

**Author(s):**

Ladislav Kristoufek, Charles University Prague

**Abstract title:**

Bitcoin and its mining on the equilibrium path

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Bitcoin as a major cryptocurrency has come up as a shooting star of the 2017 and 2018 headlines. After exploding its price twenty times just in the twelve months of 2017, the tone has changed dramatically in 2018 after major price corrections and increasing concerns about its mining power consumption and overall sustainability. The dynamics and interaction between Bitcoin price and its mining costs have become of major interest. Here we show that these two quantities are tightly interconnected and they tend to a common long-term equilibrium. Mining costs adjust to the cryptocurrency price with the adjustment time of several months up to a year.

We contribute to the discussion on the relationship between Bitcoin mining and its price formation by finding an equilibrium relationship between the two and showing that mining costs are driven (in addition to the technical factors such as electricity price, mining efficiency, and mining network power consumption) by Bitcoin price but not vice versa forming a hysteresis-like dynamics when a (possibly bubble/speculation induced) price increases are being caught up by increasing mining costs which then form a new support level for potential future price increases. Current developments suggest that we have arrived at a new era of Bitcoin mining where marginal (electricity) costs and mining efficiency play the prime role. Presented results open new avenues towards interpreting past and predicting future developments of the Bitcoin mining framework.