Ajello, Laubach, López-Salido, and Nakata, "Financial Stability and Optimal Interest-Rate Policy"[1]

Discussion by Lars E.O. Svensson
Stockholm School of Economics and IMF
Web: larseosvensson.se

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[1] The views expressed in these slides are those of the author and do not necessarily represent those of the IMF or IMF policy.

Issue

- Monetary policy and financial stability
- Assume that a higher policy rate (leaning against the wind) somehow reduces the probability of a future financial crisis
- What are the tradeoffs between current costs and future benefits of leaning?

Results of the paper

- Optimal policy implies *very* small policy-rate increase in the standard case
- Somewhat larger policy-rate increase if uncertainty about parameters taken into account
- Robust policy (worst-case policy) implies larger policy-rate increase
- Comment: Great paper!
- Comment: Leaning over backwards to get some leaning against the wind!

Comments

- Little theoretical and empirical support for an economically significant policy-rate effect on the crisis probability
- Schularick-Taylor (2012): Probability depends on real debt growth
- Monetary neutrality: No effect on long-run real debt
- Lower real debt growth and probability for a few years followed by higher debt growth and probability
- If so, just intertemporal substitution of crisis probabilities!
- 2-period model misses 3rd period with higher crisis probability, overstates benefits
- Fixed cost of crisis, understates costs
- Cost of crisis should depend on initial state of economy
- Multi-period model, dynamics, tradeoffs

Inherent problem with robust control: Not robust

- Optimal policy often on boundary of assumed feasible set of models/parameters
- Optimal policy therefore very sensitive to assumptions
- Not robust at all!
- Any probability assigned to boundary of feasible set very small
- Very unlikely outcomes determined policy
- Not practical
- Instead, Bayesian optimal control

2-period model

- Period 1: No crisis ($\gamma_1 = 0$; chg: γ_t = period t crisis probability)
$$L_1 = (y_1^{nc})^2$$

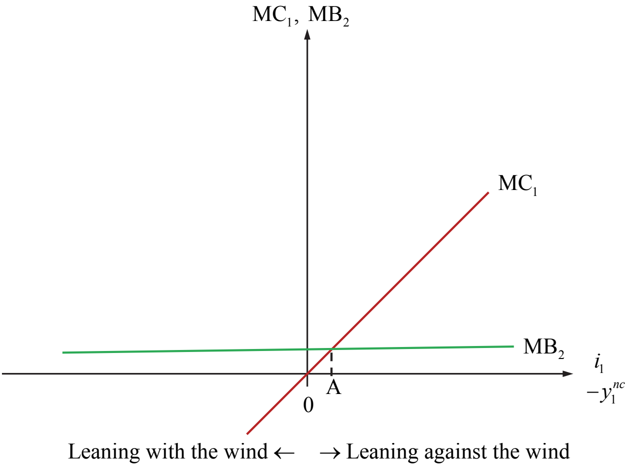
- Period 2: Zero output gap ($y_2^{nc} = 0$) implies fixed cost of crisis
$$\mathrm{E}_1 L_2 = (1-\gamma_2)\mathrm{E}_1(y_2^{nc})^2 + \gamma_2 \mathrm{E}_1(y_2^{nc} - \Delta y)^2 = \gamma_2(\Delta y)^2,$$

- Optimal policy: Some leaning against the wind
$$\frac{dL_1}{di_1} + \frac{d\mathrm{E}_1 L_2}{di_1} = 2y_1^{nc}\frac{dy_1^{nc}}{di_1} - (\Delta y)^2(-\frac{d\gamma_2}{di_1}) \equiv \mathrm{MC}_1(y_1^{nc}) - \mathrm{MB}_2$$

$$\mathrm{MC}_1 = \mathrm{MB}_2, \quad \mathrm{MC}_1(0) = 0$$

$$y_1^{nc} = \frac{(\Delta y)^2(-d\gamma_2/di_1)}{2dy_1^{nc}/di_1} < 0$$

Authors' case: Fixed crisis cost, MC(0) = 0, MB > 0



Multiperiod quarterly model

- Quarter t: Crisis probability $\gamma_t > 0$

$$\begin{aligned} \mathrm{E}_1 L_t &= (1-\gamma_t)\mathrm{E}_1(y_t^{nc})^2 + \gamma_t \mathrm{E}_1(y_t^{nc} - \Delta y)^2 \\ &= \mathrm{E}_1(y_t^{nc})^2 + \gamma_t[(\Delta y)^2 - 2\Delta y \underbrace{\mathrm{E}_1 y_t^{nc}}] \end{aligned}$$

$$\begin{aligned} \frac{d\mathrm{E}_1 L_t}{di_1} &= 2(\mathrm{E}_1 y_t^{nc} - \underbrace{\gamma_t \Delta y}) \frac{d\mathrm{E}_1 y_t^{nc}}{di_1} - [(\Delta y)^2 - 2\Delta y \underbrace{\mathrm{E}_1 y_t^{nc}}](-\frac{d\gamma_t}{di_1}) \\ &= 2\mathrm{E}_1 y_t \frac{d\mathrm{E}_1 y_t^{nc}}{di_1} - [(\Delta y)^2 - 2\Delta y \mathrm{E}_1 y_t^{nc}](-\frac{d\gamma_t}{di_1}) \\ &\equiv \mathrm{MC}_t(\mathrm{E}_1 y_t^{nc}) - \mathrm{MB}_t \end{aligned}$$

$$\mathrm{MC}_t(0) = -\gamma_t \Delta y \frac{d\mathrm{E}_1 y_t^{nc}}{di_1} > 0 \;\Rightarrow\; \text{tendency to lean } \textit{with} \text{ the wind}$$

Exogenous probability of crisis: Lean *with* the wind

$$\mathrm{MC}_t - \mathrm{MB}_t \equiv 2\mathrm{E}_1 y_t \frac{d\mathrm{E}_1 y_t^{nc}}{di_1} - [(\Delta y)^2 - 2\Delta y \mathrm{E}_1 y_t^{nc}](-\frac{d\gamma_t}{di_1})$$

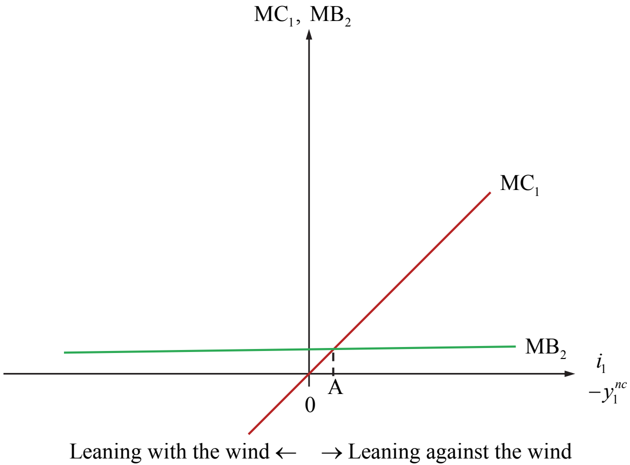
- Exogenous probability of a crisis:

$$\frac{d\gamma_t}{di_1} \equiv 0 \Rightarrow \mathrm{MB}_t \equiv 0$$

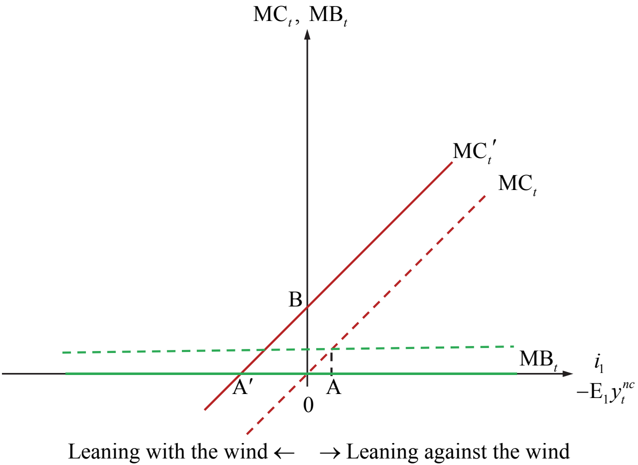
$$\mathrm{MC}_t = 0 \;\; \Rightarrow \;\; \mathrm{E}_1 y_t = \mathrm{E}_1 y_t^{nc} - \gamma_t \Delta y = 0$$

$$\mathrm{E}_1 y_t^{nc} = -\gamma_t \Delta y < 0 \;\; \Rightarrow \;\; \text{Lean } \textit{with} \text{ the wind}$$

Authors' case: Fixed crisis cost, MC(0) = 0, MB > 0

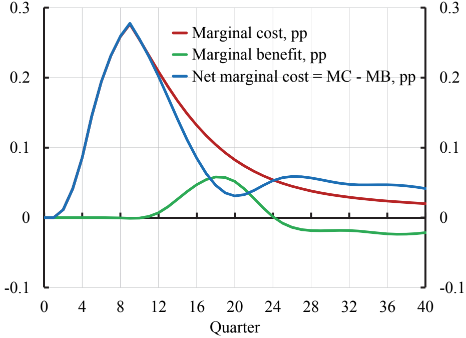


Crisis cost not fixed, MC(0) > 0; Exog. prob., MB = 0



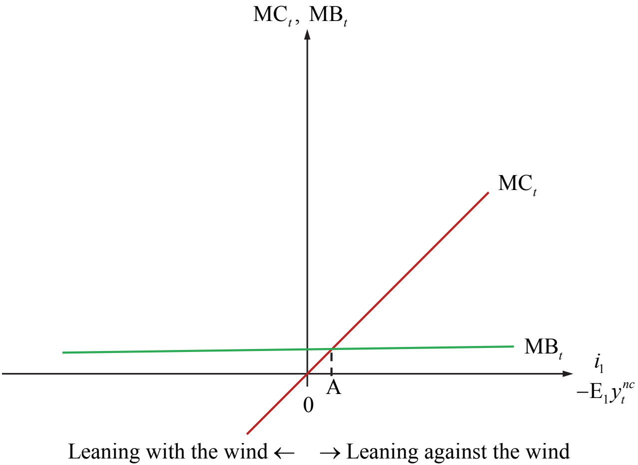
Endogenous probability of crisis

- Effect of policy rate on crisis probability must overcome tendency to lean against the wind
- Does not happen for empirical estimates of effect (Svensson 2015)

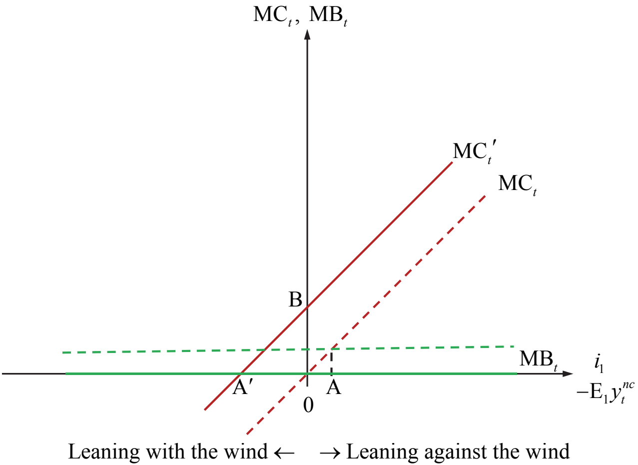


Svensson (2015), "Cost-Benefit Analysis of Leaning Against the Wind: Are Costs Always Larger Than Benefits, and Even More So with a Less Effective Macroprudential Policy?"

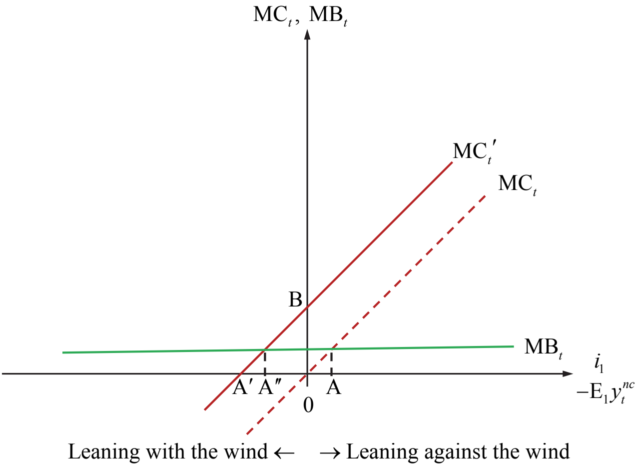
Authors' case: Fixed crisis cost, MC(0) = 0



Crisis cost not fixed, MC(0) > 0; Exog. prob., MB = 0



Crisis cost not fixed, MC(0) > 0; Endog. prob., MB > 0



Summary

- Great paper
- But limits to 2-period setup:
  - Overstates benefits (no period 3, monetary nonneutrality)
  - Understate costs (no crisis period 1, fixed crisis cost period 2)
- Marginal cost of leaning against the wind may almost always exceed marginal benefit
- Optimal tendency to lean *with* the wind, not against
- But small net gain; hardly worth bothering about