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Partnerships for affordable and equitable disaster insurance

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Abstract

Extreme events are becoming more frequent and intense, inflating the economic damages and social hardship set-off by natural catastrophes. Amidst budgetary cuts, there is a growing concern on societies' ability to design solvent disaster recovery strategies, while addressing equity and affordability concerns. The participation of private sector along with public one through *Public-Private Partnerships* (PPPs) has gained on importance as a means to address these seemingly conflicting objectives through the provision of (catastrophic) natural hazard insurance. This is the case of many OECD countries, notably some EU Member States such as the United Kingdom and Spain. The EU legislator has adapted to this new scenario and recently produced major reforms in the legislation and regulation that govern the framework in which PPPs for (catastrophic) natural hazard insurance develop. This paper has a dual objective: (1) review the complex legal background that rules the provision of insurance against natural catastrophes in the EU after these major reforms, (2) assess the implications of the reforms and offer concise Policy Guiding Principles.

1 Introduction

The steep upward-rising damage trend incurred by natural hazard risk and the alarming prospects of man-made induced climate change inflate the economic losses and social hardship set-off by extreme climate and weather events (IPCC, 2014; UNISDR, 2012). This has alarmed the governments and the insurance enterprises alike. Many have suggested that while the extreme events' probability distribution is getting progressively more fat-tailed, the private insurance businesses alone will not be able to keep the pace (Botzen and van den Bergh, 2008; Capitanio et al., 2011; DEFRA, 2013; Mills et al., 2006; Munich Re, 2009; Surminski, 2009; Warner et al., 2013). The *unprecedented* (EC, 2009a) economic crises the EU has faced since the summer 2007 has sparked further concerns about the states' ability to co-finance the disaster protection and recovery, and the extent to which the public funds can compensate the private damage even in countries where this is a regular practice (EC, 2013a). Similarly, to meet the ambitious goals of the growth package for integrated European infrastructures (including critical infrastructures to improve resiliency) alone by means of public funds restrained by the Stability and Growth Pact (SGP) is little probable (Mysiak, 2014). Hence the participation of private sector along with public one in meeting the great societal challenges has been increasingly advocated not only as an opportunity but as a sheer necessity (EC, 2014a).

Public-Private Partnerships (PPPs), a term coined for the multiple ways of public and private collaboration to provide a *public service or project*, have gained on importance across OECD countries, notably in some EU Member States (MS) such as the UK and Spain (Bielza et al., 2009; CEA, 2011). The PPPs discussed in this paper address provision of (catastrophic) natural hazard insurance for property owners and enterprises located in areas exposed to low probability-high impact risks. While being in origin a private service, *equitable* and *accessible* insurance against low probability/high impact natural disasters may meet the scope of a *Service of General Economic Interest* (SGEI), that is a *public service* deemed by public authorities as being of particular importance to citizens and that would not be supplied, or only under different conditions, if not for a public intervention. Public-mandated and/or subsidised insurance systems existent in the EU create PPPs that address this need.

Recently, the EU legislation and regulation that govern the framework in which PPPs for (catastrophic) natural hazard insurance develop have experienced major reforms. Some of these reforms are specifically designed to enhance insurance provision and governance and tackle some of its flaws, as with the new Solvency II Directive. Some others define an overarching set of norms aiming at the harmonization of European law, and are transversal to insurance provision. These include the 2014 reform of *public procurement* that governs PPPs, which revised the previous regulation of public works, supply and service contracts, and introduced a new directive on concession contracts; changes of de minimis aid and General Block Exemption Regulation (GBER) in the context of *national state aid* regulation; the development of the Internal Security Strategy (ISS) and the reform of the EU Solidarity Fund (EUSF) for *transnational support* in disaster recovery; and the new Environmental Liability Directive in the context of EU *tort law*. This paper has a dual objective: (1) review the complex legislative framework that rules the provision of insurance against natural catastrophes in the EU after these major reforms, (2) assess the implications of the reforms and offer concise Policy Guiding Principles (PGP).

The paper is structured as follows: in Sect. 2 we present the current policy context for natural hazard insurance in the EU. In Sect. 3 we address in depth the EU policies behind PPPs, focusing on the new directive on concession contracts (the most frequent PPP form in the EU) and the changes of SGEI regulation the EC completed in early 2010s. Section 4 is dedicated to the Union's insurance market regulation and solvency requirements (notably Solvency II Directive). In Sect. 5 we discuss the EU state aid regulation and recent changes of de minimis aid and GBER for making good the damage caused by natural disasters. Sect. 6 is dedicated to the review of the Union transnational solidarity provisions in the view of extraordinary natural disasters, including the solidarity clause (Article 222 of the Treaty of Functioning of European Union, TFEU), along with the ISS and the EUSF. Section 7 attends to the various liability regimes across the MS and the early attempts to harmonise the Civil law's provision for tort liability. Finally, in Sect. 8 we offer PGP worth to follow when designing PPPs.

2 The policy context for natural hazard insurance in the EU

Insurance is but a part of the wider disaster risk management strategy. Disaster risk management strategies are typically adapted to the specific challenges faced by a society at risk, within the formal constraints imposed by the legal and institutional framework and the informal ones stemming from local customs, traditions and norms (UNISDR, 2012). This complexity creates some degree of path dependency and slows down transitions (Williamson, 2000). Accordingly, instruments for disaster risk management, in-

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cluding insurance, display highly heterogeneous features and uneven coverage and penetration rates across the Union (CEA, 2011).

Disaster risk management entails a set of instruments aimed at minimizing economic damage, in a first stage, and economic losses, in a second stage. *Risk prevention and protection instruments*, including hard and soft engineering[1], information and awareness campaigns or economic incentives, among others, fall in the first stage. Despite these barriers, economic damages are not always fully preventable, making necessary a second stage consistent of *damage compensation instruments*. Damage compensation instruments ease recovery after a catastrophe, and are ultimately designed with the purpose of short-circuiting the link between damages and losses[2]. Damage compensation policies are subject to regulation on liability (tort law), and comprise the interplay between insurance and state aid (see Fig. 1).

Risk prevention and protection is typically funded by the public sector, thus transferring part of the hazard risk burden from risk-exposed asset holders to tax-payers. At least to some extent this may distort risk perception and result in concentration of population and wealth, and inflated property values, in highly exposed areas enjoying some comparative advantages (e.g. aesthetic values, better soils, accessibility) (EC, 2007a). This trend has been particularly intense during the two decades of sustained economic growth before the financial crisis started (Crichton, 2008). Instead of addressing this problem by deploying complementary instruments to reduce risk exposure, natural catastrophe management has become reactive and incremental. This reinforced observed trends and led to a rapid increase in the marginal costs of protection, as

[1]Hard engineering projects involve the construction of artificial structures that prevent natural catastrophes (e.g., dams, dykes, channel straightening and diversion spillways in the case of floods). Soft engineering projects are low maintenance and low cost tools that integrate human activities with the natural processes and ecological systems in a river basin (e.g., floodplain zoning/land use restrictions, afforestation, wetland restoration, river restoration).

[2]For example, recent research has shown that sufficiently insured natural hazards are inconsequential in terms of foregone output (Von Peter et al., 2012).

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more exposed areas are increasingly expensive to protect (Botzen and van den Bergh, 2008). The current financial crisis, which amplified the opportunity costs of these investments, and the growing frequency and intensity of the extreme events reported in the EU during the last years (UNISDR, 2012), added pressure on this unsustainable dynamics. In spite of the considerable uncertainty surrounding the future projections of human induced climate change, it is expected that damage caused by extreme climate and weather events will continue to rise, leading to more frequent crises and demanding further investments (IPCC, 2014; Mirza, 2003). Eventually, the marginal costs of protection infrastructures may (in some places already did) reach a point where either the budgetary implications are prohibitive or the economic costs outweigh the benefits.

At that point, traditional policy making based on risk prevention and protection becomes insufficient per se to address the threat posed by extreme natural hazards. *Damage compensation policies* such as tort law (liability) and ex-post state aid provide relief, but in the aftermath of a low probability-high impact catastrophe they have proved to be insufficient (tort law is applicable only under certain conditions) or increasingly unaffordable (ex-post state aid) (CRED, 2015). Consequently, calls have been made for transition towards more resilient and adaptive societies (OECD, 2014; UNISDR, 2012; World Bank and CMI, 2011). In this context, insurance has received renewed attention, as exemplified by the recent EU "*Green Paper on the insurance of natural and man-made disasters*" (EC, 2013a).

Insurance is an arrangement offering individual protection against the risk of losses caused by various perils through pooling of risks (Baltensperger et al., 2007). Insurance is complementary, rather than a substitute, to risk prevention and protection and other damage compensation policies. Similarly to tort law and state aid, insurance eases recovery after a natural catastrophe and thus limits its economic impact. But unlike tort law, it is widely applicable; and unlike ex-post state aid, it is (at least partially) privately funded. Private actuarial insurance redistributes the cost of risk from tax-payers back to asset holders. Moreover, if risk based pricing applies (e.g. flood insurance in the UK), insurance introduces disincentives for risky behavior (Warner et al., 2009; Surminski, 2009; Surminski and Oramas-Dorta, 2013). This could contribute to revert the current trends towards higher risk exposure and facilitate the transition towards a resilient and adaptive society. However, even assuming Pareto optimal insurance markets (heroic assumption[3]) that enhance disaster risk reduction, risk based pricing does not guarantee equity or affordability (EC, 2013a). For example, risky assets in disadvantaged areas may be relatively more expensive to insure, or even uninsurable, attending to local income. This motivates public intervention in the market.

The inclusion of affordability and equity issues in the design of insurance against natural catastrophes expands the role of the public sector from basic regulatory oversight and residual risk management[4] to a combination of ex-ante and ex-post subsidization, with an active involvement in insurance design; this in turn demands new and more sophisticated regulations, both at a national and EU level. Public intervention has also negative byproducts, especially those concerning the weakening of the linkage between risk and pricing and its negative impact over incentives for undertaking risk adaptation measures (Surminski, 2009). Managing this tradeoff poses relevant technical, operational and coordination challenges (Pérez-Blanco and Gómez, 2014). The overlapping roles and conflicting outcomes of private and public agents interventions make necessary the coordination between the public and private sectors through PPPs.

[3]This would require perfectly competitive markets with no externalities, in full equilibrium, with negligible transaction costs and perfect information.

[4]Residual risk falls in the tail end risk; it is the uninsurable risk with a very small though unpredictable likelihood and a potentially high though unpredictable damage. This uncertainty may be too high for private insurance markets to develop without public support, and lies in the origin of PPPs for insurance provision (Sugarman, 2006).

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3 Public-Private Partnerships

Public-Private Partnerships (PPPs) are a form of *cooperation* between public authorities and enterprises intended for provision[5] of an infrastructure, a service or both (EC, 2004c). PPPs are typically characterised as a long-lived relationship bringing forth mutually beneficial resource and risk sharing arrangements (EC, 2004c). Though flexible in nature and application, PPPs are substantiated either as a contract[6] or an institutional entity (i.e. Institutionalised PPP or IPPP). Both types are used for insurance provision in the EU.

Contractual PPPs embrace the "*concessive model*". The *public service concession* means that a contracting entity (public partner) entrusts a provision of public service to a contractor (private partner) according to predetermined terms of reference, whereas the remuneration of the service is covered by charges levied on the users of that service, sometimes supplemented by public subsidies. The *public work concession* on the other hand implies that the contractor is chosen to carry out and administer an infrastructure (e.g. water supply network) and is remunerated by users of that infrastructure which may be supplemented by payments from contracting entity. This specific way of remuneration, that is the *right to exploit the work or service*, is essentially what distinguishes *classic* public *service* or *works contracts* (in which the pecuniary compensation to the contractor is born directly by the contracting entity) from a public *service* or *work concession*. This right however also connotes that the operational risk of not being able to recover the investment costs is born essentially by the contractor and only to some extent by the contracting entity. The Statement of Principles (SoP), a PPP between the UK government and the insurance industry to offer affordable and equitable flood insurance, is close to this *concessive model* (Surminski et al., 2014). According to this agreement, insurance is purely underwritten by the private market, while government commits to flood risk management activities. The SoP aims to make flood insurance

[5] I.e. funding, construction, renovation, management or maintenance.

[6] Specifically, as "contract for pecuniary interest concluded in writing" (EC, 2004c).

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available for households while managing the financial implications for insurers[7]. The SoP can be traced back to the "Gentleman"s Agreement' that resulted from the 1952 flooding and the East Coast floods of 1953. By then few properties held contents cover or buildings cover, leading to large uninsured losses. Although initially considered, the government discarded compulsory insurance and opted in favour of private providers until large losses again occurred in 1960. The government aimed then at higher penetration rates, and these were attained, partly under the threat of nationalisation if insurers failed to deliver more flood insurance to private, commercial and industrial properties. The SoP was finally established in 2000 as a result of growing flood losses. The SoP is now under transition to a new system, known as FloodRe[8].

[7]The SoP generally provides flood insurance to both households and small businesses up to floods with a 1 : 75 return period. Those properties facing higher risk should be granted cover after being informed by the Environmental Agency about plans to improve flood defences in the area in the next five years – although this has been noted as not having actually been available. Government commits to investment in flood defences and improved flood risk data provision as well as a strengthened planning system. The 2007 floods and concerns regarding rising intensity and frequency of floods led the insurance industry to maintain that the SoP was a temporary solution.

[8]FloodRe maintains a free market approach to low-risks, but the high risk households will obtain flood insurance cover via a not-for-profit pool (FloodRe). The subsidy for the latter is claimed from a levy taken from all policyholders. This levy will be GBP 10.50 per policy for a total aggregate sum of GBP 180 m. To maintain affordability the pricing limits of insurance policies are determined by council tax bands, allowing low income homes a better opportunity to meet the costs. Allegedly, FloodRe will reduce incentives to reduce exposure to flood events by property owners and will ultimately result in higher flood risk and damages (Surminski et al., 2014). FloodRe agreements are subject to agreement with the European Commission for State Aid approval, and this may bring into question the design of the scheme and its eventual implementation (Surminski et al., 2014).

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IPPPs are entities established for delivery of public works or services that are "held jointly" by the public and private partners (EC, 2004c). The joint entity is responsible for delivering the work or service for the benefit of the public. This is close to the French *NatCat* and the Spanish *Insurance Compensation Consortium* (ICC) systems. In both cases insurance against natural hazards is mandatory (linked with a base policy) and funded via a flat rate surcharge on the insurance premium collected by private companies. Under NatCat, the French State co-manages the insurance fund (setting additional premiums, establishing deductibles and declaring the state of natural catastrophe), offers reinsurance (through the state owned *Casse Centrale de Réassurance*) and channels part of the resources into a state-managed fund for the development of prevention and protection instruments. On the other hand, under the Spanish system the ICC provides direct insurance against natural hazards on a subsidiary basis if the cover is not explicitly assumed by a private company or the company cannot meet its indemnification obligations. As a result, premium surcharges vary widely, from 0.008–0.021 % in Spain to 6–12 % of the insurance premium in France (Maccaferri et al., 2012).

PPPs are not defined by Union's legislation and regulation directly. However, within the ambit of the Treaty of Functioning of European Union (TFEU), PPPs qualify either as public contracts or public concessions (EC, 2005a). While public contracts and partly public work concessions were regulated by Community secondary legislation for long time, until recently the public *service concessions* were only subject to TFEU rules and principles of *transparency*, *equality of treatment*, *proportionality* and *mutual recognition*. The Interpretative Communication on concessions under Community law (EC, 2000) provided some clarity of the concept and guidance for public authorities for selecting a concessionaire, but did not disperse the legal uncertainty. In 2004, the EC carried out a public consultation as for whether a concerted action was needed to harmonise the governing rules of PPPs (EC, 2004c). Based on the feedbacks and comments received, the EC decided, among others, to (i) not pursue a new piece of legislation addressing all contractual PPPs, (ii) explore a scope for a policy filling the regulatory gap with respect to the public *service concession* (later materialised through the Directive 2014/23/EU, see below), and (iii) develop an interpretative communication on IPPPs (initially scheduled for 2006, but still pending) (EC, 2005a).

Directive 2014/23/EU (OJ, 2014a) and the revised rules for public procurement (Directives 2014/24/EU and 2014/25/EU) (OJ, 2014b, c) provide greater legal certainty for the participation of private enterprises in PPPs through *service concessions*. The set of rules rely on the "*competitive dialog*" scheme introduced in 2004 (EC, 2004a). The *competitive dialog* enables the public authorities to "negotiate" the alternative means of fulfilling its needs and identify so the solutions best suited. The major development introduced in the reform is the concept of "*innovation partnership*", which grants a similar flexibility for the development of innovative products, services or works, not already available on the market (EC, 2014c).

4 Insurance market regulation

The Solvency II Directive 2009/138/EC (OJ, 2009) codifies and harmonizes regulation on insurance across the Union. It represents the latest among a series of efforts to facilitate the development of a single market in insurance services, while ensuring an adequate level of consumer protection. Following an EU Parliament vote on the Omnibus II Directive[9] on 11 March 2014, Solvency II is scheduled to come into effect on 1 January 2016 and replace 13 previous EU directives.

Early EU solvency regulations go back to the 1970s. Substantial modifications were adopted through the new generation of insurance directives in the 1990s, which even-

[9]The Solvency II directive needs to be adapted to the implementing measures introduced in the Lisbon Treaty (OJ, 2007) and the financial supervision measures introduced in the Regulation 1094/2010 (which established the European Insurance and Occupational Pensions Authority, EIOPA) (OJ, 2010). The harmonization process is implemented through the Omnibus II directive (EC, 2011b), adopted by the Council of the EU in December 2013 and by the EU Parliament in March 2014.

tually led to the Solvency I Directive (OJ, 2002), and have finally crystalized in Solvency II. As its predecessors, Solvency II regulates margin requirements to limit the risk of insolvency. The newly added regulations include authorization, corporate governance, supervisory reporting, public disclosure, risk assessment and management, as well as other aspects of solvency and reserving. The Solvency II project is divided in three areas (OJ, 2009) or "pillars" (EIOPA, 2014): quantitative basis (Pillar 1), qualitative requirements (Pillar 2), and enhanced reporting and disclosure (Pillar 3).

Pillar 1 focuses on quantitative solvency in two ways: (i) it addresses how insurers value their liabilities and assets, and (ii) specifies the amount of resources insurers need to hold to make sure they are solvent and able to pay eventual claims by policyholders. For the former, Solvency II introduces EU-wide harmonized valuation standards. In the latter case, two thresholds are established: Solvency Capital Requirement (SCR) and Minimum Capital Requirement (MCR). The SCR is the capital that guarantees that the insurance company will be capable of meeting its obligations during 12 months with a probability higher or equal to 99.5 %. It is calculated using a standard formula or (only under regulatory approval) an internal model. The MCR represents the capital threshold below which the regulator intervenes the insurance company. It is calculated as a linear function of specified variables and cannot fall below 25 %, or exceed 45 %, of an insurer's SCR.

Pillar 2 addresses how the structure and management of insurance businesses are governed, enabling insurers to identify, measure, monitor, manage and report risks to which they are exposed. In particular, it comprises (i) the Own Risk & Solvency Assessment (ORSA), a decision-making tool that continuously assesses the solvency needs related to the specific risk profile of the insurance company, (ii) a risk management system that quantifies and models risks, not limited to a contribution to the ORSA and also including involvement in asset-liability management, risk mitigation arrangements, etc.; and (iii) a supervisory review and intervention including an independent internal audit function.

Pillar 3 specifies what information insurers report on their business and how it is reported. Some reports are public and anyone can see them, while others are privately reported to the financial regulator. Insurers are required to publish details of the risks facing them, capital adequacy and risk management. Enhanced reporting and disclosure provides transparency and open information that help to assist market forces in imposing discipline on the industry.

The implementation of the Solvency II directive is overseen by the European Insurance and Occupational Pensions Authority (EIOPA), which succeeded the Committee of European Insurance and Occupational Pensions Supervisors (CEIOPS). The activity of these authorities comprises *advice on implementing measures* (comprising 5 Quantitative Impact Studies, large scale field-testing exercises to assess the practicability, the implications and possible impact of the different alternatives considered) and *advice on equivalence assessments* (analysing the compatibility between the solvency regime of a third country and that of Solvency II, and implemented so far for Switzerland, Japan and Bermuda) (EIOPA, 2014).

On 31 January 2014, EIOPA defined a timeline with the objective of delivering the regulatory and supervisory framework for the successful technical implementation of the Solvency II regime from 1 January 2016 onwards (although this date has been previously pushed back many times). This will be done through the delivery of *Implementing Technical Standards* (or ITS, legally binding standards to ensure the uniform application of the Solvency II Directive) and *Guidelines* (to all national supervisors). These two products will be developed in two sets each. For the ITS, Set 1 will comprise "Approval processes" and Set 2 the three pillars plus "supervisory transparency". For the Guidelines, Set 1 will comprise "Guidelines relevant for approval processes, including Pillar 1 and internal models" and Set 2 "Guidelines relevant for Pillar 2 and Pillar 3" (EIOPA, 2014).

Solvency II sets a broad, unique and transparent regulatory framework for insurance provision and solvency assessment. Predefined solvency thresholds (Pillar 1), homogeneous assessment methods (Pillar 2) and consistent reporting (Pillar 3) offer a sound basis to accurately identify and address the need for public support in the provision of insurance against low probability-high impact risks, addressing different degrees of equity and affordability.

5 State aid to make good the damage caused by natural disasters

Regular financial support by the public sector is a key component of PPPs for equitable and affordable insurance provision, and typically supplied through ex-ante (e.g. premium subsidization) and/or ex-post (e.g. public reinsurance) subsidization in compliance with national and Union's regulation (Maccaferri et al., 2012). Besides that, public funding for direct damage compensation is sporadically supplied after intense natural catastrophes that existent disaster risk management strategies cannot cope with. This may be the result of insufficient prevention and protection systems, flaws in insurance design (e.g. deficient solvency regulation, limited risks coverage, low market penetration rates) and/or the unique nature of the natural disaster. In this scenario, MSs may opt to compensate the residual costs above the (insufficient) absorption capacity of the risk management strategy. The EU displays a comprehensive set of regulations on how state aid can be implemented.

State aid on selective basis that distorts (or threatens to distort) free-market competition is, according to the Article 107 of the TFEU, incompatible with the EU internal (single) market (EC, 2014d). The coma 2(b) of the same Article declared an *aid to make good the damage caused by natural disasters*[10] admissible, provided that any intention to grant a similar aid is (i) timely notified to the European Commission (EC) (Article 108 TFEU), and (ii) the EC raises no objection ((Article 4 of the Council regulation 659/1999 (EC, 1999)). Without a prior notification, an aid not otherwise exempted[11]

[10]Until recently, there was no unambiguous definition of what constitutes "*natural disaster*" for the scope of the state aid regulation, although floods and some other natural hazard risks have been recognised as such previously (EC, 2013f).

[11]See further down for the exemptions from the notification requirement.

is not permitted and an already provided unlawful aid may be revoked. The regulation applies to state aid granted to economic undertakings only and any compensation of losses to individuals (citizens) not associated with pursuing of any economic activity does not constitute state aid in the sense of the Article 107 of the TFEU.

The Council regulation 994/98 (EC, 1998), amended in 2013 (EC, 2013b), empowered the Commission to declare some categories or levels of aid as compatible with internal market and hence exempt them from the notification requirement. These provisions are known as group exemptions and de minimis aid. As a part of the State Aid Modernisation initiative (EC, 2012a), the Commission has revised and simplified both de minimis aid regulation and the General Block Exemption Regulation (GBER). The categories for which block exemptions can be applied were substantially extended in 2013 to include, among others, the aid in favour of making good the damage caused by natural disasters and aid making good the damage caused by certain adverse weather conditions in fisheries (EC, 2013b). The reform of de minimis aid (EC, 2013a) maintained the ceiling of EUR 200 000 for a single undertaking over a period of three fiscal years[12] irrespective of the form of aid and expressed as net present value if granted through periodic instalments. If granted in other than direct grant, such as soft loan or guarantee, the gross grant equivalent of the aid needs to be estimated. A subsidised loan up to EUR 1 000 000 over a period of 5 years is possible under the revised de minimis aid rules if the loan is secured by collateral covering to the level of at least 50 % of the loan.

Finally, the Commission Regulation 651/2014 (EC, 2014a) exempted aid to make good damage caused by natural disasters from the obligation to notify the state aid, pursuant to the following conditions:

(i) the regulation declared "earthquakes, landslides, floods (in particular floods brought about by waters overflowing river banks or lake shores), avalanches, tornadoes, hurricanes, volcanic eruptions and wildfires of natural origin" (EC, 2014a,

[12] Except the road freight transport sector for which the ceiling is EUR 100 000.

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recital 69 and Article 50(1)) as events constituting a natural disaster, while excluding damage arising from adverse weather conditions (frost, hail, ice, rain or drought),

(ii) the damaging event has to be recognised by competent authorities as a natural disaster; a clear causal link needs to be established between the disaster and damage suffered; and the total payments for making good the damage, including the payments under insurance policy, may not exceed 100 % of eligible damage costs,

(iii) the aid scheme has to be introduced within three years, and any aid granted within four years after the disaster,

(iv) the eligible damage costs include material damage incurred as a result of disaster and loss of income resulting from suspension of activity for a period of six months after the disaster event occurred (the damage assessment based on repair cost or economic value of the affected asset before the disaster should be certified by accredited experts or insurance undertaking).

Over the period between December 2006 and May 2014, the EC delivered 85 decisions on the granting of state aid (EC, 2014e). The years 2010 and 2013 stand out for the highest number of notified aid schemes (22 in each year), followed by the years 2011 and 2012. Germany, Italy and Spain feature among the countries who initiated most schemes. Direct grants are the most frequent form of aid, followed by soft loans and interest subsidies, while debt write-off, tax deferment, reduction of social security contributions and guarantee represent relatively less preferred ways of aid provision. As an established practice, the Commission has considered aid to make good damage caused by natural disasters compatible with the internal market if (i) a clearly established *causal* link exists between the damage and the natural disaster, and (ii) the aid does not exceed damage experienced (EC, 2014e).

The only case on record in which the Commission decided to initiate a formal investigation refers to not notified aid schemes granted by the Italian government in the

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aftermath of the 1990 Sicily earthquake, the 1994 floods in the Northern Italy, and the 2009 Abruzzi earthquake (SA.35083/SA.35083) (EC, 2014e). Note that for the latter disaster the EU Solidarity Fund (see Sect. 6) was mobilised for more than EUR 490 million. The form of aid included suspension, deferral, or payment in instalments of taxes and compulsory social security and occupational insurance contributions by undertakings located in the disaster affected municipalities. Following the Eastern Sicily earthquake on 13–16 December 1990, the payment of taxes and contributions for years 1999–1992 was deferred until 2000s and subsequently reduced to 10 % of the amount due. Similar aid was granted in the aftermath of the November 1994 flood in the Northern Italy for the years 1995–1997, the April 2009 Abruzzo earthquake for the years 2009–2010. In 2007 and 2010 the Italian Supreme Court of Cassation ruled that the reduction of taxes and contributions granted ought to be applied to all undertakings who could have claimed the same right, to avoid "unjustified disparity in treatment". The EC enjoined Italy to suspend any aid under these schemes and opened a formal investigation. If eventually the EC rules the aid as unlawful, it may decide to refer the matter to the European Court of Justice (ECJ).

6 Solidarity in the wake of extraordinary natural disasters

Some natural catastrophes may overcome not only disaster risk management strategies, but also the budgetary constraints of the MS to deal with the damages, making necessary resorting to transnational Union's resources. Solidarity between the Union's MSs, extended somewhat to the candidate and occasionally neighbouring countries, pervade the EU primary and secondary legislation. The Treaty on European Union (TEU) uplifted "*solidarity*" to essential values on which the Union is based and which include respect for human dignity, freedom, democracy, equality, rule of law, and respect for human rights (Article 2). The Chapter IV (Articles 27–38) of the Charter of Fundamental Rights of the European Union is entirely dedicated to solidarity (social and economic) rights and justiciable civil and political rights (O'leary, 2005). The for-

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mer include, among others, Services of General Economic Interest (SGEI) such as social and territorial cohesion (Article 36), and environmental protection and improved quality of the environment (Article 38).

The Treaty on the Functioning of the European Union (TFEU) substantiates the solidarity principles through the Articles 174–175, 196, and 222. The Article 174 recognizes (actions meant to strengthen) economic, social and territorial cohesion as vital for harmonious development. Hence the Union shall act towards reducing disparities between the levels of development of the various regions and the *backwardness* of the *least favoured regions*. The latter include rural areas, areas affected by industrial transition, and regions which suffer from severe and permanent *natural* or demographic handicaps. The Article 175 compels conduct and coordination of economic policies towards attainment of the objectives set in Article 174, through the policies and actions taken through Structural Funds, the European Investment Bank, and Financial Instruments. Turning to disaster risk reduction, the Article 196 stipulates a cooperation between MSs to improve risk prevention, protection and response to the natural and man-made disasters.

The article 222 of TFEU (the *Solidarity Clause*, SC) invokes solidarity, in the most explicit way (Myrdal, 2010) in cases of a terrorist attack, or a *natural* or man-made *disaster*[13]. When requested by a Member State (MS), victim of a disaster or a terrorist attack, the Union is bound to "mobilise all the instruments at its disposal, *including the military resources*" (emphasis added). The declaration (37) on Article 222 of the TFEU however leaves the choice of the "*most appropriate means*" to comply with solidarity obligation to the MS. The SC complements, or offers alternatives to, the *mutual defence* clause (Article 42(7) of TU) which compels aid and assistance in the case of armed aggression.

[13]The scope of the solidarity clause includes the land, sea and air of the EU territory, the ships in international waters and airplanes in international airspace, as well as critical infrastructure such as off-shore oil and gas installations under the jurisdiction of a Member State (Myrdal, 2010).

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Coma 3 of the article 222 of the TFEU stipulates that the practical implementation of the SC shall be defined by a decision adopted by the Council acting on a joint proposal by the Commission and the High Representative of the Union for Foreign Affairs and Security Policy (hereafter High Representative). Coma 4 compels a regular assessment, by European Council, of the threats the Union is facing to enable an effective action.

The SC is invoked by a request of the affected MS in the wake of an *extraordinary* threat or damage beyond own response capacity of the state, after all other means, national and at Union level, have been exploited. Whereas it is a sole decision of the MS whether or not to invoke SC, the European Parliament (EP) emphasised that it is a primary responsibility of each MS to invest in own security and disaster response capabilities, rather than rely excessively on the solidarity of others (EP, 2012). However, when the MS made the call, "*it should not be a matter for debate for the others to offer assistance*" (EP, 2012). Once the SC has been invoked, the Commission and the High Representative jointly identify and mobilise the best suited Union's instruments and, if necessary, suggest how these should be further reinforced. The proposed implementation of SC (EC, 2012b) defines crisis[14] and disaster[15] rather broadly and in a way which is not entirely consistent with natural disasters as stipulated by the State Aid regulation (see previous section).

The European Union Solidarity Fund (EUSF), created in 2002 (EU Council, 2002) and amended in June 2014 (EC, 2014g), translates solidarity in form of financial aids to the EU Member and Candidate countries experiencing "*serious repercussions on living conditions, the natural environment or the economy*" following a *natural disaster* (EC, 2014g). Attempts to extend the scope of the Fund to the man-made disasters

[14] *Crisis*: a serious, unexpected and often dangerous situation, requiring timely action; a situation that may affect or threaten lives, environment, critical infrastructure or core societal functions, may be caused by a natural or manmade disaster or terrorist attacks.

[15] *Disaster*: any situation, which has or may have an adverse impact on people, the environment or property.

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(EC, 2005b) were unsuccessful so far. According to the newly revised rules, the EUSF can be mobilised in cases in which the direct damage exceeds EUR 3 billion (in 2011 prices) or 0.6 % of the country's gross national income (GNI), whichever is the lower, or if the damage at regional (NUTS2) level exceeds 1.5 %[16] of that region's Gross Domestic Product (GDP). A neighbouring MS or accession country that is affected by the same disaster can also receive aid, even if the amount of damage does not reach the threshold. The EUSF has an annual budget of EUR 500 million, down from a billion under the previous regulation (EU Council, 2002). The aid is limited to *non-insurable damages* and essential emergency and recovery operations[17]. The recent reform of the EUSF respond to some weaknesses identified previously in (EC, 2009b, 2011a, 2013e) with respect to the rapidity of the aid and the transparency of the criteria allowing mobilising of the Fund.

The EUSF is not the only instrument available. The EU Internal Security Fund (EC, 2014e), established in April 2014, and the resources endowed to the new EU Union Civil Protection Mechanism (EC, 2013c) provide additional resources that can be mobilised for an extended cooperation across the MS in the field of prevention, protection and response to the natural hazard risk. Furthermore, the article 122 of the TFEU empowers the Council to grant additional financial assistance, in spirit of solidarity, to the MS "*threatened with severe difficulties caused by natural disasters or exceptional occurrences beyond its control*".

Coordination of EU solidarity instruments listed above along with MSs own security policies and strategies is implemented through the Union's Internal Security Strategy (ISS) adopted in 2010 (EC, 2010b). ISS portrays a European Security Model as a pool of existing tools, along with *commitments* for further cooperation and *solidarity* among

[16]This threshold is lowered in cases of outermost regions to 1 % of regional GDP.

[17]Including infrastructure restoration in the fields of energy, water and waste water, telecommunications, transport, health and education; temporary accommodation and rescue services; preventive infrastructure and measures of protection of cultural heritage; and cleaning up disaster-stricken areas, including natural zones.

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MSs, and under a close involvement of the EU institutions, agencies and bodies (EC, 2010b, 2010d). The risks posed by natural and man-made hazards are targeted by the ISS along with organised crime, terrorism and cybercrime, and management of EU external borders. Solidarity is exhibited between Member States "*in the face of challenges which cannot be met by Member States acting alone or where concerted action is to the benefit of the EU as a whole*" (EC, 2010d). The ISS sets to, among others, "*increase Europe's resilience to crises and disasters*". This comprises crises and disasters including those associated with climate change, requiring "*both solidarity in response, and responsibility in prevention and preparedness*" (EC, 2010b). The ISS placed an emphasis on multi-hazard risk assessment covering all natural and man-made disasters. In the pursue of this goal, the EC elaborated the Guidance on risk assessment and mapping (EC, 2010a) and a Synthesis cross-sectoral assessment of major natural and man-made risks (EC, 2014b), the latter based on the National Risk Assessment (NRA) reports produced by 17 MSs and Norway. The newly revised Union's Civil Protection Mechanism (CPM) regulation (EC, 2013c) introduced an obligation for all MSs to report, starting from 2015 and every three years thereafter, on risk assessments at national or appropriate subnational level and risk management capabilities (Article 6 of the Decision 1313/2013/EU).

Likewise, a proposal in the sense of the Article 222(3) of the TFEU was released in December 2012 (EC, 2012b) as an umbrella framework of the *existing* instruments and policies, notably the European Union Internal Security Strategy, the European Union Civil Protection Mechanism (EC, 2013c), the European Union Solidarity Fund (EC, 2014f; EU Council, 2002), and the Common Security and Defence Policy (CSDP).

7 Civil and environmental liability

The reparation of disaster losses caused or exacerbated *intentionally* or through *negligence or omission* that damage rights or protected interests of others can be granted through civil liability. The established liability systems across the EU Member States

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differ substantially in taxonomy and structure (von Bar and Drobnig, 2004). The German civil code for example associates general liability for fault with cases where the wrongdoer infringed a legal right of the victim (Wagner, 2009). In contrary, the scope of English tort law is based on the duty of care. English and Irish Common Law distinguish some 70 torts among which the most important ones for our scope are trespass, negligence, breach of statutory duty, and nuisance (von Bar and Drobnig, 2004). An example of *nuisance* is a use of land which cause damage or interference with another's use and enjoyment of their land. Under the English and Irish Common Law's *common enemy doctrine* a landowner is empowered to defend his land from diffused surface waters, for example by improving the drainage system, while increasing the volume of discharged water on lower property. In contrary, the German *civil law doctrine* subjects landowners to a flowage easements for natural drainage patterns. Hence the landowners cannot alter the drainage pattern of their own land in a way that increases the discharged water on lower properties of others. The *reasonable use* doctrine is a compromise of the both, in a sense that while some alteration of natural drainage patterns is necessary, it is only lawful if conducted in a reasonable manner and the utility of drainage outweighs the gravity of resulting harm to others. Similarly, the U.S. Association of State Floodplain Managers has advocated a No Adverse Impact[18] (NAI) management principle (Kusler, 2011), adopted also in some EU MS (Mysiak et al., 2014). According to NAI, the actions of one property owner are not allowed to adversely affect the rights of other property owners.

The EC backed the development of "Common Frame of Reference" (CFR), primarily in the contract law, as a collection of common principles, terminology and model rules to be referred to by the Union legislator (EC, 2003). The Draft Common Frame of Reference (DCFR; Von Bar et al., 2009) was conceived as a legal experts' response to the EC quest; an attempt to harmonise European private law. The book VI of the

[18] *No Adverse Impact* floodplain management is an approach which ensures that the action of one property owner does not adversely impact the properties and rights of other property owners (Kusler and Thomas, 2007)

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almost 5 000 long compilation addresses *non-contractual* liability arising out of damage caused to another. The term "non-contractual liability" is neutral in language used in common law civil law systems, making reference to the incidence of damage being the only connection between the damaged party and the party held accountable. The DCFR Article VI.–1:101 states "a person who suffers *legally relevant damage* has a right to reparation from a person who caused the damage *intentionally* or *negligently* or is *otherwise accountable* for the causation of the damage" (emphasis added) (Von Bar et al., 2009, p. 2978). The *legally relevant damage* (Article VI.–2:101) is a (economic or non-economic) loss or injury resulting from a violation of a right otherwise conferred by the law or from a violation of an interest worthy of legal protection.

The European Group on Tort Law produced in 2005 an alternative compilation of guidelines aiming at the harmonization of European tort law, the Principles of European Tort Law (PETL) (European Group on Tort Law, 2005). It defines the damage as a "material or immaterial harm to a legally protected interest" (Art. 2:101) while the accountability for the damage is given either by a fault, or by abnormally dangerous activity (Art. 1:101).

The Union's primary and secondary legislation has a little sway over the liability regimes across the MS. Generally, the damages for which third parties are held liable are excluded from the eligible damage in the state aid regulation and the solidarity aid. The so-called Rome Regulations (EC, 2007b, 2008) specify rules on cross-border contractual, non-contractual, and pre-contractual obligations in situations where there is a conflict of law. In 2010 the EC launched a consultation on how to make contract law in the EU more coherent (EC, 2010c). Included among the presented policy options, but not supported by the stakeholders, was the option (7) aiming at establishing a European Civil Code covering tort law and other obligations along with the contract law.

An exception from the above is the liability for damage caused to environment addressed by the Environmental Liability Directive (ELD; 2004/35/CE). The ELD (EC, 2004b) was adopted in 2004 but applies only to activities that caused environmental damage after the full transposition of the Directive into national legislative frameworks (i.e. 30 April 2007). The ELD does not supplant civil liability insofar only the damage caused to environment (i.e. protected species and habitats, water and land) is comprised. Consequently, personal injuries, damage to property or economic losses incurred to third parties are not tackled, as they are subject of civil liability claims. Likewise, the environmental damage caused by "a natural phenomenon of exceptional, inevitable and irresistible character" (Article 4) is exempted from the scope of the Directive. The ELD holds liable both physical and natural, private and public persons. In line with the Article 191(2) TFEU committing the environmental damage rectification "*at source*" and by polluter, the ELD obliges those who exercise or control *occupational* activities causing environmental damage[19] to (i) adopt preventive and remedial measures; and (ii) inform competent authorities. The Directive distinguishes two liability regimes: first, *strict liability* applied to activities listed in the Annex III holds the operator liable irrespective of whether the damage caused is a result of fault or negligence. Second, the *fault-based* liability applies to any other activities not listed in Annex III for damage to protected species and natural habitats only in case of proved fault and/or negligence. MSs are left wide discretion whether or not to impose financial security mechanisms, including for the case of insolvency, so that the operator is capable to fulfil the imposed liability. The ELD is due to be reviewed in 2014[20] and the European Commission may propose the amendments deemed necessary. The EC commissioned several reports analysing the ELD transposition by MSs, definition of biodiversity damage, and possible revision of the Annex III activities (BIO Intelligence Service, 2012, 2013; Ltd and IUCN, 2014; Salès et al., 2014; Stevens and Bolton LLP, 2013). The possible changes include imposing a strict liability on activities currently under fault-based liability regime, extending the scope of the environmental damage to the air; a stricter

[19]In the sense of the Article 2.

[20]Due to delays in reporting and evaluation, the report expected by April 2014 will be submitted in 2015 (see http://ec.europa.eu/environment/legal/liability/index.htm, accessed in January 2015).

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regulation of the financial security and guarantees; and establishment of an industrial fund.

8 Conclusions

We have reviewed and analysed Union's legislation and regulation setting a playground for private insurance against natural hazard risk, and crafting options for PPPs in the wake of natural catastrophes. Our analysis concentrated on (i) public procurement and concessions, (ii) internal market regulation of insurance and solvency, (iii) state aid for making good the damage caused by natural disasters, (iv) European Union Solidarity Fund and transnational disaster prevention and response policies, in the framework of the SC, and (v) civil and environmental liability. On this basis we draw a preliminary list of Policy Guiding Principles (PGP) that allow for better designing a PPP for (catastrophic) natural hazards insurance provision.

The recent directive 2014/23/EU on public concession contracts along with the revised rules of public procurement have contributed to a greater legal certainty and flexibility in the design of PPPs, especially the public *service concession* which accounts for an estimated 60 % of the partnership programs in Europe. The reconfirmed *competitive dialog* and newly introduced *innovation partnership* in public procurement regulation provide for opportunity to develop innovative and well-tailored partnership schemes where existing marketable products are either not available or not suitable for the given purpose; this is the case of equitable and affordable insurance provision for property owners and enterprises located in areas exposed to low probability-high impact risks, with least competition distorting effects. Including the catastrophic natural hazards insurance among the Services of General Economic (if not social) Interest (SGEI) allow even greater flexibility of procurement and higher thresholds of de minimis state aid, compared to otherwise. Though the Member States (MS) are left a wide discretion in this area, the practical feasibility of declaring an affordable and equitable state-participated catastrophe insurance partnership as a SGEI is yet to be closely explored.

The insurance partnerships in which the state plays a role as a partner will have to comply with solvency requirements even if operating under state guarantee. It is of public interest to render the guarantee *transparent* in terms of state aid regulation, that is assessed in terms of *gross grant* equivalent. A sound risk analysis and assessment is an essential prerequisite and a preferred theme to be addressed in PPPs. The reformed GBER has no bearing on the public-private ventures but makes it easier to develop alternative state administered or supervised schemes of economic recovery in the aftermath of the disaster. This may encourage the MS to keep open the gateway for direct grants or other parallel forms of economic aid to citizens and enterprises, within the margins of the Stability and Growth Pact (SGP). While account is taken for disaster induced hardship in the SGP corrective arms (the excessive deficit procedure), recent calls to exclude the disaster recovery and protection expenditure from the SGP margins may undermine the fiscal rigour and consolidation. On contrary, the reduction of the annual endowment of the EU Solidarity Fund from one to a half of billion, while extending the scope of its mobilisation (regional disasters are eligible on their own right and not as a derogation from the general rule), may possibly lead to more frequent calls for a larger public compensation and aid in the aftermath of a disaster.

The definition of what constitutes a disaster beyond the coping capacity of the MS is contingent to the scope of the regulation. The ISS and DRR policies substantiating the TFEU *solidarity clause* embrace a broad-spectrum of natural and man-made hazards, leaving the decision of summoning for assistance to the affected MS. Similarly, the other MSs may choose the most appropriate means of assistance upon their own judgement and assessment. In contrary, the state aid regulation is more conservative and narrows down substantially the eligible natural hazards exempted from the notification obligation.

Borrowing from the policies reviewed in the paper we draw PGP that are valuable for the design of PPPs for (catastrophic) natural hazard insurance provision in the EU context. *First*, the partnerships should be *well-designed* and targeted at *market failures*, that is uninsurable losses and the design of affordable, socially-fair risk transfer mechanisms. *Second*, the partnerships should promote a *sound use of public resources* while limiting to the extent possible the *distortion of competition*. This also means that the partnerships should not substitute or sustain actions that would materialise anyway (additionality principle). The agreements should actively promote or at least not harm the *incentive for risk reduction*, for example by making the individual insurance costs reflecting those risks that result from each individual's choices (e.g. rewarding with lower premiums behaviours that reduce exposure and vulnerability and penalizing actions that go in the opposite direction). *Third*, the partnership should be built on principles of *transparency*, *equal treatment* and *effective analysis and monitoring*. Sound risk analysis and assessment along the agreed principles is the most encouraged scope of a collaboration. The MS are obliged to produce both sector specific assessment (for example under the Floods Directive) and cross-sector assessment under the reformed Civil Protection Mechanism. Regrettably, the costs of data collection is not contemplated among the eligible expenses under the EUSF. *Fourth*, the sustainability of the partnership should be based on clear rules of *viability and legitimacy*.

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References

Baltensperger, E., Buomberger, P., Luppa, A. A., Wicki, A., and Keller, B.: Regulation and Intervention in the Insurance Industry – Fundamental Issues, The Genova Association – Risk & Insurance Economics, Zurich, 2007.

Bielza, M., Conte, C., Gallego, F., Stroblmair, J., Catenaro, R., and Dittman, C.: Risk Management and Agricultural Insurance Schemes in Europe (JRC Reference Reports No. EUR 23943 EN), Joint Research Centre, Ispra, Italy, 2009.

BIO Intelligence Service: Study to Explore the Feasibility of Creating a Fund to Cover Environmental Liability and Losses Occurring From Industrial Accidents, Final report prepared for European Commission, DG ENV, Brussels, Belgium, 2012.

BIO Intelligence Service: Implementation Challenges and Obstackles of the Environmental Liability Directive, Final report prepared for European COmmission – DG Environment, in collaboration with Stevens and Bolton LLP, Brussels, Belgium, 2013.

Botzen, W. J. W. and van den Bergh, J. C. J. M.: Insurance against climate change and flooding in the Netherlands: present, future, and comparison with other countries, Risk Anal. Off. Publ. Soc. Risk Anal. , 28, 413–426, doi:10.1111/j.1539-6924.2008.01035.x, 2008.

Capitanio, F., Bielza, M., Cafiero, C., and Andolfini, F.: Crop insurance and public intervention in the risk management in agriculture: do farmers really benefit?, Appl. Econ., 43, 4149–4159, 2011.

CEA: Insurance of Natural Catastrophes in Europe (Report), European Insurance and Reinsurance Federation, Ispra, Italy, 2011.

CRED: EM – DAT – International Disaster Database (WWW Document), Cent. Res. Epidemiol. Disasters, Leuven, Belgium, available at: http://www.emdat.be/ (last access: 27 January 2015), 2015.

Crichton, D.: Role of Insurance in Reducing Flood Risk, Geneva Pap. Risk Insur. – Issues Pract. 33, The International Association for the Study of Insurance Economics Place of publication: Geneva, Switzerland, 117–132, doi:10.1057/palgrave.gpp2510151, 2008.

DEFRA: Securing the Future Availability and Affordability of Home Insurance in Areas of Flood Risk (Report), Department for Environment, Food and Rural Affairs, London, UK, 2013.

EC: Council Regulation (EC) No 994/98 of 7 May 1998 on the application of Articles 107 and 108 of the Treaty on the Functioning of the European Union to certain categories of horizontal State aid, Off. J. Eur. Communities L-142, 1–4, Brussels, Belgium, 1998.

EC: Council regulation (EC) No 659/1999 of 22 March 1999 laying down detailed rules for the application of Article 93 of the EC Treaty, Off. J. Eur. Communities L 83/1, Brussels, Belgium, 1999.

EC: Commission interpretative communication on concessions under Community law [C 121 of 29.04.2000], Off. J. Eur. Communities, 2–13, Brussels, Belgium, 2000.

EC: Communication from the Commission to the European Parliament and the Council, A More Coherent European Contract Law: an Action Plan, COM(2003) 68, Brussels, Belgium, 2003.

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EC: Green Paper on Public-Private Partnerships and Community Law on Public Contracts and Concessions, COM(2004) 327 final, Brussels, Belgium, 2004a.

EC: Directive 2004/18/EC of the European Parliament and of the Council of 31 March 2004 on the Coordination of Procedures for the Award of Public Works Contracts, Public Supply Contracts and Public Service Contracts, Brussels, Belgium, 2004b.

EC: Directive 2004/35/CE of the European Parliament and of the Council of 21 April 2004 on Environmental Liability With Regard to the Prevention and Remedying of Environmental Damage, Brussels, Belgium, 2004c.

EC: Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions on Public-Private Partnerships and Community Law on Public Procurement and Concessions, Brussels, Belgium,, 2005a.

EC: Proposal for a Regulation of the European Parliament and of the Council Establishing the European Union Solidarity Fund, COM(2005) 108 final, Brussels, Belgium,, 2005b.

EC: Flood Directive 2007/60/EC, Council Directive, Brussels, Belgium, 2007a.

EC: Regulation (EC) No 864/2007 of the European Parliament and of the Council of 11 July 2007 on the Law Applicable to Non-Contractual Obligations (Rome II), Brussels, Belgium,, 2007b.

EC: Regulation (EC) No 593/2008 of the European Parliament and of the Council of 17 June 2008 on the law applicable to contractual obligations (Rome I), Off. J. Eur. Union, 6–16, Brussels, Belgium, 2008.

EC: Economic Crisis in Europe: Causes, Consequences and Responses, European Economy 7/2009, Brussels, Belgium,, 2009a.

EC: Report from the Commission: European Union Solidarity Fund Annual Report 2008 and Report on the Experience Gained After Six Years of Applying the New Instrument, Brussels, Belgium,, 2009b.

EC: Communication from the Commission to the European Parliament and the Council, the EU Internal Security Strategy in Action: Five steps towards a more secure Europe, COM(2010) 673 final, Brussels, Belgium,, 2010a.

EC: Internal Security Strategy For the European Union: Towards a European Security Model, Publications Office of the European Union, Luxembourg, 2010b.

EC: Commission Staff Working Paper on Risk Assessment and Mapping Guidelines for Disaster Management, SEC(2010) 1626 final, Brussels, Belgium,, 2010c.

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EC: Green Paper From the Commission on Policy Options For Progress Towards a European Contract Law For Consumers and Businesses, COM(2010) 348 final, Brussels, Belgium„ 2010d.
EC: Proposal For a Directive of the European Parliament and of the Council Amending Directives 2003/71/EC and 2009/138/EC in Respect of the Powers of the European Insurance and Occupational Pensions Authority and the European Securities and Markets Authority – Omnibus (Communication No. COM/2011/0008 final), Brussels, Belgium„ 2011a.
EC: Communication From the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions on the Future of the European Union Solidarity Fund, Brussels, Belgium„ 2011b.
EC: Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions EU State Aid Modernisation (SAM), COM(2012) 209 final, Brussels, Belgium„ 2012a.
EC: Joint Proposal For a Council Decision on the Arrangements For the Implementation by the Union of the Solidarity Clause, JOIN(2012) 39 final, Brussels, Belgium„ 2012b.
EC: Green Paper on the Insurance of Natural and Man-Made Disasters, COM(2013) 213 final, Brussels, Belgium„ 2013a.
EC: State Aid No. SA.36027 (2013/N) – Italy, Aid Scheme For the Compensation of Damage Caused by Future Natural Disasters in Valle d'Aosta (All Sectors Except Agriculture, Fisheries and Aquaculture), C (2013) 2829, Brussels, Belgium„ 2013b.
EC: Council Regulation (EU) No 733/2013 of 22 July 2013 Amending Regulation (EC) No 994/98 on the Application of Articles 92 and 93 of the Treaty Establishing the European Community to Certain Categories of Horizontal State aid, Off. J. Eur. Union L204, 11–14, Brussels, Belgium„ 2013c.
EC: Commission Regulation (EU) No 1407/2013 of 18 December 2013 on the Application of Articles 107 and 108 of the Treaty on the Functioning of the European Union to de minimis Aid, Off. J. Eur. Union L352, 1–8, Brussels, Belgium„ 2013d.
EC: Proposal for a Regulation of the European Parliament and of the Council Amending Council Regulation (EC) No 2012/2002 Establishing the European Union Solidarity Fund, Brussels, Belgium„ 2013e.
EC: Decision No 1313/2013/EU of the European Parliament and of the Council of 17 December 2013 on a Union Civil Protection Mechanism, Off. J. Eur. Union, 924–947, Brussels, Belgium„ 2013f.

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EC: Directive 2014/24/EU of the European Parliament and of the Council of 26 February 2014 on Public Procurement and Repealing Directive 2004/18/EC, Off. J. Eur. Union 65–242, Brussels, Belgium„ 2014b.
EC: EU Competition Law Rules Applicable to State Aid, Office for Official Publications of the European Union, Luxembourg, 2014c.
EC: Commission Regulation (EU) No 651/2014 of 17 June 2014 Declaring Certain Categories of Aid Compatible With the Internal Market in Application of Articles 107 and 108 of the Treaty, Off. J. Eur. Union L187, 1–87, Brussels, Belgium„ 2014d.
EC: DG Competition Database (WWW Document), DG Compet. Database, Brussels, Belgium, available at: http://ec.europa.eu/competition/elojade/isef/index.cfm, 2014e.
EC: Regulation (EU) No 661/2014 of the European Parliament and of the Council of 15 May 2014 Amending Council Regulation (EC) No 2012/2002 establishing the European Union Solidarity Fund, Brussels, Belgium„ 2014f.
EC: Regulation (EU) No 513/2014 of the European Parliament and of the Council of 16 April 2014 Establishing, as Part of the Internal Security Fund, the Instrument For Financial Support For Police Cooperation, Preventing and Combating Crime, and Crisis Managem, Off. J. Eur. Union 93–111, Brussels, Belgium„ 2014g.
EC: Commission Staff Working Document – Overview of natural and man-made disaster risks in the EU Accompanying the document Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions The post 2015 Hyogo Framework for Action: Managing risks to achieve resilience. SWD/2014/0134 final, Brussels, Belgium, 2014h.
EIOPA: European Insurance and Occupational Pensions Authority – Solvency II (WWW Document), Eur. Insur. Occup. Pensions Auth., available at: https://eiopa.europa.eu/regulation-supervision/insurance/solvency-ii (last access: 12 August 2015), 2014.
EP: European Parliament Resolution of 22 November 2012 on the EU's Mutual Defence and Solidarity Clauses: Political and Operational Dimensions (2012/2223(INI), Strasbourg, France, 2012.
EU Council: Council Regulation (EC) No 2012/2002 of 11 November 2002 Establishingthe European Union Solidarity Fund, Off. J. Eur. Communities, Brussels, Belgium, 2002.

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European Group on Tort Law: Principles of European Tort Law, European Group on Tort Law, Springer, Vienna, Austria, 2005.
IPCC: IPCC Fifth Assessment Report (AR5) (No. WGII), Intergovernmental Panel on Climate Change, Geneva, 2014.
Kusler, J.: Flood risk in the courts: reducing government liability while encouraging government responsibility, Legal paper, The Association of State Floodplain Managers, available at: http://www.floods.org/index.asp?menuID=301&firstlevelmenuID=188&siteID=1 (last access: 12 August 2015), Wisconsin, USA, 2011.
Kusler, J. A. and Thomas, E. A.: No adverse impact and the courts: protecting the property rights of all, Legal paper, The Association of State Floodplain Managers, available at: http://www.floods.org/index.asp?menuID=301&firstlevelmenuID=188&siteID=1 (last access: 12 August 2015). Wisconsin, USA, 2007.
Ltd, M., IUCN: Experience Gained in the Application of ELD Biodiversity Damage, Final Report for the European Commission, DG Environment, Brussels, February 2014, 2014.
Maccaferri, S., Carboni, J., and Campolongo, F.: Natural Catastrophes: Risk Relevance and Insurance Coverage in the EU (EUR – Scientific and Technical Reports No. JRC67329), Joint Research Centre, Ispra, Italy, 2012.
Mills, E., Roth Jr., R. J., and Lecomte, E.: Availability and affordability of insurance under climate change: a growing challenge for the US, J. Insur. Regul. , 25, 109–149, 2006.
Mirza, M. M. Q.: Climate change and extreme weather events: can developing countries adapt?, Clim. Policy, 3, 233–248, doi:10.1016/S1469-3062(03)00052-4, 2003.
Munich Re: From Knowledge to Solutions, Solvency II, Climate Change (Report), Munich Re, Munich, Germany, 2009.
Myrdal, S.: The European Union's Solidarity Clause: Empty Letter or Effective Tool?, An Analysis of Article 222 of the Treaty on the Functioning of the European Union, Ocassional Pap. Swed. Inst. Int. Aff., Stockholm, Sweden, 2010.
Mysiak, J.: Partnership For Disaster Resilient and Climate-Proof Infrastructure, Report of the Enhance project [enhanceproject.eu],, 2014.
Mysiak, J., Carrera, L., Amadio, A., Pérez-Blanco, D., Santato, S., Alessandrini, C., Pecora, S., Haro Monteagudo, D., Andreu Álvarez, J., Solera Solera, A., Paredes Arquiola, J., Gerkensmeier, B., M. W., R. B., Vollmer, M., Surminski, S., Leck, H., Crick, F., Eldridge, J., Hall, J., Jenkins, K., Nikolic, I., Nicolai, R., Pleijter, G., de Greef, J., van Vuren, S., Otto, A., Kellermann, P., Kirnbauer, R., Kundela, G., Meyer, N., Rachoy, C., Schöbel, A., Thieken, A., Co-

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Partnerships for affordable and equitable disaster insurance

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laço, C., Rego, F., Rocha, M., Bento, L., Macedo, A., Netto, C., McLean, L. J. A., Guha-Sapir, D., Hochrainer-Stigler, S., Ioncică, M., Lorant, A., Petrescu, E. C., Ulfarsson, G. F., Petursdottir, G., and Reichardt, U.: Development of multisectoral partnerships, Report of the Enhance project [enhanceproject.eu]„ 2014.

OECD: Climate Change, Water and Agriculture, Organisation for Economic Co-operation and Development, Paris, 2014.

OJ: Directive 2002/13/EC of the European Parliament and of the Council of 5 March 2002 Amending Council Directive 73/239/EEC as Regards the Solvency Margin Requirements For Non-Life Insurance Undertakings – Solvency I, C2007/306/01, Brussels, Belgium, 2002.

OJ: Treaty of Lisbon amending the treaty on European Union and the treaty establishing the European Community, signed at Lisbon, 13 December 2007, Official Journal of the European Journal, Brussels, Belgium, 2007.

OJ: Directive 2009/138/EC of the European Parliament and of the Council of 25 November 2009 on the Taking-Up and Pursuit of the Business of Insurance and Reinsurance (Solvency II), Directive, Brussels, Belgium, 2009.

OJ: Regulation (EU) No 1094/2010 of the European Parliament and of the Council of 24 November 2010 establishing a European Supervisory Authority (European Insurance and Occupational Pensions Authority), amending Decision No 716/2009/EC and repealing Commission Decision 2009/79/EC, Official Journal of the European Journal, L 331/48, 2010.

OJ: Directive 2014/23/EU of the European Parliament and of the Council of 26 February 2014 on the Award of Concession Contracts, Directive, Brussels, Belgium, 2014a.

OJ: Directive 2014/24/EU of the European Parliament and of the Council of 26 February 2014 on Public Procurement and Repealing Directive 2004/18/EC Text with EEA relevance, Directive, Brussels, Belgium, 2014b.

OJ: Directive 2014/25/EU of the European Parliament and of the Council of 26 February 2014 on Procurement by Entities Operating in the Water, Energy, Transport and Postal Services Sectors and Repealing Directive 2004/17/EC Text with EEA relevance, Directive, Brussels, Belgium, 2014c.

O'Leary, S.: Solidarity and citizenship rights in the charter of fundamental rights of the European Union, in: EU Law and the Welfare State: In Search of Solidarity, edited by: de Búrca, G., University Press Scholarship Online, Oxford, UK, 1–54, 2005.

Pérez-Blanco, C. D. and Gómez, C. M.: Insuring water: a practical risk management option in water-scarce and drought-prone regions?, Water Policy, 16, 244–263, doi:10.2166/wp.2013.131, 2014.
Salès, K., Mugdal, S., and Fogleman, V.: Study on ELD Effectiveness: Scope and Exceptions, Final Report, 19 February 2014, European Union, ISBN: 978-92-79-35536-3, doi:10.2779/70236. Brussels, Belgium, 2014.
Stevens and Bolton LLP: The Study on Analysis of Integrating the ELD into 11 National Legal Frameworks, Final Report prepared for the European Commission – DG Environment, European Union, ISBN: 978-92-79-35203-4, doi:10.2779/69062, Brussels, Belgium, 2013.
Sugarman, S. D.: Roles of Government in Compensating Disaster Victims, Berkeley Electron Press, Berkeley, USA, 2006.
Surminski, S.: How Can the Insurance Industry Promote Climate Change Adaptation? A Case Study from the UK (Report No. 18), Association of British Insurers, London, UK, 2009a.
Surminski, S.: How Can the Insurance Industry Promote Climate Change Adaptation? A Case Study from the UK (Report No. 18), Climate Change Series no. 3, Association of British Insurers, London, UK, 2009b.
Surminski, S. and Oramas-Dorta, D.: Flood insurance schemes and climate adaptation in developing countries, Int. J. Disaster Risk Reduct., 7, 154–164, 2014.
Surminski, S., Leck, H., Crick, F., Eldridge, J., Hall, J., Jenkins, K., and Nikolic, I.: Development of MSPS in the London case study, Report of the Enhance project [enhanceproject.eu], 2014.
UNISDR: Number of Climate-Related Disasters Around the World (1980–2011) (WWW Document), U.N. Int. Strategy Disaster Reduct, available at: http://www.preventionweb.net/files/20120613_ClimateDisaster1980-2011.pdf (last access: 2 January 2014), 2012.
Von Bar, C. and Drobnig, U.: Study on Property Law and Non-contractual Liability Law as they relate to Contract Law, Submitted to the European Commission – Health and Consumer Protection Directorate General, 2004.
Von Bar, C., Clive, E., and Schulte Nölke, H.: Principles, Definitions and Model Rules of European Private Law. Draft Common Frame of Reference (DCFR), Sellier, Munich, 2009.
Von Peter, G., Von Dahlen, S., and Saxena, S. C.: Unmitigated disasters? New evidence on the macroeconomic cost of natural catastrophes, BIS Work. Pap. 394, 38, 1–28, Basel, Switzerland, 2012.

NHESSD
3, 4797–4832, 2015

Partnerships for affordable and equitable disaster insurance

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Wagner, G.: The Law of Torts in the Draft Common Frame of Reference, available at SSRN: http://ssrn.com/abstract=1394343 (last access: 12 August 2015), doi:10.2139/ssrn.1394343, 2009.

Warner, K., Ranger, N., Surminski, S., Arnold, M., Linnerooth-Bayer, J., Michel-Kerjan, E., Kovacs, P., and Herweijer, C.: Adaptation to Climate Change: Linking Disaster Risk Reduction and Insurance, United Nations International Strategy for Disaster Reduction Secretariat (UNISDR), Geneva, Switzerland, 2009.

Warner, K., Yuzva, K., Zissener, M., Gille, S., Voss, J., and Wanczeck, S.: Innovative Insurance Solutions for Climate Change: How to Integrate Climate Risk Insurance Into a Comprehensive Climate Risk Management Approach, (Report No. 12), United Nations University Institute for Environment and Human Security (UNU-EHS), Bonn, 2013.

Williamson, O. E.: The new institutional economics: taking stock, looking ahead, J. Econ. Lit., 38, 595–613, 2000.

World Bank, CMI: North African Coastal Cities Address Natural Disasters and Climate Change (Report No. June 2011), Climate Change Adaptation and Natural Disasters Preparedness in the Coastal Cities of North Africa, World Bank and Marseille Centre for Mediterranean Integration, Washington DC, Marseille, France, 2011.

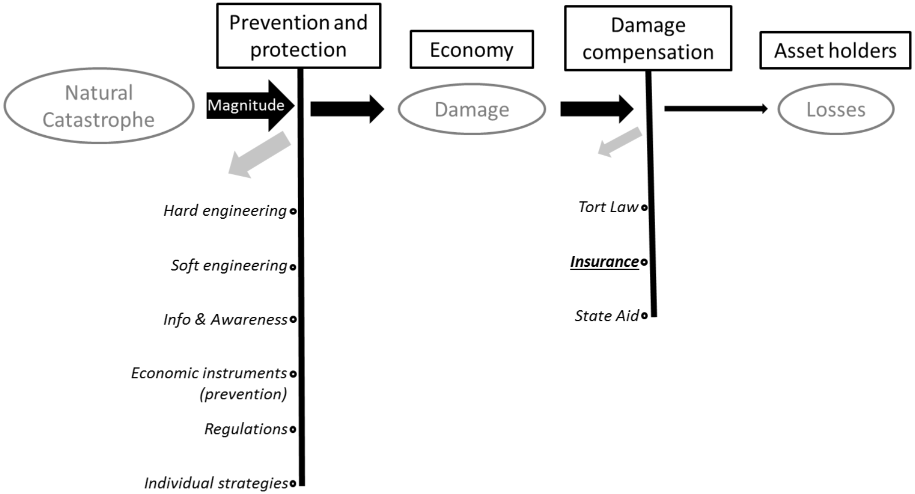

Figure 1. Disaster risk management strategies. Source: own elaboration.

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