Independent Review of Flood Insurance Analysis
Professor Stephen Diacon, June 2013

0. Statement of Aims

The Government and Association of British Insurers are discussing a proposal to set up a stand-alone insurance pool (Flood Re) to protect primary insurers from exposure to extreme flood risk on UK domestic property. Insurance prices on high-risk properties would be effectively capped - with caps set separately for buildings and contents polices, and varying by Council Tax (CT) band in order to avoid poorer households subsidising wealthier ones. These capped premiums would be passed to Flood Re, which would pay any and all buildings and contents property damage claims relating to these policies. The capped prices paid under Flood Re would be higher on average than those currently paid (under the 2008 Statement of Principles), but lower than the prices that might become charged within a free market. It is anticipated that around 0.5 million households will fall within the remit of the Flood Re scheme.

According to the ABI's figures these 1,000,000 household polices would account for more than half of UK household flood damages with expected annual claims of £190 million. The ABI expect premium income from the policies ceded to Flood Re to be £140 million. The difference, £50 million, is the effective subsidy on risk-reflective prices delivered via Flood Re. The tables accompanying this review summarise an assessment of the financial position which uses a weighted average of typical prices paid now (see 1. below).

In order to evaluate the impact of the Flood Re proposals, it is necessary to compare the prices that these high-risk households would pay for buildings and contents insurance in order to understand:
- How Flood Re capped prices compare with the typical prices currently paid under the existing Statement of Principles system, split by Council Tax (CT) band, and
- How these prices compare with those (risk-related) prices that insurers might charge in a 'free market' (once the existing Statement of Principles (SoP) have ended, and insurers have complete discretion on pricing high-risk policies).
- How the risk-related prices compare with the ABI's estimates of flood risk obtained from their flood modelling exercises.
- How the risk-related prices compare with the suggested annual industry levy of £180m.

1. The calculation of typical prices paid now on high-risk properties

Typical prices paid now by high flood-risk properties can vary according to the method of estimation. ABI provided a range of typical prices obtained from different combinations of insurers, and commented that there is a lot of uncertainty about how to compute average typical prices by CT band. These prices relate to premiums paid on actual contracts in force issued by a small number of ABI members which were able to break-down their policies by CT band.

The computation of typical average prices needs to allow for the fact that some households purchase their buildings and contents in a combined policy, while others (including all households living in property rented from small private landlords) are covered by buildings only and contents only policies purchased separately. Typically separate BO and CO policies involve a higher total price when purchased separately then when buildings and contents cover is combined in a single policy, and many insurers offer a discounts of around 10-15% to do so. Higher discounts of 20-25% are typically offered if the combined policy is purchased online.

Clearly tenants and landlords of private rented property will buy separate CO and BO policies, but this only accounts for about 10% of dwellings (although a higher proportion of lower CT band properties come into this category). A further 65% of dwellings on average are owned by owner-occupiers, and insurance industry estimates suggest that 60% of these buy separate CO and BO policies (while the remaining 40% buy a combined policy). This suggests that the average typical prices paid now should be a weighted average of the sum of Separate CO and BO prices (with weight $(10+0.6(65))/75 = 65\%$) and the Combined BO/CO price (with weight $0.4(65)/75 = 35\%$).

Using data provided by the ABI and applying the above weights yields the following Weighted Average typical prices in Table 1 below, and these lie within the acceptable range suggested by ABI. These can be compared to the estimated price caps under the Flood Re scheme shown in the final column.

Table 1: Typical Prices Paid Now (High flood risk properties, by Council Tax Band)

CT band	Typical prices paid now					
	BO	CO	Combined	Separate (BO+CO)	Weighted Average	Flood Re price cap
A	394	170	478	564	534	650
B	380	182	455	562	525	650
C	430	191	479	621	572	720
D	486	204	531	690	634	800
E	560	224	574	783	710	920
F	648	257	671	905	823	1100
G	888	349	971	1237	1144	1550

Using these Weighted Average prices as a comparator, the Flood Re proposal would generate prices around 22-24% higher than currently paid for Council Tax bands A and B, rising to around 30-35% for bands E-G.

The estimated prices of high-risk policies ceded to Flood Re are based on combined buildings and contents policy and therefore presumably incorporate the 10-15% discount mentioned above. Further discounts of around 10% are likely to be available to householders who purchase these policies online (because this reduces insurers' selling costs) and this 'online' discount will therefore narrow the gap between typical prices now and the prices of contracts ceded to Flood Re. In other words, the price uplift of the Flood Re scheme for the highest risk households may be ameliorated if they do not currently buy combined policies online, but do so in future.

It should also be noted that the typical prices in the above table relate to prices paid by households which have actually purchased their policies (as these have been obtained from an analysis of existing business). In contrast, the prices obtained from price comparison websites are quotations and do not necessarily relate to prices actually paid. In general, typical prices actually paid tend to be greater than the cheapest quotations from price comparison websites, for a number of reasons:

- Customers don't always purchase the cheapest policy, but are also influenced by brand and quality perceptions.
- Insurers may offer lower prices to new customers as opposed to renewals. All quotations are for new customers.
- Price quotations can change over time, but consumers only buy once a year (i.e. policies purchased within a year prior to the quotation are excluded from the cheaper prices because the policies have not expired)
- Only about 70% of household insurance contracts are thought to switch insurers each year anyway – for reasons of inertia, or switching costs (such as changing bank mandates etc). To a certain extent, non-switching by high flood risk households is reinforced by the existing Statement of Principles, as these require insurers to guarantee renewal.
- Price quotations typically exclude 'add-on' features which many policyholders actually pay for. For example price quotations often exclude legal protection and 'all risks' cover, which incur extra charges
- Many customers purchase insurance in installments which increases the price, whereas the quotations are likely to be for one up-front payment.

2. The calculation of risk-related prices

The ABI provided conjectured risk-related market prices that might be charged in a free-market (that is, on the ending of the existing Statement of Principles), for those 0.5 million private UK properties across Council Tax bands A-G which are exposed to the greatest risk of flooding (see Table 2). The prices are conjectures by an ABI member company (with 10-12% market share) of the prices they may wish to charge when the SoP ends. The prices relate to combined buildings and contents insurance (and therefore apply to owner-occupiers). Comparable 'typical premiums paid now' are taken from the Combined column of Table 1.

No details are available on how these conjectured prices have been derived, although it is presumed that they assume that flood risk for such high-risk properties will continue to be bundled with non-flood risk (such as fire, theft etc).

Table 2: Conjectured Risk-Related Prices for High Flood-Risk Properties (following the end of the Statement of Principles)

CT Band	A	B	C	D	E	F	G
Average risk-related price, presented in ABI proposal (worst case) **(1)**	1399	1399	1399	1599	1756	2029	2907
Typical premiums paid now **(2)**	478	455	479	531	574	671	971
Ratio (1) / (2)	2.93	3.07	2.92	3.01	3.06	3.02	2.99

The conjectured risk-related prices in Table 2 seem rather high in comparison with the typical premiums paid under the current SoP. This increase may be the result of pessimistic forecasts about the incidence of flood risk by the responding insurers, or because of a higher implicit profit margin for high-risk business embedded in their prices. Discussions with the ABI suggest that the high risk-related prices arise because insurers are unlikely to find the business particularly attractive, and will require a high profit margin to induce them to take the risk. Insurers may not have much of an appetite for high-risk properties, and the prices would need to be high to persuade them to offer cover. They may also be concerned that this risk may be under-priced. There is unlikely to be much competition in the market for such business.

A word of caution about the above comparison relates to the assumption that bundled flood and non-flood polices will continue after the current Statement of Principles expires. The experience of other countries with a free-market in risk-related prices suggests that cover for flooding will be offered as an add-on or option for high-risk properties: it is likely that high-risk properties will be offered buildings and contents insurance with flooding excluded, and available as an 'add on' for an additional premium. Furthermore the take-up of such add-ons is likely to be extremely low[1], primarily because a lack of competition for such business means that the add-on prices are very high (along with the hope among uninsured families that they will be bailed out by the Government in the event of a disaster). In other words, the experience of other countries indicates that risk-related pricing of flood insurance results in the unavailability of affordable add-on cover for flood risk: it is therefore possible that the high-risk properties represented in the above table will not actually be able to buy bundled cover against flood risk.

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[1] Crichton, D. (2008) Role of Insurance in Reducing Flood Risk, *Geneva Papers on Risk and Insurance*, 33, 117-132

3. The reliability of the figure of £190m relating to the expected gross-of-reinsurance claims paid by Flood Re p.a.

An alternative interpretation of the high risk-related prices in Table 2 is that the expected flood losses for high-risk properties are much higher than that allowed for in the financial forecasts for Flood Re. Analysis in the accompanying tables suggest that, if this were indeed the case, the anticipated annual flood losses paid by Flood Re would be almost double the £190m annual estimate. Although there is an element of uncertainty and imperfection about the data and the estimates, the ABI are confident that a figure of £190m for the long-run expected value of Flood Re annual gross claims is reasonable, and that the discrepancy is attributable to the higher implicit profit margins in the risk-related prices (as argued in section 2. above).

ABI confidence in the £190m figure is based on the following:
- It has been derived from two different flood catastrophe models from providers in the market which produced similar results
- It seems about right in comparison with the estimate of the expected value of total domestic flood claims in the UK of £343m pa
- A reinsurance broker that has been working with the ABI to consider reinsurance options for Flood Re, is prepared to provide an illustrative quote (£165m) based on the estimate – demonstrating its confidence in the results of the flood catastrophe models.

A word of caution relates to the purchase of an aggregate excess-of-loss reinsurance contract to protect against Flood Re against aggregate losses in excess of £250m, where an illustrative 'best price' of around £165m per annum has been quoted. It should be noted that catastrophe property reinsurance prices are capable of fluctuation over time, as illustrated by the chart of a reinsurance price index constructed by reinsurance brokers Guy Carpenter[2]. The chart shows that property reinsurance prices have increased 2.5 times since 1991, and are capable to sharp year-to-year fluctuations.

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[2] Guy Carpenter (2011) World Catastrophe Insurance Market Review (p6)

Index, rates were flat to up 10 percent year-on-year as of July 1, 2011 (see Figure 2). However, rates in non-catastrophe lines continue to experience downward pressure.

FIGURE 2: GLOBAL PROPERTY CATASTROPHE ROL INDEX[1]

Source: Guy Carpenter & Company, LLC
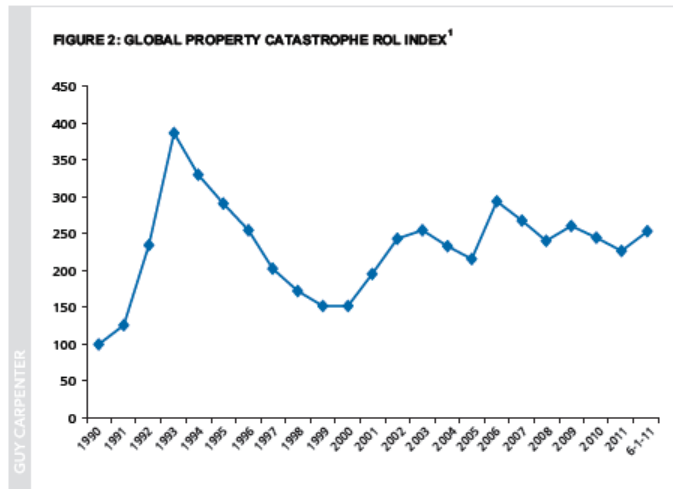
4. The £180m levy mirroring the existing cross-subsidy within the market for the 500,000 households

The tables accompanying this report include an estimation of the cross-subsidy using weighted average typical prices. Lines 76-85 indicate that the estimate cross-subsidy may be around £168m i.e. 6.9% less than the proposed levy of £180m. However this is based on 'derived' risk-related prices (which reflect estimated risk related prices on the assumption that market conditions remain unchanged so that the insurers' overhead/profit margin would still be around 40%) and then made consistent with total expected Flood Re claims of £190m.

The levy of £180m should ideally be broadly equal to the difference between the prices paid now amongst the 500,000 households and those that might be charged in a free market. The difficulty in making this comparison is that the conjectured risk-related prices obtained from the ABI (line 41) effectively assume a change in the competitive conditions in the market for these high-risk policies once risk-related prices (on bundled policies) are charged (as argued in section 2. above). In contrast, the 'derived' RRPs use a profit margin which is consistent with the competitive conditions under the current Statement of Principles (which of course was explicitly designed to protect the market from destructive competition and possible market failure). Since the purpose of this calculation is to estimate the *current* cross-subsidy, the use of the 'derived' RRPs seems reasonable, although it might be sensible to use a different term.

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Independent Review of Flood Insurance Analysis - accompanying tables

1. Details from ABI proposal

Premium income	£ 140,000,000
Average annual losses	£ 190,000,000
Reinsurance premium	£ 165,000,000
Reinsurance recoveries	£ 60,000,000
Operating costs	£ 10,000,000
Target surplus, to build reserve	£ 15,000,000
Proposed annual levy	£ 180,000,000
Household policies ceded to Flood Re	1,000,000

ie. 500,000 buildings, 500,000 contents

Assumptions

		of gross price
Insurer overheads, profit etc is:	40%	price

RRP = risk-reflective premium

GROSS prices = include overheads, profit etc

NET prices = 'technical' price for risk

CT = Council Tax

2. Impact on prices currently paid

CT Band	A	B	C	D	E	F	G	H
Price paid now (if separate policies bought)	564	562	621	690	784	905	1,237	
Price paid now (35% COMBINED + 65 % SEPARATE)	534	525	572	634	710	823	1,144	
Price if ceded to Flood Re (combined policy)	650	650	720	800	920	1,100	1,550	
Difference	*22%*	*24%*	*26%*	*26%*	*30%*	*34%*	*35%*	

...if households currently buy a combined policy?

	A	B	C	D	E	F	G	H
Price paid now (if a combined policy bought)	478	455	479	531	574	671	971	1,846
Difference	*36%*	*43%*	*50%*	*51%*	*60%*	*64%*	*60%*	

Conclusion: households ceded to Flood Re may see prices rise on average by 22-35% (36-64% for combined policies), rather than 15-25%, based on a sample of one insurer's premiums.

3. Flood Re's premium income

CT Band	A	B	C	D	E	F	G	H
Non-flood GROSS premium within Flood Re price	300	300	310	340	370	420	650	
Flood GROSS premium within Flood Re price	350	350	410	460	550	680	900	
NET premium cap delivered by Flood Re	210	210	246	276	330	408	540	

	A	B	C	D	E	F	G	H
% of insured households in each CT Band	16.1%	18.7%	24.1%	18.4%	12.0%	5.6%	4.6%	0.5%
Households ceded to Flood Re	81,147	93,873	121,220	92,224	60,331	28,074	23,132	
Flood Re premium income	17,040,922	19,713,315	29,820,041	25,453,725	19,909,126	11,453,989	12,491,454	
Flood Re premium income	**135,882,570**							

Conclusion: premium income of £140m appears to be reasonable if 500,000 combined polices are ceded.

4. Flood Re's average annual losses

CT Band	A	B	C	D	E	F	G	H
Average RRPs, from ABI proposal	1,399	1,399	1,399	1,599	1,756	2,029	2,907	5,420
Flood GROSS premium within ABI RRPs	1,099	1,099	1,089	1,259	1,386	1,609	2,257	
Flood NET premium within ABI RRPs	659	659	653	755	832	965	1,354	
AALs for Band according to ABI figures	53,508,494	61,899,809	79,204,938	69,665,738	50,170,997	27,102,158	31,325,791	
Flood Re average annual losses	**372,877,924**							

Conclusion: if the ABI's risk-reflective premiums are correct, Flood Re's average annual losses could be as much as double those suggested by the ABI.

Note: ABI say that the Insurer Overheads/profit loading embedded in RRPs are much greater than the usual 40%

5. If this higher average annual loss figure is correct, what would the levy need to be?

Cash flow	Income (£)		Cash flow	Expense (£)	
Premium income	140,000,000		Average annual losses	**372,877,924**	
Reinsurance recoveries	102,257,381		Reinsurance premium	323,815,039	
Levy income required	**479,435,583**		Operating costs	10,000,000	
			Target surplus	15,000,000	
TOTAL	721,692,963		**TOTAL**	721,692,963	

Conclusion: Flood Re would need a levy double or more that currently proposed, if the ABI's risk-reflective premiums are correct (but see note above).

6. If Flood Re's average annual losses are £190m, what RRPs are implied?

Flood Re's average annual losses	190,000,000				
Flood Re's premium income	140,000,000				
Subsidy to NET RRPs delivered by Flood Re	50,000,000	or	£ 50.00	per policy	

CT Band	A	B	C	D	E	F	G	H
Non-flood GROSS premium within Flood Re price	300	300	310	340	370	420	650	
Flood GROSS premium within Flood Re price	350	350	410	460	550	680	900	
Subsidy to GROSS RRP delivered by Flood Re	167	167	167	167	167	167	167	

Average RRPs, implied by ABI £190m loss figure	817	817	887	967	1,087	1,267	1,717
Average RRPs, as actually presented by ABI	1,399	1,399	1,399	1,599	1,756	2,029	2,907
Difference	*71%*	*71%*	*58%*	*65%*	*62%*	*60%*	*69%*

Conclusion: if the ABI's figures on Flood Re losses are correct, risk-reflective prices within a free market could be 60-70% lower than the ABI suggest.

Note: The high profit margin embedded in the RRPs is an indication of limited competition for high-risk business.

7. If the RRPs derived in 6 above are correct, what would this mean for the size of the current cross-subsidy?

CT Band	A	B	C	D	E	F	G	H
Price paid now (35% COMBINED + 65 % SEPARATE)	534	525	572	634	710	823	1,144	
Average RRPs, derived from ABI figures on Flood Re	817	817	887	967	1,087	1,267	1,717	
Average current cross-subsidy, for combined policy	283	292	315	333	377	444	573	
Households ceded to Flood Re	81,147	93,873	121,220	92,224	60,331	28,074	23,132	
Current cross-subsidy	22,937,622	27,379,604	38,143,792	30,679,731	22,724,558	12,455,277	13,247,110	
Current cross-subsidy for Flood Re policies	**167,567,693**							
Proposed annual levy	**180,000,000**							
Difference	*7%*							

Conclusion: if the ABI's estimate of Flood Re annual loss is correct, the proposed annual levy will be 7% higher than the current cross-subsidy.

Price paid under Flood Re, buildings + contents (using ABI figures)

Legend:
- Price if ceded to Flood Re (combined policy)
- Average RRPs, implied by ABI £190m loss figure
- Price paid now (if separate policies bought)
- Average RRPs, from ABI proposal

Y-axis: £ price paid (total 'all perils' price) — 6,000 / 5,000 / 4,000 / 3,000 / 2,000 / 1,000 / -

X-axis: Council Tax band — A, B, C, D, E, F, G, H