims that individuals express dissatisfaction in public arenas if the costs of going public are low and the expectation that somebody will respond to it high. In cultures where the expression of dissatisfaction is encouraged we will find more public manifestations of dissatisfaction than in those culture in which such behavior is politically or socially sanctioned. However, the likelihood of further escalation rises if people face high costs of expressing dissatisfaction. The reasons is obvious: If people decide in spite of high costs to go public they are much more inclined to organize themselves and mobilize other citizens than in a situation where there is no obstacle to expressing dissatisfaction.

The theory of rational action provides a concept of how people make decisions in the face of uncertainty. It does not explain why people may become dissatisfied with their environment. The literature contains endless theoretical concepts for explaining dissatisfaction. Often dissatisfaction is linked to the gap between personal expectation and perceived reality. In some cultures even the most deprived groups do not complain about their situation because they do not expect anything better. In other cultures even the well-off tend to express dissatisfaction because they expect to be entitled to even more privileges in the future. In general, one can assume that the expression of dissatisfaction is a function of experience of unfair treatment by others, an expectation that such treatment is not justified or legitimate and a context in which such dissatisfaction can be voiced in the public.

If one turns specifically to the experience of risk, we can be more specific. Psychometric research has demonstrated the properties of risks and risk-related situations that amplify or attenuate the feeling of being endangered or threatened. The main characteristics that shape risk perception include voluntariness, personal control, dread, impression of inequities, blame, familiarity and others. Risks that are perceived as dreadful, involuntarily or out of personal control trigger more stress and concern than risks that are taken voluntarily, have no or minute catastrophic potential and allow personal control. Accordingly we can expect people sharing a perception of high risk to be more inclined to express dissatisfaction than those with low risk perception. This insight is useful when diagnosing the types of risks that could trigger the first steps of social unrest. If people face risks such as the global financial crisis they will probably associate a feeling of dread, involuntariness, lack of control and blame with this crisis, while other collective risks such as car accidents with a high death toll are attenuated due to the perception of voluntariness, personal control and lack of catastrophes.

In addition to the well-known psychometric variables one needs to consider two other relevant factors. The first factor relates to the perception of inequity or injustice. Even small risks are seen as intolerable if the persons exposed to this risk believe that all the benefits of the risk-bearing activity are reaped by

others. The financial crisis may be a good example of such a perception of inequity. More frequent are risk situations in which people believe that they are expected to take all the risks while only sharing a small proportion of the benefits (neighbors of a nuclear power plant). If people feel to be treated unfairly they are not only dissatisfied with the resulting risk they are also deeply disappointed about the way that political or economic decision makers have violated their sense of justice (Renn/Zwick 2008:79f.). This will contribute to a loss of trust, the second factor that is likely to promote a feeling of dissatisfaction. Trust is particularly important in cases of lacking personal control (for example the operation of large dam). If people do not trust the operators and/or the regulators they will most likely be dissatisfied with the situation and express this publicly (Renn/Zwick 2008: 88).

Psychometric theory and studies on trust and equity attempt to explain social behavior from the perspective of individual perception. On a more aggregate system-related level the theory of reflexive modernization might add additional structural aspects to the list of factors that make the expression of dissatisfaction more probable. Sociologist Ulrich Beck is one of the most important representatives of this school of thoughts. In his book “Risikogesellschaft” (risk society) he claims that modern societies face a new quality of risks which is characterized by an increase in unintended consequences and irreversibility of decisions. People are faced with promises of risk management that policy makers cannot meet due to the complexity of the issues and the interconnectivity of impacts. Furthermore, the benefits of new technologies or policies are contested as well as the acceptability of the risks that go along with them. Hence society tends to polarize between those who want to invest in uncertain changes and those who prefer a precautious strategy. A rational discourse about potential social benefits and risks is not possible since no one can assess the potential systemic impacts on society with any degree of confidence. In the end it is a question of belief as well as of reflexive self-monitoring which risks are taken and which risks are rejected. The process of modernization makes itself to its own theme and problem (Beck 1986: 26). In terms of triggering or even causing dissatisfaction the theory of reflexive modernization claims that the discourse about new technologies or new policy options tend to polarize societies and facilitate a climate in which one side will try to make its discontent a public topic while the other side is wholeheartedly convinced that the new technologies will only benefit society. Such discontent with modernity may be more closely related to a feeling of unease than a rational balancing of pros and cons. Public acceptance of policies and technologies are thus associated with the experience of alienation from one’s living environment and resistance to further modernization (Zinn 2006: w.p.).

### ***Conclusion of Step 1***

The reasons for people to express dissatisfaction are plenty and diverse. In general people are more dissatisfied if the gap between perceived reality and personal expectation widens. With respect to risk experience our review focused on three major theoretical approaches: rational actor theory (social production function), risk perception concepts and reflexive modernization. For diagnosing structural reasons that may increase the likelihood of dissatisfaction reflexive modernization provides cues that could be used as precursors or indicators for trouble to come. When it comes to individual motivation and incentives for expressing dissatisfaction rational actor theory provides the general frame in which individuals balance the pros and cons for taking stances in society while risk perception concepts can assist analysts to classify and evaluate situation in which people tend to amplify or attenuate threats to what they value. The feeling of dissatisfaction by itself is ineffective for political processes unless it is openly expressed and communicated to others. Once this is done, the next step is to organize those who expressed their dissatisfaction and make the voice of these “people” better heard in the respective political arenas in a world of abundant information and communication.

## **Step 2: Organization of protest**

Under which circumstances do we expect that people organize their interests or rally around a common theme? Even if people are unsatisfied they will not necessarily try to organize their protest. Organization implies that dissatisfied people look either for an existing group, organization or initiative that would transport their protest into the public arena or they will form a new organization of its own kind.

The escalation from expressing dissatisfaction to organized protest rests upon many conditions. First, the number of people that share the same feeling of dissatisfaction must be large enough to form a larger group. Secondly, the potentially affected individuals must know of each other and find a way to communicate to each other. Most important, however, is the motivation to invest time, effort and often finances to start an organization or relate to an existing organization. The theory of collective behavior, most notably the studies by Mancur Olson, provides some hints of what motivates dissatisfied people to become organized. Olson claims that the organization of interests is the more likely to occur the more the benefits of such collective actions can be exclusively used by the members and not shared with non-members. Again rational actor theory provides the explanation: if everybody benefits there is no incentive for each individual to get active since one can reap the benefits without investing one's own resources. This free rider position is the main reason for a lack of organized groups that engage for goals that are in everybody's interest (Olson 2004: 6). Common interests are connected with individual interests. Common goods serve common interests and are available for every member within the group (Leuffen 2006: 96).

The emergence of groups depends for Olson on the size of the group in relation to the rest of the population. If the group is too small it may not be visible in the political arena. Potential members will not even bother to join since the organization demands resources but does not promise any realistic opportunity for success. The same is true if the group is very large. Then each individual has no incentive to join because his or her engagement adds only marginal benefit to the success of the group. So recruiting new members will be difficult in particular if non-members will also benefit from the group's success. In this respect it is crucial to have the right size: small enough to provide motivation for each individual to join and large enough to convey a realistic expectation that the group's goals are reached. (Olson 2004: 42).

In addition, Olson claims that groups have a better chance of motivating their members if the composition of the group is heterogeneous. If all members are very similar each member will expect the other to perform the necessary tasks to get the group's voice heard in the public. If the group integrates people from many different backgrounds each one has an incentive to mobilize others or work for the common goal in the arena in which he or she feels at home (Leuffen 2006: 100). Large groups are likely to be formed if the group produces selective incentives for each individual in addition to the collective good that they strive for. Among them are gratifications (for example certain benefits are for active members only, or group members have access to privileged information, or provision of resources in case of a strike or a boycott) or incentives (e.g. such as cheaper insurance fees for members of the automobile clubs) (Leuffen 2006: 104, Olson 2004: 49f.).

In addition to costs and gains, there are other variables that make individual participation in an organization more likely. One of these variables refers to the socio-economic background of a person. Analyzing social positions and social status has a long tradition in the social sciences and can be traced back to the seminal work of Ralf Dahrendorf. The main idea is that social norms, values and expectations shape the behavior of an individual. Surveys were able to show that well-educated individuals from the middle class are more likely to start organizations or initiate links with existing organizations. However, people of lower income and education are easier to recruit and, in particular, to mobilize if the organization already exists. This result can be explained by the mechanisms of socialization: To take initiative in collective action is often a goal within the educational system and parents of middle class families encourage their children to believe in the power of individual agency.

In families of lower income and education the value of solidarity with a mass movement or the work ethics of being active in something one believes in is more wide spread than in other social classes. In addition to class, some studies were able to demonstrate that men are more active in interest groups than women (different gender roles). Other important variables (with different explanations) are age, religion or profession.

Of high importance are value clusters or belief systems that have an impact on personal and collective propensity to initiate collective action (Renn/ Zwick 2008: 84f.) The most prominent example is the distinction in materialistic and post-materialistic value cluster proposed by Inglehard. His approach is directed towards explaining participation in new social movements. Participants of new movements have distinct value patterns that differ from those of non-participants. Inglehard is convinced that this difference is due to a generational effect. Since members of the older generations had frequently experienced material shortage in their lives they tend to favor (materialistic) values such as material wealth, order, regularity and cleanliness. Those who did not experience the problems of wars and post-wars periods tend to place more emphasis on non-materialistic values such as clean environment, harmony, equity and variety of lifestyle options (Renn/ Zwick 2008: 87f.).

### ***Conclusion of Step 2***

We can conclude that people tend to organize themselves if they believe that the resources they have invested in this organizing effort are worth the chance of getting the desired benefit. The more exclusive a group can produce benefits for its members the more likely it is that individuals will opt to join the group and become active contributors. Furthermore, the group needs to have the right size to attract and motivate new members (favoring small groups) but also to demonstrate effectiveness in the respective political arenas (favoring larger groups). Very large groups need to offer additional incentives and gratifications in order to be attractive to newcomers. In addition, individual characteristics such as class, gender, education, religion and profession have an impact on the likelihood for initiating or joining social protest movements and organizations.

### **Step 3: Mobilization of protest groups**

Organized groups could use their momentum and strength to influence the policy making process by using legal and conventional means. What counts as legal and conventional depends on the culture in which the organization is located. Strikes may be legal forms of protest in one culture but not in another. At the next step of our escalator the question arises what motivates organized protest groups to choose unconventional forms of expressing their claims. To answer this question we will have a closer look at resource mobilization theories. Resource mobilization theories use the rational action paradigm to explain the procedure of selecting the most appropriate means for reaching pre-defined goals (Klandermans 1984: 584 ff.). Most conventional forms of influencing decisions rely on the means of money, power, value commitment, evidence and social solidarity. These means are called resources (McCarthy 1979). They can be used in a public arena to put pressure on the decision maker(s). For example, one can use financial assets to compensate those who might be against the group's claims. Another group could use its potential for mobilizing those individuals who share the same or similar convictions (for example environmental NGOs). Other may use evidence as a means to produce a common understanding that the desired change will lead to better outcomes (Jaeger et al. 2001).

If a group has little access to resources or is not allowed to use its given reservoir of resources the likelihood that illegal and/or unconventional modes of actions are selected increases steadily. Resource mobilization theory predicts that particularly groups with highly motivated individuals will retreat to unconventional forms of protest if other channels of influencing public decision making are not available or simply ignored. This insight leads to the normative conclusion that, for a society that attempts to avoid unconventional forms of protest, the availability of channels for communication and decision making as well as access to resources are crucial.

In addition, theorists of social mobilization have discussed more formal properties of groups that tend to use unconventional means for reaching their goals. Organizations need a minimum of money and commitment of its members to initiate unconventional protest. They require also some experience and knowledge about the effectiveness of their actions. In addition, they must take into account the potential support by people who are either sympathetic to their cause or at least indifferent. If these bystanders perceive the actions as non-proportionate or illegitimate the protest movement can easily break down or the legal authority faces far less public resistance against the use of force to break the protest. If the protest is supported by large portions of the population the protest is reinforced and the legal authorities face major difficulties in justifying force or other radical forms of sustaining order. It is self-evident that the total number of participants (the more participants the higher the likelihood of success), the dedication of the members, (dis-)trust in the official authorities, and the common appeal and resonance of the cause of action among the total population increase the chance that even unconventional means are perceived as acceptable and may become more attractive for the respective organizations (Geissel, Thillmann 2006: 171.f). In addition, escalation is likely to occur if the response by public authorities (police or military force) to first signs of violence or unconventional methods is perceived as being out of proportion.

In general terms, escalation and de-escalation are closely related to the openness or closeness of the political system in its response to the collective actions of the movement. Often informal patterns of bargaining with the political systems may be a possibility to reduce the degree of conflict when all legal forms are exhausted (Geissel, Thillmann 174f.).

One major problem of resource mobilization theory is the common pool dilemma. Why should individuals invest their resources in terms of time, money and commitment for a common cause that might be delivered even without their engagement? Furthermore, since common goods are available to all members of society there is always the opportunity for free riders to enjoy the benefits without sharing any of the costs. As mentioned in the last section of this paper, Olson has suggested some features of social movements that may entice individuals to join a collective movement even if the benefits cannot be used exclusively. In addition to the partial or extra benefits of membership resource mobilization theory suggests two additional approaches to overcome the commoner's dilemma. First, the common good may be so precious and valuable to the individual that s/he does not mind if others would benefit from such a good without payment (this is particularly true if the commitment rests on common values and convictions). Secondly, being part of a "winning" movement adds social prestige and recognition to the person which in itself may be a sufficient motivator to join. In some cases the expectation of a career move within a social movement might be a sufficient incentive to become a member or sustain membership. The larger the social movement grows the less realistic such expectations become, however (Gupta/Singh 1992: 380f.; Jerkins 1983: 536f.). But even in large social groups individuals should not be seen as isolated actors that are easily lost within such a large compound. Social movements offer collective identity and opportunities for identification. In the terms of A. Giddens, movements provide a feeling of ontological security. Each individual can associate a sense of meaning and purpose with his or her own action. This symbolic gratification is often much stronger than the expectation of material gains or exclusive use of goods. In addition, new members are often recruited by established members who can offer personal assistance and support which reinforces a feeling of collective identity and solidarity (Gupta/Singh 1992: 381; Jerkins 1983: 537f.).

### ***Conclusion of Step 3***

Mobilizing people to initiate acts of unconventional protest or even violence relies on a set of structural and motivational factors. First of all, motivating individuals to join movements for a common cause rests on the ability of the organization to provide in-kind or symbolic incentives to members for compensating the barriers of common cause organizations, i.e. the free-rider problem and the marginal input by each member. If groups can motivate many followers to join the organization, it depends on the response of the others, particular public authorities, if and how the protest will escalate. Among the most influential factors are a lack of openness on the side of public authorities or other addressees of



the protest, an inability to react proportional to the activities of the protest organization and a shortage of available communication channels for the activists to make their voice heard in society.

Furthermore, historical evidence shows that a very narrow scope of legally accepted protest actions can indeed prevent small movements from becoming influential and also impede mobilization efforts, yet if special thresholds of dissatisfaction are surpassed the mobilization can develop into a major national crisis since no de-escalation mechanisms are in place and the frustrations of being ignored for a long time can easily result in increased violence. This will be the topic of the next section.

#### **Step 4: Acts of organized civil violence**

Deliberate and organized civil violence is the last step of escalation. Such planned violent acts may even result in civil war. Occasional uncontrolled violence is always a risk when large masses of people take their protest to the streets. In most cases such acts of isolated violence do not lend themselves to further escalation. On the contrary, most protest organizations distance themselves from violent outbreaks if there were neither planned nor secretly tolerated. In most countries, civil violence is seen as a clearly illegitimate action of protest. So if violence occurs the leaders of the respective protest organizations can either distance themselves from the violence or blame the other side for having provoked the violence. Yet they normally will try hard to reduce the extent to which its members use force during protest actions. Although small pockets of violence can also initiate a route of gradual escalation, this is rather unlikely.

The picture changes dramatically if protest organizations plan or tolerate the outburst of violence as a means to promote their cause of action. The leaders of these organizations may not disclose their strategies publicly and insist in the public on a peaceful pathway to pursue their cause. Secretly, however, they encourage their members to use violence and justify these actions later as “spontaneous” outbursts of public frustrations. In most cases, organizations need to legitimize their radical protest by blaming the other side (most often the political elite) to perform major acts of civil rights violations or to exploit one part of the population to the benefit of the other part. Often such accusations are linked with ethnic, religious or class-related differences which tend to amplify motivation and willingness to use violence. Many outbreaks of civil violence are also expressions of major unresolved geographic conflicts (Misra 2008: 7-23). In any case, a call to violent actions requires a major cause. Such causes may appear not very dramatic or as being highly exaggerated by an outside observer, what counts is that they are believed by those who are sympathetic to the cause (not only the activists). Furthermore, there must be a common conviction among the activists and their sympathizers that the conditions will only change if violence is used. Both conditions can transform a peaceful movement into a radical uprising that leads to numerous acts of violence.

It is not clear, however, how such a gradual escalation evolves over time and what factors are causing the stepwise escalation from mere dissatisfaction to civil war. There are many case studies but we still lack a coherent theory of what leads to violent outbreaks and what measures can help society to prevent them. In line with our arguments, Keppinger has outlined a typical escalation scenario that starts with the rise of critical positions towards one's own society or parts therein. If this criticism is not taken up by any authority, small protest groups will emerge who will start to recruit members for joining their cause and to use the media for legitimizing their actions. Broad media coverage in conjunction with some demonstrative actions makes the cause a top topic in the respective society. This experience of sudden prominence encourages the protest groups to become more pronounced in their communication and often more radical in their demands. If the public authorities ignore the protest or employ rather harsh counter-measures, the conflict is likely to escalate. Yet even if public authorities signal openness to the demands and try to accommodate the protest groups they may fail to de-escalate the situation. Many protest leaders may interpret this as a sign of a weakness and take the opportunity to fight for even more radical changes in the political system. So both a too strong as well as a too lenient approach may actually contribute to the escalation. Most effective is probably a step-by-step approach

by which negotiations with the protest groups and the setting of clear boundaries are used intermittently.

Kepplinger argues that the most crucial variable for explaining civil violence is the perception of the protesters that their actions are morally justified given the extent of perceived oppression or interest violations by the other side. The more the protesters experience what they would interpret as undue pressure or force the more they feel motivated to increase their own violence. So they start to radicalize (Kepplinger 2009: 100). Kepplinger concludes that violators do not regard their acts as examples of deviant behavior, but as part of legitimate and justified response that is embedded in the self-image of actor networks that reinforce the belief that such violent acts are the “right” thing to do under the given circumstances (Kepplinger 2009:99). Violence becomes normal. An entirely different route of escalating violence occurs in societies with weak social coherence and a dysfunctional political culture. In these circumstances the leaders of protest movements easily lose control over their members and neither the group leaders nor public authorities are able to contain the violent outbursts of renegade fractions of the movement to use violence. This scenario is frequent in countries with a history of political and social instability. This comes close to situations of anarchy.

#### ***Conclusion of Step 4***

The escalation to mass violence is still a process that is not well understood in the social and historical sciences. There seem to be three major components that have to come together: the perception of a legitimate cause that would justify even the use of force; the inability of the public authorities to cope with the situation due to lack of capacity, overreaction or over leniency and a random factor of mass momentum that may kick in when some trigger is released (a tipping point).

## **Reflection of the theoretical model**

### **Fit between the theoretical model and the case studies**

This section tries to figure out how much of the theoretical model outlined above resonate with the case studies. Based on our model we will examine the cases more systematically and try to outline the range of factors that amplify or attenuate the escalation process.

In the case of financial crises people seemed to be dissatisfied with their situation. On the grounds of our assumption the situation can be described in the following way: Many people feared to find no job, to lose their job, to be faced with a decline of social status or feared not being able to earn enough income to hold up their common standard of living. As nobody would seriously fear famine in that country we face mainly a problem of psychological well-being with a physical component. At the same time many people might have felt to be treated in an unfair way, as they had to pay for the financial crises without being at fault. In their eyes the failures were done by others who were not made accountable for their inability to provide effective and fair countermeasures. They were also accused of reaping some benefits from this crisis. Many Greeks had been disillusioned about the financial institutions in their country even before the global financial crisis took place. So the global financial crisis made the situation even worse. The vulnerability of the Greece society was very high to be hit by the financial crisis as the government had overspent their budget for many years. In addition, the social vulnerability was high as the country had witnessed numerous protests against alleged injustice over the last three decades, most notably in 2008. In terms of consequences it is obvious that the country faced financial losses and individuals were forced to pay higher taxes or to forego economic benefits. Also four lives were lost as a consequence of the riots. The affected people had not voluntarily taken this risk and had no personal control over its outcomes. In addition, the people were quick in blaming economic and political institutions for the crisis. Accordingly the attribution of trust to the key actors was low. Most Greeks did not believe that the Greece government was able to resolve the problems. In addition to the feeling of strong dissatisfaction, the costs of the protesters to take to the streets and make their outrage visible were low, as Greece provides the opportunity of public demonstration as an essential right to citizens as integral part of its democratic system. All this has led to an open communication of dissatisfaction among the Greek.

The next step: organization of protest can also be traced in the Greek case study. First of all the dissatisfied groups in 2008 as well as in 2010 were large enough to make a difference in public opinion and were well organized in order to form a rather coherent movement. So the possibility was given to be publicly recognized in the political arena. The main actors knew each other and were powerful enough to mobilize the public effectively. In 2008 the group consisted mainly of students - a hint for the thesis that well educated people are more expected to start a movement - , in 2010 also other groups like employees and workers were involved. In both cases networks were formed in which individuals had personal contacts to each other and were able to organize mass demonstrations and joint actions. Maybe this fact helps to explain the motivation of the individuals to join the organization: This is less probable in the case of the student protests. In 2010, however it appealed to almost all classes in society: there were enough incentives for a larger coalition to join the protest. The protests in 2010 included activists from labor unions and small businesses. These new groups hoped for revisions of the governmental plans which in their eyes were biased to the disadvantage of the poorer sections of society. The fact that those groups already existed and were well organized facilitated their participation and kept the costs for mobilization low. It is also important to note that the financial crisis evoked feelings of being treated unfairly and that the big guys would get away with it while the little guys were asked to take most of the burden.

Why did the organized groups become active? Many protest groups had not enough access to money and power to stimulate conventional forms of influencing politics. So they resorted to unconventional forms of protest. This is less dependent on the availability of monetary resources and relies more on the ability to provoke the attendance of mass media. In 2008 the death of the young protester (interpreted as sign of violence that should not happen in an open political system) has triggered the outbreak of the protests among students. So the ground for more protests was well prepared when the financial crisis struck. The press was alerted and through their extensive coverage enabled the organizers to receive nationwide attention and visibility. They were able to coordinate the protest mainly by using the public media as well as mobile phones and the internet. The provision of communication infrastructure seems to play an important role in this case.

The outbreak of violence during the protests 2010 signaled the end of the protests. Since the violence originated from the side of the protesters their moral integrity was challenged and the great wave of sympathy towards the protesters came to an abrupt end. The government also amplified this by disseminating the information that protesters refused to help saving people from a deadly fire. In the end it was shown that these allegations were not true but given the allegation in the popular press the protest movement basically collapsed. This case history matches our theoretical model about triggers for escalation and de-escalation. The protest leaders distanced themselves from the acts of violence but this did not help them to lose legitimacy in the public eye.

In the case of H1N1 the connection to our escalation model is more complex. Generally we face two directions from where dissatisfaction can originate. The first one is that people fear the infection of H1N1. In this case people feel the endangerment of physical as well as psychological well-being. In this case the risk of an infection is not seen primarily as societal problem but the risk management activities are scrutinized by all observers. Is the government able to deal with a potential spread of the virus? So the issue of personal control is delegated to governmental institutions. They are made responsible for the fate of the potentially pandemic spread of the disease. The feeling of dread depends in that case on two factors: The first factor is how many people within the personal social network of an individual are affected by the disease, the second factor is how dreadful the disease is either experienced or portrayed in the mass media. In the case of H1N1 we had a rich media coverage that contained many drastic images about the potential dangers of the flu. In general flu is a common disease that almost all adults have experienced at least once in their lives. They were, however, not familiar with H1N1 since this flu was communicated as new virus to them even though it was not. The risk regulating institutions did what they could to navigate between under- and overstating the potential hazard.

Dissatisfaction did not arise from the experience of the risk itself as from the institutional handling of this risk. Political decision makers were quick to make preparations for a major pandemic. In their perspective overreaction was more rational as the risk of being accountable for human lives weighs much heavier than the risk of spending too much money on vaccination or other medical preparations. Many people suspected that pharmaceutical industries had an interest to drive governments, mass media and the people self to an overestimation of the risk. Here two are at least two characteristics of our model can be traced back: The first one is that blame could be attributed to some actors such as public health officials the other one is that relevant social or cultural values tended to be infringed such as the perception of fairness in the distribution of advantages and costs connected with the risk. Again, there are some organizations blamed to make profit by implanting fear in the public mind. These two factors may have contributed to the communication of dissatisfaction.

*Organization:* In the case of H1N1 outbreak 2009 we had no organizations (and with that none of the following steps of our model) that put the theme (leading to acts of social unrest) on their agenda. For those people that saw the main risk in an infection the reasons to become dissatisfied were just not given. The cases in which people complained about the waste of money no interests group (neither a new one nor an existing one) started a public campaign. It can be assumed that interest groups would have a hard time blaming authorities for wasting taxpayers' money if human lives are at stake. Such a

trade-off is seen as being unsuitable for many people and lacks the legitimization of greater parts of society.

In the case of cyber security we emphasized the risk of damaged infrastructures. Public protest is likely to be associated with indirect effects of IT failures leading to lack of communication and coordination in the aftermath of a serious disaster or infrastructure failure. Depending on the affected region or country and its connected culture as well as on the historical tensions, one can predict the outbreak of dissatisfaction and outrage. Most likely people will blame institutions or individuals for the IT failures if their livelihood is threatened (either as having triggered them or as having not done anything against it). The risk is caused by negligence, incompetence or malicious act. This implies that accountability and responsibility can be attributed to individual or organizational actors. In the case of IT failures, the risk is probably not taken voluntarily and there is hardly any personal control by those affected by the failure. It will depend on the performance of the risk regulating institutions how much trust is invested in them.

In the case of hurricane Katrina people were highly dissatisfied with their situation. Many people feared for their lives during the storm or at least feared that their basic needs such as nutrition, water and medical care were not met. Nobody knew how long this situation would last. Also the mass media coverage about looting and other crimes in the absence of state power lead people to fear for their property and safety. In this case the physical as well as psychological well-being was seriously endangered. The mass media also shaped the dominant images of the event. There were reports that black people were disadvantaged during the event. The stories raised sympathy with the poor victims. At the same time, the press emphasized looting and criminal gang acts that transformed the victims into the culprits. This ambiguity might be one of the reasons that the victims failed to organize a major protest movement directly after the event. Only much later when mainly poorer quarters of New Orleans were considered to be abandoned demonstrations took place to revoke this consideration and reconstruct the devastated parts of town. The organizational failures and the inconsistent policies of reconstruction contributed to the loss of trust. Although the hazard was natural and was out of the control of human agency, the risk management efforts were seriously flawed and the communication between the relief organizations disrupted. The handling of the disaster included all the qualitative risk factors that tend to emphasize risk experience: lack of institutional control, dread, uncertainty, and inequitable treatment of the affected residents.

Looting during the catastrophe seems not to fit in our model on first sight. How can we explain this phenomenon? We need to differentiate here: Different kinds of looting emerged in the aftermath of the crisis. The first motive for looting was hunger and thirst. It was an act of self-help. People broke into stores to get food or other goods to meet their basic needs. According to our definition of social unrest as an act to express dissatisfaction with the performance of the political system, we can state that looting here occurred as a consequence of institutional failure not as an expression of social unrest. The second type of looting was looting to get consumer products such as electronic equipment or other non-basic goods. This type of looting also occurred during the crisis but according to police statistics is was not more frequent than during normal days in New Orleans which has a high crime rate.

## **Drivers - A Synopsis between the analytical model and the results from the case studies**

From the case studies we derived that dissatisfaction occurs in the first stage of social unrest. With the help of rational choice theory we could outline five motives that people strive for (stimulation, comfort, status, behavioral confirmation and affection). The theory helps us to explain why people decided to act, but not which specific ways they preferred to express their dissatisfaction. We assume, in accordance with the scientific literature, that dissatisfaction originates in a misfit between personal expectations and perceived reality. The expectations as well as the perception of how these expectations are met in reality depend on social and cultural norms and values. This assumption could be illustrated in our case studies. The perception or actual experienced harm induced by an event or an activity is directly related to the degree of people's dissatisfaction. In the terms of rational choice theory we could say that people confronted with harmful events are unable to reach their expected goals. In theory they would try to change that situation by initiating actions that promise to reach the predefined goals again. Whether they are able and motivated to act against the barriers of reaching their goals depends on the costs associated with the action and the benefits that they are likely to gain when the actions succeed. In terms of the rational actor paradigm individuals calculate the costs of involvement and protest against the product of probability and expected revenues of being successful. Such calculations will not be performed in any conscious act of deliberation but more or less as an internalized process of weighing the pros and cons (Jaeger et al. 2001). Furthermore, as resource mobilization theory suggests the likelihood of success as well as the costs for protests are highly dependent on the actions of others. The more people join the movement the more likely the success and the lower the individual costs. At the same time, with more people to join the movement, the incentive to play out the free rider role also increases. So the success of a movement rests on the perception of each actor that s/he can count on the solidarity of many others but that his or her personal involvement is crucial for serving the common cause. In the Greek case it was apparent that each protester had the feeling to be embraced by a large movement but, at the same time, it was essential for each individual to turn to the streets even if one more protester would not make much of a difference. Furthermore, as the balance between costs of engagement and probability of success indicates, the degree of dissatisfaction has to reach a special plateau (threshold) before it seems rational for an individual to invest time and resources in protest movements since the success of such movements is always contested and uncertain while the costs of one's own engagement are truly certain and inevitable.

Both the motivation to act and the assessment of costs and benefits depend highly on the images that are portrayed in the public sphere. A highly influential factor here is assumed legitimacy. In addition to personal gains and losses people are driven by the quest for social recognition and socio-cultural identity. Both aspects are highly dependent on the perceptions of others and the portrayal of the cause in the public media. The importance of legitimization was highly visible in the case of the Greek protest movement. The movement almost collapsed when three "innocent" bystanders were killed as a consequence of protesters' inability to provide access for the rescue teams. Individual actors do not want to be involved in any action that appears as being illegitimate in the eyes of their respected reference groups. In particular the Greek media did not hesitate to blame the protesters for the three lives lost and this public image undermined the credibility of the protest in the eyes of the otherwise sympathetic observers.

Turning to the second step, we outlined reasons why people organize themselves in interest groups. Rational actor theory would predict that people organize in groups if they can gain a collective good exclusively and if the costs of becoming organized are low. The case studies confirmed this insight from theory and specified some of the conditions for the likelihood that dissatisfaction can translate into organized protest. A major condition for the emergence of an organized protest is a real or easy-to-construct fit with an already existing agenda of major interest groups. If nobody is there to pick up the

dissatisfaction of the affected individuals it is very unlikely that the individualized protesters would be able to organize themselves. In the case of swine flu as well as in the case of Katrina there was a lack of proximity between the agendas of existing interest groups and the overt dissatisfaction of the affected people. None of the groups involved could gain a major benefit in resources or reputation by picking up the cause and mobilize around this cause. In the case of the Greek finance crisis the unions were the natural partner for the dissatisfied people. The agenda of the unions matched the perceptions of the dissatisfied people and this alliance proved to be a strong motivator for a highly visible protest in the streets.

The third step addressed the issue of mobilization. According to rational actor theory, organizations calculate the expected benefits for using conventional versus unconventional forms of protest. This calculation is ultimately related to the perceived probability of success. However, the value of the probability assessment depends on many variables. These include: the expected reactions by public authorities, the solidarity effects by the general population, the major images that are conveyed by the public media, the impression of legitimacy for the protest goals and means of reaching them and the availability of solutions if the protesters have success in changing the course of actions. In the case of swine flu many economic associations had complained about wasting so much money on vaccines. They were rather reluctant, however, to express this preference in public as the alternative of having not enough vaccine was regarded as more detrimental for their public image.

In addition to cost-benefit considerations, mobilization depends on the access to resources and strategies. Important here are factors such as the knowledge of how to organize and protest, to deal with the media and to control the emotions of those who feel deeply dissatisfied. Lack of control was one the major reasons that delegitimized the Greek protest when protesters blocked the entrance for rescue operations. Our case studies also demonstrated the importance of new media like mobile phones or the internet. Access to these new media provide timely tools for coordinating protest even across distant areas and to disseminate opinions, pictures and reports to a wider public.

Turning to step 4 we concluded that the management skills of the public authorities are the main drivers for escalating violence. Again the issue of legitimacy is crucial here. It all depends on who is responsible for the increased violence in the public eye. If the public authorities are blamed the protest movement can respond adequately and counter the violence with similar violent actions. However, if the public believes that the violence has been caused by the protest movement the sympathy will be attributed to the public authorities. This may indicate the end of the protest movement or at least a phase of re-sorting and re-organizing the movement.

The description of the escalation ladder leads to the question whether we can identify causes or triggers that are responsible for each stage of escalation or de-escalation. Some of these causal factors have been mentioned in the previous sections. Looking over the entire escalation chain one driver appears to dominate the escalation process: institutional failure to respond to the protest in the various stages of protest articulation.

In the very early stages protest movements are often simply ignored or ridiculed. Once the protest movements evolve into more powerful organizations they are either criminalized or labeled as deviant outsiders. This strategy of segregating the movement from the rest of society encourages the members of the protest groups to become more radical and determined to fight for their goals. As soon as they start to use violence public authorities often tend to overreact by using undue force. This leads to a spiral of violence on both sides. The other extreme of giving in and retreating quickly may be just as detrimental for sustaining public order as is the use of excessive violence. In the end both under-reaction and overreaction may fuel the escalation of the process. In addition, if public institutions are not functioning at all or appear to be incoherent and arbitrary civil violence is most likely to increase.

What can government and other responsible actors do to promote de-escalation? Organizational theory can provide some clues of how a route of de-escalation can be pursued. First, public institutions should develop monitoring services that detect the emergence of dissatisfaction and unease within the population. One important variable to watch is the perception of fairness. If public decisions are seen as unfair or unjust it is likely that people feel motivated to express their discontent in public. Another important factor is the alleged or real violation of religious or value-laden beliefs and convictions. High trust in governmental institutions can act as a moderator in this situation. Often people lack the expertise or the knowledge to understand complex decisions so that they need to trust that the “right” decision has been made. Trust in the competence of the decision making bodies can overcome a lack of understanding in the rationale of public policies (Short 1984: 714). However, trust cannot be manufactured and is itself a product of experience that in the past even difficult-to-understand decisions turned out to benefit society as a whole.

So if public officials face a loss of trust or experience a wave of dissatisfaction they need to act immediately. The effectiveness of public protest is not a question of how many people are dissatisfied but how many of them are willing to articulate their protest in the public arenas. Most often 5% of individuals out of an affected population who are willing to act in the public is already enough to make the protest movement visible in the public eye and to attract massive media attention. Therefore it is essential to install a monitoring system that does not only include public surveys but also more focused methods of social sciences (such as focus groups, media analysis, and surveys among special groups). Once the monitoring system detects a high degree of dissatisfaction, in particular if special groups are involved or issues of fairness and belief are affected, policy makers should respond by a revision of policies (if justified), a better strategy to communicate the rationale for existing policies and an open debate about how to deal with the problems. Such actions could already be sufficient to stop the escalation process from the beginning.

### CAUSES, DRIVERS, VECTORS... (Examples)

#### Expressions of social unrest and its precursors

#### dimensions

Experience of fear, injustice, disappointment

- person level (micro)
- groups/organizations (meso)
- nation or ethnic level (macro)

#### Failed infrastructures

- Failure of parts of a single infrastructure of
- Failure of complete single infrastructure
- Failure of multiple infrastructures

#### Governance deficits

- Inadequate responses to dissatisfaction
- Inadequate institutional capacity
- Abuse of workers (exploitation)
- General corruption and nepotism

#### Economic failures

- Low/unpaid wages
- Layoffs
- Loss of workers' benefits
- Inflation, Bankruptcy
- Real estate crashes

#### Environmental degradation

- General environmental degradation
- Access to water
- Access to land, land confiscation



At the second stage, i.e. organization of protest movements, public authorities can provide platforms for these movements to voice their opinions, to develop alternative strategies and to have access to those who are legitimate decision makers. Often it is sufficient that these organizations experience that they are taken seriously, their arguments are taken into consideration and their values and preferences are respected by public authorities. They may still continue to protest and oppose governmental policies but it is very unlikely that they will then use force to press for change.

During the third and fourth step of increasing violence institutions may retreat to neutral and highly respected individuals and organizations for facilitating a negotiated agreement between the protesters and the public authorities. In addition, the response to violence should be proportional to the extent of the original violation yet decisive enough to demonstrate to others that violence is not tolerated. To fulfill their function of keeping order public institutions should avoid the impression that their authority is in doubt. "Authorization can be seen as a process by which norms supporting the exercises of authority by a given agent are defined and enforced by a subordinate unit. Authority is legitimate power" (Scott 1987:502). If people have the feeling that there is no public authority left they may even join the protest movement as a means to be on the winning team or to re-establish order.

In addition, experts on street violence have developed many methods for de-escalation that can be used if either small groups within the larger body of protesters use the opportunity to perform violent acts as well as if violence emerges "out of the blue" that is that some unforeseen trigger initiates a violent reaction by an incited mass.

# System for modelling social unrest

## Modeling and simulation of social unrest

Models, as reflections of the essences of events and/or processes taking place in the real world (e.g. "case studies" in this report), are a useful representation of highly relevant aspects of the actual global social system, and are used to better understand and predict several of the investigated aspects ("future global shocks" in our case).

State-of-the-art approaches provide three main elements, namely:

- modeling
- simulation and
- visualization

They look for ways to capitalize on newest achievements in both science

and engineering in order to understand and predict the highly complex globalized and interdependent network. The last couple of decades brought a rapid development in the science of these complex systems. Building on methods, tools and knowledge from traditional social or economic sciences, these results have been extended, unified and recast in network language. Today's exponentially increasing computational resources allow to efficiently implement and simulate network models of arbitrary size – a fact that is of particular interest to the study and understanding of emerging social behavior, such as unrest.

Advancements in computer software and hardware as well as artificial intelligence and software agents have not only hastened the pace of maturation of modeling and simulation as a discipline and tool, but in turn also enhanced the capabilities of simulation for even more complex phenomena, including, e.g., social stress and other conflict situations. For example, in the early 1990s, some US military modeling and simulation practitioners began to explore ways to link stand-alone simulations used to model and represent distinct real-world functions into a system of simulations where simulation entities were given semi-automated behaviors, commonly called semi-automated forces. The initial efforts to link simulations showed promise and led to standards in simulation data exchange and the establishment of protocols for creating simulation federations (Ören, 2005). To emphasize the modeling process and associated activities and environments, the term "modeling and simulation" is used by large number of people, usually within a larger perspective of the Simulation Systems Engineering needed for the analysis and possible prediction of "future global shocks".

Two main types of modeling and simulation can be distinguished:

- Stand-alone simulations, generally following the H. A. Simon (Langley, Simon, Bradshaw, Zytrow, 1987) notion of learning-by-doing, or "train-as-you-operate", and
- Integrated simulations, used to enrich and support real systems.

For many single aspects of this study stand-alone simulations may work best, whereas the overall system for "future global shocks" will probably have to recur to the integrated simulations. The stand-alone application areas can be grouped into five main categories (Ören, 2005):

1. Training ("provide real-world experience in a controlled environment")
2. Decision support ("description, explanation, prediction, evaluation, prescription")

### **SOCIAL UNREST AS A FINAL OUTCOME OF GLOBAL ISSUES**

The claim that every big risk and global issue ends up as a social unrest might be exaggerated, but the modeling methods and models applied for the big risks and global issues must be able to encompass social unrest.

3. Understanding ("testing a hypothesis relative to the structure and function of a complex system")
4. Education and learning ("teaching and learning systems with dynamic behavior and game-based learning")
5. Entertainment ("realistic representation for elements possessing dynamic behavior ")

The emphasis of social unrest tools is, obviously, on types 2 and 3. In particular, the stand-alone simulations for virtual simulations, combined with traditional methods of modeling including

- statistical modeling,
- formal modeling, and
- agent-based modeling.

These can be used (e.g.) for the discovery and interpretation of patterns in large numbers of events, analytic specification of choices, or observation of aggregate behaviors that emerge from interactions of large numbers of autonomous actors. Integrating this traditional modeling and analysis capacity with other forms of modeling (simulation and visualization) provides a tool for expanding and disseminating social scientists' grasp of the subject area and a much denser schematic for the engineer's model. For the needs of this study the qualitative and quantitative analysis has to expand into areas such as:

- measuring the effects of actions onto the behavior of the certain groups/stakeholders in the society
- assessing global and national issues of dependency and to study economic, political, and social capacities to manage crises
- assessing layered and geographical effects (effects impacting several layers like, e.g., labor, education and health must be correlated with state, regional, or national interests)
- optimization of governance and/or urban design (e.g. improving modeling urban development to prescribe improvements in land-use, transportation, and infrastructure design and use).

## **Agent based models for modeling social unrest**

Agent based models (ABMs) and agent based modeling (ABM) are considered as one of the promising options for the issue of modeling in the complex financial systems in Future Global Shocks project (Thurner, 2010). In the social sciences they entered the playfield in the mid-90s enlightening how social structures and group behavior arise through individual social interactions (Epstein, Axtell, 1996) and how different social and cultural beliefs may coexist in societies (Axelrod, 1997). Other fields where ABMs can efficiently be utilized to describe and understand complex systems include eco-systems systems (e.g. Cioffi-Revilla et al., 2010), stock markets (Farmer, 2002) or the dynamics of revolutions (Epstein, 2002).

How to fully exploit the promises and potential of ABMs in helping to learn the lessons of crises and, if possible, to develop an early-warning systems for future ones is still an open issue.

Generally, the following features make ABMs a highly useful way to model social unrest:

- ABM allow to study systems composed of heterogenous agents, that is, agents may widely differ in their utility functions, goals, views, resources etc. This makes them especially useful to study scenarios or cases where different groups of stakeholders are involved. The system does not need to be populated with "representative agents" such as identical decision-makers, firms or governments whose individual behavior mirrors the system as a whole;

- Conventional models often produce equilibrium states, that is the dynamics comes basically to an end. Social systems, on the other hand, are known to often exist in a state of punctuated equilibrium: there is a large, maybe even infinite, number of different equilibrium states between which the system erratically jumps, a phenomenon which can be reproduced by ABMs;
- ABM uses a bottom-up approach which assigns particular behavioral rules to each agent. For example, some may believe that unrest reflect fundamentals of the psychological behavior whereas others may rely on empirical observations of external behavior;
- Agents' behavior may be determined (and altered) by direct interactions between them, whereas in conventional models interaction happens only indirectly through predefined links; This feature enables, for example, the copycat behavior that leads to "herding" among stakeholders in the society;
- The agents may learn from experience or switch their strategies according to majority opinion. They can aggregate into institutional structures such as social groups and parties. These things are very hard, sometimes impossible, to build into conventional models;
- Not only may the agents change their dynamical rules, the boundary and surrounding of the entire (social) system may be subject to change itself and co-evolve with the agents. A change in boundary conditions may then impact the agent's dynamics again, and so on ...

Agent-based models run computer simulations to explore emerging dynamical patterns, free from any top-down assumptions. In contrast to conventional models, ABMs make no assumptions about the existence of efficient policies or general equilibrium, these may or may not emerge due to the dynamical rules. The policies and social behaviors that they generate are more like the weather system, subject to constant storms and seizures of all sizes. Big fluctuations and even crashes are often inherent features. That is because ABMs allow feedback mechanisms that can amplify small effects, such as the herding and panic that generate bubbles and crashes. In mathematical terms the models are "non-linear", meaning that effects need not be proportional to their causes.

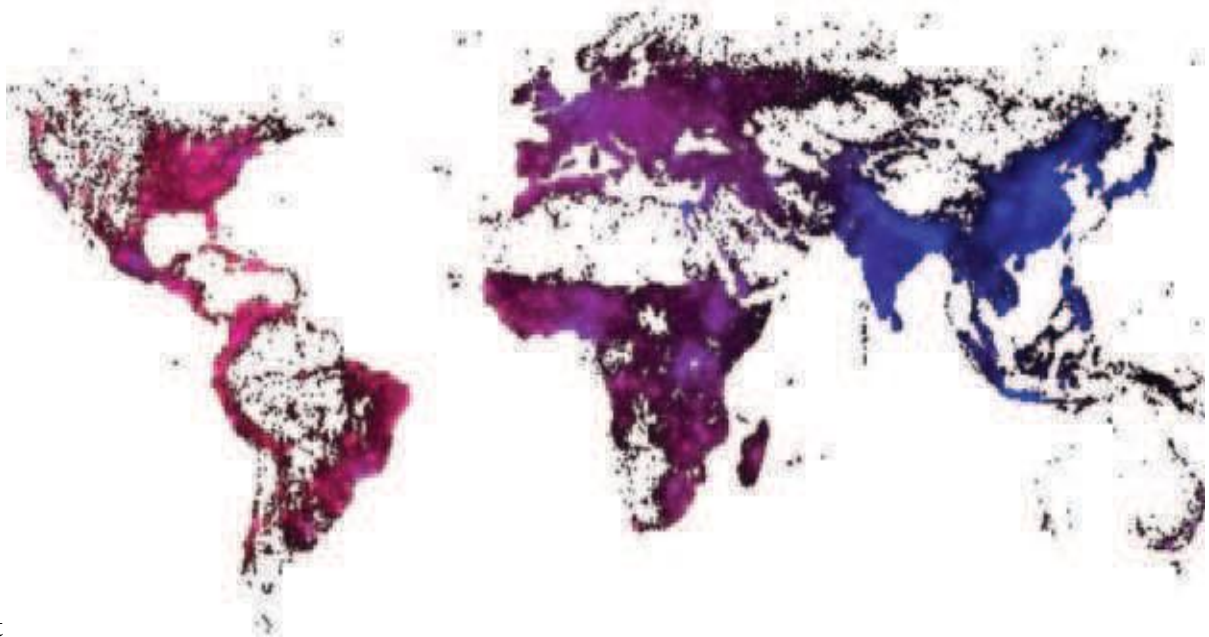


Figure 5: The system built for modeling the pandemic, including social (also social unrest) aspects (Epstein, 2009)

But even with such promising features ABMs cannot bring the issue of modeling of the global social system into the category of "*Known Knowns*" or, at least "*Known Unknowns*" (cf. Casti., 2010, p.15),

especially not in the times of turbulence or crises, so typical for social unrest. Even the option to interlink or cluster any ABMs into one complex system (“wiring” of many ABMs together) is still just a hypothetical solution, mainly because most of the currently developed ABMs do not follow any common template or widely agreed conventions related to definition of agent and/or their behavior.

Nevertheless, a real-time simulation, fed by masses of data that would operate rather like the current traffic or weather forecasting models (projecting various possible futures!) is the only way to go in the future and if a suite of such models is to be used, such a suite will probably have to be built step-by-step, probably around a core system which will serve as a reference. An example of such a candidate system for the area of social unrest could be the system built for modeling the pandemic (Figure 5, see Epstein, 2009, p. 687). In either case (one large model or wired models), the solutions will need much more data on the activities of individuals, governments, companies and other stakeholders, what raises justified privacy fears. But such data-gathering is essential and it should include also the mapping of the evolution of stress patterns, identifying areas at risk and refining heuristics for unrest potential assessment.



Figure 6: Social unrest - Global tinderbox (© <http://www.economist.com/node/15098974>)

**Applicability of ABMs to past and future cases of social unrest**

In order to apply proposed solution to the past and future cases, possible ABM should, as a minimum, include

- Construction of a relevant set of model parameters on agent-level (that is attitudes or other properties of agents which govern their behavior and influence the phenomena of interest). Ideally these should be measurable or defined and backed up by existing theories on social interaction.
- Identification of the correct set of order parameters across different layers of the social system. This may include tendencies to form communities or cliques on the local level up to mass hysteria on geopolitical levels.

- In addition to specifying and measuring the emerging dynamics, ABMs should be aided and bolstered by massive data mining to e.g. build indices for social mood. These may include economic of financial aggregate indices, but also the abundance of data on social inter-relations existing in online worlds offers unlimited possibilities to gain quantitative insight in social dynamics.

For ABMs, as for the other solutions the following notion/requirements apply:

- All big risks end up as social risks
- Social unrest is both cause and consequence
- No proportionality between drivers/causes and effects in the case of social unrest
- Ensure quality
  - Review of analysis in single given cases
  - Verification by stakeholders concerns
- Use both qualitative and quantitative approach
  - Apply global assumptions
  - Use a variety of models
  - Provide qualitative insight
- Gather all relevant information and cases

Given the above is respected, the models should yield a predictive analytical map of global risk of social unrest, which would be a significant improvement of current ones (Figure 6).

The challenge in employing ABM as a method to deal with social unrest basically lies in getting a trade-off right. If the degree of abstraction of a model is too high it may provide results which are catchy and easy to visualize but also depart too much from reality to be of any use. This can be counteracted by increasing the number of model-parameters and dynamical rules, which may on the downside lead to models which are simply intractable and idiosyncratic. It should also be noted that using too much data as input to calibrate a model may have drawbacks, as well when one is interested in predictive models, here one runs in danger of “overfitting” the model.

Getting this tradeoff between abstraction and applicability right is the main challenge. That it is within reach to develop agent-based model methods to deal with social unrest is maybe best documented by the number of ambitious projects which are currently pursued. Most prominently features maybe the “FuturICT Knowledge Accelerator” (Helbing, 2010) which aims at a techno-social-economic-environmental simulator in Manhattan Project or CERN dimensions.

## Normative governance

Risk governance denotes both the institutional structure and the policy process that guide and restrain collective activities of a group, society or international community to regulate, reduce or control risk problems. Risk governance has shifted from traditional state-centric approaches with hierarchically organized governmental agencies as the dominant locus of power to multi-level systems, in which the political authority for handling risk problems is distributed to distinct public bodies with overlapping jurisdictions that do not match the traditional hierarchical order (cf. Skelcher 2005; Hooghe and Marks 2003). This implicates an increasingly multilayered and diversified socio-political landscape in which a multitude of actors, their perceptions and evaluations draw on a diversity of knowledge and evidence claims, value commitments and political interests in order to influence processes of risk analysis, decision-making and risk management (Jasanoff 2004). Institutional diversity can offer considerable advantages when complex, uncertain and ambiguous risk problems such as social unrest need to be addressed because, first, risk problems with different scopes can be managed at different levels, second, an inherent degree of overlap and redundancy makes non-hierarchical adaptive and integrative risk governance systems more resilient and therefore less vulnerable, and third, the larger number of actors facilitates experimentation and learning (Renn 2008: 177ff.). Disadvantages refer to the possible co-modification of risk; the fragmentation of the risk governance process; costly collective risk decision-making; and the potential loss of democratic accountability (Charnley 2000).

The last section of this report will address the ability of institutional actors to intervene in the escalation process of social unrest and arrange for risk reduction measures that terminate or at least attenuate the path from dissatisfaction to mass violence. The ability of risk governance institutions to cope with complex drivers of unrest has become a central concern to politicians and administrators. In our view such a complex situation demands for an adaptive and integrative governance response. We understand adaptive and integrative governance on risk broadly as the ability of politics and society to collectively design and implement a systematic approach to organizational and policy learning in institutional settings that are conducive to resolving emerging problems and conflicts about risks.<sup>1</sup> It is a dynamic governance process of continuous and gradual learning and adjustment that permits a prudent handling of complexity, scientific uncertainty and/or socio-political ambiguity. Adaptive and integrative capacity in risk governance processes encompasses a broad array of structural and procedural means and mechanisms by which politics and society can handle collectively relevant risk problems. In practical terms, adaptive and integrative capacity is the ability to design and incorporate the necessary steps in a de-escalation process that allow risk managers to reduce, mitigate or control the emergence of social unrest in an effective, efficient and fair manner (cf. Brooks and Adger 2005). The adaptive and integrative quality of the process requires the capacity to learn from previous and similar experiences to cope with current crisis situations and apply these lessons to future events and developments.

For this reason, we propose a comprehensive and inclusive risk governance model with adaptive and integrative capacity that addresses four core functions:

- Systematically and consistently complementing early warning, risk assessment, concern assessment and risk reduction in a risk governance cycle;
- Coping with vulnerabilities of the institutional structures that may aggravate or fuel the emergence of social unrest;

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*1 To the definition and understanding of adaptive capacity, e.g. Armitage et al. (2007), Berkhout et al. (2006), Folke et al. (2005), Pelling and High (2004), Staber and Sydow (2002) and Webster (2009).*

- Providing adaptability and flexibility in risk governance institutions in response to actual signals of crisis and
- Enhancing the resilience of the risk governance system by enhancing the capacity to retain the basic functions and structures of crisis de-escalation and to absorb disturbance when responding to the crisis.

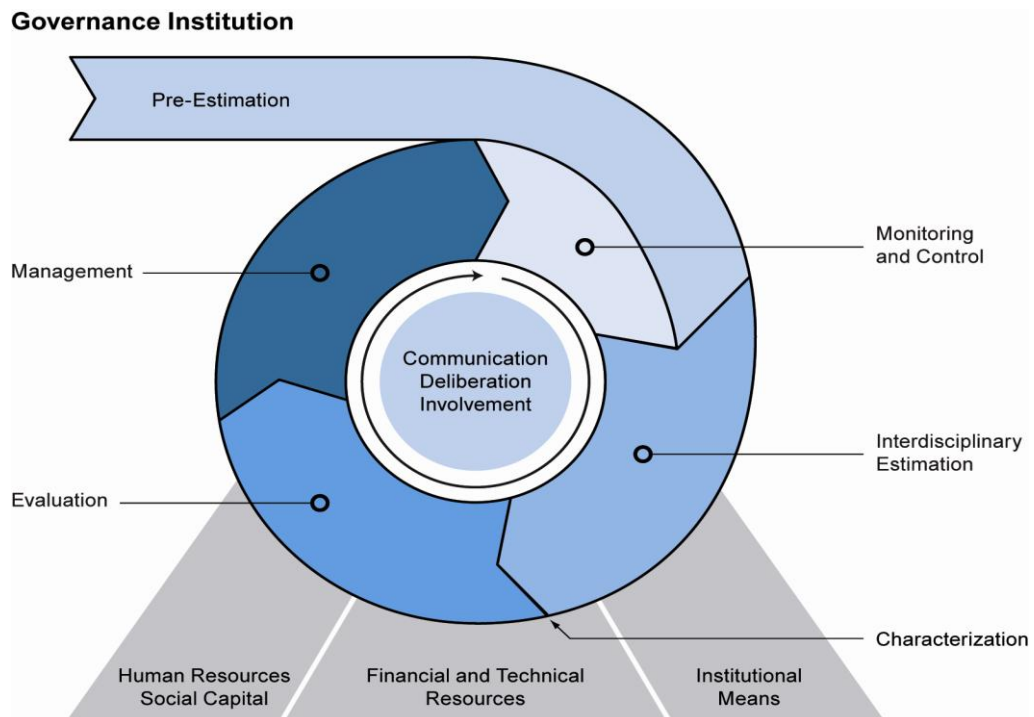


Figure 7: Adaptive and integrative risk governance model<sup>2</sup>

Adaptive and integrative governance on the risk of social unrest requires a set of resources available for accomplishing the tasks associated with the prudent handling of complexity, uncertainty and ambiguity. In 2005, the International Risk Governance Council suggested a process model of risk governance (IRGC 2005; Klinke and Renn 2002; Klinke et al. 2006; Renn 2008; Renn and Walker 2008). This framework structures the risk governance process in four phases: pre-assessment, appraisal, characterization and evaluation, and risk management. Communication and stakeholder involvement were conceptualized as constant companions to all four phases of the risk governance cycle. Based on this framework and informed by many comments on the original framework (for example the edited volume by Renn and Walker 2008), we modified the original IRGC proposal. The modified framework suggested here is specifically designed for dealing with social unrest. It consists of the steps: pre-estimation (emphasis on early warning), interdisciplinary risk estimation (including concern assessment), risk characterization (dynamic modeling of drivers and responses), risk evaluation (need to take action) and risk management (designing de-escalation strategies). This is all related to the ability and capacity of risk governance institutions to understand the situation and to have the resources to intervene if necessary. Appropriate resources include institutional and financial means as well as social capital (e.g. strong institutional mechanisms and configurations, transparent decision-making, allocation of decision making authority, formal and informal networks that promote collective risk handling, education), technical resources (e.g. databases, computer soft- and hardware etc), and human resources (e.g. skills, knowledge, expertise, epistemic communities etc).

<sup>2</sup> The adaptive and integrative risk governance model is based on a modification and refinement of the IRGC framework (IRGC 2005).



## Pre-Estimation

Risks are not real phenomena but mental constructions resulting from how people perceive uncertain phenomena and how their interpretations and responses are determined by social, political, economic and cultural contexts and judgments (cf.: Luhman 1993; OECD 2003; IRGC 2005). The introduction of risk as a mental construct is contingent on the presumption that human action can prevent harm in advance. Risk as a mental construct has major implications on how risk is considered. Risks are created and selected by human actors. What counts as a risk to someone may be a destiny explained by religion or even an opportunity for a third party. Although societies have over time gained experience and collective knowledge of the potential impacts of events and activities, one cannot anticipate all potential scenarios and be worried about all the many potential consequences of a proposed activity or an expected event. By the same token, it is impossible to include all possible options for intervention. Therefore societies have been *selective* in what they have chosen to be worth considering and what to ignore.

The insight that risk are not objective entities that need to be discovered but mental constructs of how people select signals of the environment in order to be better prepared if a hazard strikes leads to the necessity to establish (culture-sensitive) institutions for early warning. Many such institutions exist – particularly for natural or technological hazards. However, an adequate national, let alone international mechanism for the *detection and early warning* of socially induced risks such as social unrest is lacking. The world community would certainly benefit from more international mechanism that would be responsible for the timely and integrated detection of social risks leading to social unrest. It should underpin and stimulate existing relevant research, collect and synthesize valid scientific data and information, interpret findings and implications, deliberate and determine the appropriate scientific conventions for future action, and present these to policy-makers in a purposeful form. This would be a preliminary and superior process step where available knowledge provides an indication of the need to proceed then in more specialized risk governance processes (WBGU 2000).

This process is not arbitrary. It is guided by cultural values, by institutional and financial resources, and by systematic reasoning. An international mechanism would function as network node in which various national risk identification and assessment processes are collected, collated and coordinated. The model developed above could function as an orientation for monitoring drivers and escalation stages.

A systematic review of the stages in pre-estimation would start with screening as an exploration of a large array of social indicators looking for those with a specific feature related to the pre-cursors of social unrest. It is important to explore what major political and societal actors such as e.g. governments, companies, epistemic communities, nongovernmental organizations and the general public identify as signals for emerging unrest and what types of problems they label as problems associated with such a move. This is called *framing* and it specifies how society and politics rely on schemes of selection and interpretation to understand and respond to those phenomena what is socially constructed as relevant social risk topics (Kahneman and Tversky 2000; Nelson et al. 1997; Reese et al 2003). Interpretations of risk experience depend on the frames of reference (Daft and Weick 1984). The process of framing corresponds with a multi-actor and multi-objective governance structure since governmental authorities (national, supranational and international agencies), risk and opportunity producers (e.g. industry), those affected by risks and opportunities (e.g. consumer organizations, environmental groups) and interested bystanders (e.g. the media or an intellectual elite) are all involved and often in conflict with each other about the appropriate frame to conceptualize the problem. What counts as risk or a pre-cursor to risk may vary among these actor groups. Whether an overlapping consensus evolves about what requires consideration as a relevant risk depends on the legitimacy of the selection rule.

## Interdisciplinary Risk Estimation

For politics and society to come to reasonable decisions about social unrest, it is not enough to consider only the calculations done on the basis of relevant social indicators. In order to understand the concerns of people affected and various stakeholders, information about both risk perceptions and the further implications of the direct consequences of a risk is needed and should be taken into account by risk management.<sup>3</sup>

Interdisciplinary risk estimation thus includes best available assessment of the risks to human health and the environment and an assessment of related concerns as well as social and economic implications (cf.: IRGC 2005; Renn and Walker 2007). The interdisciplinary estimation process should be clearly dominated by scientific analyses – but, in contrast to traditional risk regulation models, the scientific process includes both the natural/technical as well as the social sciences, including economics. The interdisciplinary risk estimation comprises two stages:

1. *Risk assessment*: experts produce the best estimate of the drivers and their likely consequences when looking at social unrest;
2. *Concern assessment*: experts of social sciences including economics identify and analyze the issues that individuals or society as a whole link to a certain driver of social unrest or a chain of events that would lead to social unrest. For this purpose the repertoire of the social sciences such as survey methods, focus groups, econometric analysis, macro-economic modeling, or structured hearings with stakeholders may be used.

There are different approaches and proposals how to address the issue of interdisciplinary risk estimation. The German Advisory Council on Global Change (WBGU) has developed a set of eight criteria to characterize risks beyond the established assessment criteria (Klinke and Renn 2002; WBGU 2000). Some of the criteria have been used by different risk agencies or risk estimation processes (for example HSE 2001).

- *Extent of damage*: Adverse effects in natural units, e.g. death, injury, production loss, etc.
- *Probability of occurrence*: Estimate of relative frequency, which can be discrete or continuous.
- *Incertitude*: How do we take account of uncertainty in knowledge, in modeling of complex systems or in predictability in assessing a risk?
- *Ubiquity*: Geographical dispersion of damage.
- *Persistence*: How long will the damage last?
- *Reversibility*: Can the damage be reversed?
- *Delay effects*: Latency between initial event and actual damage.
- *Potential for mobilization*: The broad social impact. Will the risk generate social conflict or outrage etc.?
  - *Inequity and injustice* associated with the distribution of risks and benefits over time, space and social status;
  - *Psychological stress and discomfort* associated with the risk or the risk source (as measured by psychometric scales);
  - *Potential for social conflict and mobilization* (degree of political or public pressure on risk regulatory agencies);

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<sup>3</sup> This includes the social mobilization potential, i.e. how likely is it that the risk consequences generate social conflicts and psychological reactions by individuals or groups?

- *Spill-over effects* that are likely to be expected when highly symbolic losses have repercussions on other fields such as financial markets or loss of credibility in management institutions.

These four sub-criteria of the last category reflect many factors that have been proven to influence risk perception. The “appraisal guidance” published by the UK Treasury Department in 2005 recommends a risk estimation procedure that is similar to our proposal and includes as well both the results of risk assessment and the direct input from data on public perception and the assessment of social concerns (HM Treasury 2005).

## Risk Evaluation

A heavily disputed task in the risk governance process relates to the procedure of how to classify a given risk and justify an evaluation about its societal acceptability or tolerability (see Figure 8). In many approaches, risks are ranked and prioritized based on a combination of probability (how likely is it that the risk will occur) and impact (what are the consequences, if the risk does occur). In the so called traffic light model, risks are located in the diagram of probability versus expected consequences and three areas are identified: green, yellow and red (Klinke and Renn 2002; Renn 2008: 149ff.). A risk falls into the green area if the occurrence is highly unlikely and the impact is negligible. No further formal intervention is necessary. A risk is seen as tolerable when serious impacts might occur occasionally (yellow area). The benefits are worth the risk, but risk reduction measures are necessary. Finally, a risk is viewed as intolerable when the occurrence of catastrophic impacts is most likely (red area). Possible negative consequences of the risk are so catastrophic that in spite of potential benefits it cannot be tolerated.

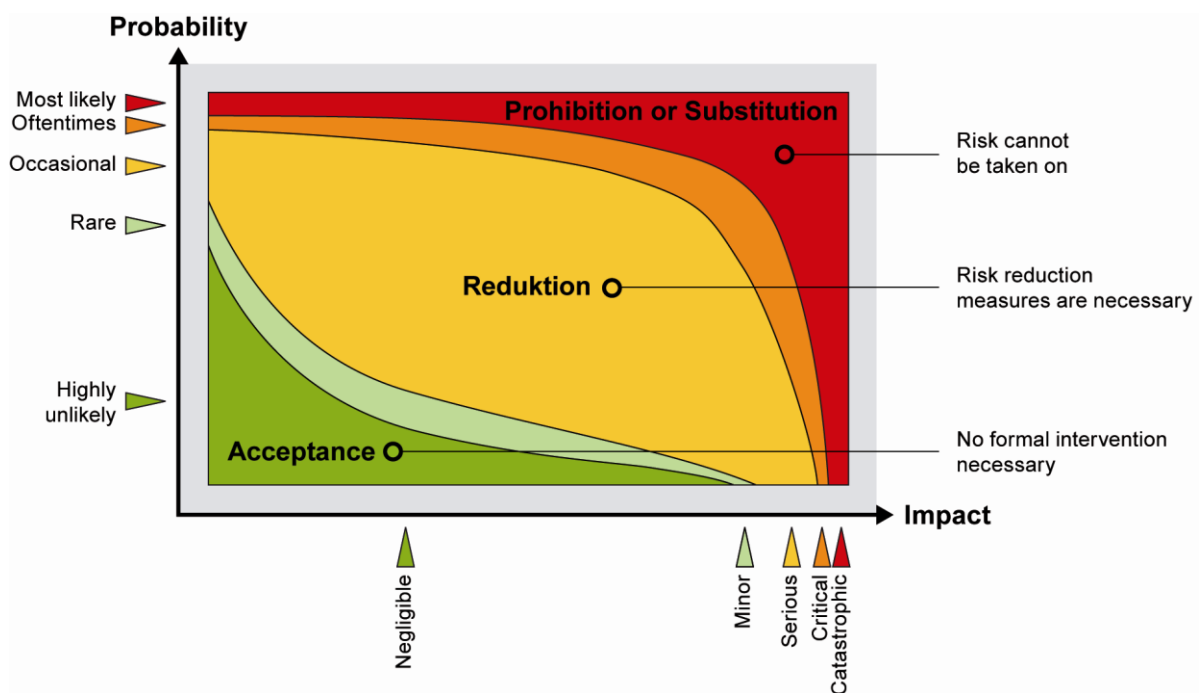


Figure 8: Risk areas

To draw the lines between ‘acceptable’ (green area), ‘tolerable’ (yellow area) and ‘intolerable’ (red area) is one of the most controversial tasks in the risk governance process. The UK Health and Safety Executive developed a procedure for chemical risks based on risk-risk comparisons (Löfstedt 1997). Some Swiss cantons such as Basle County experimented with Round Tables as a means to reach consensus on drawing the two demarcation lines, whereby participants in the Round Table represented industry, administrators, county officials, environmentalists, and neighborhood groups. Irrespective of

the selected means to support this task, the judgment on acceptability or tolerability is contingent on making use of a variety of different knowledge sources. One needs to include the data and insights resulting from the risk assessment activity, and additional data from the concern assessment.

With respect to social unrest, public authorities have to assess the likelihood that a given situation of dissatisfaction is likely to grow into a stage of serious unrest or even violence. The classic traffic light model might assist them to identify situations which either look like normal degrees of dissatisfaction with unpopular decisions by public bodies or like potential amplifiers for more social unrest to come (yellow and red). Our escalation model in conjunction with the list of potential drivers can assist risk managers to evaluate the situation and warn public officials to act before it may be too late.

Risk evaluations in general rely on causal and principal beliefs as well as world views (cf. Goldstein and Keohane 1993). Causal beliefs refer to the scientific evidence from risk assessment, whether, how and to what extent the hazard potential causes harm to the environment or to human health. This dimension emphasizes cause-effect relations and provides factual guidance which strategy is appropriate to achieve the goal of risk avoidance or reduction.

However, the question of what is safe enough implies a moral judgment about acceptability of risk and the tolerable burden that risk producers can impose on others. The results of the concern assessment can provide hints of what kind of associations are present and which moral judgments people would prefer in a choice situation. Of major importance is the perception of just or unjust distribution of public activities that may trigger protest and even unrest. How these moral judgments are made and justified depends to a large degree on cultural values and world views. They affect personal thinking and evaluation strategies and are shaped by collectively shared ontological and ethical convictions. The selection of strategies for risk handling is therefore understandable only within the context of broader world views. Hence society can never derive acceptability or tolerability from looking at the evidence alone. Likewise, evidence is essential if we are to know whether a value has been violated or not (or to what degree). With respect to values and evidence we can distinguish three cases:

*Interpretative ambiguity* means that evidence is seen as ambiguous but not on values. In those cases where there is unanimous agreement about the underlying values and even the threshold of what is regarded as acceptable or tolerable, evidence in the form of risk estimates may be sufficient to locate the risk within the risk area diagram. A judgment can then best be made by those who have most expertise in risk and concern assessments, in which case it makes sense to place this task within the domain of risk estimation by experts.

*Normative ambiguity* refers to the ambiguity on values but not on evidence. If the underlying values of what could be interpreted as acceptable or tolerable are disputed, while the evidence of what is at stake is clearly given and non-controversial, the judgment needs to be based on a discourse about values and their implications. Such a discourse should be part of risk management by the legitimate decision makers. In these cases, science is very familiar with the risks and there is little uncertainty and interpretative ambiguity about dose-effect relationships. Yet there is considerable debate whether the application is tolerable or not. We assume that normative ambiguity is a typical characteristic of social unrest as a risk or as a response to another risk. This implies that studies about the perceptions of the affected publics are the most valuable information for decision makers to design the appropriate management responses.

*Interpretative and normative ambiguity* addresses a third case where both the evidence and the values are controversial. This would imply that assessment should engage in an activity to find some common ground for characterizing and qualifying the evidence and risk management needs to establish agreement about the appropriate values and their application. A good example for this third case may be the interpretative and normative implications of global climate change. With regard to social unrest we believe that interpretative ambiguity is less of a problem compared to normative ambiguity. However, as outlined in the beginning of this paper the issue of definition and conceptualization of social unrest demonstrates a level of interpretative ambiguity that needs further attention.

Since the last case includes both issues of the other two, the process of judging the tolerability and acceptability of a risk can be structured into two distinct components: risk characterization and risk evaluation (IRGC 2005). The first step, *risk characterization*, determines the evidence-based component for making the necessary judgment on the tolerability and/or acceptability of a risk; the step *risk evaluation* determines the value-based component for making this judgment.

## Risk Management

Risk management starts reviewing all relevant data and information generated in the previous steps of interdisciplinary risk estimation, characterization and risk evaluation. The systematic analysis of risk management options focuses on still tolerable risks (yellow area) and those where tolerability is disputed (light green and orange transition zones). The other cases (green and red area) are fairly easy to deal with. Intolerable risks demand immediate prevention strategies. In order to curb the pending social unrest as quickly as possible. If risks are classified as tolerable, or if there is a dispute as to whether they are in the transition zones of tolerability, public risk management needs to design and implement actions that make these risks either acceptable or at least tolerable by introducing reduction strategies. This task can be described in terms of classic decision theory (cf.: Aven and Vinnem 2007; Hammond et al. 1999; Klinké and Renn 2010):

- Identification and generation of generic risk management options (such as establishing conflict resolution mechanisms such as Round Tables, improving performance by public service providers, investing in more effective risk communication; exercising all means for de-escalating protests, etc.
- Assessment of risk management options with respect to predefined criteria such as effectiveness, efficiency, fairness and sustainability (long lasting impact)
- Evaluation of risk management options;
- Selection of appropriate risk management options;
- Implementation of risk management options, and
- Monitoring and control of option performance.

Meeting the different challenges raised by complexity, scientific uncertainty and socio-political ambiguity, it is possible to design general strategies for risk management that can be applied to four distinct categories of risk problems, thus simplifying the process step of risk management mentioned above (Klinké and Renn 2002).

The first category refers to linear risk problems: they are characterized as having low scores on the dimensions of complexity, uncertainty and ambiguity. They can be addressed by *linear risk management* because they are normally easy to assess and quantify.

If risks are ranked high on complexity but rather low on uncertainty and ambiguity, they require a systematic involvement and deliberation of experts representing the relevant epistemic communities for producing the most accurate estimate of the complex relationships.

Complex risk problems therefore demand *risk-informed management* that can be offered by scientists and experts applying methods of expanded risk assessment, determining quantitative safety goals, consistently using cost-effectiveness methods, and monitoring and evaluating outcomes.

Risk problems that are characterized by high uncertainty but low ambiguity require *precaution-based management*. Since sufficient scientific certainty is currently either not available or unattainable, expanded knowledge acquisition may help to reduce uncertainty and, thus, move the risk problem back to first stage of handling complexity.

Finally, if risk problems are ranked high on ambiguity (regardless of whether they are low or high on uncertainty), *discourse-based management* is required demanding participative processing. This includes the need to involve major stakeholders as well as the affected public. The goals of risk management is to produce a collective understanding among all stakeholders and concerned public on interpretative ambiguity or to find legitimate procedures of justifying collectively binding decisions on acceptability and tolerability. This last management regime is highly applicable to the risk of social unrest. It is highly recommended to include major stakeholders in the risk management effort. If some of the potential protesters are given the opportunity to interact with the risk management team the likelihood that public responses turn out to be disproportional or inadequate decreases. Furthermore, acts of violence are difficult to justify if there is still a platform for dialogue and negotiation. Discourse-based management is inclusive as it opens up the risk management efforts to those who may suffer from these measures. Of course, it may be a delicate process to involve those who contemplate to use force and violence against the government and there is also a risk of being lured into a false sense of security. However, international experience with social unrest seem to demonstrate that early involvement and direct negotiations have been more instrumental in reducing tensions than in aggravating the intensity of protest. However, the success of such inclusive policy depends on the willingness of both sides to engage in compromise.

## SOCIAL UNREST IN DIFFERENT RISK MANAGEMENT FRAMEWORKS

The proposed framework is one possible way for analyzing social unrest in the future and its relation to Future Global Shocks. For the sake of completeness our analysis will identify other frameworks that could be applied to social unrest . In particular, we refer to

- World Economic Forum (WEF) Risk Management Framework
- IRGC Framework and
- IRGC Risk-Deficits Framework

Other options, such as ISO 31000, could be explored, too.

Particularly promising is the WEF framework for analyzing and comparing case studies. A first tentative application of the kind is shown below:

System Wide Perspective	Governance & Culture
<ul style="list-style-type: none"> <li>▲ <b>Redundancies in social system(s):</b> Most of the social systems contain a significant number of redundancies helping mitigate and/or manage better social unrests.</li> <li>▲ <b>Existence of some global and/or globally accepted approaches</b> – "what is universally just", cf. UN Charta, globalized media ...</li> <li>▼ <b>Lack to apply above approaches</b></li> </ul>	<ul style="list-style-type: none"> <li>▲ <b>Personal stakes involved:</b> Rich societies can have higher thresholds related to outbreak of unrests than poor ones (On the other side, the poor ones may be more resilient to unrest already broken out).</li> <li>▼ <b>Lack of culture of speaking out</b></li> </ul>
Transparency & Information Flow	Decision Tools & Processes
<ul style="list-style-type: none"> <li>▲ <b>(de facto) Mandatory reporting:</b><i>In some areas (e.g. large industrial accidents) reporting became de facto mandatory.</i></li> <li>▲ <b>Transparency of strategic data:</b><i>Emerging in policies more and more – e.g. EU (e.g. the EU Directive INSPIRE).</i></li> <li>▼ <b>Poor aggregation of system-wide data</b></li> <li>▼ <b>Poor recording management of Near Misses</b> Stakeholders often reluctant recognizing need to collect, manage and communicate data on near misses.</li> </ul>	<ul style="list-style-type: none"> <li>▲ <b>Global and local response:</b><i>Multi-level structures ensuring both global and local response</i></li> <li>▲ <b>Cooperation mechanisms :</b><i>Available at local, regional, national and international level</i></li> </ul>

Since social unrest is associated with high ambiguity, it is not enough to demonstrate that risk regulation addresses the issues of public concerns. In these cases, the process of evaluation needs to be open to public input and new forms of deliberation. This starts with revisiting the question of proper framing. What has been the main driver for the social unrest? What has caused the massive expression of dissatisfaction? Are the reasons that affected citizens proclaim in public those that motivate their action? Are special groups taking advantage of the dissatisfaction and fuel the conflict? Thus the controversy is often much broader than dealing with risks only. The aim here is to find an overlapping consensus on the dimensions of ambiguity that need to be addressed in comparing the consequences of social unrest and the costs for reducing its likelihood. High ambiguity would require the most inclusive strategy for involvement because not only directly affected groups but also those indirectly affected should have an opportunity to contribute to this debate. Resolving ambiguities in risk debates necessitates a participatory involvement of the public to openly discuss competing arguments, beliefs and values. The chance for resolving these conflicting expectations lies in the process of identifying overarching common values, and in defining options that allow a desirable lifestyle without compromising the vision of others.

Other issues refer to finding equitable and just distribution rules when it comes to common resources and to activating institutional means for achieving common welfare so that all can benefit. The set of possible forms to involve the public includes citizen panels or juries, citizen forums, consensus conferences, public advisory committees and similar approaches (cf.: Abels, 2007; Beierle and Cayford 2002; Hagendijk and Irwin 2006; Klinke 2006; Renn et al. 1995; Rowe and Frewer 2000).

## Concluding remarks and recommendations

### Preliminary concluding remarks

The framework of this study did not provide a basis for in-depth analysis of the cases studies looked at in this document. Nevertheless the cases (those given in Table 1) do provide hints about what kind of issues could be of interest to explore for "social unrest related to future global shocks". A non-exhaustive list could contain the following issues:

1. *Non-proportionality and non-linearity*  
level of unrest is not proportional to the extent of cause (drivers) leading to unrest
2. *Networking and globalization*  
fast spread of unrest from one area to another and from country to another related to the speed of and access to global communication
3. *"Swarm behavior"*  
even large unrests tend to lack a clear focal point or "center of command" – very much linked to theories of networking
4. *Heterogeneity of stakeholders*  
stakeholders from different, sometimes opposite, social groups acting (often completely unexpectedly) together
5. *Multiple goals, dynamic portfolio of goals and strategies*  
plurality of society produces unlikely coalitions of dissatisfied groups for many (even often conflicting) reasons

#### SOCIAL UNREST IN FRANCE 2010 and "STUTTGART 21" – Precursors of future unrests?

The retirement-related social unrest in France in fall 2010 as well as the "Stuttgart 21" protest against the new railway station in Stuttgart have shown some common features, such as non-proportionality between the cause and level of unrest, multiplicity and non-homogeneity of goals, heterogeneity of stakeholders involved (Figure 9) and tendency to "criminalize" the participants.

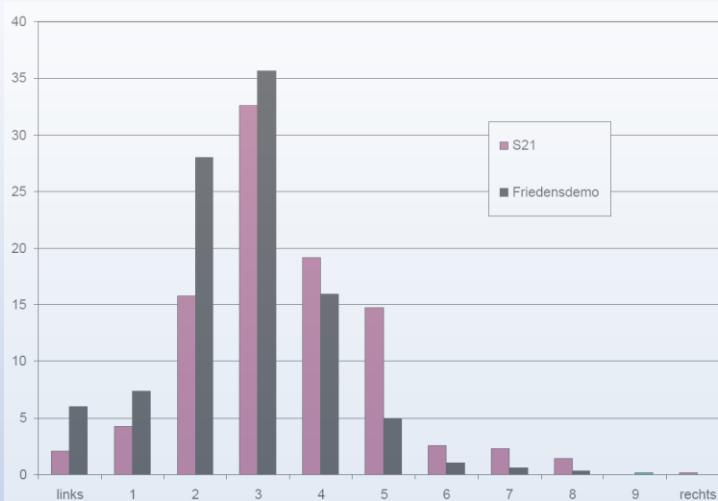


Figure 9: Stuttgart 21 ("S21") vs. peace protests ("Friedensdemo") – more heterogeneity (stakeholder coming from different age groups and with different political orientations) than in previous unrests in Germany; the histogram above showing the political orientation of protesters ("links"- "rechts", left vs. right, respectively). Results from Rucht, Baumgarten and Teune (2010), further research/results needed

Social unrest is the result of a dynamic process that includes various stages of escalation. Each stage starting from dissatisfaction to violence provides the opportunity to intervene. The main challenge for risk managers in this field is to understand the present situation in terms of stage dynamics and to initiate the appropriate actions that promise to de-escalate the situation. There is a tendency on the side of governmental officials to criminalize the protest movements. This can cause a vicious cycle of self-fulfilling prophecies: the opposition feels justified to do what is expected from them. As obvious as it



is that such a criminalization strategy misses the purpose of de-escalation one has to take into account the emotional reactions by public officials who tend to take many of the accusations personally.

Generally, it seems that the society as a whole, national governments as well as other major actors on the field are not well prepared to monitor the triggers for social unrest and to design the appropriate risk management measures to contribute to de-escalation. In particular, the required regime of discourse – based management is still alien to most risk managers. That is why many countries are "caught by surprise" when social unrests occur. Since they are not well prepared they tend to overreact or apply wrong, counterproductive or, even, conflict aggravating strategies.

## **Main preliminary recommendations: Policy makers and governance**

The development of a framework, based on the model proposed here, should help dealing with social unrest being (a) a consequence of other possible future global shocks, (b) part of the possible future global shocks or (c) cause of other possible future global shocks. The framework should possibly take into account the following main aspects:

1. It should be integrative and global; the framework should include universal elements that are characteristic of global unrest in principle. Many of these characteristics have been described in this paper. It should then be case and country specific as the effects of many escalation and de-escalation triggers depend on cultural and situational context. OECD could provide guidelines for the universal parts of the framework and procedural advice of how to include context-related variables and modifiers.
2. It should be anticipatory and directed towards early warning and monitoring: The analysis has shown that social unrest is a dynamic process that can be stopped or reduced in intensity if the problem is acknowledged in the early phase of collective dissatisfaction. The higher up a protest moves on the escalation ladder the less effective are potential countermeasures. It is essential to develop a tool that could help to warn public authorities that the first stages of social unrest have occurred. The model outlined above could act as a first conceptual structure to build such a monitoring and early warning station.
3. It should be associated with a risk governance scheme that is tested and adapted to include social risks. In this paper we referred to the IRGC risk governance model which is one powerful candidate for such a genuine model. The link between the general governance model and the specific model for social unrest serves as a double check that all important aspects are included and all steps for prudent management are considered.
4. It should be participative/collaborative and open (for all stakeholders, in particular for direct users, developers and data providers); The framework should embrace a fair and transparent data management policy and should be adapted to represent real existing systems (even if some of them, even in the medium or long-term remain in the "legacy system domain").
5. It should be tested and re-tested with empirical data and case study analyses. The non-linearity of the effects between triggers and social unrest make it very unlikely that we will find a genuine algorithm that could describe the complex causal connections between a set of triggers and their impacts. The framework should be organized as a learning system that incorporates new data when this is available and adjusts its causal representations accordingly.

## **Main preliminary recommendations: System/Tool and future R&D**

The development of a possible tool helping to deal with social unrest being (a) a consequence of other possible future global shocks, (b) part of the possible future global shocks or (c) cause of other possible future global shocks should possibly take into account the following main aspects:

1. Start to develop a "Global Compact on Future Global Shocks" (as suggested by Rubin, 2010 and OECD, 2010). This Global Compact could be the "core" of the global system in which such a tool is embedded. This is essential for ensuring (a) internal consistency of the tool(s), (b) agreement about globally accepted indicators and, last but not least, (c) acceptance of the tool(s);
2. Be oriented towards systemic risks, including the strong and "false positives"; provide free early warning as well as the continuous monitoring component as outlined above; the systemic risk component must be accompanied with the strong benefit part (global leverage);
3. Be based on ABM-like methods, but not limited to them; understanding that we have neither the universal theoretical or methodological concepts for dealing with "Xevents" (Casti, 2010) nor do we have data for them, let alone a common (global) agreement about the principles of the scenario-building for future global shocks.

In addition, requirements such as continuous improvement of capacities and capabilities, international standards, mapping and corresponding GIS platforms, structuring heterogeneous data (aggregation, levels, seamless transition among levels, combining safety AND security, establishing agreed principles of prioritization, finding an appropriate balance between decentralization and centralization, "death of Internet democracy" will certainly keep the developer busy for a very long time.

***Final remark: CAN SOCIAL UNREST BE PREDICTED AND MANAGED:  
MICE, MAZES and MEN, vs. BLACK SWANS***

*More than half a century ago, from 1930s to 1960s, it finally appeared as if the era of a grand system theory by which "people's actions and behaviors eventually their thoughts, could be predicted and controlled" was approaching (Lemov, 2005). Indeed, the expansion of Internet, developments in data and text mining, Google Streets, killing drones, orange, blue, green and all the imported and exported "revolutions" in all rainbow colors seemed to indicate the end of history (Fukuyama, 1989, 2005, 2006) These breakthroughs seemed to confirm the thesis of manageability of human behavior and, consequently, social unrest.*

*The real life events, however, did not follow the prediction and rather gave birth to a completely different impression of how people behave and respond in complex situations: black swans were suddenly all around us. The world has become a laboratory, but the experiment that is running in this complex maze blurs the distinction between the experimentators, the subjects ("mice") and the experimental conditions. Hence, what seems to be perfectly manageable and predictable pops up as a "global shock" and evolves into a series of surprises just like the proverbial "black swan".*

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