Comments on “Equilibrium Bitcoin Pricing”

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Research Question

• Do Cryptocurrencies, and in particular Bitcoin, have a fundamental value?

• Can we use the fundamental solution to test whether or not investor behavior is consistent with the rational expectation hypothesis?
Research Question

• Tricky question because, as opposed to stocks, pricing at the fundamental value is consistent with equilibrium multiplicity.

• «The reason why I'm not interested in investing in bitcoin or shorting bitcoin is to me it's like arguing how many angels dance on the head of a pin. I have no idea how to value it. » Steve Eisman, CNBC Interview May 2018
The model

• Tirole (1985) with two currencies.

• OLG model: Fiat or Crypto is used to transfer endowment from young to old age.

• Returns from Crypto has three specific components:
  • Transaction costs $\varphi(q)$, with $\varphi'(.)>0$.
  • Risk of hacking $h$.
  • Transactional benefits $\theta p$ (N.B. proportional to crypto price).
Rational Expectation Solution

• Equilibrium Price

\[ p_t = \frac{1}{1 + r_t} \frac{E_t \left( \frac{u'(c^o_{t+1})}{E_t [u'(c^o_{t+1})]} \right)}{1 - h_{t+1}} \left( p_{t+1} + T_{t+1}p_{t+1} \right). \]

where \( 1 + T_{t+1} = \frac{1 + \theta_{t+1}}{1 + \varphi'(X_t)}. \)

• Multiple solutions because price enters multiplicatively.
Empirical Strategy

• Simplifies pricing kernel by focusing at risk-neutral agents.

• GMM test of equilibrium condition

\[ E_t \left[ (1 - h_{t+1}) \frac{1 + \theta_{t+1}}{1 + \varphi' (X_t)} (1 + \rho_{t+1}) \right] - 1 = 0. \]

• Construct empirical proxies for \( \varphi \), \( h \) and \( \theta \).
Comments

• Why OLG? Is it fundamentally different from day and night market à la Lagos-Wright?

• What happens if bequest motive is introduced?

• Risk neutrality debatable at the agent’s level.

• Would be good to discuss the bias induced by ignoring the pricing kernel.
Comments

• Cannot reject model since proxies are significant.

• However explanatory power is small. Can we conclude that Bitcoin price is essentially driven by “animal spirits”?

• Testing alternatives specifications would be instructive:
  • Non-proportional convenience yield of crypto?
  • If non-proportional term is significant, doesn’t it mean that there is no multiplicity?
Comments

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  • Convenience yield is likely to interact with demand shifters that are observable (e.g. Cyprus bailout).
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  • Regulatory decision preventing US citizens from holding tokens.

  • Introduction of Tether increases liquidity of Bitcoin.