

The benefits of introducing a mandatory state hurricane insurance scheme in Florida

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Abstract. As a result of its hurricane exposure, Florida is probably the part of the industrialised world most prone to natural catastrophes. Over the last 20 years the Florida legislator has tried to maintain a situation, where the private insurance sector plays a major role in providing hurricane-insurance. Its attempts to keep such insurance affordable have, however, led to a situation, where the public sector still ends up bearing a large part of the risk. Drawing on the experience of various European countries with mandatory state run catastrophe insurance schemes, we argue that the cost of hurricane insurance for the population could be substantially reduced, if Florida created a similar institution. The massive reduction in sales costs, loss adjustment costs and general administrative costs would allow such a system to work with premiums that are on average 25% lower. The problems of adverse selection which plague the current situation would of course (by definition) be eliminated.

Key Words: Hurricane Insurance, Mandatory Insurance, Regulation, Market Failure, Florida

JEL Classification: L51, L88

0 Introduction

A house-owner in the county of Monroe (southern tip of Florida, c.f. the map in Appendix 1) with a house worth \$400'000 on average pays a property insurance premium of more than \$12'000 per year. The cost of property insurance is thus about the same as the cost of health insurance for a four person household in Switzerland. The situation in Monroe is no exception. The average premium rate is typically of this order of magnitude for most properties in southern Florida situated near the Atlantic coast. It is thus hardly surprising that in a 2006 survey Florida property owners named "rising property insurance costs" as their biggest concern. (For obvious reasons falling property prices have since taken the first spot).

One might be tempted to argue that the high cost of insurance is just a logical consequence of the "irresponsible" behaviour, which consists of building houses in hurricane prone areas such as the Florida coast. It is therefore worth emphasising that the Florida insurance industry is in large part responsible for this "irresponsible" behaviour. Just 20 years ago the property owners on the Florida coast paid only about 3'000 dollars a year for their insurance. The price signal potential house-owners got from the insurance market was thus quite clear: The additional risk of building near the coast is quite low and well worth the amenities such a location has to offer. However, over the last 20 years Florida has experienced a number of (costly) hurricanes and the insurance industry has reacted by massively increasing the cost of property insurance (premiums, deductibles etc).

It seems reasonable to argue that the property insurers should be better informed about the potential cost of hurricanes than any of the other market participants. Their premium policy is thus at least partially responsible for the fact that Floridians (arguably) built too close to the coast and/or did not apply sufficiently severe building standards.

This being said, it is of course true that the insurance industry cannot possibly (in the long run) survive, if it has to charge premiums that do not cover its expected claims costs. A massive increase in claims costs due to hurricanes must therefore inevitably lead to higher insurance premiums. Any attempt (e.g. by the government) to limit such premium increases are in the long run doomed to fail since somebody (either the property owner or the taxpayer) must ultimately foot the bill. This argument is certainly correct, if one talks about premium increases that are of the same order of magnitude as the increase in expected claims costs.

The current situation in Florida¹ is, however, very different. The property owners in the high risk areas close to the Atlantic coast must pay additional insurance premiums that are about **three times higher** than the expected additional claims costs they generate. The best way to illustrate this is to compare the insurance rates in the county of Monroe with the expected claims costs in that county.

According to the Florida Public Hurricane Loss Model (FPHLM) the expected claims costs per \$1'000 insured are about **\$9** higher in Monroe than in the inland counties. The average insurance premium in Monroe is however **\$28** higher than in the less exposed counties.

¹ This paper is a follow-up paper to Jametti and von Ungern-Sternberg (2009) "Hurricane Insurance in Florida" which gives a much more detailed description of the current institutional set-up.

If we translate these numbers back into the \$400'000 property we mentioned in the first paragraph, we come up with the following orders of magnitude. The average annual premium in Monroe is around \$12'000, in the less exposed counties it is \$1'200. The owners in Monroe must thus on average pay \$10'800 more per year. Of this \$10'800 in additional annual premium \$3'600 are due to the higher expected claims costs, **which leaves a difference of \$7'200 that still has to be explained.**

As mentioned above, the situation in Monroe is by no means exceptional. The orders of magnitude are the same all along the Atlantic coast of Southern Florida. However, other highly exposed counties (like Miami-Dade, Broward or Palm Beach) have a substantial part of their building stock located further inland. Since the average premium data available are by county, the very high premiums paid by the coastal inhabitants are diluted by the buildings inland. As a result the average county premiums do not reflect the high premiums the property owners near the coast have to pay even in those counties. The specificity of Monroe is that most of the buildings there are located close to the sea. As a result the Monroe premiums are a good indicator of the premiums the coastal inhabitants in other counties have to pay.

So far we have talked only in terms of the insurance premium paid by an individual house-owner. The following example may help to get a feeling of the order of magnitude these higher insurance premiums mean for the population as a whole: If one focuses just on the 6 counties with the highest average premium rates (Monroe, Miami-Dade, Broward, Palm Beach in the South and Gulf, Franklin in the Panhandle), and the personal residential owner occupied houses, the owners are each year paying \$1'500 million more in property insurance premiums, because their hurricane exposure is higher than the average for the whole of Florida. Their expected claims costs are higher "only" by about \$1'000 million. Just for these 6 counties, the premiums the owners are paying the insurance companies over and above the higher expected claims costs they generate is thus of the order of \$500 million per year. Note that most of these additional costs are borne by the owners near the coastal regions. As one moves further inland hurricane losses decrease, both because storm surge (flooding) is no longer a problem and because the hurricanes progressively lose their power. Insurance premiums fall accordingly.

In spite of the fact that the additional premiums for the high risk customers are substantially higher than the expected claims costs they generate, the private insurance companies in Florida complain that they will have to leave the market unless they are given the possibility to impose still further premium increases. If this argument is taken seriously it would indicate that insuring properties in Monroe (and other high risk areas) imposes additional costs on the insurance companies that are twice as high (\$7'200 vs. \$3'600) as the additional expected claims costs. Potential candidates for such costs might be: higher commissions to their agents, higher administrative costs (due to high screening costs?), higher cost of obtaining risk capital, higher reinsurance costs etc.

These observations are important for several reasons. First Florida has created a public insurance company (Citizens), which was initially intended as a "residual insurance mechanism" but which has by now grown to be the biggest property insurer in Florida. A large part of its portfolio consists of properties in the high risk areas. Its commercial success and high market share are due to the fact that it is insuring these high risks at lower (affordable) premiums than the private insurance market. The private insurance sector is pushing hard to reduce the importance of Citizens and to bring it back to its initial role of a "residual market mechanism". The premium and cost data above strongly indicate that

Citizens might well be able to provide hurricane insurance at much lower premiums than the private insurance sector and nevertheless be economically viable, if it just managed to keep these “additional costs” at a (substantially) lower level than the private companies.

Second, the very high costs for the private sector of insuring catastrophic risks like hurricanes in Florida raise the question whether it might not be possible to organise the hurricane insurance market in Florida differently, save a substantial part of these costs and thus massively reduce the insurance premiums for the average Floridian.

There are good reasons to believe that the answer might be yes. Hurricanes and other forms of natural catastrophes are typically referred to as “uninsurable risks” i.e. risks where the standard mechanism of risk spreading does not work as efficiently as with other risks.

Several European countries (Switzerland, Spain, France, Germany) have long-standing experience in providing insurance cover against such catastrophic risks using different insurance solutions, in which the public sector plays a predominant role. The most efficient solution has turned out to be the creation of a mandatory state-owned (and run) insurance scheme, which provides property insurance for certain types of risks².

One of the major advantages of such a solution is best illustrated by looking at the Consorcio de Compensacion de Seguros in Spain. The Consorcio insures all properties in Spain against a wide range of catastrophes. One of the specificities of the Spanish system (which was created in the aftermath of the Civil war) is that the Consorcio covers both natural catastrophes and damage due to civil unrest (including terrorist attacks). The cost structure of the Consorcio is simple: It pays the private insurance companies 5% of premium income as a commission for collecting the premiums and keeping the files on the individual customers. The Consorcio has direct contact with the customers only once a loss has occurred. From the perspective of the customer this 5% commission is very favourable. In the private property insurance market insurance sector, the sales representatives typically get to keep 15% to 20% of the annual premium. The justification for the low commission rate is simple: Since the insurance cover offered by the Consorcio is highly standardised and mandatory, the agent has no particular sales effort to make. There is thus no reason to pay him a high commission. The Consorcio’s own operating costs (including claims settlement) absorb a further 5% of its premium income. Over the last 20 years at the Consorcio commissions and administrative costs thus absorbed a mere 10% of premium income. If one takes the example of Monroe described above at face value, it would seem to suggest that of the average additional premium of \$28/\$1000 insured, the Florida insurance companies claim to spend around \$20 per \$1’000 insured (**i.e. around to 70%**) on various kinds of costs (other than claims payments).

The example of the Consorcio seems to indicate that the home-owners in Florida might be able to benefit from massive cost savings if Florida implemented a well designed insurance scheme, in which the state played an important role. The purpose of this paper is to analyse in greater detail the premium reductions, advantages and disadvantages of introducing a mandatory state run hurricane-insurance scheme in Florida.

The rest of the paper is organised as follows. In section 1 we discuss the data used in this paper. Section 2 provides a cross-section analysis of insurance premiums and expected hurricane loss costs for the different counties in Florida. Section 3 estimates the costs savings

² C.f. von Ungern-Sternberg (2004) for a detailed discussion of the institutional arrangements in these countries.

that might be expected from introducing a mandatory state run hurricane insurance scheme in Florida. Section 4 discusses various other aspects of such an institutional change. Section 5 ends with some concluding remarks.

1 The data

We will use a cross sectional approach to study how premiums in the Florida property insurance market increase with expected loss costs.

A Premiums

The Wharton School has recently published an ambitious book on catastrophe insurance³. In the chapter devoted to hurricane insurance it calculates average “Homeowner Insurance Rates per \$1000 by County” in Florida for the years 1997 and 2006. The Table is reproduced in Appendix 2.

As the authors correctly point out, there is a wide variety of reasons, why the average premium rate might vary from one county to the next. Differences in the intensity of competition, differences of cover, differences in the choice of deductible, differences in the average value of properties etc could all be expected to have some effect on the average county insurance rates. All other things being equal, one would however expect insurance premiums to increase with the degree of hurricane exposure. For the purpose of this study we will focus on the average premium rates for the year 2006.

B Loss Costs

A number of institutions calculate hurricane loss models that have to be submitted to the Florida Commission on Hurricane Loss Projection Methodology in order to be approved and certified. The Commission checks the models carefully, as these are the models that are used by the insurance companies to justify their insurance rates and premium increases. A list of the models submitted in 2007/2008 can be found under

<http://www.sbafla.com/methodology/previous.asp?FormMode=Call&LinkType=Section&Section=52>

Since major hurricanes are (very?) low probability events and hurricane loss prediction is still far from being an exact science, it is hardly surprising that these models sometimes produce quite divergent results. For the purpose of this study we base ourselves on the Florida Public Hurricane Loss Model (FPHLM). Of all the model submissions, it is the most transparent (public) in the sense that the authors actually publish the key assumptions on which their model is based. The other models use much more of a “black box” approach.

The model produces a variety of expected loss cost estimates, depending on the type of insurance contract chosen. In practice, by far the most frequently chosen option (close to 60%

³ Wharton Risk Management and Decision Process Center (March 2008) “Managing Large-Scale Risks in a New Era of Catastrophes” henceforth referred to as the “Wharton study”

of all contracts⁴) is the 2% deductible. We thus focus on the loss cost predictions for policies with a 2% deductible.

As regards the owner-occupied properties, the model produces 2 kinds of loss estimates, depending on the type of construction: one for “frame” buildings and one for “masonry” buildings. The share of these different kinds of structures is very different among counties. In particular the high risk counties on the Atlantic coast have a substantially larger share of masonry buildings than the inland counties. There is a variety of reasons for this (date of construction, average income or wealth of owner etc), but the extent of hurricane risk is probably also an important explanatory factor. Masonry buildings are less vulnerable than frame constructions. In the rich hurricane exposed coastal counties along the south Atlantic coast, like Florida, Broward and Palm Beach over 90% of the buildings are masonry. In Monroe the rate is still 65%. In certain inland counties it drops to as low as 25%.

The loss data used in this study are a weighted average of the “frame” and masonry” loss projections, the weights being the share of these different kinds of building in each county. (The data are reproduced in Appendix 3).

2 Cross-section Analysis of premiums and expected claims cost per county

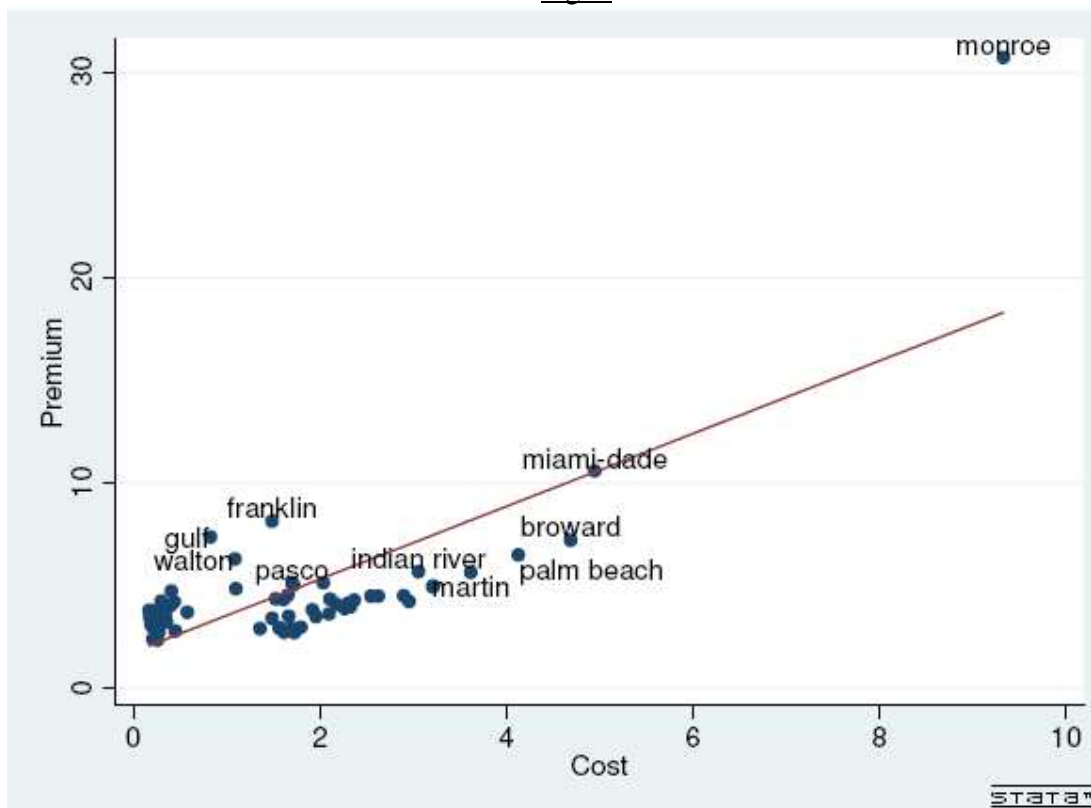
Fig. 1 gives a scatter plot of average insurance premiums and expected loss costs for the different counties. One notes (unsurprisingly) that there is a strong positive relationship. To obtain a first indication of the rate at which insurance premiums increase with the expected cost of hurricane damage in Florida, one might start off by running a simple linear regression of the premium rate on the expected hurricane loss costs. The result is:

$$\text{Premium} = 1.8 + 1.8 * \text{Cost} \quad R^2_{\text{adj}} = 0.58 \quad \text{MSE} = 2.3$$

(0.40) (0.18)

⁴ C.f. Wharton study p. 83.

Fig. 1



The slope coefficient of 1.8 (standard errors in brackets) indicates that on average the premium rate increases by \$1.8 when the expected loss cost increases by \$1.

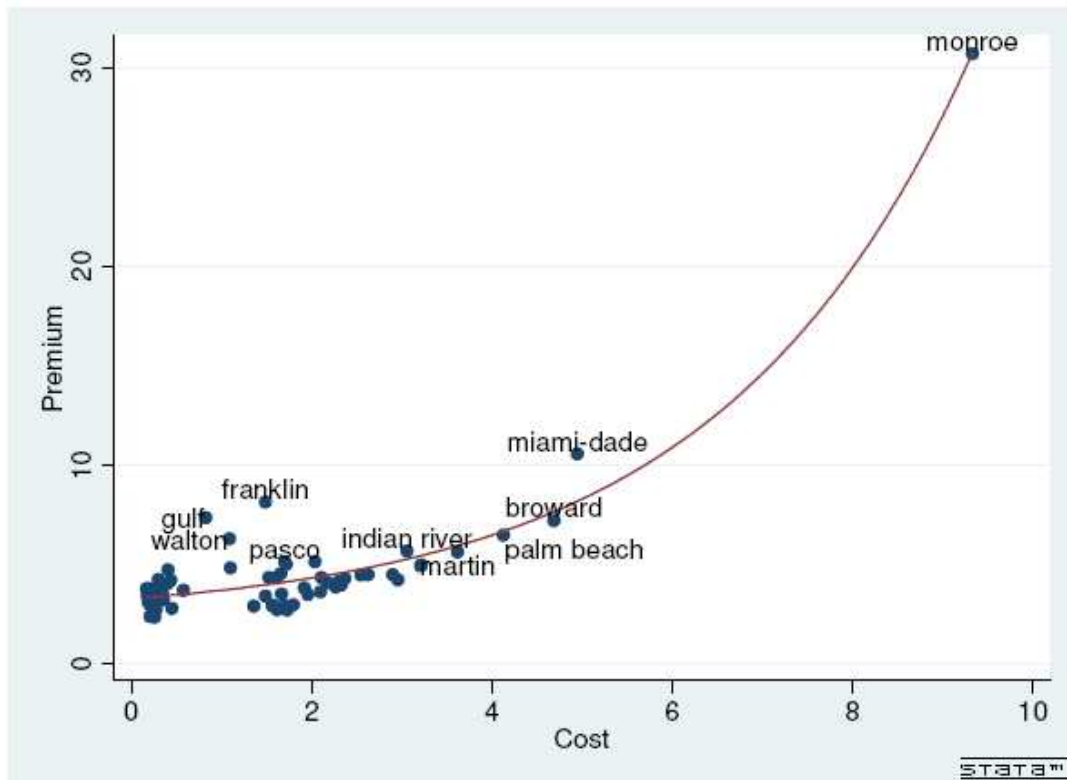
Even a cursory look at the plot of residuals shows, however, that the linear regression is misspecified. For low levels of hurricane risk, the premium does not rise much faster than the expected costs. For high expected hurricane costs the opposite is true. As a result the premium rate in county Monroe lies far above the linear regression line. A simple way to capture this non linear relationship between average premiums and expected hurricane costs is to perform an exponential regression:

The result is:

$$\text{Premium} = 2.3 + e^{(0.35 * \text{Cost})} \quad R^2_{\text{adj}} = 0.91 \quad \text{MSE} = 1.05$$

(0.13) (0.004)

Fig. 2



The interesting feature of this non linear specification is that it clearly shows that the premium increases much more rapidly as one moves from the “low risk” counties to highest risk counties like Monroe or Miami-Dade.

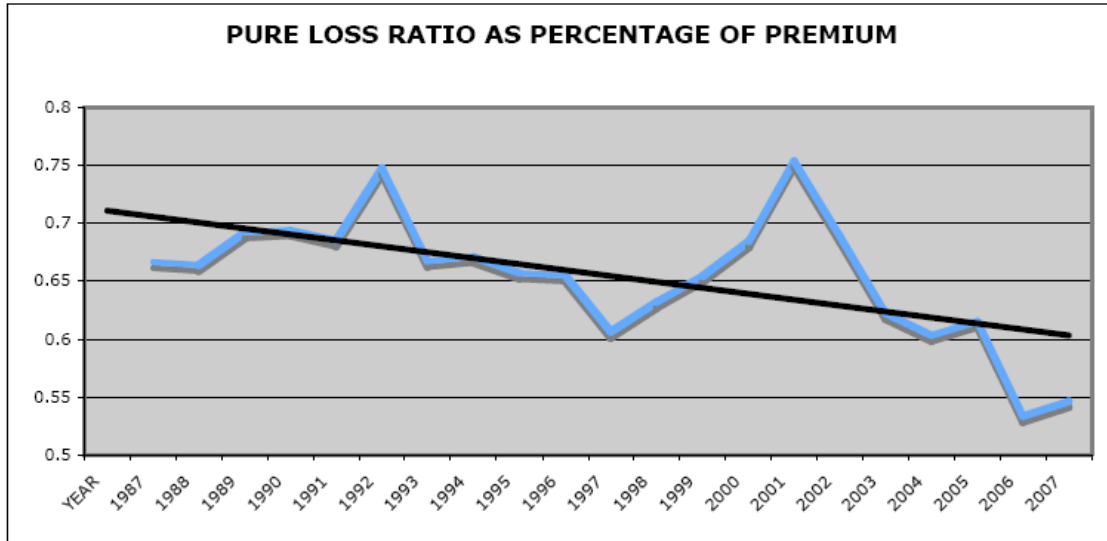
When one takes a closer look at the scatter plot, one notes that the counties on the northern Gulf coast (Gulf, Franklin and Walton) have much higher premiums than their expected loss costs (according to the FPHLM) would seem to warrant. The loss estimates for these counties seem quite reasonable, given that these counties have not suffered any severe hurricane damage in the last decades. The high premiums are thus hard to explain. One should note, however, that other models estimate much higher loss costs for these counties. According to these models the high premiums are thus entirely justified. The point deserves emphasis, because it illustrates the uncertain nature of the models, projections and forecasts one necessarily has to work with.

3 The savings-potential of a state-run hurricane insurance scheme.

According to various sources (including the Insurance Information Institute, an institute close to and funded by the private insurance industry) premiums have increased much faster than loss costs in the US property liability insurance market. As a result the average

Claims/Premium ratio (also called loss ratio) has been of the order of only 65% over the last 20 years⁵, and the tendency is clearly falling. (c.f. Fig 3)

Fig 3



There is no reason to assume that the ratio should be higher in Florida. To the contrary: as we have seen from the premium analysis in section 2, the private insurance industry requires much higher margins to cover hurricanes in the high risk areas.

However, to be on the conservative side, let us from now on work with a benchmark in which we assume that the private insurance sector would aim at a loss ratio of 60% (i.e. the trend average for 2007)⁶.

As mentioned in the introduction we have several decades of experience from Spain and other countries (notably Switzerland and Germany) that mandatory state run insurance schemes can operate with much lower administrative costs. In the case of the Spanish Consorcio, the sales and administrative costs (including loss adjustment costs) amount to a mere 10% of total premium income. Since the empirical evidence from both Germany and Switzerland⁷ goes in the same direction, it seems reasonable to assume that a mandatory hurricane insurance scheme in Florida should be able to operate with a similar cost structure. (See section 4 for a more detailed discussion of this point).

⁵ Source: "Property/Casualty Insurance in 2008 : Overpriced Insurance and Underpaid Claims Result in Unjustified Profits, Padded Reserves, and Excessive Capitalisation" J. Robert Hunter, Consumer Federation of America

⁶ A marginal loss ratio of 0.6 means that the premium should increase by \$1.66 when the expected loss increases by \$1. According to the simple linear regression in section 2, the average premium in Florida increases by \$1.8 when the expected loss cost increases by \$1. This comforts us in our belief that the approach we are using is quite conservative.

⁷ C.f. von Ungern-Sternberg (2004)

Let us assume now that Florida introduced such a system and calculates the average premiums in the following way: 75% of the premium income is used to cover expected loss costs, 10% of premium income is used to cover sales and administrative costs and 15% of premium income is used to accumulate reserves and/or purchase reinsurance cover.

Since the loss ratio of this scheme would be 75%, it would be 15% higher than the 60% the private insurance industry works with. Alternatively formulated, a first immediate beneficial effect for the home owners would be that their average premium rate would fall by 15%.

Second, the mandatory insurance scheme would dispose of 15% of annual premium income to buy reinsurance and/or constitute reserves.

Presented in this fashion, one might get the impression, that something must be wrong with the numbers. It looks too much like the kind of “all gain no pain” situation politicians often promise when election time is close.

The main reasons why such a massive reduction in the insurance premiums is indeed possible are to be found in the cost savings generated by a mandatory purely state-run solution. In the short run the most important ones are the savings in commissions, loss adjustment costs and general overhead expenses.

A Costs

A.1 Commissions

First and foremost, as mentioned above the Consorcio pays only 5% of the annual premium income to the private sector in return for collecting the premiums and keeping the files of the customers. If the customer uses an insurance agent, the 5% commission is split between the agent and the insurance company).

In a market environment the private insurance companies typically pay their insurance representatives 15 to 20% of the premium each year in the form of commissions.

The much lower commissions of the state run insurance scheme are justified, since the agent does not have to provide any kind of advice or consultancy services. The Consorcio offers only one (highly standardised) contract, in which the degree of coverage, the deductible etc are fixed. The insured value is equal to that for which the other types of coverage are bought. The insurance agent cannot even advise the customer whether to take out catastrophe insurance or not (it is mandatory).

From the perspective of the insurance agent adding cover against catastrophes to the property insurance contract thus requires roughly the same amount of effort as adding on the sales tax. Just as there is no reason for the sales representative to keep 15%-20% of the sales tax, there is no justification for him to obtain any substantial share of the catastrophe insurance premium.

This being said, one can expect strong political opposition from the insurance agents to the introduction of any such scheme. Their revenues would be (severely) curtailed.

A.2 Loss Adjustment Expenses (LAE)

The US insurance industry claims that its average loss adjustment costs for property liability insurance are of the order of 12% of premium income. This is huge in comparison with the state run property insurance schemes in Spain and Switzerland, which spend **substantially less than 5%** on LAE. In the absence of more detailed information, one can only speculate as to the origin of this huge discrepancy. Two possible explanations immediately spring to mind.

First, the insurance companies take some of their general overhead costs and put them under the heading “Loss Adjustment Costs”. This makes the “Loss + LAE as a fraction of premium income” statistics they prefer to publish look more attractive (higher).

Second the private insurance companies may be more inclined to try to take their customers to court in order to reduce claims payments. These legal costs are then accounted for under the heading “LAE”.

A.3 General Overhead Costs

Private insurance companies spend substantial amounts on advertising and other forms of customer acquisition. They also have the tendency to not only pay their management excessive salaries but also provide them with costly fringe benefits. The recent “workshop” organised by the management of AIG in a luxury resort to decide on how best to spend the billions they had just received from the government as part of a bail-out plan, put these practices into sharp perspective. Since the mandatory state run schemes are (by definition) mandatory, customer acquisition is no longer an issue. This leads to substantial savings of marketing and sales costs. The general overhead costs of the state run schemes are also substantially lower. These cost savings can be passed on to the customers in the form of lower premiums.

B Reserves

The first few years after creating a large scale catastrophe insurance scheme are of course always critical. If Florida were to be hit by a large hurricane shortly after the inception of the scheme, it would not have sufficient reserves to cover its obligations. At this stage, all we are interested in is the question, at what rate the scheme would be able to accumulate reserves. In the next section, the issues involved will be discussed in greater detail.

Obtaining a rough first estimate of the rate at which the scheme would **on average** be able to accumulate reserves is straightforward. According to the FPHLM the expected annual loss for the owner occupied houses is of the order of \$2.4 billion per year. Given the assumption of a loss ratio of 60% this implies that the schemes annual premium income is around \$4 billion per year. 15% of this amount, i.e. \$600 million per year, are thus available to accumulate reserves and/or purchase reinsurance.

To avoid misunderstandings it should be emphasised that the \$600 million per year are **not** the maximum amount that could potentially be spent to purchase reinsurance cover. If reinsurance rates were fair (in the sense that the premium is roughly equal to the expected claims cost) the scheme could in principle purchase 100% reinsurance. The \$600 million p.a. is thus the amount that can be spent on reinsurance to cover that part of the premium that is over and above the expected claims costs.

Since it is likely that the scheme would purchase some reinsurance cover, it is difficult to make any predictions over and above this first rough estimate. Furthermore, since strong hurricanes tend to be low probability high cost events, the rate at which reserves would in fact be accumulated, is likely to deviate substantially from any prediction one could produce, depending on whether the first few years have high or low hurricane activity.

In the long run, however, experience shows that the interest income the state run schemes can earn on their reserves end up being substantial. These incomes are then passed on to the customers in the form of further premium reductions.

4 Discussion.

In the preceding section we have limited ourselves to providing a rough first approximation of the kind of cost savings a mandatory state run hurricane insurance system might generate for the home owners. The purpose of this section is to provide a more detailed discussion of the main economic issues involved.

A The mandatory nature of the scheme

In the current situation the home owners can to a certain extent chose whether they wish to buy cover against catastrophes or not, and if they do what type of contract (deductible) they opt for. In practice, of course, the degree of freedom is not all that large because adequate insurance cover against hurricanes is usually a necessary prerequisite for obtaining a mortgage loan. Even for those home-owners who do not require a mortgage, the risk of having ones property totally destroyed is too large, and some kind of insurance cover is typically bought.

This being said, the introduction of a mandatory hurricane insurance scheme is undisputably a reduction in the house-owners freedom of choice. Since in practice a large part of the population opts for the 2% deductible, it would seem natural, that the mandatory insurance scheme also chose this solution.

There is, of course, nothing in principle to prevent the house-owners from buying private insurance to cover (reduce) this deductible, if they so wish. In practice the high transactions cost of providing such cover would essentially price it out of the market.

The mandatory nature is unfortunately a necessary prerequisite for making the hurricane insurance scheme financially attractive.

As mentioned above, one of the major cost savings of the scheme is that it allows the state insurance companies to work (almost) without sales agents. In Switzerland the public cantonal property insurance providers spend nothing on sales agents, in Spain the private insurance industry gets just a 5% commission for doing the paperwork with their customers. On the private property liability insurance market sales commissions typically make up between 15% and 20% of annual premiums.

One could not, of course, expect the sales agents to work for such a low commission, if they did in fact have to provide the customers with sophisticated advice on which type of cover best suits their needs. Hence the need to provide just one highly standardised contract.

The huge cost savings obtained by making the system mandatory can be further illustrated by looking at the National Flood Insurance program (NFIP). When devising this system, the legislator decided it should be optional. The NFIP thus depends on the sales efforts of the private insurance industry and their sales agents to sell their cover.

Over the period 1968-2005 the private insurance industry has kept a total of **30%** of the premium income collected, i.e. \$7.4 billion, just for the role of financial intermediary they play. **All** of the risks of the program (including the “Write Your Own” WYO policies) are borne entirely by the public sector⁸. The \$3 billion deficit the program accumulated prior to the 2005 hurricane season is thus in large part due to the excessive commissions which continue to be paid to the private insurance industry. Unfortunately the program officials know full well that their attempts to expand the coverage of the program depend critically on the sales efforts of the insurance agents. And, as the numbers show, these do not sell their services cheaply. The basic trade-off for the NFIP is thus the same as for the hurricane insurance program. Does the policy maker wish to leave the program optional, which means that the premium level has to be about 25% higher; or does he take the additional step of making it mandatory, thus permitting a premium reduction of around 25%.

The mandatory nature of the program also has the advantage of eliminating the problem of adverse selection. One of the reasons general administrative costs of the private insurance companies are so high, is that they devote substantial resources to risk screening. In a mandatory system the insurer by definition covers all the risks and the costs of risk screening disappear.

In summary, the cost savings that result from this streamlining of the system are substantial, but the reduction in the freedom of choice for the customers is undeniable.

B Claims settlement

As mentioned above, the state run insurance schemes in both Spain and Switzerland have massively lower claims settlement costs than the private insurance companies in the US. The benefits to the customers are, however, much larger than the substantial cost differential might suggest. The state run insurance schemes do not have a profit motive. There are no shareholders whose dividends might be increased if they managed to reduce the claims payments they make to the victims of a disaster. There are thus good a priori reasons to assume that their claims settlement policy will differ substantially from that of the private insurance sector. An interesting study recently tested this hypothesis empirically. It studied the degree of customer satisfaction in three countries (Germany, Austria and Switzerland) that were hit by the same heavy rainfalls and floods in August 2005. The best results were obtained by the mandatory system in Switzerland, both as regards the amount (fairness) of the claims payments and the speed with which the claims were settled⁹.

⁸ C.f. the Wharton Study p. 89 f.f.

⁹ C.f. Präventionsstiftung der kantonalen Gebäudeversicherungen (2009), „Alternative Finanzierungs- und Versicherungslösungen.“

In the US the dissatisfaction with the private insurance companies' claims settlement practices seems to be increasing quite rapidly. The bitter recent debates as to the question whether the destruction of a house was caused by the hurricane (immediately preceding the flooding) or the subsequent flooding is a good example of this trend. The introduction of a mandatory hurricane insurance scheme would substantially alleviate the uncertainties currently faced by a Florida household once the hurricane damage has actually occurred.

C Prevention.

It is widely accepted that the cost of hurricanes can be substantially reduced if the owners take appropriate preventive measures. The topic of which type of low cost changes to existing buildings can best reduce the cost of hurricanes is currently being intensively researched, but the evidence available is clear: when it comes to a direct hit by a major hurricane, the destruction of the building is practically certain. However, this scenario applies only to a relatively small fraction of the properties damaged by hurricanes. When it comes to lower wind speeds, a lot can be done with simple measures, whose costs are (substantially) lower than the expected benefits.

For new buildings the implementation of more severe building regulations would, of course, seem a natural response to an increase in hurricane activity.

It is widely accepted that the implementation of such cost reducing measures also has substantial positive external effects. The better one house resists the winds, the lower the chance of the neighbouring houses being hit by its debris and the better the wind protection they get from the neighbouring buildings. The existence of a state run hurricane insurance scheme can improve the incentives to invest in prevention in several ways.

First by implementing an appropriate system of premium rebates it can give the house-owners strong financial incentives to invest in preventive measures. As compared to private insurance providers it has two major advantages in this respect:

- The house-owner has the certainty that in the event of a sale the next owner will continue to benefit from the same premium rebates (there is only one insurance provider). Investing into preventive activities is thus financially more attractive. (It increases the resale value of the property).
- When determining, what is the "appropriate" financial incentive to provide, the unique insurance provider will also take into account the expected reduction in damages to neighbouring buildings (the externality). This is not the case for the individual insurer active on a competitive insurance market.

Second it is much more cost efficient to implement information campaigns (e.g. through newspapers, TV etc) if one knows that a large fraction (100%) of the population one reaches is ones own customer.

Third the fact that adequate building codes exist is unfortunately no guarantee that they will also be implemented. In Switzerland the mandatory state owned insurance providers not only participate in the drawing up of residential zoning plans, they also collaborate closely with the

construction industry to make sure that the building codes are respected. Their financial incentive to do so is, of course, the future cost savings in terms of reduced claims payments.

D Financial situation

As mentioned above, any insurance scheme taking on the hurricane risk of the whole of Florida will, of course, be in a critical financial situation in the first few years of its existence. It could try to reduce this risk by taking out extensive cover on the re-insurance market. However, the more it goes down this road the less reserves it can accumulate (in expected terms). If it does keep a substantial part of the risks on its own books, and a major catastrophe does strike in the first few years, its reserves will not be sufficient to cover its costs.

Even now this is an argument that is being frequently put forward to criticise the existence of Citizens [c.f. von Ungern-Sternberg (2007)] and to a lesser extent the FHCF.

The most obvious way to address this problem is to adopt the same mechanisms that have already been put in place to allow both Citizens and the FHCF to cover their deficits. The mandatory hurricane insurance scheme should be given the possibility to cover its deficits by levying surcharges (assessments). Just as for the case of Citizens, these surcharges should be limited in any given year so as not to impose excessively high unexpected costs on the home owners. Should these assessments prove insufficient the rest should be covered by issuing state guaranteed bonds.

The necessity to resort to such assessments should be smaller than is currently the case for Citizens. Indeed, while Citizens' customers are to be found mainly among the highest risk groups, the mandatory state hurricane insurance scheme would have a much more balanced and diversified risk portfolio.

Furthermore since even in the current situation Citizens can levy assessments on all home owners, the situation for the low risk customers would not change much.

There are good reasons to believe that the good risks also will end up being financially better off than in the current situation. In the last two decades several sometimes large private insurance companies have declared bankruptcy when faced with the costs of a major disaster. The best known example is the Poe Insurance company, which went bankrupt in the aftermath of the 2005 hurricane season, leaving the State Guaranty Association with a bill of around \$750 million. There is widespread belief that some of the small insurance companies that have bought up parts of Citizens' portfolio in recent years may well have a similar fate the next time a major hurricane strikes. The pattern is simple: An insurance company rapidly accumulating a high risk portfolio can make good money and pay out handsome dividends to its shareholder if it is lucky enough to have no major disaster in the first few years. The initial investment is thus rapidly recuperated. When a major event does occur the assets are insufficient to cover the liabilities and the Guaranty fund is left to cover the losses. The necessary funds are, of course, raised through assessments on all the home owners.

This highlights a further major advantage of the state monopoly insurers. Since there are no shareholders, the premium income cannot be paid out in the form of dividends and/or share buybacks. Furthermore, management compensations are supervised by the state. As a result, the premium income paid in the past is certain to be available when a catastrophe strikes.

One caveat should, however, be noted in this respect. It is essential that the Hurricane insurance should be organised in such a way that its accounting and finances are clearly separated from the rest of the States finances. If this is not done, there is a real danger that the reserves of the insurance company might be used to cover the states deficits in other domains.

This is in fact what occurred when the Consorcio in Spain was given its autonomous structure in 1990. The price of its greater independence was that the Consorcio had to leave its accumulated reserves with the ministry of finance, and start again from zero.

E Premium structure - the precision of the models.

The exposure to hurricanes is of course very different depending on the location of the house, the type of construction etc. To have any chance of political acceptability the premium structure of the mandatory hurricane insurance scheme must take these differences of exposure into account. An obvious point of departure would be to use the expected claims costs of one of the existing hurricane models as a reference point. It is, however, undeniable that these models are by no means precise. It thus seems reasonable that the premium structure should be adapted every 5 years or so to take into account the effective costs of hurricanes over the preceding period.

Similarly, once the reserves of the hurricane insurance have reached an adequate level the home owners should receive premium rebates. While it is certainly useful for the hurricane insurance scheme to have an adequate level of reserves, there is no reason why the insurance should be able to accumulate huge levels of reserves at the cost of the home owners. To the contrary: one of the major advantages of a mandatory insurance scheme is the possibility to cover the costs of catastrophic events through ex post assessments rather than through the accumulation of huge and potentially unnecessary reserves.

F Competition on the Florida property insurance market.

It should be emphasised that the creation of a monopoly hurricane insurance should lead to additional savings for the customers that stem from a more indirect source. Several major insurance companies have massively reduced their exposure to the property insurance market in Florida, because they do not want the exposure to the hurricane risks.

Well known examples are "State Farm Group" which reduced its market share from 30.5% in 1992 to 20.1% in the year 2000 and "Allstate Insurance Group" which reduced its market share from 20.4% in 1992 to 11.2% in the year 2000. The main reason for this massive reduction in market share was the cost of the high hurricane risk. Once the hurricane risk is transferred to a mandatory state insurance scheme, the insurance companies would have every incentive to once again increase their exposure in the other more traditional (and less risky domains) of property insurance in Florida such as fire, theft, water damage etc. This increase in competition should exert downward pressure on the premium level in these other traditional domains.

5 Conclusion

The empirical evidence from several European countries showing that mandatory state operated insurance schemes can provide efficient global cover against the consequences of natural catastrophes spans several decades. The evidence that the most exposed Florida properties are not getting a cost efficient insurance cover from the private insurance industry is just as convincing. Not only are the home-owners faced with premiums that substantially exceed their expected loss costs; when a hurricane does strike the process of obtaining adequate compensation from the insurance companies can become a nightmare. That is, of course, if the insurer does not declare bankruptcy and lets the Guaranty Fund (the Florida house-owners) foot the bill.

The purpose of this paper was to set out the advantages for the Florida house-owners, if the legislator were to introduce a mandatory state run hurricane insurance system along the lines of the institutional settings that have proven their efficiency in Europe.

We have emphasised that the mandatory nature of the system is one of the key corner-stones to its success. As long as the system is voluntary, it will be the private insurance companies which reap most of the benefits of the system: either in the form of excessive compensations for their sales efforts (c.f. the NFIP) or in the form of “cream skimming” where the state is left holding most of the bad risks (c.f. Citizens).

The State of Florida has already introduced a system of assessments, which allows both Citizens and the FHCF to cover potential deficits by levying ex post surcharges on all the Florida house-owners. This possibility is a necessary prerequisite for getting a mandatory hurricane insurance system started. The scheme would not have sufficient reserves if Florida were to suffer a bad hurricane season in the first few years of its existence.

However, the European examples show that in the long run, the mandatory state run systems are able to provide a much better insurance cover at considerably lower costs. The reasons they can do this are straightforward:

- Their sales and loss adjustment costs are considerably lower.
- They have much stronger incentives to develop and implement an efficient strategy of damage prevention.
- They use their premium and interest income to pay for their customers’ losses rather than distributing them in the form of dividends, share buybacks and inflated executive salaries.

The Florida policy maker has already gone some way in the right direction with the creation of both Citizens and the FHCF. So far, however, he has not had the necessary courage to take the final essential step and make the participation in a state run insurance scheme mandatory.

Just a few years ago, many politicians thought they could defend the private interests of the insurance industry by appealing to the blind faith in the advantages of a “free competitive market” over any state run solution. Recent economic events have more than shaken peoples belief in the advantages of unregulated markets. The question, what is the appropriate level of state regulation is fast moving to the top of the political (and scientific) agenda. As regards the insurance against natural catastrophes the empirical evidence is overwhelming. From the perspective of the house-owner, a mandatory state operated insurance scheme is far more efficient than any of the other mixed solution being experimented with. All that is missing is the political lobby to implement it.

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Appendix 1

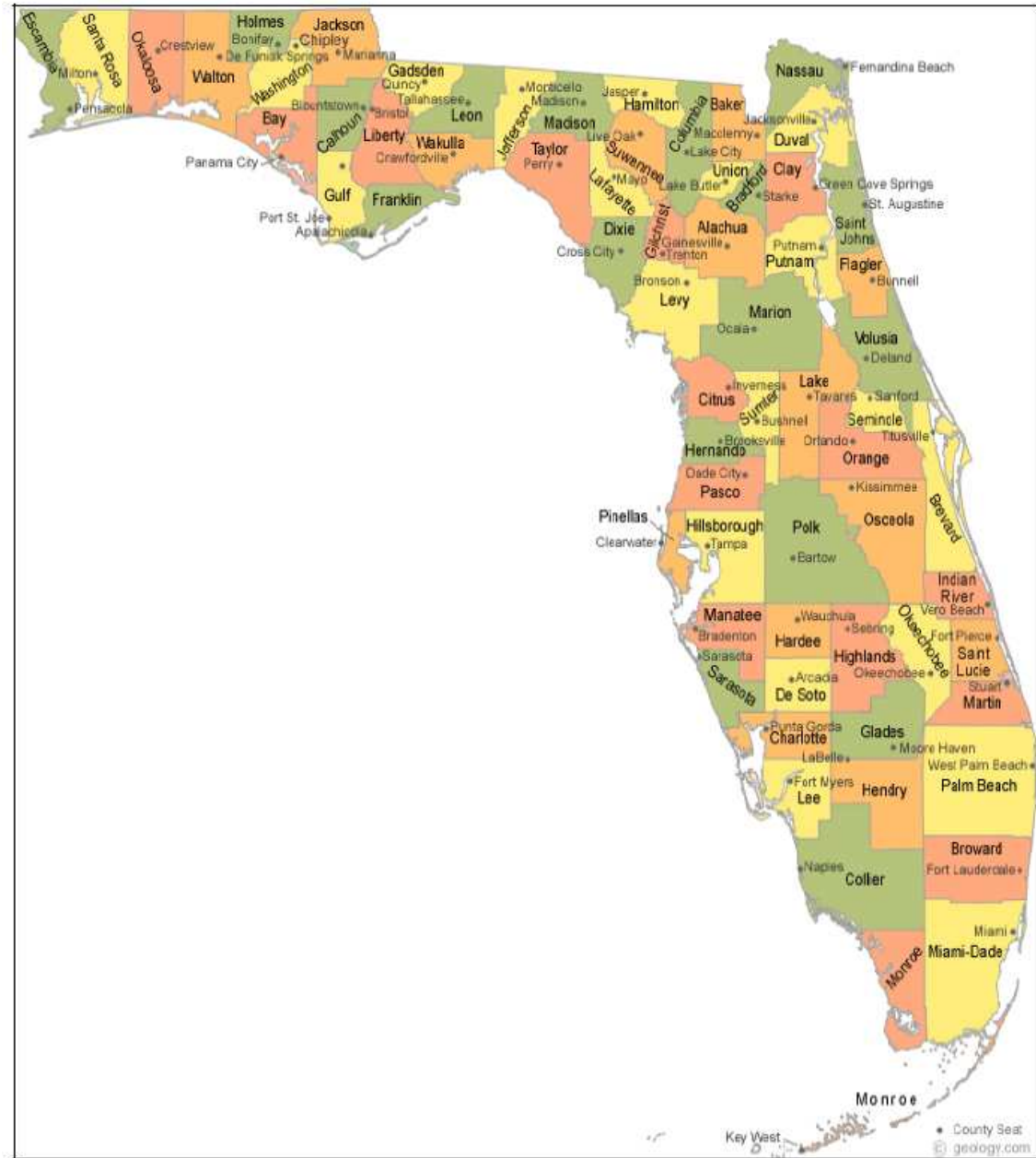


FIGURE 3.1. MAP OF COUNTIES AND MAIN CITIES IN FLORIDA

Appendix 2

TABLE 3.8. HOMEOWNERS INSURANCE RATES PER \$1,000 BY COUNTY IN FLORIDA

| County | 1997 | 2006 | County | 1997 | 2006 |
|--------------|---------|---------|------------|--------|--------|
| Monroe | \$18.98 | \$30.70 | Hamilton | \$4.14 | \$3.78 |
| Dade | \$7.23 | \$10.57 | Gadsden | \$3.61 | \$3.78 |
| Franklin | \$6.42 | \$8.13 | Lafayette | \$4.36 | \$3.71 |
| Gulf | \$4.90 | \$7.36 | Washington | \$3.81 | \$3.70 |
| Broward | \$5.35 | \$7.20 | Highlands | \$3.24 | \$3.62 |
| Palm Beach | \$4.45 | \$6.48 | Gilchrist | \$3.89 | \$3.57 |
| Walton | \$4.47 | \$6.29 | Liberty | \$4.15 | \$3.56 |
| Indian River | \$3.80 | \$5.67 | Calhoun | \$3.80 | \$3.54 |
| Martin | \$3.66 | \$5.63 | Volusia | \$2.77 | \$3.50 |
| Pasco | \$3.07 | \$5.15 | Polk | \$3.00 | \$3.49 |
| Pinellas | \$3.25 | \$5.13 | Union | \$3.78 | \$3.48 |
| Escambia | \$3.68 | \$5.01 | Suwannee | \$3.91 | \$3.46 |
| St. Lucie | \$3.95 | \$4.97 | Citrus | \$2.98 | \$3.40 |
| Collier | \$3.88 | \$4.93 | Madison | \$4.04 | \$3.34 |
| Bay | \$3.64 | \$4.83 | Jackson | \$3.64 | \$3.30 |
| Dixie | \$4.70 | \$4.72 | Putnam | \$3.60 | \$3.22 |
| Okaloosa | \$3.90 | \$4.53 | Bradford | \$3.41 | \$3.17 |
| Lee | \$3.34 | \$4.49 | Jefferson | \$3.86 | \$3.11 |
| Glades | \$3.96 | \$4.48 | Nassau | \$3.38 | \$3.07 |
| Charlotte | \$3.16 | \$4.47 | Baker | \$3.49 | \$2.97 |
| Santa Rosa | \$3.06 | \$4.34 | Osceola | \$2.67 | \$2.97 |
| Brevard | \$3.15 | \$4.33 | Columbia | \$3.35 | \$2.96 |
| Hernando | \$2.84 | \$4.32 | Flagler | \$2.76 | \$2.95 |
| Okeechobee | \$3.54 | \$4.29 | Seminole | \$2.53 | \$2.92 |
| Wakulla | \$4.26 | \$4.24 | Orange | \$2.66 | \$2.91 |
| Hendry | \$3.42 | \$4.22 | Marion | \$2.98 | \$2.90 |
| Holmes | \$3.89 | \$4.20 | St. Johns | \$2.71 | \$2.79 |
| Sarasota | \$3.30 | \$4.14 | Alachua | \$2.61 | \$2.76 |
| Hardee | \$3.87 | \$4.08 | Sumter | \$3.36 | \$2.72 |
| Levy | \$3.93 | \$4.02 | Lake | \$2.83 | \$2.70 |
| Taylor | \$3.76 | \$3.97 | Duval | \$2.76 | \$2.67 |
| Desoto | \$3.55 | \$3.96 | Leon | \$2.42 | \$2.38 |
| Manatee | \$3.37 | \$3.87 | Clay | \$2.55 | \$2.35 |
| Hillsborough | \$3.44 | \$3.81 | Total | \$3.87 | \$4.73 |

Source: Data from FLOIR; Authors' calculations

Appendix 3

| County | Premium | Cost (frame) | Cost (masonry) | Building (frame) | Building (masonry) | Cost (average) |
|---------------|----------------|-------------------------|---------------------------|-----------------------------|-------------------------------|---------------------------|
| clay | 2.35 | 0.27 | 0.24 | 6'718'058'335 | 3'373'016'520 | 0.26 |
| leon | 2.38 | 0.21 | 0.2 | 9'486'895'233 | 3'276'973'193 | 0.21 |
| duval | 2.67 | 0.27 | 0.24 | 25'387'956'407 | 15'982'550'722 | 0.26 |
| lake | 2.7 | 1.84 | 1.7 | 4'276'974'972 | 14'455'493'018 | 1.73 |
| sumter | 2.72 | 1.72 | 1.52 | 2'776'738'226 | 2'833'317'434 | 1.62 |
| Alachua | 2.76 | 0.295 | 0.26 | 5'867'396'014 | 3'964'177'264 | 0.28 |
| saint johns | 2.79 | 0.45 | 0.44 | 10'494'716'186 | 4'837'658'585 | 0.45 |
| marion | 2.9 | 1.54 | 1.3 | 4'014'489'653 | 11'448'654'073 | 1.36 |
| orange | 2.91 | 1.97 | 1.64 | 11'059'869'829 | 51'028'857'588 | 1.70 |
| seminole | 2.92 | 1.78 | 1.52 | 4'972'714'484 | 19'386'008'463 | 1.57 |
| flagler | 2.95 | 1.89 | 1.51 | 1'201'778'933 | 6'461'872'755 | 1.57 |
| columbia | 2.96 | 0.23 | 0.21 | 1'081'480'120 | 743'583'410 | 0.22 |
| Baker | 2.97 | 0.22 | 0.2 | 415'908'857 | 230'003'788 | 0.21 |
| osceola | 2.97 | 2.02 | 1.74 | 3'239'849'501 | 11'765'170'109 | 1.80 |
| nassau | 3.07 | 0.24 | 0.2 | 3'216'317'029 | 1'048'871'295 | 0.23 |
| jefferson | 3.11 | 0.19 | 0.17 | 348'171'573 | 98'551'816 | 0.19 |
| bradford | 3.17 | 0.24 | 0.22 | 298'280'563 | 256'816'127 | 0.23 |
| putnam | 3.22 | 0.38 | 0.34 | 981'563'861 | 927'882'234 | 0.36 |
| jackson | 3.3 | 0.29 | 0.26 | 920'546'314 | 396'265'072 | 0.28 |
| madison | 3.34 | 0.2 | 0.18 | 299'346'216 | 117'145'364 | 0.19 |
| citrus | 3.4 | 1.71 | 1.46 | 1'188'566'069 | 7'469'043'212 | 1.49 |
| suwannee | 3.46 | 0.19 | 0.17 | 591'659'058 | 297'260'499 | 0.18 |
| union | 3.48 | 0.26 | 0.24 | 117'443'982 | 99'599'257 | 0.25 |
| polk | 3.49 | 2.27 | 1.9 | 4'726'840'271 | 22'310'096'978 | 1.96 |
| volusia | 3.5 | 1.91 | 1.6 | 6'663'838'310 | 21'029'514'044 | 1.67 |
| calhoun | 3.54 | 0.35 | 0.32 | 173'258'472 | 89'147'696 | 0.34 |
| liberty | 3.56 | 0.28 | 0.25 | 91'171'266 | 42'565'155 | 0.27 |
| gilchrist | 3.57 | 0.36 | 0.32 | 161'032'227 | 141'390'587 | 0.34 |
| highlands | 3.62 | 2.44 | 2.05 | 593'783'329 | 4'155'520'766 | 2.10 |
| washington | 3.7 | 0.6 | 0.53 | 429'123'788 | 165'616'903 | 0.58 |
| lafayette | 3.71 | 0.26 | 0.24 | 67'973'812 | 39'197'602 | 0.25 |
| gadsen | 3.78 | 0.21 | 0.19 | 902'693'249 | 340'689'579 | 0.20 |
| hamilton | 3.78 | 0.17 | 0.16 | 153'656'986 | 62'303'689 | 0.17 |
| hillsborough | 3.81 | 2.25 | 1.85 | 10'599'994'068 | 50'445'716'013 | 1.92 |
| manatee | 3.87 | 2.77 | 2.19 | 2'773'877'141 | 17'767'992'760 | 2.27 |

| | | | | | | |
|------------------|-------------|-------------|-------------|------------------------|------------------------|-------------|
| desoto | 3.96 | 2.62 | 2.21 | 258'687'212 | 624'586'032 | 2.33 |
| taylor | 3.97 | 0.33 | 0.29 | 369'183'162 | 156'193'400 | 0.32 |
| levy | 4.02 | 0.43 | 0.37 | 449'375'821 | 555'247'276 | 0.40 |
| hardee | 4.08 | 2.47 | 2.05 | 170'639'184 | 400'467'160 | 2.18 |
| sarasota | 4.14 | 2.72 | 2.25 | 3'771'044'002 | 24'679'412'285 | 2.31 |
| holmes | 4.2 | 0.45 | 0.4 | 275'022'285 | 109'735'581 | 0.44 |
| hendry | 4.22 | 3.29 | 2.78 | 294'931'981 | 549'722'012 | 2.96 |
| wakulla | 4.24 | 0.31 | 0.28 | 943'920'311 | 197'973'852 | 0.30 |
| okeechobee | 4.29 | 2.69 | 2.25 | 302'026'216 | 778'302'284 | 2.37 |
| hernando | 4.32 | 1.81 | 1.58 | 1'260'673'218 | 8'491'895'396 | 1.61 |
| brevard | 4.33 | 2.44 | 2.03 | 6'508'660'842 | 24'966'297'878 | 2.11 |
| santa rosa | 4.34 | 1.56 | 1.42 | 6'739'951'901 | 1'993'892'319 | 1.53 |
| charlotte | 4.47 | 3.23 | 2.47 | 1'380'890'763 | 11'466'060'856 | 2.55 |
| glades | 4.48 | 2.94 | 2.45 | 41'330'895 | 69'934'924 | 2.63 |
| lee | 4.49 | 3.68 | 2.77 | 6'392'542'695 | 37'754'089'412 | 2.90 |
| okaloosa | 4.53 | 1.73 | 1.44 | 8'448'572'055 | 2'647'455'834 | 1.66 |
| dixie | 4.72 | 0.44 | 0.34 | 177'559'184 | 76'383'787 | 0.41 |
| bay | 4.83 | 1.18 | 0.91 | 6'094'211'708 | 2'490'734'564 | 1.10 |
| collier | 4.93 | 3.88 | 3.12 | 2'921'134'155 | 23'128'288'225 | 3.21 |
| saint lucie | 4.97 | 4.28 | 2.93 | 3'196'870'867 | 11'637'116'747 | 3.22 |
| escambia | 5.01 | 1.77 | 1.55 | 10'107'315'397 | 3'013'282'248 | 1.72 |
| pinellas | 5.13 | 2.48 | 1.93 | 8'702'892'046 | 36'494'762'183 | 2.04 |
| pasco | 5.15 | 2.01 | 1.65 | 3'090'357'478 | 18'913'651'244 | 1.70 |
| martin | 5.63 | 4.76 | 3.26 | 2'436'477'711 | 7'580'561'238 | 3.62 |
| indian river | 5.67 | 3.49 | 2.89 | 2'714'207'022 | 6'703'319'834 | 3.06 |
| walton | 6.29 | 1.13 | 0.89 | 3'892'555'424 | 784'537'926 | 1.09 |
| palm beach | 6.48 | 5.76 | 3.95 | 8'124'478'304 | 73'419'210'926 | 4.13 |
| broward | 7.2 | 7.03 | 4.61 | 2'419'357'706 | 72'950'012'666 | 4.69 |
| gulf | 7.36 | 0.85 | 0.71 | 714'729'116 | 124'325'981 | 0.83 |
| franklin | 8.13 | 1.5 | 1.35 | 918'992'719 | 88'552'766 | 1.49 |
| miami-dade | 10.57 | 7.57 | 4.87 | 2'287'220'472 | 74'375'858'571 | 4.95 |
| monroe | 30.7 | 9.2 | 9.4 | 2'435'626'347 | 4'362'430'418 | 9.33 |
| statewide | 4.73 | 2.03 | 2.78 | 133'128'794'508 | 305'140'163'452 | 2.55 |