

On Moral Hazard and Macroeconomics

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"A model of moral-hazard credit cycles" Journal of Political Economy 120(5):847-878 (2012).

"On Keynes and the theory of banking" (2010 blog)
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These notes:
<http://home.uchicago.edu/~rmyerson/research/mhazmacro.pdf>



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 game theory and information economics, particularly theory of moral-hazard agency problems, for much of the new understanding that is needed.

A loss of confidence in banks precipitated the economic crisis of 2008. So why did American economic policy in 2009 focus on a stimulus to increase aggregate demand instead of financial regulatory reform? Before game theory, traditional economists found it difficult to bring financial regulatory rules into their analytical framework.

This conceptual bias led early macroeconomists to focus more on price-theoretic constructs like aggregate demand and interest rates.

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, building on advances in **game theory**.

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)



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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 are lower than was expected, however, these debts become 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 are overburdened by debt, they are less able to make new productive investments, which can cause a recession.

Then inflation could help reduce the real burden of entrepreneurs' debts.

So the vital role of price-level changes in Fisher's (1933) *debt-deflation theory of depressions* can be derived from adverse selection in finance.

Proposal: *The central bank should aim to keep the general price level or nominal GDP on a predictable long-term path.*

7 (DiTella: Why don't firms borrow in stock-index units?)



Focusing on moral hazard in financial intermediation

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

Problems of moral hazard in banking were evident at many stages of the recent financial crisis.

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.

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

Bankers and other financial intermediaries borrow much of what they invest, but their incentives to invest well depend on their having a stake in the profits of their investments (bank capital).

Rules of bank regulation can create systemic risk

Meyers-Majluf explains the adverse-selection reasons for debt, but moral hazard explains why those who control the firm must have some ownership stake in its profits.

Regulatory capital requirements that are based on public information can help reduce the adverse-selection problem in selling new equity.

Capital = Assets – Liabilities = Owners' value.

Under Basel rules, regulators let banks have less capital when they hold assets that are considered safe: **Capital $\geq \sum$ assets \times riskweights**

When some "safe" assets are not, first their high returns attract bank investment, and then the whole banking system is put at risk.

Basel bank regulations emphasized scrutiny of foreign currency risks, but treated sovereign government debt in its own currency as safe.

So the creation of the eurozone moved large international debts from a category that regulators scrutinized to a category that they ignored.

Banking rules make small-business credit particularly vulnerable

Under Basel standards, bank capital requirements are reduced by holding highly rated marketable securities.

But loans to small businesses and individuals are considered risky and entail maximal capital charges (unless "securitized").

So when capital is scarce, banks can avoid selling new equity by reducing loans to small business, instead buying marketable bonds from governments and large corporations.

This amplified the effect of bank losses on credit to small-business.

We should rethink the whole concept of basing capital requirements on the assessed riskiness of different assets.

Systemic risk can be created by any regulatory attempts to identify "safe" assets that banks can buy with less capital.

Proposal: *Diversified loans to small business and individuals should not entail greater capital requirements than other investments.*

No reason not to require more capital in banks

Martin Hellwig and Anat Admati's new book *Bankers' New Clothes* argues that banks should be required to hold much more capital. 100 years ago, bank capital was regularly $>20\%$ of assets.

Bankers argue that it is more costly to finance loans by capital (retaining profits or selling new bank stock) than by deposits. (Consider arguments of Modigliani-Miller, Myers-Majluf...)

Raising capital reduces risk of bankruptcy costs for depositors and taxpayers, shifts risk to bank's owners, who may find it "expensive." This is no reason for taxpayers to vote for lower capital requirements!

Proposal: *Bank capital requirements should be a much larger fraction of total assets ($>20\%$).*

Banks should not be allowed to distribute profits to shareholders until capital reaches these newly required levels

Can moral hazard in banking cause recessions?

In "Moral-hazard credit cycles," I show how macroeconomic fluctuations can be driven by moral hazard in financial intermediation.

I assume investors can find good investments only through bankers, who may be tempted to divert funds to their cronies' bad investments.

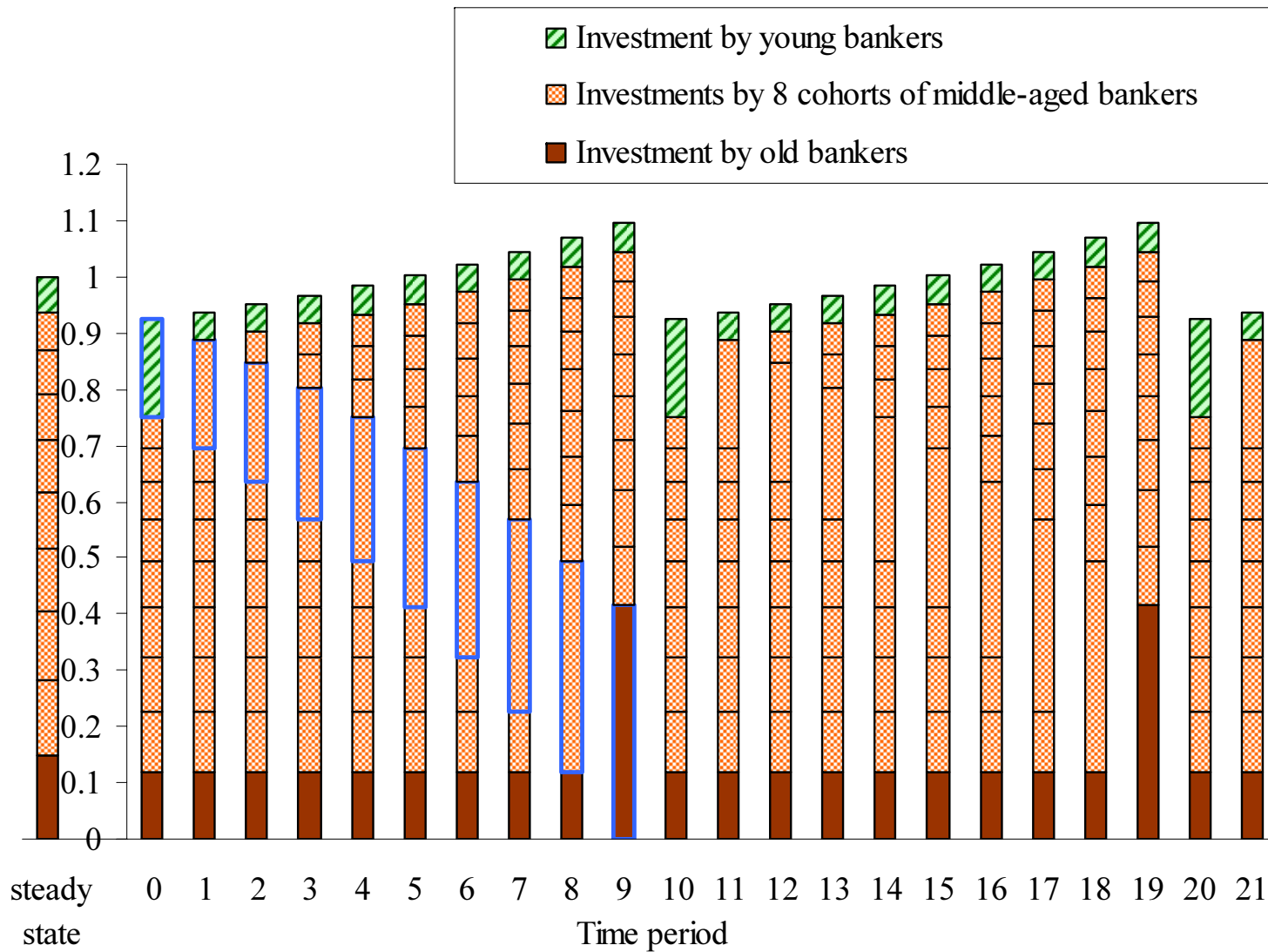
Such behavior is efficiently deterred by promising big late-career rewards for bankers who consistently deliver successful investments.

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

This need to invest through intermediaries who have long-term career incentive plans can create complex macroeconomic dynamics.

When there is a shortage of trusted financial intermediaries, aggregate investment is reduced, and employment may suffer; but then increased recruiting of young bankers can create a future surplus, as their responsibilities will grow until retirement under efficient incentive plans.

The result: a cycle of booms and recessions.



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.

(Parameters: $n=10$, $\rho=0.1$, $M=0.33$, $A=0.36$, $b=0.327$)

A final proposal for financial bankruptcy reform

In this model we find that, in a recession, *a tax on workers to subsidize bankers may benefit workers by more than the tax.*

When banks fail, the economy suffers a loss of mid-career bankers. So there can be a real public benefit to preventing the failure of a major bank, which may be justification for a public bailout.

But the possibility of a bailout can create new forms of moral hazard for banks, and can encourage creditors to lend carelessly.

So we may need other alternatives between bailouts and bankruptcy (where creditors become the owners of the bank).

Proposal: *When a vital bank or financial institution is at risk of bankruptcy, the government should have power to convert some fraction of any of the bank's debts into equity, at an administratively determined price, provided that the government must also buy some proportionate amount of equity at the same price.*

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.

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