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Subject: The Capitalization Of Stricter Building Codes In Miami, Florida House Prices

Hurricane Andrew, the costliest natural disaster in history up to that time, destroyed parts of southeastern Florida in August 1992. Twenty-five thousand homes were destroyed, 100,000 homes were damaged, and insurance claims totaled over \$16 billion (Fronstin and Holtmann, 1994). A contributing factor for the extensive damage was felt to be the erosion of building codes in the years leading up to the storm. After Hurricane Andrew, Broward and Dade (renamed Miami-Dade in 1997) counties passed tough new building codes (then known as the South Florida Building Code) which became effective on September 1, 1994. Following Hurricane Andrew, the next hurricane related losses of catastrophic proportions occurred over a seven-week period beginning in mid-August 2004. During that time, four hurricanes (Charley, Francis, Ivan, and Jeanne) made landfall in the southern U.S. resulting in a substantial number of deaths and billions of dollars in damage to residential and commercial properties. Florida was the only state to be directly impacted by all four hurricanes. Reinsurers Swiss Re and Munich Re estimated that the 2004 hurricane season (the four hurricanes and Tropical Storm Bonnie) represented more than two million claims. Total insured losses in Florida in 2004 exceeded \$25 billion (Florida Office of Insurance Regulation, 2006)

In August of the following year, Hurricane Katrina made landfall in Florida as a category one storm. While it did not cause substantial damage in Florida, the hurricane strengthened over the Gulf of Mexico and was a category three storm when it made landfall near New Orleans, Louisiana. Catastrophic losses from wind, storm surge, and flooding resulted in Hurricane Katrina being the costliest hurricane in history with losses in excess of \$81 billion (unadjusted for inflation) (Blake et al, 2007). In addition to Hurricane Katrina, Hurricanes Rita, Wilma, and Dennis made landfall in Florida in 2005. Insured losses in Florida from the four hurricanes were in excess of \$10.8 billion (Florida Office of Insurance Regulation, 2006). Total insured losses in Florida from the 2004 and 2005 hurricane seasons were approximately \$36 billion (Florida Office of Insurance Regulation, 2006). The Insurance Information Institute (2004) estimated that

one-fifth of homes in Florida were damaged by the 2004 hurricanes. Although significant, the total damage was reduced because of stricter building codes instituted after Hurricane Andrew. Research shows that newer homes built under tougher building codes perform better in hurricanes. However, while houses built after the implementation of the stronger building codes in South Florida could be presumed to be “safer” based on previous research, no study has measured the extent to which these stricter building codes are valued by consumers. This study addresses this issue by measuring the capitalization of the stricter building codes into house prices. In addition, the study examines whether homebuyers attach greater value to the stricter building codes after the “reality check” of the 2004 and 2005 hurricane seasons.

Mitigation against disaster, including hurricanes, is a complex issue. Consumers must first recognize and value safety and then be willing to pay a premium for safety and to bear the cost of mitigation. To more fully understand consumers’ attitudes toward disaster mitigation, specifically building codes, this study reviews a wide range of literature on topics including (1) consumers’ attitudes toward recognition of risk, their demand for safety, and their willingness to pay for mitigation, (2) building code regulations and housing, (3) the cost effectiveness and price effects of disaster mitigation through tornado shelters, and (4) the determinants of residential property damage caused by hurricane disaster.

A hedonic pricing model is used to capture the differential effect on house prices of the stricter 1994 South Florida Building Code for properties sold from 2000 through 2007 in Dade and Broward Counties. The model also measures any increase in the marginal value of the stronger building code after the 2004 and 2005 storm seasons. Results are presented for the aggregate data and for individual zones based on risk exposure. The results for the aggregate data (which appear to be driven primarily by the results for Zone 2) show no price premium for houses built under the new, stricter building code.

Results for the individual zones show that the stricter building code has a positive effect on selling price. The greatest effect is seen in the coastal zone, which has the greatest risk exposure. Selling prices for homes built under the new code in the coastal zone were about 10.4 percent higher than prices for comparable homes built under the older, less strict code. The premium for safety is shown to decrease as the hurricane risk exposure decreases. For geographical areas with less risk exposure, there is less capitalization of the stricter building code into house prices. The post-catastrophe (“reality check”) variables show that, following the minimal impact of the 2004 hurricanes on the Miami area, the premium that consumers are willing to pay for structural integrity disappears. However, after the 2005 hurricanes, which were more devastating to the Miami area, the building code premium returns.

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