

## Essay on the Financial Crisis

by Andrew Winkler

The current crisis is catalyzing an array of responses, including searching for causes, reworking regulations, scapegoating and a massive capital injection. Without a clear understanding of the cause, the remedies may do more harm than good, innocents may be scapegoated, and valuable progress in financial tools may be lost. Worse, it will happen again.

From a simple mathematical model of the underlying economics, I first predicted this crisis in July of 2004. An economic dynamic relating very low interest rates to the structure of the demand curve in the housing market made this outcome foreseeable, indeed inevitable. The current crisis had a mathematical cause. There isn't space here for full explanations; see *mattersofinterestmatters.blogspot.com*.

This much is clear to everyone—the crisis results from an epidemic level of mortgage defaults, in turn caused by ballooning monthly payments from variable rate mortgages, caused by a rise in interest rates from historically low levels. This made the monthly payment change quite large, because while the rise was small in absolute terms, it was huge in relative terms.

The simultaneous plummet in property values made default the only option. This is the effect which we must understand—why do low interest rates cause a bubble in real estate value, and why do rising interest rates burst that bubble?

Like all equilibrium pricing, there is a supply curve and a demand curve for housing. Over the short term, the housing supply can't change, so it's the demand curve that's crucial. The two central facts are these: for reasons we'll discuss, buyers buy a monthly payment, not a house price, and buyers buy as much house as they can afford.

This brings us to the heart of the matter: mortgages that require no down payment, and only interest payments, alter the structure of the demand curve for real estate, in a way that is harmless enough when interest rates are high, but which drives a bubble at low interest rates. Specifically, they

make housing prices inversely proportional to the interest rate. If interest rates are cut in half, house prices double. When those rates double, house prices are slashed in half. When interest rates are large, they are not likely to double or halve, but when interest rates are small, a small adjustment can be a big percentage change, and the danger of big swings in housing prices is appreciable, even inevitable.

With no down payment, no amortization and closing costs folded into the loan, the only issue in affording a house is the monthly payment, which is the house price multiplied by the interest rate. If interest rates are cut in half, the house you can buy with a given monthly payment costs twice as much. But the same number of people with the same income distribution are competing for a fixed stock of housing. The house price is bid up until the new monthly payment at the new interest rate matches the old monthly payment at the old interest rate. The house price varies inversely with the interest rate.

The effect is somewhat mitigated, ironically, by property taxes, which effectively raise the interest rate, but it's no accident that the bubble occurred during a time of historically low rates, and burst when those rates rose again.

This perfect storm required the confluence of a number of factors, each one of which was at worst innocuous and at best virtuous. The traditional mortgage had several features which had recently been relaxed; fixed rates were forced by unpredictable inflation rates to become variable; sophisticated credit models and rising markets made down payments and amortization less meaningful. Each of these innovations, in isolation, represents a significant advance in making home ownership affordable and available. Interest rates were low for valid economic reasons. Taken together, however, they arm a trap which springs when interest rates dip by a significant factor, and then rise again.

But that raises significant issues. Why would homeowners walk into that trap? Why would mortgage lenders? Dr. Alan Greenspan recently testified that he discovered

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a flaw in the model of how the world works, that he had relied on the self-interest of lenders to act rationally.

The market worked, however. Supply met demand.

To fully understand what did happen, and why, we need to answer three questions: Why do buyers buy a monthly payment? Why do buyers buy as much house as they can afford? Why didn't lenders see the trap, and avoid it? The short answer is that supply and demand are not magic; they're Selection at work, which tells us the limits of the model.

Economic activity is human activity is biological activity is physical activity. And physics, the body of knowledge, is simply a collection of technologies for calculating probabilities, with the key insight being the Principle of More. In biological systems, the Principle of Selection occurs in at least two distinct forms, the Principle of Natural Selection, and the less familiar, but more important, Principle of Sexual Selection.

The Principle of Natural Selection, if you recall, states that a heritable trait which confers a higher degree of probability of survival to an individual, has a higher probability of surviving in a population; while the Principle of Sexual Selection states that a heritable trait which confers a higher degree of probability of having offspring, has a higher probability of surviving in a population.

Seen in this light, maximizing utility, which drives both supply and demand, means neither more nor less than maximizing the long run number of surviving offspring. Any economic behavior that raises the probability of survival, or of offspring, which is also heritable, whether as DNA or cell structure or ideas or skills, will predominate. This makes supply meet demand, and forces the time value of money.

But nobody knows the future. Biological selection can't (or at any rate hasn't) given us the power to formulate decisions based on perfect knowledge of the future. Rather, it gives us tendencies and faculties that have, on average,

worked better in the past than the alternatives did.

Why do buyers buy as much house as they can afford? Sexual selection forces it, as does natural selection. You don't want your kids exposed to drive-by shootings or gang violence. You do want your kids to be attractive, and you know that your display of wealth will have a real impact on their attractiveness. Don't shoot the messenger—I'm not lauding that undeniable fact.

Why do buyers buy a monthly payment? There are two, related reasons. It reduces what is at heart a very complicated transaction full of unknowable future uncertainties to a single, knowable, comprehensible number. The other reason has to do with personality, itself a manifestation of Sexual Selection. Estimates vary, but around 40 percent of the population of the United States has the "Improviser" temperament, characterized by a preferred reliance on the "extroverted sensing" cognitive function, profound awareness of sensory input from the external world, creating a strong orientation to the "here and now," and a relative blindness to the past or the future. For such a person, the monthly payment is the "here and now".

Another approximately 40 percent of the population of the United States has the "Stabilizer" temperament, characterized by a preferred reliance on "introverted sensing," a deep awareness of sensory memory, creating a strong orientation to the past, and a keen awareness of standards and tradition, as well as a strong bias that whatever used to work is going to continue to work, and a high level of trust in "the system". For such a person, the fact that a mortgage product contains innovative elements would be counterbalanced by the source of those products—(formerly) large rich prestigious established institutions.

Both Stabilizers and Improvisers share a strength, in noticing details, as well as a vulnerability, in sometimes missing patterns, and in being relatively unaware of the future.

The two other temperaments, Conceptualizers and

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Catalysts, share a strength in noticing patterns, as well as a vulnerability, in sometimes missing details, and in being overly future-focused.

Which brings us to why lenders failed to see the trap. Wall Street has a strong bias for detail-focused rather than pattern-focused people. Businesses do in general. The mathematical component of the GMAT tests heavily your knowledge of Euclidean geometry, which has been essentially useless since the days of Descartes, but draws heavily on your “extraverted thinking” faculties, largely ignoring your analytic “introverted thinking” capabilities.

As such it is largely a test for identifying smart Stabilizers. Quant interviews lean heavily on “fact sheet” questions, or tricky problem solving. Einstein need not apply here! Asked what the speed of sound was, he wondered why he would bother to memorize something he could look up in an encyclopedia. In the modern world of rapid technical advance, businesses which rely solely on the Improviser’s here-and-now, real-time response have become just as vulnerable as those which rely solely on the Stabilizer’s resistance to innovation.

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