How much speculation is socially optimal?

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Motivation

- The GFC of 2007-2009 has generated several regulatory reforms proposals:
  - prohibiting banks‘speculative activities(Volcker)
  - ring fencing them (Vickers)
  - separating these activities from traditional banking.

- The Liikanen report has also made propositions on how these activities should be regulated.

- The fear is that losses on these activities may be transferred to insured deposits , while gains are exclusively appropriated by banks‘ shareholders.

Motivation (2)

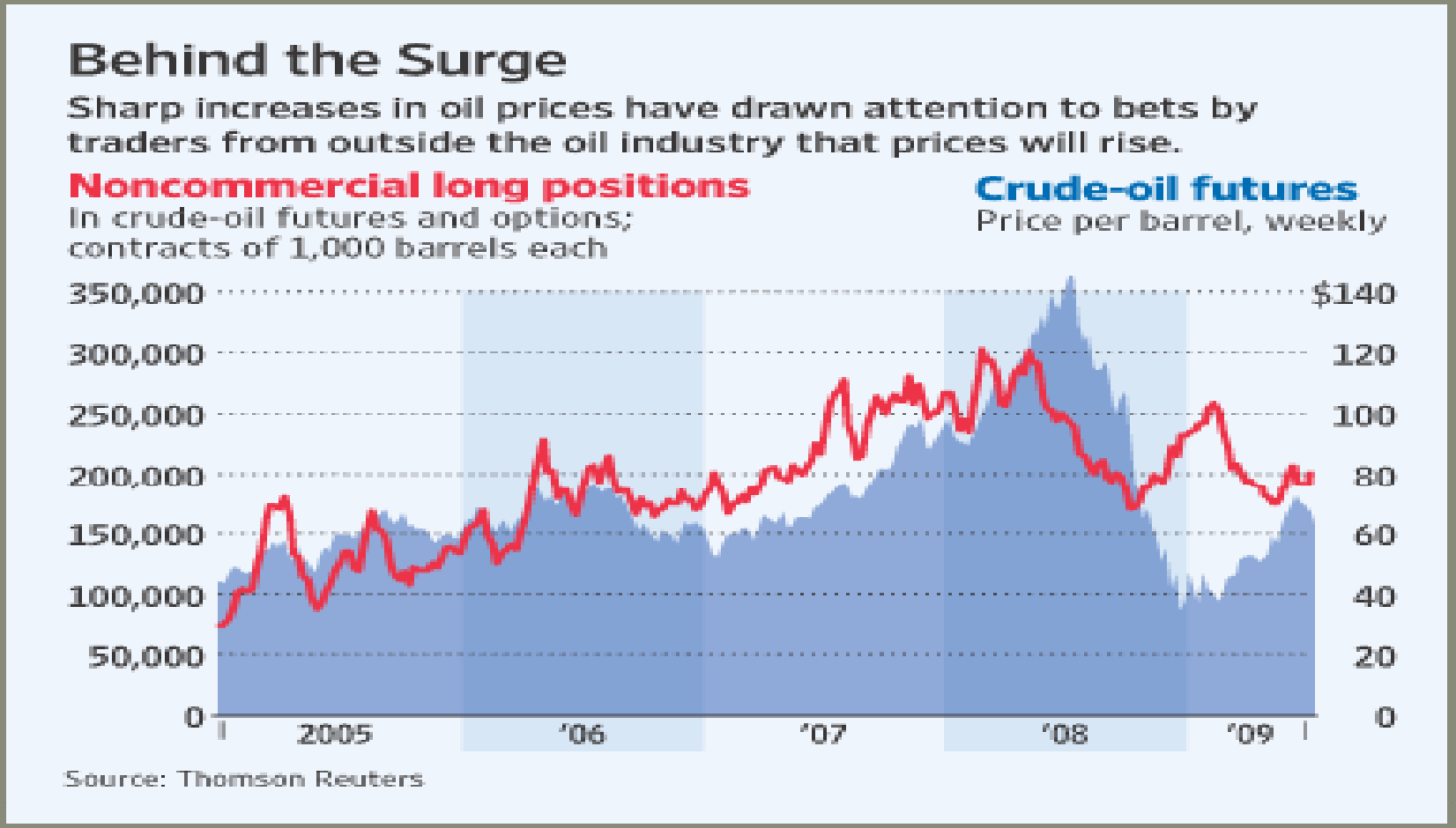
These questions are part of a wider discussion on the social impact of speculation:

- Commodities;
- High Frequency Trading;
- Excess volume on FX markets?

Regulatory solutions include:

- Tobin tax.
- Limit on futures positions.
- Capital/ margin requirements.

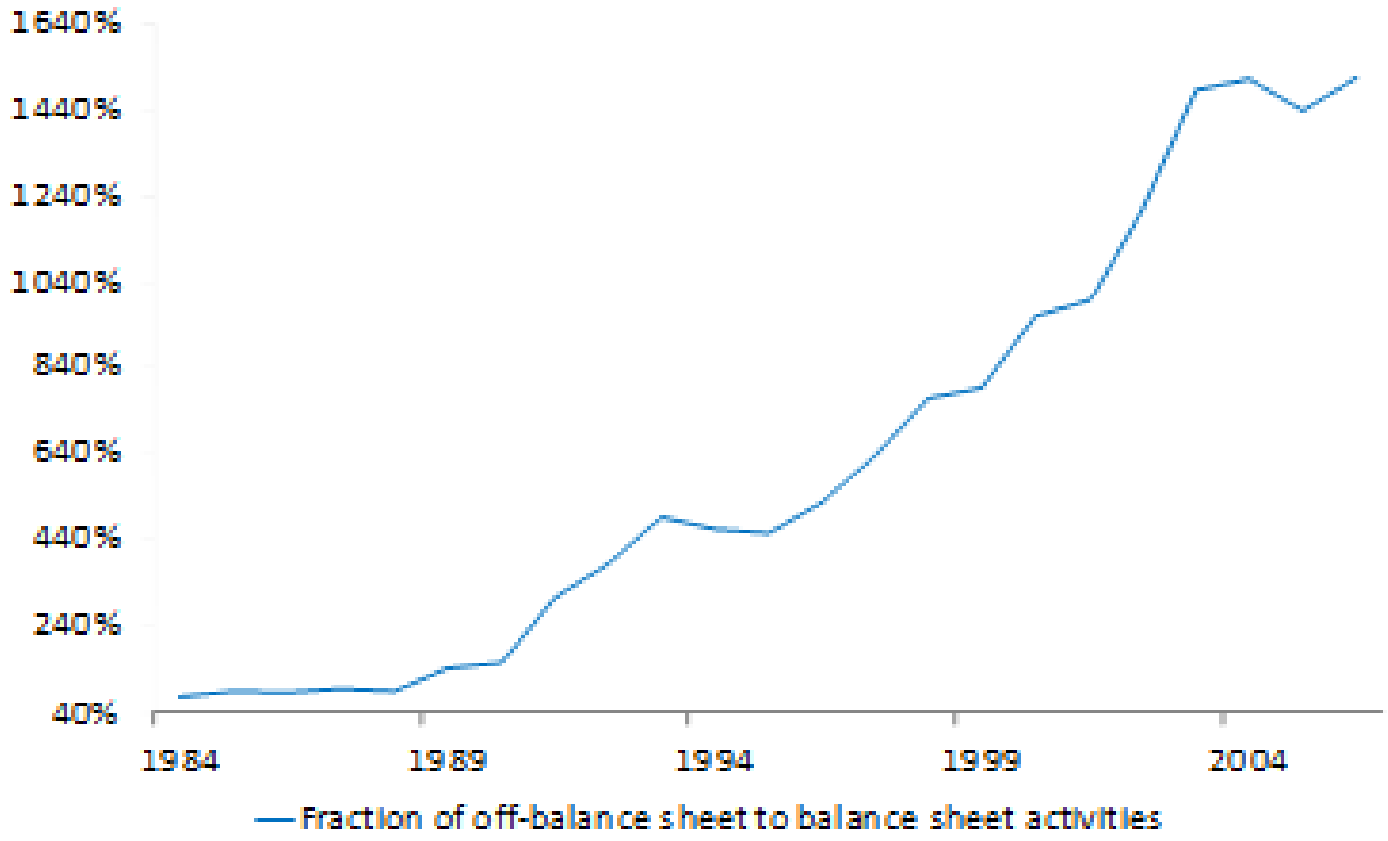
Financialisation of Commodities



Motivation (3)

- Bankers respond that their «speculative» activities are socially useful: they provide liquidity to financial markets (especially futures and derivatives).
- They claim that prohibiting them to exert market making activities would seriously impair these markets.
- They lobby very actively to prevent the applications of the regulatory proposals discussed above.
- However, it is hard to defend the vue that no limits should be put on speculation.

Growing role of Off Balance-Sheet Activities (France, 1984- 2006)



Source: French Commission Bancaire

Academic Literature

- Traditional economic models always lead to the conclusion that more speculation is good (Friedman 1953) because it insures hedgers against spot price risk, and it stabilizes the spot market (i.e. it reduces the volatility of spot prices).
- The Rational Expectation Hypothesis is incompatible with the notion of excessive speculation.

Academic Literature (2)

Of course one can abandon the REE paradigm:

- Irrational noise traders: De Long et al. (1990)
- Eductive instability: Guesnerie and Rochet (1993)
- Herding behavior by fund managers: Basak and Pavlova (2013)
- Differences in opinions: Banerjee (2011)

But in all these models, it is difficult to perform a proper welfare analysis.

This is why we stick to the REE paradigm, but introduce possibilities of default by speculators/intermediaries.

This paper

- We explore the idea that speculative activities of banks should not be prohibited altogether but simply limited to a certain level.
- The question is then how this cap should be computed.
- We develop the simplest possible model that could answer this question.
- We provide a rough qualitative indication of: how much speculation is too much?

The model

- Two dates *t=0,1;*
- Two goods (wheat and money).
- Two types of agents: N_H risk averse hedgers and N_S risk neutral speculators.
- Hedgers produce 1 unit of wheat at *t*=1 and sell it on the spot market at a random price P
- Wheat can also be traded at *t=0* on a futures market for price *p*.

The model (2)

- Hedgers have mean variance preferences with risk tolerance τ: $U_H = E[\pi] - \frac{1}{2\tau} Var[\pi].$

- Each hedger sells f_H futures contracts. Inverse demand for hedging: $p = \mu - \frac{\sigma^2}{\tau}(1 - f_H)$
- Speculators take the opposite position: $f_S = \frac{N_H}{N_S} f_H$
- They make expected profit:

$$E[\pi_S] = f_S(\mu - \hat{p})$$

Social welfare

- When speculators never default, social welfare is just the sum of utilities:

$$U = N_H U_H + N_S U_S = N_H [\mu - \frac{\sigma^2}{2\tau}(1 - f_H)^2]$$

- This social welfare is maximum when hedgers are perfectly insured:

$$f_H = 1;\ U = N_H \mu.$$

- There is never any excessive speculation.

When speculators default

- Assume now that a speculator defaults when his losses exceed his cash reserves C:

$$C + f_S(P - p) < 0$$

- In that case hedgers are bailed out by public authorities at a unit cost λ. Social welfare is now:

$$U = N_H[\mu - \frac{\sigma^2}{2\tau}(1 - f_H)^2] - (1+\lambda)E[N_S C + N_H f_H(P - p(f_H))]_- - rC,$$

two additional terms:
expected shortfall paid by public authorities
financing cost for speculators

When speculators default (2)

If the regulator can choose the amount of reserves *C* and the level of hedging f_H he will select the values that maximize *U*.

This implies:

$$PD = \frac{r}{1+\lambda} = \Pr[P < P^*]$$

The level of reserves is then determined by: $\frac{C}{f_S} \geq p - P^*$

The corresponding value of the risk premium is:

$$\frac{\mu - p}{p} = \frac{r\{\mu(1+\varepsilon) - E[P \mid default]\}}{\mu + r(1+\varepsilon)}$$

Where ε is the inverse elasticity of the demand for hedging

Mini Calibration

- Log normal spot price P with volatility s=20%.
- r=2% (riskless rate) λ=100% (cost of public funds)
- ε=3 (inverse elasticity of demand)

One finds:

- PD= 1% (probability of default); risk premium = 6.6%
- Reserve requirement = 30%
- Rate of return for speculators= 18%

Policy Implications

One should not put too much emphasis on this mini calibration. But it illustrates two points:

- One can model excessive speculation without having to assume irrational behaviors or complex models of learning.
- Considering the possibility of speculators default is enough to justify policy interventions such as reserves (or capital) requirements and positions limits.

Policy Implications (2)

- Of course such policies are already implemented by private exchanges for centralized trades.
- There, a zero probability of default is (in theory) attainable if perioding margin calls are combined with circuit breakers.
- Our proposal is to adapt the same logic at the macro level: as aggregate circuit breakers are not feasible, there will be a positive probability of default/crisis.

Policy Implications (2)

The main trade-off underlying the policy intervention is simple and natural:

- As they are protected by limited liability, speculators tend to take excessive risks, especially if they have little reserves/capital.
- A cap on speculative positions reduces the expected cost of future bail-outs.
- However this cap also increases risk premia on futures markets and reduces hedgers‘ expected utility.

Policy implications(3)

Model is simple enough to lend itself to calibrations based on few and easy to estimate parameters .

Orders of magnitude of results are reasonable:

- reserve requirement (30%),
- probability of default (1%)
- risk premium (7%).

More needs to be done to make model more realistic and /or apply it to other forms of financial speculation.

CONCLUSION

- Current debate about financial regulation reforms is plagued by industry lobbying and political interference.
- Also, the academic community starts being shaken by harsh debates based on ideological positions rather than scientific considerations.
- Policy makers need simple models where trade-offs can be analyzed in a transparent way and where quantitative recommendations can be derived from simple calibrations.

CONCLUSION (2)

- Our responsibility as academics is to contribute to the policy debate by producing and testing such simple models for financial stability analysis.
- There is a middle ground between building “Mickey Mouse” models for pure theory and recycling excessively complex DGSE models that were designed for other purposes (assessing monetary policy).