

# Cryptocurrencies and economics

Off-site seminar— [REDACTED] Funds

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Economics Commentary

# It's official: cash is dying



By **MICHAEL RUNDLE**

Thursday 21 May 2015



Credit: Shutterstock

# Content

Cash

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Initial coin offerings

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Central bank digital currencies

# Cash

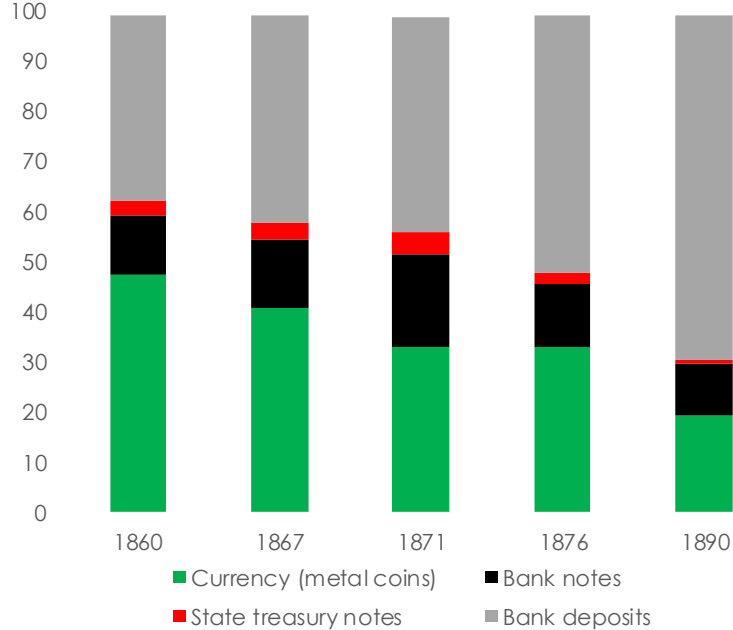
What is cash?

What is money?

# History of cash

Germany

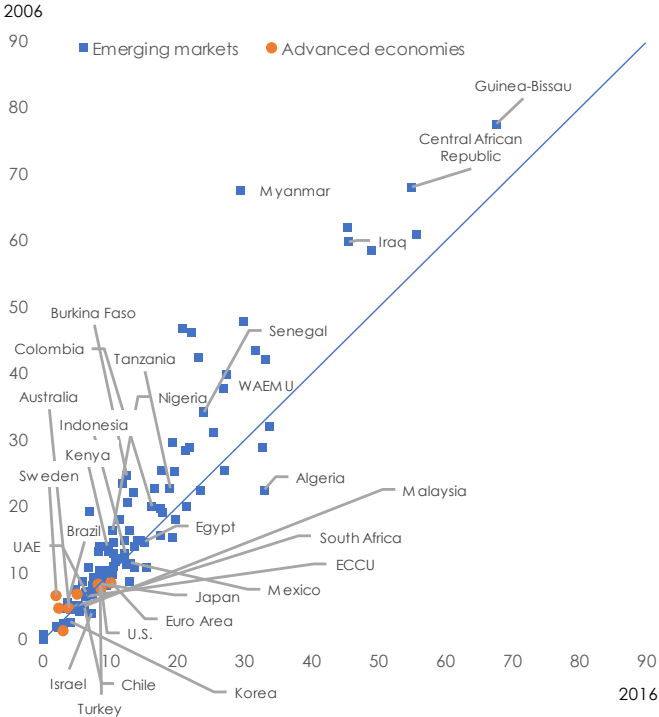
Percent of broad money



Source: Holtfrerich, 2006; Kroha, 2009; Sprenger, 2006.

# Decline of cash

Currency in circulation, percent of broad money



Source: IMF.



# Cryptocurrencies

What are cryptocurrencies?

Why do cryptocurrencies matter?

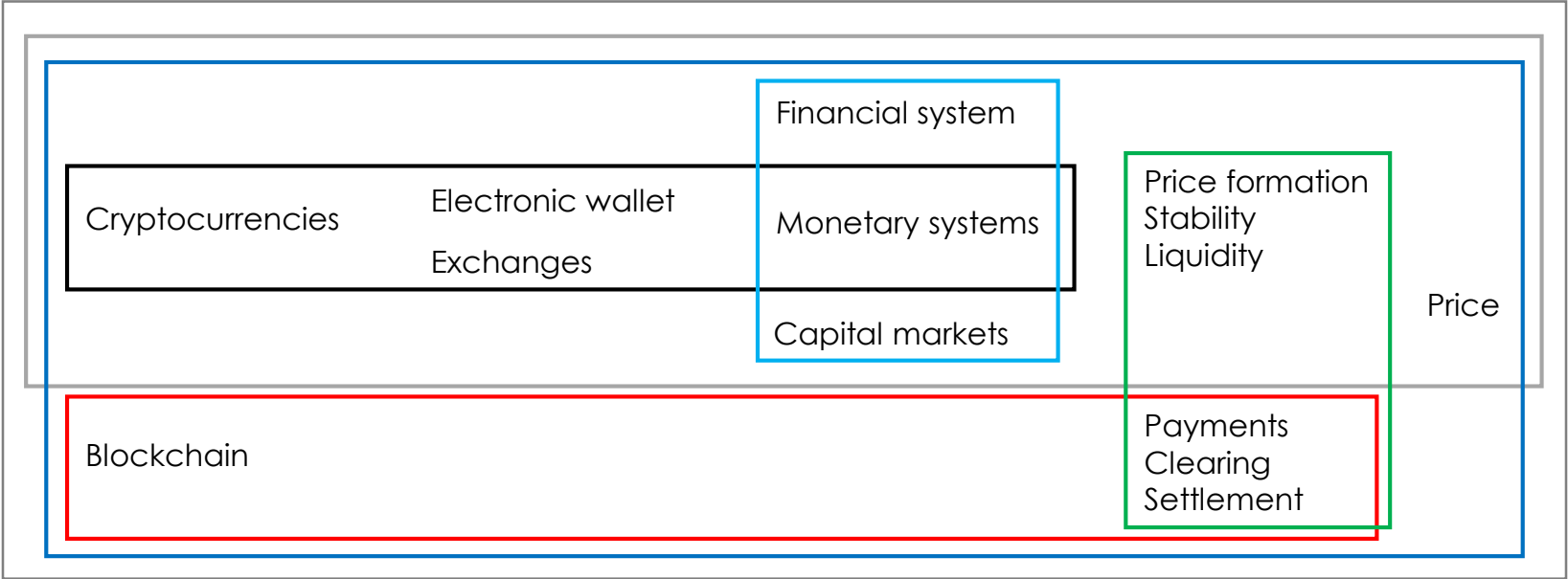
Who is behind cryptocurrencies?

Cryptocurrency ecosystem



# Cryptocurrency ecosystem

Regulation  
Standards



# Main cryptocurrencies

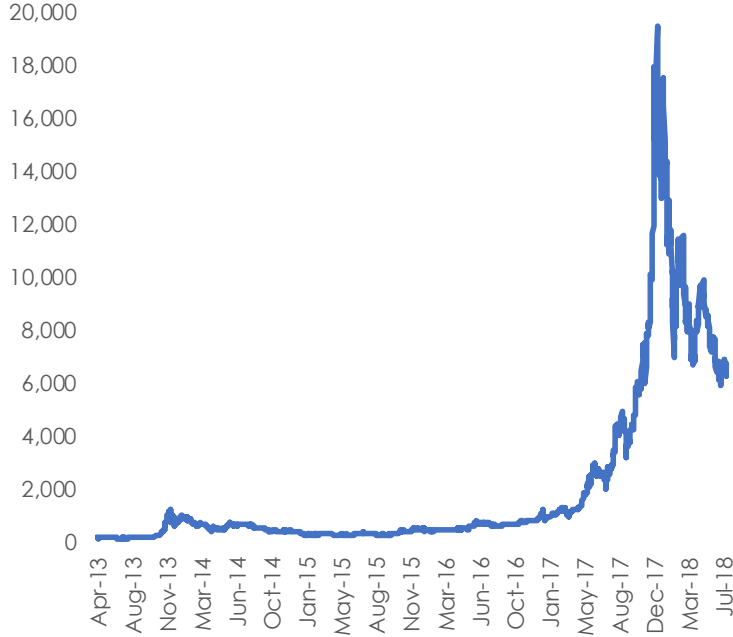
|    |                  |       | Classification | Market capitalisation (US\$ billion) | Circulation (number of coins) | Maximum supply (number of coins) | Description  |
|----|------------------|-------|----------------|--------------------------------------|-------------------------------|----------------------------------|--|
| 1  | Bitcoin          | BTC   | Currency       | 22-Jul-18<br>126.9                   | 22-Jul-18<br>17,164,575       | 21,000,000                       | Electronic cash. Original cryptocurrency based on blockchain.  |
| 2  | Ether            | ETH   | Voucher        | 46.2                                 | 100,856,390                   | Unlimited                        | Token to be used on Ethereum's decentralised platform for blockchain applications running smart contracts on a customised built blockchain. Offers possibility to issue own crypto-currency. |
| 3  | Ripple           | XRP   | Voucher        | 17.7                                 | 39,315,683,476                | 100,000,000,000                  | Token for processing and sending payments used by banks and other payment providers including for cross-border transactions  |
| 4  | Bitcoin Cash     | BCH   | Currency       | 13.6                                 | 17,251,625                    | 21,000,000                       | Electronic cash. Hard fork of Bitcoin (all Bitcoin holders as of block 478558 are also owner of Bitcoin Cash)  |
| 5  | EOS              | EOS   | Voucher        | 7.1                                  | 896,149,492                   | 1,000,000,000                    | Token for blockchain technology focused on scalability and smart contracts based on the Ethereum blockchain  |
| 6  | Stellar          | XLM   | Voucher        | 5.3                                  | 18,766,734,471                | 104,125,061,584                  | Token for cross-border payments with focus on low-cost money transfers using the Stellar network   |
| 7  | Litecoin         | LTC   | Currency       | 4.8                                  | 57,520,357                    | 84,000,000                       | Electronic cash. Based on the Bitcoin blockchain   |
| 8  | Cardano          | ADA   | Voucher        | 4.4                                  | 25,927,070,538                | 45,000,000,000                   | Token for smart contract blockchain platform   |
| 9  | IOTA             | MIOTA | Voucher        | 2.7                                  | 2,779,530,283                 | 2,779,530,283                    | Token for distributed ledger applications based on Tangle to build internet-of-things (connecting internet enabled devices)  |
| 10 | Tether           | USDT  | Security       | 2.7                                  | 2,657,140,346                 | 3,080,109,502                    | Electronic cash based and backed by national currencies  |
| 11 | TRON             | TRX   | Voucher        | 2.3                                  | 65,748,111,645                | 99,000,000,000                   | Token for blockchain based application to power smart contracts and interact with Tron network   |
| 12 | NEO              | NEO   | Voucher        | 2.2                                  | 65,000,000                    | 100,000,000                      | Token for blockchain based application to pay for transactions and to be used towards developing new projects.   |
| 13 | Monero           | XMR   | Currency       | 2.1                                  | 16,249,426                    | 22,640,658                       | Electronic cash with focus on anonymity *  |
| 14 | Dash             | DASH  | Currency       | 2.0                                  | 8,209,366                     | 18,900,000                       | Electronic cash  |
| 15 | Ethereum Classic | ETC   | Voucher        | 1.7                                  | 103,224,302                   | Unlimited                        | Token for transactions on blockchain. Hard fork from Ethereum after disagreements after hacking attack in June 2016  |
| 16 | NEM              | XEM   | Voucher        | 1.5                                  | 8,999,999,999                 | 8,999,999,999                    | Token for NEM smart asset system for customised blockchain applications.   |
| 17 | Tezos            | XTZ   | Voucher        | 1.3                                  | 607,489,041                   | 763,306,930                      | Token for smart contract for blockchain based applications   |
| 18 | Binance Coin     | BNB   | Currency       | 1.1                                  | 95,512,523                    | 192,443,301                      | Electronic cash to pay for transactions on Binance exchange  |
| 19 | VeChain          | VEN   | Voucher        | 1.0                                  | 554,545,494                   | 873,378,637                      | Token for smart contract for blockchain based applications to pay for smart contracts related transaction costs  |
| 20 | OmiseGO          | OMG   | Voucher        | 1.0                                  | 140,245,398                   | 140,245,398                      | Staking token as reward for proof-of stake to validators for honest validations  |

Source: Conmarketcap.com; token websites.

\* Estimated based on existing halving projections.

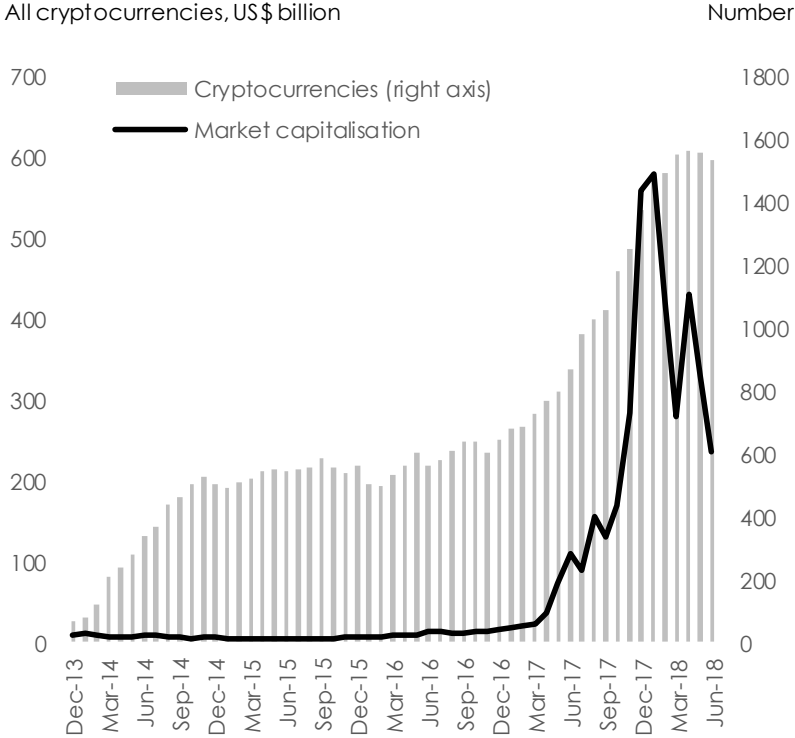
# Bitcoin price

US\$ per coin



Source: Coinmarketcap.com. Through 16 July 2018.

# Market capitalisation

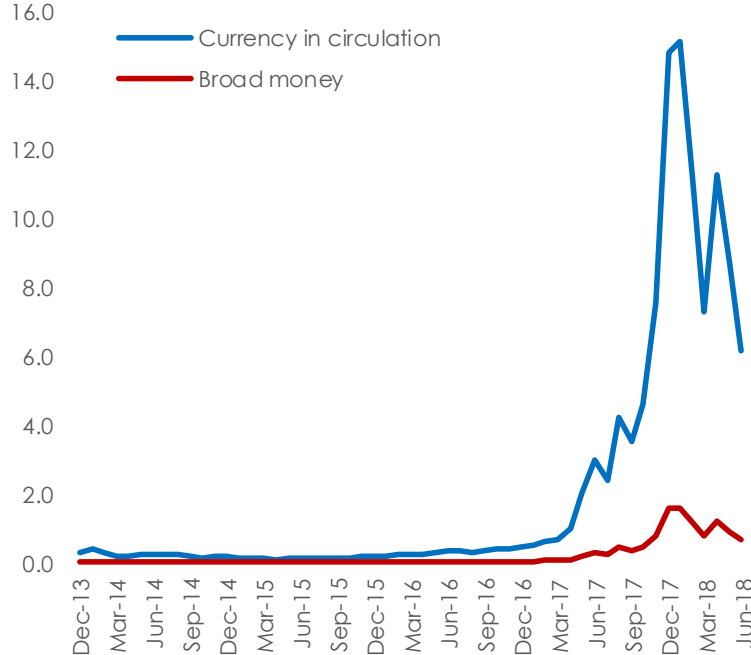


Source: Coinmarketcap.com. Through 27 June 2018.

# Monetary impact

## Cryptocurrency market capitalisation

Percent of monetary aggregate of Euro Area, Japan, U.S. combined\*



Source: Bank of Japan, Coinmarketcap.com, ECB, Federal Reserve, IMF. Currency in circulation seasonally adjusted for Euro Area and Japan; weekly averages for U.S. Broad money (M2) seasonally adjusted.

# Blockchain

What is blockchain?

What are key blockchain applications?

Verification and concentration in the blockchain

# Bitcoin blockchain blocks

## LATEST BLOCKS

[SEE MORE](#) →

| Height                 | Age               | Transactions | Total Sent    | Relayed By                | Size (kB) | Weight (kWU) |
|------------------------|-------------------|--------------|---------------|---------------------------|-----------|--------------|
| <a href="#">532181</a> | 44 minutes        | 2435         | 6,875.34 BTC  | <a href="#">BTC.TOP</a>   | 1,131.73  | 3,992.63     |
| <a href="#">532180</a> | 50 minutes        | 2319         | 8,342.39 BTC  | <a href="#">BTC.TOP</a>   | 1,202.98  | 3,992.69     |
| <a href="#">532179</a> | 1 hour 10 minutes | 1851         | 4,543.58 BTC  | <a href="#">Unknown</a>   | 1,165.14  | 3,992.56     |
| <a href="#">532178</a> | 1 hour 18 minutes | 2293         | 20,585.21 BTC | <a href="#">SlushPool</a> | 1,160.79  | 3,993.05     |

# Bitcoin blockchain transactions

|  |   |  |                                  |
|--|---|--|----------------------------------|
| <a href="#">b57ca394538b4c0fe4bbcd76c63e7086f6af77240f9c8aab7c2e1192d0a7b073</a>   |   |  | <b>2018-07-16 17:45:59</b>       |
| <b>No Inputs (Newly Generated Coins)</b>   | ➔ | <a href="#">1Hz96kJKF2HLPGY15JWLB5m9qGNxvt8tHJ</a><br>Unable to decode output address                    | 12.89519736 BTC<br>0 BTC         |
|  |   |  | <b>12.89519736 BTC</b>           |
| <a href="#">788c6ce1c982959a0dcf28aadeaae4a19fb3ab7947c1ad73738bfc3e32629a79</a>   |   |  | <b>2018-07-16 17:44:06</b>       |
| <a href="#">181yyqWKmhTaseA3L1Rvf8VGEpuYFBXiHV</a>   | ➔ | <a href="#">1KrCqjXdLYCGHCCiqFGqhbEzK3Bhi6RApf</a><br><a href="#">34DqH7wgnD9CGqpsHCUXGFzBW9XWdsyEo</a>  | 0.68512 BTC<br>0.9 BTC           |
|  |   |  | <b>1.58512 BTC</b>               |
| <a href="#">e316ece8ef61a02d7040ee847f09f55a32bafc45a0ad36249412377af939d22b</a>   |   |  | <b>2018-07-16 17:33:21</b>       |
| <a href="#">1D2EaWd4TM4zLjkkLYq6qvWoRSrAPEvAm</a><br><a href="#">18J7uu6wtGMZcXMgDzAGuRVVfsf47oBkkw</a><br><a href="#">12vpTY9VsbQwTtAeJSWFFWmXbj9Q4ZswdA</a><br><a href="#">14bfsPy1tKbQZvrUGytUxX93ZNXS4aFAM</a><br><a href="#">1P366dxiY6br8KhFJLcf3BHnqEk8K2VBNM</a><br><a href="#">1FBY5Sk7F2xhd5SUF9wwPXCJvQ6EKi3u4o</a> | ➔ | <a href="#">1LZnX4ZYwNN2SeEYM4ECp6bZnKgfMDZubd</a>   | 0.50240901 BTC                   |
|  |   |  | <b>0.50240901 BTC</b>            |
| <a href="#">026673cd565966df4093db5f4e3348202f3cc5edd7f6b1c68b1350a00bdaf307</a>   |   |  | <b>2018-07-16 17:27:15</b>       |
| <a href="#">12hPgNnxKqHw5LFnJ7RmKUYcnFfeZ7PFSX</a>   | ➔ | <a href="#">1DPfggorVoD785xAwLf1wKgMeHu9k9sspT</a><br><a href="#">3NX1C3RG5oXAauV3XhNNw3szarYYeGVrAc</a> | 0.00106553 BTC<br>0.02700007 BTC |
|  |   |  | <b>0.0280656 BTC</b>             |

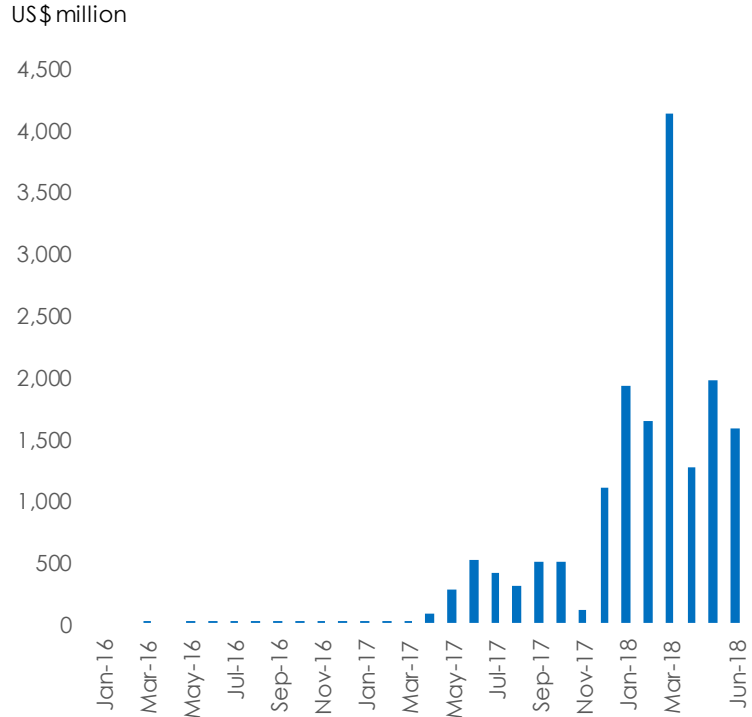


## **Initial coin offerings**

What are initial coin offerings?

Why do they matter?

# ICO funds raised



Source: Coinschedule.com.

# Regulation

Why regulate?

How to regulate?

Expected regulatory developments

## **Regulation direction**

U.S. court rulings

Regulator opinions

G20 (FSB) regulatory framework approach

## Central bank digital currencies

What are central bank digital currencies?

Swiss Sovereign Money initiative (Vollgeld) referendum (10 June 2018)

Who is leading central bank digital currency introduction?

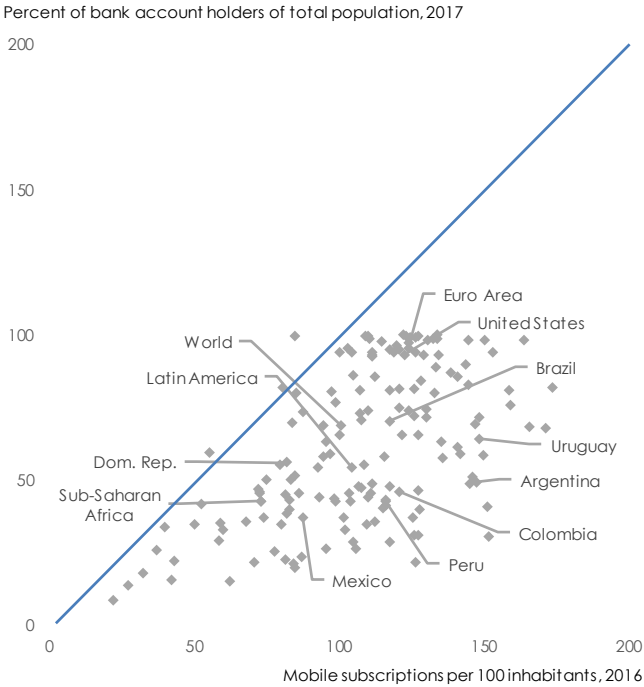
## **Swiss Sovereign Money initiative**

Fractional banking

Access to central bank money

Legalisation of cryptocurrencies

# Financial inclusion



Source: World Bank.