Insurance coverage of natural hazard damages and fiscal gap in EU

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1. INTRODUCTION

The incurred global damage from natural hazards shows a rising trend, which is however for a large part attributable to growth of the capital stock. Yet, for non-geophysical natural hazards in developed countries the wealth normalized insured losses show an upward trend as well (Barthel & Neumayer 2012). The highest direct damages were recorded in 2011, being estimated at $386 billion of which $110 billion as insured damages (von Dahlen & von Peter, 2012). In addition to direct damages, natural hazards cause indirect damages. These indirect damages are usually expressed as foregone output, which results mainly from the loss of productivity caused by the loss of capital and critical infrastructure. There is a broad consensus that these indirect effects are negative, causing output to be significantly lower for at least some time compared to the potential output (Cavallo & Noy, 2009). The level of indirect damages depends on a number of factors such as the size of the country and the wealth level. Risk transfer has been lately acknowledged to be one of the most important factors explaining the consequent macroeconomic effects.

Macroeconomic effects of hazards in conjunction with the role of insurance coverage have been studied both by the use of macroeconomic modelling (Perrels et al 2011) and by means of regression analysis (e.g. Von Peter et al (2012). These studies indicate that there is a link between the indirect effects and the level of risk transfer. This can be explained by at least two mechanisms: 1) supplementing direct resources to the areas suffering the largest resource scarcity, and 2) spurring economic activity in the affected area via multiplier effects. The prime concern of this study is that an area can be underinsured, causing slow recovery in case of a major natural hazard and high indirect damages. Government action usually entails compensation schemes with damage coverage rates, which lack risk reducing incentives or can exacerbate repair booms (Perrels et al 2011). In addition, these schemes increase the budget deficit and crowd out private investment, thus being inefficient compared to private insurance schemes.

In the FP7 project CRISMA (http://www.crismaproject.eu/) economic indicators for natural hazard related to crisis management were proposed (see also Engelbach et al 2014). This paper deals with two of them: insurance coverage and the so-called 'fiscal gap' indicators. Fiscal gap (Mechler et al, 2010) refers to high budget deficits, which can cause insufficient ability to mobilize funding for reconstruction, especially when coupled with low insurance coverage. The measurement basis, preliminary results, limitations of interpretation, illustration of use, and some suggestions for improvements of the two indicators are discussed. The indicators merit further development, whereas the statistical monitoring of the underlying data should be improved and get more transparent. The coordinated use of such indicators is illustrated by discussing the role that insurance coverage had in natural hazard preparedness policies in France, with special reference to flood prone areas.

2. COVERAGE OF NATURAL HAZARD DAMAGES BY INSURANCE AND STATE COMPENSATION SCHEMES

The 28 Member States of the European Union show a large variation in the extent of insurance coverage of direct damages from natural hazards. Exposure and vulnerability levels per type of hazard vary greatly within and across countries and therefore low insurance levels are sometimes caused by low risk levels, sometimes by lack of supply of insurance products, and sometimes by large variations in the income distribution. Furthermore, the public capital stock and ex-post aid for private sector need to be backed by a resilient public finance situation, if there is no reinsurance scheme adopted by the government. If one or both types of coverage fail, a country will have significantly larger difficulties to recover from major damage due to natural hazards.

The insurance coverage at country level was assessed for four different types of natural hazards. The way of reporting varies greatly between countries and types of hazards. In some cases information concerns the fraction of entities insured, e.g. the number of insured households divided by all households. This is indicated as Ratio A in Figure 1. In other cases only (recent) historical data on the share of the estimated total damage covered by insurance is available. This is indicated as Ratio B in Figure 1. A third way of measuring is the ratio of a country's insurance premiums and global insurance premiums divided by the fraction of a country's GDP in the global GDP. This ratio is called the penetration rate and is the information most readily (publicly)

available, and can be found from reports by the European Commission (Maccaferri et al. 2012) and by Insurers of Europe (CEA, 2007) for most EU States. This is indicated as Ratio C in Figure 1.

To reduce interpretation pressures for users of these different ratios were merged into one indicator, of which the statistical basis may vary, but which intends to convey the same message reflecting the level of the insurance coverage in each country. This also means that the insurance coverage indicator is indeed only indicative, using intervals rather than exact fractions. The indicator only provides information about the sufficiency of the insurance coverage, neglecting the possibility of too high coverage and potential repair boom effects. The indicator scores are established per hazard type (flood, storm, earthquake, forest fire).

For a few countries no information on insurance coverage could be found. For some other countries the coverage of some hazards remained unclear (white cell in Figure 1), whereas some hazards are irrelevant in various countries (grey cell in Figure 1). The results should therefore be interpreted with caution, and their uncertainty rather offers a reason for further investigation than for final judgment. For example, some hazards, notably floods, are spatially bounded, which means that national coverage rates are well below 100%, while they are higher in the risk areas, e.g. flood insurance in Germany. On the other hand sometimes high insurance coverage can be coupled with unrealistically strict policy conditions, e.g. flood insurance in Finland. Otherwise the color coding and classifications are explained at the right hand side of Figure 1.The implementation of the fiscal gap indicator is explained in chapter 3, whereas its classification is explained on the right hand side of Figure 1.

Figure 1. Fiscal Gap and Insurance Coverage Indicators by Type of Hazard for EU Member States

	Floods	Earthquakes & Volcanic Eruptions	Storms	Forest Fire	Fiscal gap - approach 1	Fiscal gap - approach 2
Austria	<25% (A)		>75% (C)	<10% (C)	91	81
Belgium	>90% (A)	>90% (A)	>75% (C)		297	87
Bulgaria	<1% (C)	<10% (C)	<10% (C)		*245*	*97*
Check Republic	>50% (A)	25%-75% (C)	25%-75% (C)	>75% (C)	72	
Denmark	100% (sea), <10% storm-water (A)		>90% (A)	>75% (C)	106	
Estonia	"low" (A)				218	
Finland	<50% (A)		>75% (C)	25%-75% (C)	*782*	*193*
France	>90% (A)		>75% (C)	<10% (C)	128	63
Germany	30% (A)	25-75% (C)	>75% (C)	>75% (C)	160	76
Greece	<10% (C)	<20% (A)	<10% (C)	<10% (C)	-26	-17
Hungary	>90% (A)				129	
Ireland	>75%	>75%	>75%		35	26
Italy	<10% (B)	10% (A)	<10% (C)		-3	-2
Luxemburg	5% (A)		80%-90% (A)		659	
Netherlands	<10% (A) + Government ex-post aid	A / B ~30%~50%	>80% (A)	>75% (C)	381	218
Poland	20% (A)		>75% (C)	>75% (C)	109	89
Portugal	25%-75% (C)	30% (A)	25%-75% (C)	10%-25% (C)	2	0
Romania	<1% (C)	<10% (C)	<10% (C)		*81*	*123*
Slovenia	25%-75% (C)	25%-75% (C)	>75% (C)		119	
Spain	25%-75% (C)	>90% (A)	>75% (C)	<10% (C)	113	40
Sweden	>75% (C)	>75% (C)	>75% (C)	>75% (C)	178	176

Classifications and intervals for private insurance	**A**	**B**	**C**
Under-insured (poor)	<20%	<15%	<10%
Under-insured (low)	20-50%	15%-40%	10%-25%
Under-insured (medium)	50-70%	40%-60%	25%-75%
Prudent insurence	>70%	>60%	>75%

Classification for fiscal gap

green: >= 100;
funding capacity for recovery more than sufficient

yellow: 10 =< x < 100
funding capacity in principle sufficient, but a very large or an unlucky decade may lead to significant deterioration of the capacity

orange: 1 = < x < 10
funding capacity is probably sufficient for one large event, but very large events or an unlucky decade may push the public finance over the threshold of fiscal gap. In turn this will start to affect fiscal policy afterwards - judgement will be influenced by insurance coverage rates

red: < 1
government lacks resources to finance large scale recovery without causing extra fiscal costs; this is especially serious if insurance coverage is also weak; privat decision makers need to activate and adjust their risk levels accordingly

NB. National debt figures refer to ultimo 2013

3. FISCAL GAP IN EU COUNTRIES

Up-to-date figures on government debt by country can be easily obtained from the European Central Bank and Eurostat. The results in figure 1 are based on the government debt levels ultimo September 2013. In recent years these figures have been changing considerably within a few years, implying this indicator needs to be checked yearly. As borderline is assumed that a debt level beyond 130% of GDP starts to seriously affect borrowing capacity. Data on direct damages of natural disasters are available from the EM-DAT database (http://www.emdat.be/database). The quality of reporting varies across countries and types of hazards, whereas economic costs of lives lost are often not accounted for. Nevertheless, these recorded damages of the largest natural hazards per country and decadal total costs of natural hazards per country provide a reasonable insight of public funding needs for recovery.

The fiscal gap is assessed in two ways:

- (130% of GDP – current government debt) / costliest event of past 20 years (approach 1 in figure 1)
- (130% of GDP – current government debt) / (total hazard cost by decade* x 0.75) (approach 2 in figure 1)

*) of a recent decade with the highest hazard cost (1983-1992/1992-2002/2003-2013)

The logic behind approach 1 is that it shows whether the country is prone very extreme hazards of a certain type, which at once may hamper recovery of the economy. Approach 2 takes into account that various countries (e.g. Germany, Spain, the UK) rate quite high in terms of frequency of costly events, while most separate events do not cause extremely high damage cost. Such countries may nevertheless experience that within a few years very large sums of repair cost accumulate, and thereby fiscal pressure may start to mount. One can infer from figure 1 that the second approach is a more critical version of the indicator. The figures for Bulgaria and Romania are in italics as the EM-DAT database did seem to lack quite some damage data from these countries or damage seemed severely understated. For Finland one very important – not reported – event was added regarding storm induced large scale forest damage, but nevertheless very solid (adapted) ratings resulted regarding state recovery funding capability. Some countries clearly have to take measures to improve their recovery funding capabilities (close their fiscal gap), but these countries are already incentivized to do so for many other reasons. If this recovery is however slow, a possibly increasing frequency of adverse weather based damage (see Introduction) may eat away the improvement.

4. ROLE OF INSURANCE COVERAGE IN NATURAL HAZARD PREPAREDNESS IN FRANCE

The French system of compensation of the victims of natural disasters, which came into effect in France on July 13th, 1982, is based on the principle of the national solidarity and implemented through a compulsory additional contribution of every person signing an insurance multi-risk contract for a house or an apartment. This earmarked contribution of all insured allows the extension of the guarantee covering the effects of natural disasters for which the state of 'natural catastrophe' (called CATNAT) was notified by governmental order. The order defines the zones and periods in which the disaster is 'recognized' as well as the nature of the inflicted damage. The justification of this system of officially 'recognized' natural catastrophes is based on the exceptional intensity of such phenomena. The CATNAT represents one of the important criteria allowing judgement of the communes' experienced vulnerability with respect to natural hazards.

The CATNAT is a compulsory extension of guarantee to any insurance contract which covers damage to property situated in France. The guarantee is framed by the state by four elements which escape the control of the insurer:

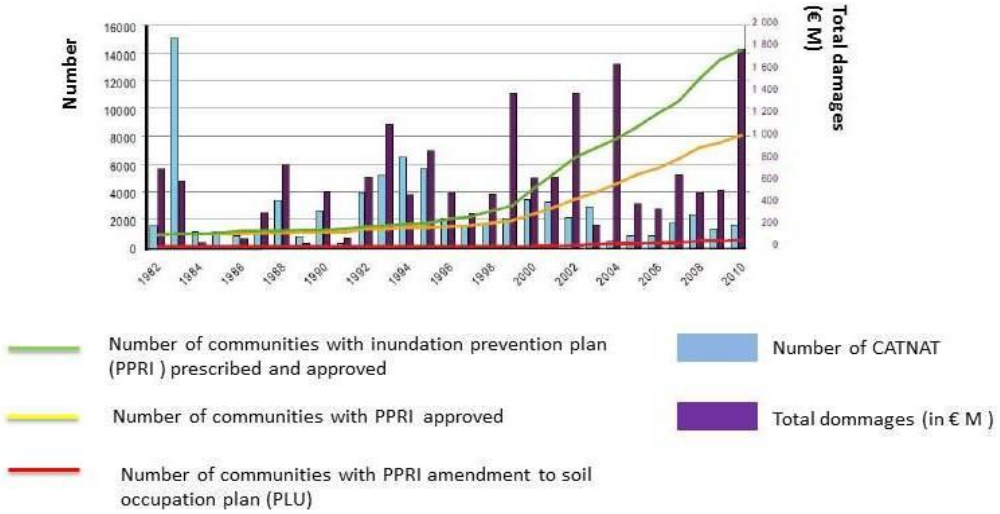
- the definition of the covered risks;
- the minimum threshold of damage compensation (eg. goods for domestic use: € 380 (€ 1520 for droughts), goods for professional use: 10% of damages (with à minimum of € 1140); exploitation losses: 3 working days (minimum € 1140);
- the pricing of the surcharge;
- the declaration of the state of natural disaster.

At present the rates of the prime are the following :

- for all goods except vehicles with an engine : 12% of the premium for the contract without catastrophe guarantee;
- for terestrial vehicles with an engine : 6% of the premium related to theft and fire.

The premium rate is independent of the hazard type and is *not* connected to implemented prevention measures.

Figure 2: Comparison of the number of flood risk prevention plans and total damages (source: Nussbaum R. (2013))



Winter storms which occurred during the winter 2013/2014 in France have been costly to the insured. Insurance companies will have to reimburse approximately € 500M for all weather events that occurred between late December 2013 and March 2014 (Assurer, 2014). Over the last eight months of 2013 French insurers indicate that the cost of natural disasters amounted to € 2 billion, exceeding the annual average by 33%, using a twenty year average. Globally, 2013 was a remarkable year regarding

natural disasters. In France, in 2009, the FFSA (French Federation of Insurance) conducted a study on climate change finding a potential doubling of the cost of compensation related to natural hazards by 2030 (Assurer, 2014).

So far, the French system of compensations of damages due to natural catastrophes, guaranteed by the state and facilitated by insurance pooling, allow balancing of good and bad years in terms of damage from natural hazard (Figure 2). Yet, climate studies such as conducted by the FFSA in 2009 question the long term robustness of the system. Indeed, while between 1988 and 2007, the cost of natural events compensated by French insurers amounted to € 34 billion, for the period 2009-2030 the estimates go up to €60 billion. However, 65% ~ 80% of this rise is owing to rising wealth levels, leaving a third or less to effects of climate change and other factors. Anticipatory land use planning, risk disclosure and insurances that promote vulnerability reduction may reduce the rise in damage cost appreciably. Conversely, absence of these measures may reinforce the rising damage cost trend. Insurance companies are keen to mobilize all stakeholders around the theme of prevention. The incentivizing features of CATNAT could be enhanced, which may help to maintain reasonably high compensation levels and moderate premium levels.

All in all the French approach is an interesting combination of private insurance and supplementing state support, which can contribute to upkeep of resilience. Yet, for the sake of financial robustness of the system in the light of climate change prevention and also more incentivizing insurance policies should be more vigorously pursued.

5. CONCLUSIONS

The capability to recover from major damage caused by natural hazards is an important (third) element of resilience, next to effective prevention and well managed emergency services. Sufficient insurance coverage and state funding capability are essential ingredients for good recovery. Insurance coverage regarding floods and geophysical hazards is far from sufficient in quite some EU Member States. Unfortunately, some countries with weak insurance coverage also face a fiscal gap. This combined weakness undermines outlooks for good recovery after high impact natural hazards. This offers another reason to improve the fiscal conditions of these Member States. The adequate monitoring of insurance coverage and fiscal gaps merits continuous improvement and adoption by all Member States. The French experience with combined insurance – state guarantee shows that this may be effective, while it also maintains public financial resilience better. However, the system (including the insurance policy conditions) does need to emphasize more preventive and vulnerability reducing actions by public and private actors, in order to remain robust in the long run.

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