Lesson Notes

MODULE 5 | LESSON 4

LEVERAGE AND CRISIS

Reading Time	30 minutes
Prior Knowledge	Debt-to-Income (DTI) ratio, Loan-to-Value (LTV) ratio, Collateral, Interest rate, Moral hazard
Keywords	Correlation, Wealth effect, Credit-price effect, Leverage

In the last lesson, we compared equity and the credit market in terms of overall size. We also quantified the relationship between bond yield and probability of default. We learned about CDS and credit ratings as indicators of credit risk (in terms of probability of default). We also discussed ways of assessing and quantifying liquidity.

In this lesson, we observe an example of correlation in the real world, namely the stock and real estate markets (especially in Turkey). We observe the role of leverage in this correlated relationship as well as the risks of leverage in individual transactions (e.g., trading stock "on margin," buying a house with a mortgage, etc.) as well as in the larger market (widespread increases in DTI). The latter led to the Great Financial Crisis, which required governmental response in the form of regulation.

1. Correlation, House Prices, and the Stock Market

We have discussed the strong relationships between many factors or variables, for example, between probability of default and credit spread: When one increases, we expect the other to increase. We can measure the strength of this relationship in many ways, but one of the most basic is correlation: the strength (and direction) of a "linear" relationship. There is a linear relationship between two variables when the graph of the two variables more or less fits on a straight line. Read the "Interpreting Correlation" (EngageNY) educational content to develop a strong intuition for this fundamental concept—to which you will return many times over the course of this program and probably your career. Note: We use Pearson correlation in this lesson, which is considered parametric, meaning it assumes the data have particular distributions. Spearman and Kendall correlations do not make assumptions about the distribution of the data–but these alternative correlations still measure the association between two variables, i.e., the degree to which two variables move in the same direction or opposite directions.

With your fresh and thorough understanding of the concept of correlation, read the introduction and literature review of the required reading paper, "The Relationship between Stock and Real Estate Prices in Turkey: Evidence around the Global Financial Crisis." Yuksel discusses two ways that we might understand the relationship between the stock and real estate markets: the wealth effect and the credit-price effect. In both views, there is a positive correlation between prices in the two markets. There also appears to be a positive linear relationship between these markets and the economy (both globally and in Turkey) as measured by GDP, as you might expect.

According to the "wealth effect" mechanism, in a rising stock market, would you prefer to buy or to sell a house? It's a good time to sell your house because the increased demand for real estate means you can get a better price. It's a bad time to buy because prices are increasing.

According to the credit-price effect, rising real estate prices should help the stock market by allowing companies to borrow more (to invest in their own operations) and at cheaper rates. Say you wanted to invest during a time of rising interest rates in only one of two very similar companies in the same industry: "Big Prop Inc." (BPI), which has significant real estate holdings or "NoMaD Inc." (NMDI) with no real estate assets. The credit-price effect suggests that BPI can borrow more or at cheaper rates than NMDI because BPI has more collateral to secure its loans. (Recall that collateral is one of the 5 Cs of credit analysis.) You would certainly want to take into account that BPI may have lower financing costs than NMDI when you analyze the two companies in more detail. On the other hand, say real estate prices have just started to decrease after years of rising. Now, you might be concerned about whether BPI is prepared for the resulting decrease in the property values that collateralize their loans, while NMDI's financing costs may not change as drastically because it didn't have as much debt in the first place.

1.1 Leverage Risk

As we see in the example of Big Prop Inc., borrowing has advantages and disadvantages. In that example, BPI was able to borrow more to invest in its operations and perhaps make more profit, but it was also vulnerable to additional risks in addition to those of its main operations—in this case, real estate price risk. As you read the required reading article "Leverage: What It Is and How We Can Profit from It," keep track of the various potential dangers and disadvantages of leverage that are mentioned.

Note:

1. The article mentions closed-end funds (CEFs) and exchange-traded funds (ETFs). These are distinct investment types, but in both types of these funds, you can buy and sell shares on an exchange, similar to traditional stocks. An investor in either of these fund types owns a portion of the underlying portfolio of securities. And, importantly, either may entail **leverage**, as described in the article.
2. This article also mentions swaps, which will be covered in much more detail in later courses. For now, just start to appreciate that certain financial products can enable very large amounts of **leverage**.

Now that you are familiar with correlation and leverage, you are ready to read "The Role of Housing and Mortgage Markets in the Financial Crisis." Notice you are already familiar with many of the mortgage-*related* credit terms—such as DTI (debt-to-income) and LTV (loan-to-value) ratios—from previous lessons. Indeed, you will read how "banks lent against increasing collateral values" (Adelino et al. 1) (which we recognize as the "wealth effect") and "underestimated the risk of defaults" (Adelino et al. 1), which we recognize as model risk. At the same time, there may be other technical terms that will make more sense as you make progress through the courses in this program.

As you read this paper:

1. Reinforce your understanding of the inherent relationship between borrowing and leverage. Note too that there are two types of leverage at play in this article: the leverage implied by buying a home with a low (or no) down payment and the leverage implied by DTI (debt to income, where debt is just another term for borrowing).
2. Use the 5 Cs of credit analysis to categorize the many factors that led to massive mortgage defaults.
3. Find as many examples of moral hazard as you can, whether or not they were explicitly discussed in the previous lesson.

2. Regulation and Crisis

Given the many types of moral hazard that proliferated at the time, it appears that the mortgage and housing markets were in need of some additional laws and stricter punishments for not adhering to the laws that were already in place. The above article (Adelino et al.) suggests that appropriate regulation could control or at least mitigate many of the factors that contributed to the Great Financial Crisis (GFC), and this echoes many of the arguments we read in a previous lesson from Schoen's "The 2007–2009 Financial Crisis: An Erosion of Ethics: A Case Study." The latter article also details many aspects of the damage from the GFC—most of which did not impact the major decision makers in the markets themselves—meaning that those players were able to take excessive risks without bearing the costs of those risks. As noted by Kling in his introduction, "[W]hen people are, themselves, exposed to the adverse consequences of their choices do they take risks that are constructive for society. When they do not have 'skin in the game,' they take risks that are harmful and dangerous."

Extensive regulation was needed due to the fact that the market was not able to address this large-scale moral hazard. Recall from Module 4, Lesson 4 that taking out a mortgage has a similar risk profile to having a call option—both of which are non-linear. The potential gains are significant (theoretically, infinite), but the risk of loss is very limited. Under such circumstances, you might be tempted to buy as many call options (or houses, using mortgages) as you possibly can because someone else has most of the risk.

Since the market did not develop ways to manage these moral hazards on its own, the government needed to step in with regulations. The market needed new "rules of the game": It needed regulations that would stop incentivizing (i.e., rewarding with handsome profits) risky behavior. As you read the article, make note of the activities and behaviors of market participants that could be considered unfair—which in turn demanded regulators step in. Also, keep track of the consequences of these actions and behaviors at the level of individuals as well as the financial system itself and society as a whole.

To balance this pro-regulation viewpoint, read this required reading, a review of Nassim Taleb's book *Skin in the Game*. Taleb became the world's most famous risk manager with his 2007 book, *The Black Swan*. Like Schoen, Taleb argues that moral hazard threatens society's best interests. The big difference is that Taleb sees regulation as a centralized restriction of freedom, which actually releases people from responsibility. In Kling's paraphrase of Taleb, "freedom and progress both depend on decentralization, which realigns decision-making with responsibility." While Schoen sees centralized rule-making (regulation) as the antidote to the moral hazards that evolve in financial markets, Taleb sees regulation as providing an excuse for market participants to behave unethically, so long as their actions are technically legal.

What do you think? Now that you are familiar with the incentives and behaviors that led to the Great Financial Crisis, and you have read about the arguments for and against financial regulation, join the forum and suggest some guidelines for regulations in the mortgage market that might help avoid similar catastrophes in the future, while ensuring the proper functioning of the mortgage market. Or propose to your peers *what is* the proper function of financial markets in the first place? Please also respond to your fellow students' suggestions with your own thoughtful and constructive feedback.

3. Conclusion

First, we tried to unravel the correlation between the stock and real estate markets and we saw that leverage helped explain this correlation. We discussed how leverage can be very helpful or very dangerous. New regulations were required to combat the dangerous combination of leverage and moral hazard. In the next module, we take a deeper look at leverage by first defining it in terms related to the balance sheet. We also talk about various other forms of real estate finance: in relation to the real estate developer, the real estate investment trust (REIT), the landlord, and the renter. We also take a look at some innovative alternatives and supplements to the traditional home mortgage.

References

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