

On Moral Hazard and Macroeconomics

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"A model of moral-hazard credit cycles" (2010)

<http://home.uchicago.edu/~rmyerson/research/bankers.pdf>



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Introduction

Macroeconomists have learned much since 1929.

But the financial crisis of 2008 and its aftermath have shown that economists still need to learn more.

I will explain why I think we should look to information economics, particularly to the theory of moral-hazard agency problems, for much of the new understanding that is needed.



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A *General Theory* without bank failures or credit rationing

Much of macroeconomic theory follows from or responds to Keynes's *General Theory of Employment, Interest and Money* (1936).

But the *General Theory* discusses of saving and investment at length without seriously considering financial intermediation or bank failures.

His *General Theory* even ignores his own observations on how monetary policy can affect aggregate investment without changing interest rates.

"There is normally a fringe of unsatisfied borrowers to whom a bank would be quite ready to lend if it were to find itself in a position to lend more. The existence of this unsatisfied fringe allows the Banking System a means of influencing the rate of investment supplementary to the mere changes in the short-term rate of interest." Keynes, *Treatise on Money*, 1930.

Why did he omit this vital observation from his "General Theory"?

Such credit rationing may have seemed theoretically indefensible in 1936...

Credit rationing from moral hazard

Credit rationing may have seemed theoretically indefensible in 1936, but 35 years later, Stiglitz and Weiss (1981) derived it from *moral hazard* and *adverse selection* in finance.

When an entrepreneur borrows from a bank to finance a new venture, the probability of its success may depend on entrepreneurial efforts that a bank cannot directly monitor.

To motivate such hidden efforts, the borrower must anticipate substantial profit from his venture's success (*moral hazard rents*).

This need to let borrowers keep enough profit from their success can impose an upper bound on the interest rate that banks can charge.

So interest rates might not rise even when qualified eager borrowers cannot find funds.

The vital role of information economics

Problems of getting people to choose hidden actions appropriately are called **moral hazard**.

Problems of getting people to share hidden information honestly are called **adverse selection**.

Such problems of agents having different information are analyzed by modern **information economics**, which first developed in 1970s.

Banks and other financial intermediaries earn profits by having better information about investments than their depositors, so a theory of banking depends on information economics.

"Twenty years ago, there was no microeconomic theory of banking, for the simple reason that the general equilibrium model was unable to explain the role of banks.

Since then, a new asymmetric-information paradigm has emerged that has been useful in explaining the role of banks and pointing out weaknesses of the banking sector." X. Freixas, J.-C. Rochet (1997)

Adverse selection can make expert investors issue debt

Entrepreneurs and industrialists have expertise about the potential profitability of their firm and its investment opportunities.

When an investment opportunity requires outside financing, they may choose between issuing debt or new equity shares.

Selling new equity can dilute the value of their own shares.

Given any market price at which they can sell new equity shares, they are more likely to do so when their private information suggests that this price may be too high.

Thus, outside investors see a firm's decision to issue new equity as bad news about the value of the firm (*winner's curse*).

This inference decreases the price that outside investors are willing to pay for equity shares.

Thus, entrepreneurs often find it better to issue debt, the value of which is less uncertain to investors. (Myers Majluf, 1984).

Deflation can cripple the economy's key experts

This result of Myers and Majluf explains why financial and industrial leaders who have the best information about investment opportunities may tend to finance their investments largely by monetary debt.

When prices go down, however, this debt becomes harder to repay from the profits of real economic investments.

Deflation causes a general decrease in the real net worth of the individuals who know the most about investment opportunities in the economy.

When such entrepreneurs lose the wealth that they would leverage for productive economic investments, the result can be a recession.

So the vital role of price-level changes in Irving Fisher's debt-deflation theory of depressions can be derived from adverse selection in finance.

Focusing on moral hazard in financial intermediation

Moral hazard in financial intermediation has an essential fundamental role at the heart of any capitalist economy.

A successful economy requires industrial concentrations of capital that are vastly larger than any typical individual's wealth.

The mass of small investors must rely on specialists to do the work of identifying good investment opportunities.

So the flow of capital to industrial investments must depend on a relatively small group of financial intermediaries (bankers).

But individuals who hold such financial power may be tempted to abuse it for their own personal profit.

Problems of moral hazard in banks and other financial institutions were evident at many stages of the recent financial crisis.

Back-loaded moral-hazard rents

Dynamic moral-hazard problems can be efficiently solved by promising large end-of-career rewards (*backloaded moral-hazard rents*) for agents who maintain good performance records.

The promise of one big bonus at the end can motivate good behavior throughout the agent's career!

But agents must trust that their performance record will be appropriately judged and rewarded.

Institutions for allocating moral-hazard rents need leaders with reputations for reliably rewarding good service.

So back-loaded rewards create an emphasis on long-term relationships (transactions that are **not** anonymous).

This is different from the traditional focus of economic theory on markets where everybody trades anonymously at the same prices.

Can moral hazard cause macroeconomic fluctuations?

My "Model of moral-hazard credit cycles" shows how macroeconomic fluctuations can be driven purely by moral hazard in financial intermediation.

To do so, the model deliberately omits all other factors:
no money, no long-term illiquid assets, no shocks.

We find that even without these factors, moral hazard in financial intermediation can cause macroeconomic fluctuations.

(See also Bernanke Gertler 1989.)

Bankers must expect back-loaded moral-hazard rents

We assume investors can find good investments only through bankers.

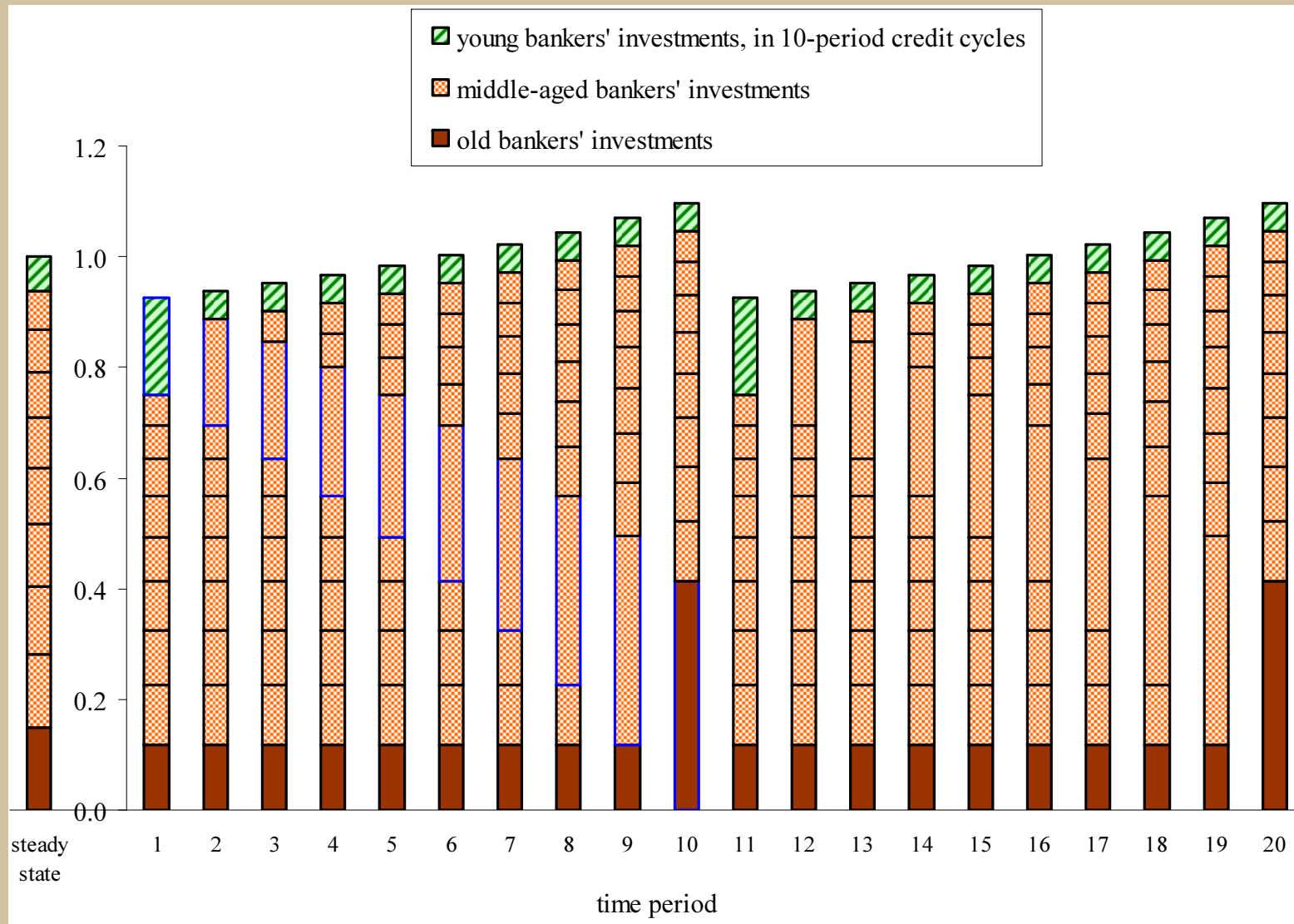
Moral hazard: bankers could profit by diverting funds to cronies' bad investments that have lower probability of success.

Bankers must expect greater rewards from putting their investors' funds in good investments that have high probability of success.

When bankers can have long careers, efficient incentive plans offer big late-career rewards (*back-loaded moral-hazard rents*) for bankers who consistently deliver successful investments.

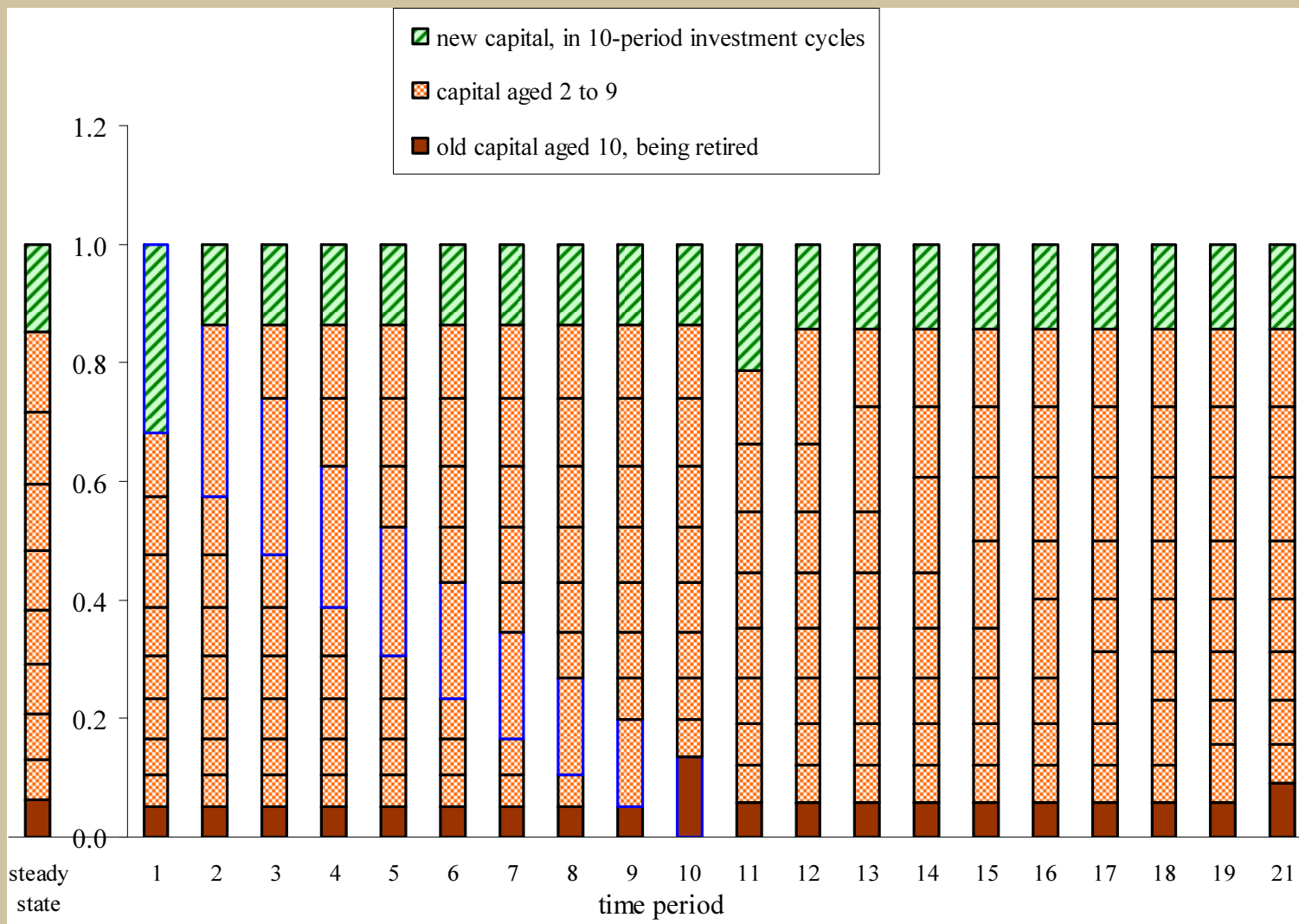
So we get a macroeconomic model in which the aggregate contractual positions of bankers form the dynamic state that can change over time.

Later in the career, as these promised rewards come closer to realization, bankers can be trusted with greater responsibilities.



Investment amounts handled by different cohorts of bankers with 10-period careers, starting at time 1 with bankers investing only 80% of steady-state amounts.

12 (parameters: $\rho=0.1$, $n=10$, $\alpha=0.95$, $\beta=0.6$, $\gamma=0.05$, $\eta=0$, $\psi=1.74$, $\pi = 0.422$).



The usual assumptions about depreciation of capital do not yield such instability. (Here capital depreciates 10% per year, scrapped after 10; initial 20% shortage.)

Lessons from the model of moral-hazard credit cycles

In recessions, investment is limited by scarcity of trusted financial intermediaries.

Competitive recruitment of new bankers cannot fully remedy such undersupply, because bankers can be efficiently hired only with long-term contracts in which their responsibilities are expected to grow during their careers.

So a large adjustment to reach steady-state financial capacity in one period would create oversupply in future periods.

Thus, a financial recovery must move gradually uphill into the next boom, which in turn contains the seeds of the next recession.

Furthermore, in this model we find that **a tax on workers to subsidize bankers may benefit workers by more than the tax**, but some of their gains are at the expense of past investors.



Conclusion: incorporating finance into macroeconomics

Paul Krugman's view of what economists have to do:

"First, they have to face up to the inconvenient reality that financial markets fall far short of perfection, that they are subject to extraordinary delusions and madness of crowds.

Second, they have to admit that Keynesian economics remains the best framework we have for making sense of recessions and depressions.

Third, they'll have to do their best to incorporate the realities of finance into macroeconomics."

Paul Krugman, NYTimes, 6 Sept 2009

I agree strongly with Krugman's third point, that **economists need to incorporate finance into macroeconomic theory.**

But we are unlikely to do this by using an old Keynesian theory that was developed when economists had no analytical models of banking or financial markets.

Conclusion: applying information economics in macro

In Keynes' day, differences among traders' information were "market imperfections," but now economists regularly analyze problems of trust among people with different information.

In particular, when information is costly, members of a crowd may rationally choose to rely on the expertise of others, whose temptation to mislead must be countered by greater long-run rewards from maintaining a good reputation.

A collapse in the supply of such good reputations would indeed be a crisis.



Conclusion: macro policy and financial intermediaries

Of course, some recessions may be caused by other macro demand shocks that create unemployment in major sectors of the economy.

Increased public investment may be worthwhile when a weakened private sector has large unemployed capacity (Keynesian fiscal expansion).

But when recession is caused by a scarcity of trusted financial intermediaries, monetary policy and financial regulatory reform may be key remedies for strengthening financial intermediation.

Monetary easing can subsidize banks with a cheap source of funds, and inflation can reduce the real value of expert intermediaries' debts.

Should the central bank aim to keep the price level on a long-term path?

Well-targeted regulatory reform can increase investors' ability to trust the intermediaries who channel their savings to productive investments, which is essential for a healthy economy.

References

"A model of moral-hazard credit cycles" (2010 working paper)

<http://home.uchicago.edu/~rmyerson/research/bankers.pdf>

"On Keynes and the theory of banking" (2010 blog)

<http://econciv.wordpress.com/2010/12/14/on-keynes-and-the-theory-of-banking/>

These notes:

<http://home.uchicago.edu/~rmyerson/research/mhazmacro.pdf>

