

# PCI White Paper

---

June 2011

## True Market-Risk Rates for Flood Insurance



## Table of contents

Executive Summary	5
PCI Methodology and Findings	7
<i>Underlying Information</i>	7
<i>Determining the Average True Market-Risk Rate</i>	8
<i>Determining True Market-Risk Rates for Full-Risk and High-Risk Pre-FIRM Policies</i>	10
Conclusion	12



## Executive Summary

The Federal Emergency Management Agency (FEMA) administers the National Flood Insurance Program (NFIP), which provides protection against flood damages for 5.6 million consumers. The NFIP expires on September 30, 2011 – its reauthorization is likely to be a top Congressional insurance issue this term.

The NFIP was created in 1968. Flood insurance was not widely available in the private market and major losses were typically covered by taxpayer-funded disaster relief. According to Housing and Urban Development (HUD), private insurers lacked adequate information to underwrite flood coverage and flood-prone residents rejected unsubsidized flood coverage as too costly or uneconomical. Flood insurance is a mandatory requirement to own a mortgage from a federally regulated lender. The NFIP also encourages and enforces mitigation of future losses through flood insurance rate maps (FIRMs) to better equate elevation/location to the premium being charged.<sup>1</sup>

This paper analyzes the true market-risk costs of flood insurance. The NFIP sets two different premium levels: (1) “full-risk rates” intended to cover administrative costs and expected annual flood losses; and (2) “subsidized rates” primarily for high-risk properties built before flood maps were issued for such properties or for coverage begun before 1975, whichever is later. Following the Congressional Budget Office (CBO) approach to computing the NFIP deficit, PCI estimated the annual cash-flow deficit created by explicit rate subsidies to be about \$2.0 billion.

NFIP’s rate-setting method is very different from that of private insurers. The NFIP bases its rates on its average annual administrative and cash-flow losses for very broadly defined types of flood zones. According to FEMA, federal flood rates are derived from a formula that follows in principle the “hydrologic method of estimating flood damage risk.”<sup>2</sup> The NFIP cannot deny insurance to “repetitive loss properties,”<sup>3</sup> making it subject to adverse selection. It does not purchase reinsurance, impose a catastrophe load, or build up or maintain a surplus to cover unexpectedly large events. The NFIP also does not seek a rate of return for the capital employed in the program nor does it include a tax provision in its rates. Furthermore, NFIP rates cannot be raised beyond an annual maximum of 10%.

When flood losses are less than a typical year, the NFIP returns any excess premium to the U.S. Treasury. When losses are greater than a typical expected year, the Treasury loans the difference to the NFIP. Hurricanes Katrina, Rita and Wilma (2005) caused greater than expected flood losses and left the NFIP \$16.75 billion in debt as of Dec. 31, 2006. As a result of additional borrowing during subsequent years, the NFIP debt is currently \$17.8 billion. The interest rate charged by the Treasury is now 0.25%.

*continued*

- 1 Specifically, the NFIP resulted from the collapse of the private market in providing flood coverage since private rates could not be achieved to cover the exposure and mitigation could not be forced on consumers. The federal government had no choice but to step in and pick up the pieces at an inadequate rate.
- 2 The hydrologic model, as adapted by the NFIP, incorporates relevant factors such as a building’s location, construction and elevation relative to expected flood levels. However, the model’s ability to estimate insured flood damage is only valid over a very long period of time; it is “not useful for estimating future loss results in the short term.” Source: NFIP, “Actuarial Rate Review in Support of the Recommended May 1, 2009, Rate and Rule Changes,” pp. 10-11.
- 3 Repetitive loss properties are subject to at least two flood claims exceeding \$1,000 each in any 10-year period.

To assist policymakers’ discussions about the NFIP rate structure, PCI calculated rough approximations of the true market-risk cost of flood insurance using historical, publicly available information. We conclude that the federal government is providing overall flood insurance at one-half the true-risk cost; specifically, in higher-risk areas, it is providing flood insurance at one-third the true-risk cost. This comports with the General Accountability Office’s (GAO) analysis which found that requiring the NFIP to build a capital surplus fund would involve a doubling or tripling of current rates.<sup>4</sup>

PCI’s approximations were calculated using 2009 NFIP rates (found in the NFIP Actuarial Rate Review) plus the estimated direct subsidy for higher-risk properties and additional amounts needed for insurance to be offered in the private sector (i.e., a minimum load typically permitted by laws governing property casualty insurers to provide for the market cost of capital, applicable federal/foreign income taxes, and state premium taxes). If additional start-up capital was needed to offer a new product niche, private carriers might begin with base rates that were even higher than the NFIP rates, resulting in even higher final market-risk rates.

Furthermore, since NFIP flood maps do not reflect present conditions – they are outdated due to lack of funding and resources – and little private-sector risk modeling information or experience currently exists, actual private sector rates would have been significantly higher when calculated in a manner that was consistent with that of private insurers during 2009.

<b>Estimated Annual Premiums for Different Risk Properties: From NFIP to True Market-Risk Costs</b>			
	<b>All</b>	<b>Full-Risk</b>	<b>High-Risk</b>
NFIP Rate	\$ 585	\$ 443	\$ 1,093
Explicit Subsidy	\$ 361	---	\$ 1,639
Minimum Required Load for Private Cos.	\$ 220	\$ 103	\$ 635
<b>Private Rate</b>	<b>\$1,166</b>	<b>\$ 546</b>	<b>\$ 3,367</b>
Private Rate is Higher than NFIP Rate by...	99.2%	23.3%	208.1%
<i>Note: Because NFIP rates do not reflect the true flood risk, the final private rates may be even higher.</i>			

*continued*

4 GAO Testimony (4/21/10), “NFIP: Continued Actions Needed to Address Financial and Operational Issues”

The average true market-risk rate for all flood insured properties was found to be twice the average NFIP rate (\$1,166 market vs. \$585 NFIP). While the market rate was only 23% higher for properties with lower flood risk, the market rate for properties explicitly subsidized under the NFIP was 208% higher than the current rate. These large disparities between NFIP and market-risk rates are the result of the non-actuarial approach required of the NFIP, in addition to the fact that program rates do not reflect lost tax revenue, capital costs, nor the costs of a catastrophe backstop (with Treasury backstopping the risk exposure for very large, less frequent events).

According to one independent study, the private market underwrites about 128,000 to 187,000 flood insurance policies,<sup>5</sup> likely in low-risk areas and typically for excess coverage or as a part of larger high-value coverage. Not only are current NFIP rates far below what a private market would have required to attract capital, but there are inadequate data available for flood risk modeling and numerous legal challenges. Insurers would find it difficult to obtain adequate rates to attract capital or be able to prevent adverse selection by homeowners, since insurers' rates and coverages are subject to price controls and mandates in most states.

## PCI Methodology and Findings

### *Underlying Information*

The following conclusions, obtained or derived from information found in several sources,<sup>6</sup> were used to determine estimated true market-risk flood premiums:

- 1) In 2009, there were approximately 5.6 million flood policies written under the NFIP program; the total premium volume was estimated at \$3.28 billion.
- 2) Most NFIP policies are issued at full-risk premiums to cover flood claims and related costs. However, rates for about 1.2 million policies (i.e., more than one-fifth of the total business), for older structures in high-risk flood areas, are explicitly subsidized.
- 3) According to FEMA, on average, premiums charged for subsidized policies are about 35%-40% of their full risk level.
- 4) In May 2009, the NFIP's recommended annual rates, less the portion allocated to premium taxes,<sup>7</sup> were \$443 (for full-risk policies) and \$1,093 (for high-risk policies). The average of all full-risk and high-risk NFIP policies was \$585.
- 5) PCI's estimated NFIP deficit was \$2.02 billion in 2009, or \$1,639 per subsidized policy. Spread across the entire program, this amount was 61.6% of total premiums (= \$2.02 B divided by \$3.28 B) or \$361 per policy.

*continued*

5 RAND Corporation, "The Lender Placed Flood Insurance Market for Residential Properties," 2007

6 CBO, "National Flood Insurance Program: Factors Affecting Actuarial Soundness," Nov. 2009; the NFIP website; and NFIP, "Actuarial Rate Review in Support of the Recommended May 1, 2009, Rate and Rule Changes."

7 In this analysis, NFIP rates exclude the portion for premium taxes in the underwriting expense allowance given to FEMA's private insurance partners; this tax portion is applied to the final private rate at the end.

***Determining the Average True Market-Risk Rate***

The fundamental principle behind insurance ratemaking is to ensure that the amount charged is sufficient to offset expected losses, including loss adjustment expenses, and other related costs. Rates should be developed at their full-risk level, i.e., without a subsidy. Given the catastrophic nature of the flood risk, it is important to note several facts if flood insurance is privatized.

- The federal government does not require reinsurance, whereas private insurers must cede a portion of the risk to reinsurers. This amount is part of the deficit which when added to the NFIP rate results in a full-risk rate intended to cover potential catastrophe losses.
- There are other items which the federal government does not take into account but private insurers must in order to conduct their operations. For example:
  - (i) The NFIP is not set up to have a capital surplus; hence, private insurers must build into their premiums an amount to reflect the cost of capital. This rate of return is needed to compensate investors for the use of their funds and the catastrophic risk they are accepting.<sup>8</sup> For this analysis, 15% of premiums was selected as the cost of capital, based on results from an industry study and the fact that flood is largely a catastrophic risk.<sup>9</sup>
  - (ii) Paying federal/foreign<sup>10</sup> income taxes is another requirement that private insurers must bear. Since the NFIP can borrow money from the Treasury, its losses may be (and have been) implicitly subsidized by all taxpayers; as such, a 35% tax rate was selected to be applied to the cost of capital.
  - (iii) The NFIP also does not pay premium taxes. However, this component is usually part of the underwriting expense allowance given to “write your own” insurers that partner with FEMA in selling and servicing NFIP’s standard flood insurance policies. Since this portion (typically 2.5%) was initially removed from the NFIP rate in this analysis, it had to be reinstated at the end to determine the final true market-risk rate.

On occasion, FEMA also sets aside a cash reserve for future heavy unexpected losses and, if needed, includes an amount in its premium to pay down debts owed to the government (plus interest). Since the portions of NFIP’s expenses, acquisition costs, commission and safety margin are similar to those of private insurers, and the debt payment is not made on a regular basis, these items were not included in the formula to determine the average

*continued*

8 Most states impose price controls on insurance companies, making it difficult for them to be able to utilize rates sufficient to earn adequate return on equity to attract the necessary new capital for such underwriting.

9 NCCI Holdings, Inc., *NCCI Research Brief*, “Measuring the Cost of Capital in the Property and Casualty Insurance Industry,” January 2008. The NCCI estimated the property casualty industry’s cost of capital to be 10.82%; given the catastrophic nature of the flood risk, the cost of capital used in this PCI analysis was 15%.

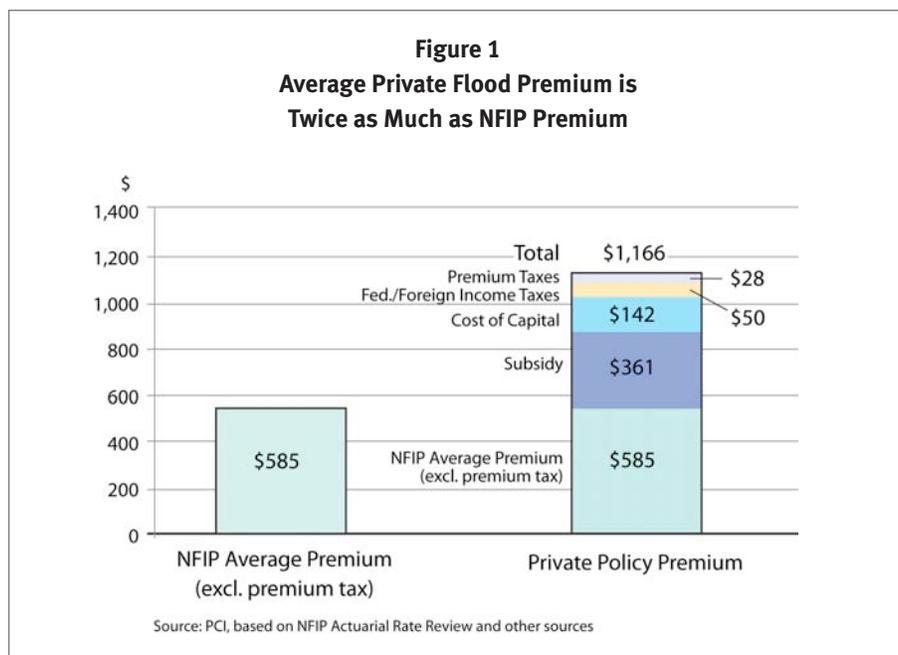
10 Foreign income taxes relate to investments in foreign subsidiaries and foreign corporate joint ventures.

private premium. There may be other taxes and assessments<sup>11</sup> paid by insurers as well, along with a contingency load; if these items were included in the calculations, the final true market-risk flood premiums could have been even higher.

Had the private market offered flood insurance, applying the minimum private carrier load to the NFIP’s 2009 average annual rate of \$585 would have resulted in the following step-by-step calculations that also included the following:

- all losses, including loss adjustment expenses, which when added to \$585 reached \$946;
- the pre-tax cost of capital (15%), which when added to the above reached \$1,088;
- federal/foreign income taxes (35% rate) on the cost of capital, which when added to the above reached \$1,138; and
- state premium taxes (2.5% rate), which when added to the above reached a final total amount of \$1,166.

In other words, the true market-risk rate per policyholder would have resulted in an amount approaching \$1,200, or twice the NFIP rate of \$585 (see Fig. 1 for a breakdown of the different components of the private premium and a comparison with the NFIP rate of \$585).

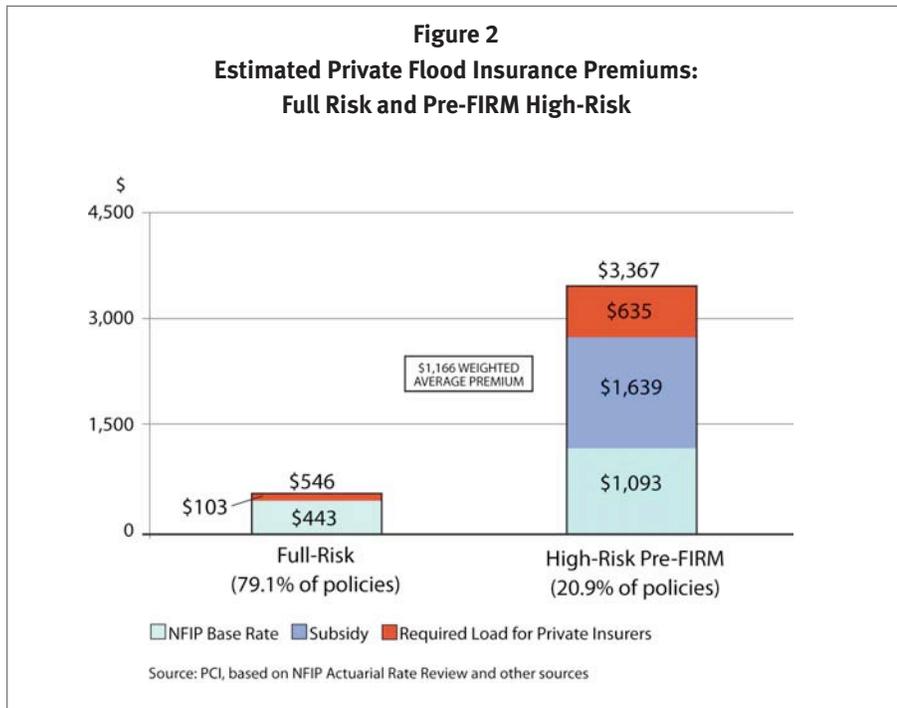


*continued*

11 Although premium taxes are part of the expense allowance given by FEMA to “write your own” partners, insurers may be subject to other taxes and assessments, including state income/franchise taxes; retaliatory taxes; municipal taxes/fees; surplus lines taxes; workers compensation guaranty trust and secondary injury trust fund assessments; guaranty fund association assessments; and underwriting association assessments. Since the application of these taxes varies by state, they are not included in the required load.

**Determining True Market-Risk Rates for Full-Risk and High-Risk Pre-FIRM Policies**

This section examines the development of true market rates for full-risk and high-risk policies separately. Beginning with the NFIP’s 2009 annual full-risk rate of \$443, the private full-risk premium was estimated to be about \$546, or 23.3% higher. Similarly, applying the subsidy and minimum load for private carriers to the NFIP’s annual subsidized rate of \$1,093 resulted in a true market (unsubsidized) premium that was 3.1 times greater, at \$3,367 (Fig. 2). The weighted average of these two premiums was \$1,166, matching the total private rate in the above chart.



*continued*

For ease of presentation, Fig. 2 displays only the 2009 NFIP rates, the pre-FIRM subsidy (\$1,639), and the aggregated minimum required loads (\$103 full-risk and \$635 high-risk) affecting the private market. A more detailed estimated breakdown of the private flood premiums is shown below, beginning with the NFIP rates of \$443 (full-risk) and \$1,093 (high-risk). Once again, amounts reflecting the items that private carriers needed in 2009 in order to run their operations were included in the computations.

<b>Breakdown of Annual Premium Rates for Standard Private Flood Insurance Policy</b>		
	<b>Full-Risk</b>	<b>High-Risk Pre-FIRM</b>
<b>NFIP Rate</b>	<b>\$ 443</b>	<b>\$ 1,093</b>
<b>Required Load for Private Carriers</b>		
Subsidy (\$1,639)	---	\$1,639
Pre-Tax Cost of Capital (15%)	\$66	\$410
Federal/Foreign Income Taxes on Cost of Capital (35%)	\$23	\$143
Premium Taxes (2.5%)	\$13	\$82
<b>Private Flood Rate</b>	<b>\$ 546</b>	<b>\$ 3,367</b>
<i>Source: PCI, using NFIP Actuarial Rate Review (recommended for May 1, 2009; Exhibit A)</i>		

The additional cost of capital, federal/foreign income taxes and premium taxes resulted in a full-risk rate of \$546, which was roughly one-fourth (23.3%) higher than the NFIP full-risk rate of \$443. In contrast, the private high-risk rate for a pre-FIRM structure was significantly higher (by 208.1%) than the NFIP rate for a comparable structure, due to the addition of the subsidy. This per-policy subsidy of \$1,639 was much greater than the NFIP premium itself (\$1,093), allowing the program's high-risk pre-FIRM policyholders to pay only 40% of their fair share (\$1,093 subsidized vs. \$2,732 NFIP unsubsidized;  $\$2,732 = \$1,093 + \$1,639$ ).

*continued*

## Conclusion

The PCI computations are intended to provide greater insight into the true price of a private sector flood policy and help facilitate discussions concerning NFIP reform. The manner in which NFIP flood rates have been calculated is very different from the method used by insurers that must consider additional factors in order to do business. As such, true-market rates were found to be roughly two times – in some cases, three times – higher than the amounts charged by FEMA.



Property Casualty Insurers  
Association of America  

---

Shaping the Future of American Insurance

2600 South River Road, Des Plaines, IL 60018    [www.pciaa.net](http://www.pciaa.net)

© 2011 Property Casualty Insurers Association of America

0811 | 2190 | pdf