

Research

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Financial crisis: Why the contagion?

- We are amidst a financial crisis. We attempt in this note to give a stylised explanation as to why the negative effects on assets are amplified and why this entails contagion effects
- Balance sheet contractions are an important factor behind the spreading of the financial crisis.
- Since we do not know for how long this crisis will last, we believe caution is warranted.

Little strokes fell great oaks

Vicious circles in good times and bad

The fact that the theUS subprime market makes up a relatively small share of the total credit outstanding has previously been a source of comfort to the market. The small size of these risky credits was believed to be an insurance against contagion to other financial instruments.

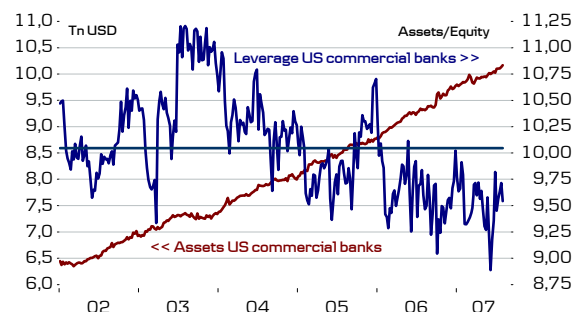
As it turns out, this was a false comfort indeed. Contagion is here and we are seeing all types of risk bearing instruments taking a beating. But why have these ripple effects come about?

One way of approaching this problem is by taking a look at the role of balance sheet expansion in the past few years. It is clear that the balance sheets at banks and hedge funds have expanded dramatically. However, what is important to acknowledge here is the fact that balance sheets expand and contract exponentially with changes in asset prices and volatility.

We have been through a strong expansion of balance sheets, which seems to have entailed rather indiscriminate buying of risky assets. What we are witnessing now seems to be an unwinding

and contraction of balance sheets. Such a process, especially when it happens swiftly, may cause an unravelling and thus indiscriminate selling of assets.

In the table below, we try to explain the workings of balance sheet expansion in a stylised manner. In order to maintain a stable level of leverage an investor with a leverage ratio higher than two (defined as assets divided by equity) will not only see its demand for assets rise as asset prices rise, but it will do this in an exponential manner. In the example we have used a leverage of ten, which incidentally is close to the average leverage among US commercial banks.



When assets rise, the investor will see its leverage decline. In order to bring back leverage to its

original level the investor will borrow money in order to buy more assets. However, it is clear that the debt and assets will increase at a rate much greater than the original asset price appreciation. Obviously, a higher demand for assets in the wake of appreciating asset prices will lead to further appreciation. This in turn entails greater demand for assets...and so on. We see a vicious (albeit asset-friendly) circle.

	Assets	Liabilities	Leverage
Starting point	Securities 100	Equity 10 Debt 90	10
Assets appreciate Equity appreciate Leverage declines	Securities 101	Equity 11 Debt 90	9,2
Debt is increased Assets are bought Leverage is restored	Securities 110	Equity 11 Debt 99	10

	Assets	Liabilities	Leverage
Starting point	Securities 110	Equity 11 Debt 99	10
Assets depreciate Equity depreciate Leverage increases	Securities 109	Equity 10 Debt 99	10,9
Assets are sold Debts are repayed Leverage is restored	Securities 100	Equity 10 Debt 90	10

Risk management adds to the leverage effects

In addition to this phenomenon, we should not forget the importance of risk management. The fact that the level of leverage in many risk models is a function of the market volatility adds to the exponential nature of balance sheet changes.

When risk bearing assets appreciate this is a reflection of greater risk appetite, which in turn is the same as cheaper volatility. Thus, in many investment banks the result is that the level of balance sheet leverage not only is kept stable, but it actually rises and falls with rising and falling asset prices.

In the table (above right) we have, for the sake of argument, divided the market into three different types on investors.

The least sophisticated investor is the average household. When a household sees its assets appreciate, say, because of rising house prices or stocks, the household is generally slow to adjust its leverage by borrowing more money and investing in more assets. It happens over time, but it is

a slower and less formalised process than among professional balance sheet managers. Moreover, demand for assets tends to decline as prices rise among households since households don't have formalised leverage targets. Common sense prescribes a normal demand curve, which seems to be the normal response for the average household.

A corporate investor will increase its balance sheet and buy more assets as asset prices increase, but the level of leverage generally stay close to the same target. In other words, the demand for assets is pro-cyclical in the sense that it rises with asset prices. This implies a perverse demand curve.

Finally, we see that the most adaptable investor, the investment bank or hedge fund, is the one that has the most extreme response to changes in asset prices and market volatility, and thus the most perverse demand curve.

	Speed of adjustment	Effect from lower risk	Demand for assets	Leverage
Households	Slow	Neutral	Neutral to negative	Declines
Corporates	Medium	Small	Increases	Neutral
Investment Banks	Quick	Expansion of BS	Increases strongly	Increases

	Speed of adjustment	Effect from higher risk	Demand for assets	Leverage
Households	Slow	Neutral	Neutral to negative	Rises
Corporates	Medium	Small	Declines	Neutral
Investment Banks	Quick	Contraction of BS	Declines strongly	Declines

Caution is warranted

We have shown the mechanics of balance sheet expansion. When asset prices start to decline the opposite happens. We see a major unwinding.

The fact that asset prices tend to decline faster in crises than they rise in times of bullishness can lead to dramatic consequences. Asset pricing, especially of more complex structures, becomes obscured. Moreover, potential losses among counterparties become unsurveyable, which hampers the willingness to trade. Hence, a liquidity crisis.

No doubt, we are witnessing such consequences now. The question is how far reaching the impact will be. We have no answer to this, but it is clearly an issue one should ponder upon with great gravity.

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