



Céspedes and Velasco's

# Macroeconomic Performance During Commodity Price Booms

Discussion by Silvana Tenreyro (LSE)



## The Question/s

- How does output respond to a commodity price boom?
- How does the response vary with
  - Structural characteristics of the economy?
  - Exchange-rate regime?

## The Approach

A stylized model to frame the empirical investigation.

## The Model Setting

A two-period small open economy with

- Two sectors: i) natural resource; ii) produced output (K, L)
- Two agents: capitalists and workers
- Nominal price and wage rigidities
- Financial constraints; natural resource serves as collateral

## The Mechanism

### Financial constraints

- Capitalists own the natural resource and invest (domestic good), financed by net worth and foreign loans; consume foreign goods.
- Ideally: invest till  $MPK = \text{expected cost of funds}$ .
- Limit on borrowing: multiple of net worth,  $\lambda$ .
- Natural resource  $R$  serves as collateral. Increases in the price of  $R$  increase the borrowing capacity of the economy, and hence increase  $I$  and  $Y$ .

## The Mechanism: Financial constraints (cont'd)

Hump-shaped relation between output change caused by CPS and financial constraints

1. If financial constraints are not binding at all, a commodity price shock has no effect on output.
  - The natural resource  $R$  is owned by capitalists who only consume foreign goods. Wealth effect without consequences for the domestic economy. (Credit conditions abroad matter.)
  - With no borrowing limits, investment is independent of  $R$ .
2. At the other extreme (financial autarky), commodity price shocks have no effect either.
3. In between: the 'multiplier' effect on output increases with the borrowing limit  $\lambda$ ---as long as the limit binds

## The Mechanism: Nominal rigidities

- Fixed exchange rates
  - With nominal rigidities, following a rise in CP, the increase in investment is higher (as domestic prices do not adjust with changes in demand).
    - CPS lead to (higher) Y-volatility with nominal rigidities (under peg).
- Flexible exchange rates *can* replicate the flexible price equilibrium and hence mitigate the impact of CP shocks on Y. (No NK cross-sectional distortion)

Empirically: continuum from pegs to flexible.

# Empirics

1. Hypotheses: effect of commodity price shock on output is
  - Higher, the less flexible the exchange rate regime
  - Hump shaped, vis-à-vis financial constraints (fin development)
2. Episodes of large commodity price booms (not busts).
3. 58 episodes in 31 countries; 1970s, early 1980s and around 2006-07.
  - Output=output gap? (Output relative to trend?)
  - 13 degrees of flexibility in exchange rate (Reinhart and Rogoff).
  - Financial constraints/ fin development= private credit/GDP (lagged).

## Empirics Continued

The baseline estimated equation

$$\Delta y_i = \alpha + \beta \Delta Com_i + \gamma (\Delta Com_i \times ERR_i) + \mu_i$$

- Average output gap during episode  $i$  minus the average output gap in the two years previous to the beginning of episode  $i$ ; percent change in commodity price...
- EER: exchange rate classification during episode  $i$ .
- Subsample for intermediate levels of development:

$$\begin{aligned} \Delta y_i = & \alpha + \beta \Delta Com_i + \gamma (\Delta Com_i \times ERR_i) + \\ & + \theta_1 FD_i + \theta_2 \Delta Com_i \times FD_i + \\ & + \theta_3 (\Delta Com_i \times ERR_i \times FD_i) + \mu'_i \end{aligned}$$

## Results

- The estimated equation

$$\Delta y_i = \alpha + \beta \Delta Com_i + \gamma (\Delta Com_i \times ERR_i) + \mu_i$$

- $\beta > 0$ ;  $\gamma < 0$ . Magnitude; economic significance?
- No stark difference across levels of financial development?
- Capital account openness, trade openness: no independent effect, though make  $\gamma$ ,  $\beta$  significant. (Reduced sample or correlations?).

## General Comments

- Great question! Relevant for academics and policy makers
- Simple, elegant model to frame the empirics. Highlights two frictions shared by many SOE: financial constraints, nominal rigidities.
- Limited contact with existing literature.
- Empirically studying amplification due to financial channel is new. No effect identified in the empirics, but more a problem with the empirics!
  - No natural resource curse! (Another literature to mcw)
- Empirics: Still a work in progress!

## Specific Comments on Empirics

1. Empirical strategy: why booms, but no bust episodes? Asymmetries (downward nominal rigidities).
2. Measurement: output gap---what is the filter filtering?
3. Economic significance: Mechanic increase or true amplification?
4. Endogeneity I: the choice of exchange-rate regime might depend on TOT volatility. Against finding any effect. But then can we learn the actual size of the causal effect?
5. Endogeneity II: financial constraints? (L. private credit/GDP, but high autocorrelation). IV: Credit conditions abroad (/investment opportunities)
6. Other omitted variables: political economy, institutions, fiscal policy, debt, size of R vis-a-vis N, the economic cycle of trading partners... For any interaction, enter the parts: EER entered separately.

## Conclusions

- Great question, promising paper: it only needs work!
- Theoretically interesting financial channel...
- ...though empirically not strong. This might be due to poor identification. Better, more exogenous measures of financial constraints?
- Empirical hurdles to overcome to make the analysis compelling
- Intriguing, though still not developed, results on the relation between REE and reserves.