Regulating Bank Portfolio Choice Under Asymmetric Information

Chris Anderson (Federal Reserve Board)

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This paper solely reflects the author's views and does not reflect the views of the Board of Governors of the Federal Reserve System.

Introduction

- Motivation: Regulators typically know less about asset risk, which leads to miscalibrated regulations (e.g., risk weights) that banks can game.
- Question: What tools should a regulator use to regulate banks' portfolio choice when taking into account this information asymmetry?
- Contribution: I build a tractable model of bank portfolio choice with asymmetric information to explore the effectiveness of different regulatory policies.

Model overview: Set-up

- Single period model with a regulator and a bank.
- An asset's risk is its loading on a single systematic factor.
- Many assets with different levels of risk and profitability are drawn from a known prior distribution.
- The bank knows each asset's true risk and profitability while the regulator only receives noisy signals of each.
- The regulator and bank have identical preferences, but the regulator perceives a social externality associated with bank risk-taking. Regulator is effectively more risk averse.
- The regulator specifies taxes (which could be interpreted as the shadow cost of quantity-based regulation) with the aim of reducing bank risk-taking .

Model overview: Timing

1. Assets' true profitability and risk are drawn from a known prior distribution.
2. The regulator receives noisy signals of profitability and risk for each asset.
3. Using their information, the regulator specifies the form of tax and decides what information about the tax to disclose to the bank.
4. The bank selects its portfolio, based on their knowledge of assets' true profitability and risk as well as the tax regime.
5. The common systematic factor is realized, which determines the bank's ex-post profits.

Baseline case: Linear tax

- The optimal asset-specific linear tax equals the regulator's expectation of each asset's risk.
- The regulator's optimal solution does not feature any additional conservatism, even though the bank can take advantage of the regulator's mistakes in setting taxes.
    - Rationale: Setting taxes too high or too low both impose costs.

Novel approach 1: Non-disclosure of linear taxes

- Idea: Set taxes (or risk weights), but don't tell the bank until *after* they've selected their portfolio. Related to stress test disclosure.
- The bank optimizes based on the expected tax. If the regulator reveals no information, then the bank's best guess is that the regulator will be correct on average.
- Even if banks have some information about the regulator's likely mistakes, it's still worthwhile to conceal as much information as possible.
- While non-disclosure creates uncertainty for banks, regulators can compensate by reducing the average level of taxes.

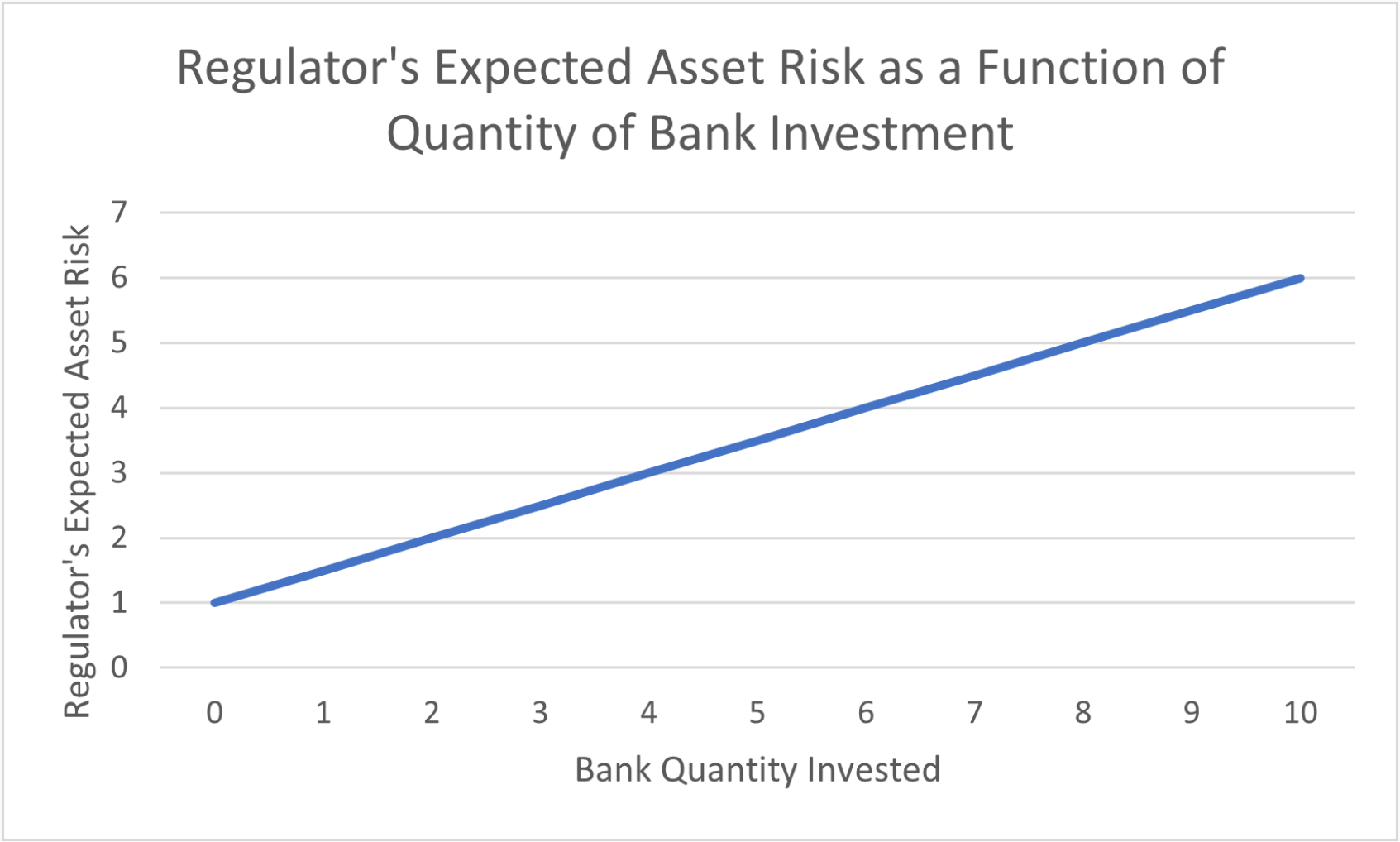
Novel approach 2: Taxes on ex-post profits

- Idea: Set an overall tax to reduce the profits that banks make in good times. This tax worsens banks' risk-return trade-off, which makes them act more risk averse.
- Caution: Taxes affect both after-tax return and risk, so a flat tax is not sufficient.
- Several ways to implement, including:
  1. Progressive tax on profits.
  2. State-dependent tax that's higher in "good" times than in "bad" times.

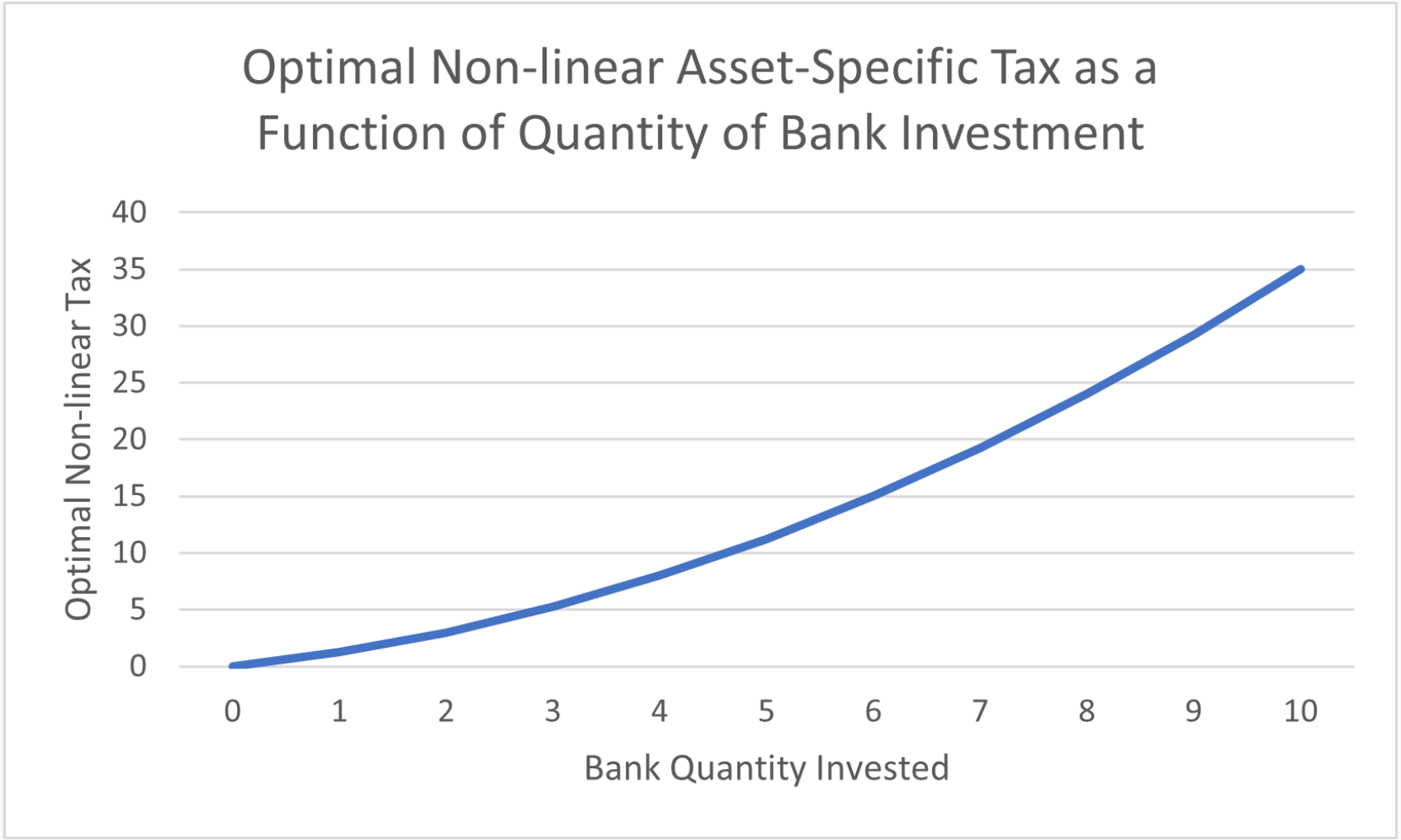
Novel approach 3: Non-linear taxes

- Idea: A bank's decision to invest more in a particular asset carries information about that asset's riskiness. Taxes (or risk weights) should adjust to incorporate that information.
- Caution: Banks might be investing more for reasons other than underestimated risks, such as good business opportunities.
- A regulator optimally sets the marginal tax equal to the expected risk conditional on the bank's investment. Integrating over the marginal taxes naturally leads to a non-linear relationship between investment in an asset and the optimal tax.

Novel approach 3: Non-linear taxes



Novel approach 3: Non-linear taxes



Conclusion

- I build a tractable model of bank regulation where the bank knows more about assets' risk than the regulator.
- Asymmetric information by itself is not enough to justify setting linear asset-specific taxes (or risk weights) more conservatively on average.
- I suggest three novel approaches to address the problem of asymmetric information:
  - Non-disclosure of taxes (or risk weights).
  - Taxes on ex-post profits.
  - Non-linear taxes (or risk weights).