AIRCURRENTS

DEMAND SURGE IN THE CURRENT ECONOMIC ENVIRONMENT

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EDITOR'S NOTE: The current worldwide economic slowdown has produced an increased supply of labor and has stabilized or caused the price of several construction materials to decline. Property values in particular have exhibited a general decline. Will these new conditions affect "demand surge," the phenomenon that is characterized by sharply increased rebuilding costs following a large catastrophic event? In this AIR Current, AIR Senior Risk Consultant Dr. Stuart Miller briefly reviews the demand surge phenomenon and then asks several questions about it, including what adjustments, if any, catastrophe model users should make when they take demand surge into account in the present economic environment.

By Stuart Miller, Ph.D.

Market forces generally ensure that the availability of materials and labor in any particular geographical area is sufficient to accommodate a normal level of demand without affecting price. However, when demand increases sharply and unexpectedly—as after a catastrophe event—consequent pressure on resources can cause prices to inflate. The relative scarcity of resources in such a situation can also result in increases in the time required to repair and rebuild damaged property. Also, there often are add-on costs associated with post-catastrophe rebuilding efforts, such as for the transportation and lodging of workers who cannot stay in the most devastated areas.

In concert with other economic factors, these circumstances can lead to insured losses that exceed "normal" expectations for a particular event and portfolio, which are based on the assumption that sufficient resources are readily available at current prices. This phenomenon is referred to as demand surge. The greater and more widespread the damage from an event, the greater is the potential for demand surge–and thus the greater the probable insured losses.

DEMAND SURGE AND THE CURRENT ECONOMIC ENVIRONMENT

Research by AIR has shown that demand surge is fundamentally a phenomenon associated with large-loss events. Indeed in the AIR peril models, the demand surge function is not triggered until industry insured losses from an event exceed $5 billion dollars (in the continental U.S.—although lower in Alaska and Hawaii). This loss trigger is based on AIR's analysis of historical movements in labor and materials prices following actual events.

Questions have recently been raised as to whether the phenomenon of demand surge is applicable in the current economic environment. Certainly when there is an increased supply of labor because of high unemployment, it is possible the demand surge function could shift to the right. That is, because it may take longer for available resources to be exhausted due to slack in the regional labor market, any given industry loss will produce a lower demand surge factor (inflationary effect). On the other hand, it is also possible that a recessionary environment could lead to a decline in inventory of construction materials. Such a fall in supply

For information on the development and validation of AIR's demand surge functions, which vary by coverage, AIR clients may wish to access the technical document The AIR Demand Surge Function on the client confidential pages of the AIR website.

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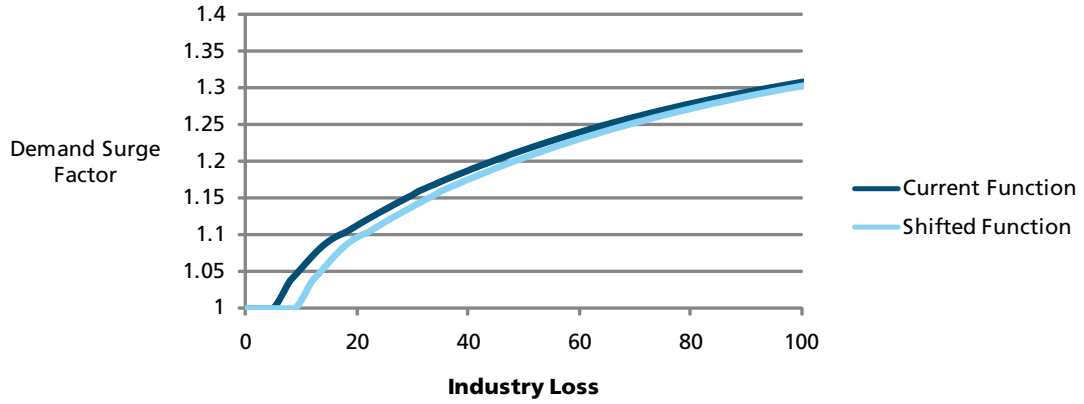


Figure 1: Standard and Shifted Demand Surge Functions

could cause materials prices to stabilize or even rise. It is difficult to say a priori which effect would dominate. In the discussion that follows we examine the former case, which Figure 1 illustrates. Note that the shifted demand surge function also raises the triggering loss from, in this case, $5.5 billion to $10 billion. Starting the curve at this amount of loss effectively sets a threshold for demand surge at losses the size of those from Hurricane Wilma (2005).

The impact of this assumption on a U.S.-wide notional portfolio that covers hurricane and earthquake perils can be tested using AIR's standard 10,000-year stochastic catalog. The impact on the exceedance probability curve is shown below in Table 1, which also provides a comparison with the "no demand surge" case.

Table 1: Impact of Shifted Demand Surge Function on Modeled Losses

Exceedance Probability	Impact on Losses of Applying Demand Surge	Impact on Losses of Shifting Demand Surge Function
Average Annual Loss (AAL)	16%	-1.12%
5.00%	18%	-0.93%
2.00%	26%	-0.37%
1.00%	29%	-0.74%
0.4%	33%	-0.40%
0.2%	34%	-0.00%
0.1%	35%	-0.12%

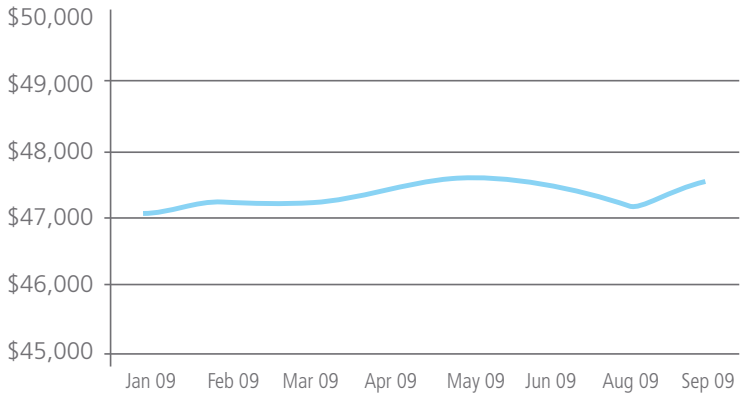
As demonstrated above, even a notable shift in the demand surge function has a negligible impact on the distribution of industry losses. As to whether there is evidence to argue that demand surge no longer applies at all, AIR does not see sufficient basis for such a conclusion at present.

THE RELATIONSHIP BETWEEN FALLEN HOUSING PRICES AND DEMAND SURGE

Home prices also have exhibited a significant decline in recent years, and AIR has received inquiries concerning what relationship there might be between housing prices and demand surge. However, while the decline in home prices holds important implications for the economy as a whole, its implications for demand surge are rather muted. This is because demand surge is driven by the costs of replacing and rebuilding structures. While the market (buying) prices of existing home have fallen notably, the cost of rebuilding those same homes has not.

AIR monitors monthly movements in labor and materials costs published by Xactware® in order to study the pattern of rebuilding costs. The fluctuation in costs is shown in Figure 2 below. Construction costs have remained stable while housing prices have declined. Based on this information, AIR does not recommend altering replacement values without conducting a supporting insurance-to-value analysis.

Figure 3: U.S. Cost of Basket of Goods: Labor and Materials (Source: Xactware)



OTHER RELEVANT FACTORS?

AIR's demand surge function provides catastrophe model users a tool to estimate the potential increases in rebuilding costs after major catastrophe. This information holds significant implications for claims paid—and for the insurer's and reinsurer's bottom line.

While an understanding of demand surge is important, an understanding of what demand surge does not include is equally important. Adjustments for additional factors influencing losses such as hazardous waste cleanup, loss adjustment expense and insurance to value are company specific and not included in AIR's demand surge function. AIR recommends that marketplace solutions be used to address such matters; those solutions can then appropriately complement the results obtained from using the demand surge function.

CONCLUSION

AIR's demand surge function is based on observed changes in materials and labor costs that have followed historical events. Although slow economic growth may restrict increases in post-event reconstruction costs, particularly labor costs, there is insufficient evidence to assume demand surge would not occur for a large-loss event. Thus, AIR recommends the continued application of demand surge and encourages clients to examine the implications of different demand surge behavior by making use of the demand surge customization capability in AIR software.

REFERENCES

1 FOR INFORMATION ON THE DEVELOPMENT AND VALIDATION OF AIR'S DEMAND SURGE FUNCTION, AIR CLIENTS MAY WISH TO ACCESS THE TECHNICAL DOCUMENT THE AIR DEMAND SURGE FUNCTION AVAILABLE ON THE CLIENT CONFIDENTIAL PAGES OF WWW.AIR-WORLDWIDE.COM.

2 FOR SOLUTIONS TO INSURANCE-TO-VALUE CONCERNS, CLIENTS MAY WISH TO ACCESS ADDITIONAL INFORMATION ON ISO'S 360VALUE, WHICH IS AVAILABLE ON AIR'S WEBSITE.

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