Understanding Mortgage Default

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The graph we’d like to understand

**Year-over-Year Change in Home Prices and Mortgage Default Rates**

Source: S&P/Case-Shiller National Home Price Index; S&P/Experian Consumer Credit First Mortgage Default Index
To understand the connection between default and house prices, start with the concept of net worth:

\[ \text{NET WORTH} = \text{ASSETS} - \text{LIABILITIES} \]

For a household whose only asset is a house and only liability is a mortgage,

\[ \text{NET WORTH} = \text{House value} - \text{Mortgage balance} = V - M. \]

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\(V - M\) is commonly known as “home equity.”
In most situations, home equity is positive, with house value \( V \) exceeding the mortgage balance \( M \).

But suppose the house value falls for some reason (e.g., bursting of a housing bubble).

If \( V \) becomes less than \( M \), home equity is negative and mortgage is said to be “under water.”

The household’s NET WORTH is then negative.
But if the household defaults on the mortgage, then the debt disappears, reducing liabilities to zero.

The house is also seized by the bank (foreclosure), so that assets are reduced to zero.

NET WORTH is then zero instead of negative, so that default increases NET WORTH.
Ruthless default?

So a household seeking to maximize net worth should default when home equity is negative.

This behavior is called “ruthless default.”

But while home equity matters in determining default, empirical studies show that some household characteristics matter too.

Are we missing something?

Yes, “default costs” also matter in the default decision.
Default costs

Default costs, denoted $C$, include

- Moving costs
- Guilt
- Cost of an impaired credit rating

Incurring default costs reduces $NET WORTH$,

So $NET WORTH$ with default is negative, equal to $-C$, not zero.
New default rule

Now default is desirable when

\[
\text{NET WORTH without default} = V - M
\]
\[
< \text{NET WORTH with default} = -C
\]

Home equity must be more negative than \(-C\) for default to be desirable.

Implies that lots of underwater households won’t default.

For example, households with top-notch credit ratings have a lot to lose, and will resist default.
Trigger events are events such as loss of a job, that appear to trigger default.

But our theory says that job loss should just lead to sale of the house if home equity is positive.

If home equity is negative, however, job loss can tip the scale in favor of default.

Since the household has to move anyway, the moving-cost element of default costs disappears.

Default may then be the right decision.
Defaulters as victims?

This picture of default as a net-worth-maximizing strategy differs from common depictions of defaulters as “victims.”

Newspaper stories refer sympathetically to defaulters as “losing their houses,” when in fact default is entirely voluntary.
Some unsophisticated households did take mortgages whose payments spiked after a few years, apparently precipitating default.

But if home equity had been positive, payment unaffordability would simply lead the household to sell the house, not to default on the mortgage.

Negative home equity is an essential ingredient of default.
The sharp decline in house prices during the financial crisis was the main driver of defaults.

But manipulation of our default rule $V - M < -C$ gives further insight.

Makes use of the fact that the mortgage balance $M$ equals the original house price $V_0$ minus the downpayment $D$.

So the default rule becomes $V - V_0 + D < -C$. 
Default rule can be further rewritten as

\[ V - V_0 + D + C < 0 \]

Three factors during financial crisis helped to satisfy this condition:

- Big drop in \( V \) (making \( V - V_0 \) strongly negative)
- Lots of subprime lending (low \( C \) for many borrowers)
- Easy mortgage terms, with low downpayments (low \( D \))

Created a “perfect storm” for mortgage default.
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Conclusion

Presentation has argued that mortgage default is an optimizing choice.

Defaulters are not victims.

Framework helps us better understand the surge in defaults during the financial crisis.