

Regulation of the Bitcoin Economy

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Blockchain: the Next Financial Revolution ? :: Zurich

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DIGITAL CURRENCIES: PRINCIPLES, TRENDS, OPPORTUNITIES, AND RISKS

This report is the first comprehensive study on digital currencies that provides a joint, deep quantitative analysis of their technological, entrepreneurial, economic, and legal aspects.

It is the result of over 2 years of work, including an extensive monitoring of the digital currency markets, involving the collection and analysis of data from over **90 different sources**.

The results of our analysis are summarised in over **60 different descriptive statistics** and original results on the (in)efficiency and dynamics of digital currency markets distributed across over **100 pages**.

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The Meaning and the Origins of Money

The Meaning and the Origins of Money

Economists define money by the functions it serves

Any item or verifiable **record** – for which there may, or may **not**, be an equivalent coin or banknote – that fulfils these functions can be considered money:

- 1 **Medium of Exchange**. It is commonly accepted for the exchange of goods and services and solves the “double coincidence of wants” problem of barter systems.
- 2 **Unit of Accounting**. It is at the base of the accounting systems being a numerical unit of measurement of the market value of goods and services. Must be: divisible, fungible, countable.
- 3 **Store of Value**. It can be saved, stored, and retrieved and can be used as a medium of exchange when it is retrieved, without costs or losses^a

^aBitcoin is a **good medium of exchange**. It is **not a unit of accounting** and it is a **bad store of value**.

The Meaning and the Origins of Money

Money is an Emergent phenomenon

Money has evolved over time according to the socio-technical evolution of our society. Historically, money is an **emergent market phenomenon** between market participants who have been striving to possess items with greater marketability than their own commodities so to facilitate the search for commodities that market participants wanted to possess or consume.

The Meaning and the Origins of Money

- ... Bartering
- (9000-6000 BC) Livestocks (cows, sheeps, etc)
- (3000 BC) Grains used in Mesopotamia
- (1200 BC) Shells firstly used in China
- (1000-600 BC) Coins made from base metals first appear in China.
- (700 BC) Precious metal coins firstly used in ancient Lydia (current Turkey) and Greece.
- (118 BC) Leather money (ancient type of banknote).
- (806) Paper banknotes first appear in China
- (1535) Wampum of beads first used by native Americans.
- (1816) Gold standard is officially put in place in England (in 1879 also in US - end in 1933).
- (1860) First EFT by Western Union.
- (1920) Charge cards provided by stores, hotel chains and service stations.
- (50s-60s) Credit cards. First credit card release in cardboard by Diners Club to be used in NYC restaurants.
- (60s-70s) First ATMs.
- (1999) Mobile banking begins in Europe.
- (2009) [Bitcoin decentralised payment protocol](#).

The Meaning and the Origins of Money

The evolution of money is characterised by two effects:

- **Technological shift** → Information as Money: What Internet did for information with the Intent of media and information exchange, blockchain is doing for money with the internet of value exchange.
- **Network Effects** → Tipping point effects (e.g. Haldane, 2009).

The Meaning and the Origins of Money

Bitcoin is a Deflationary Currency → **Not a Good Type of Money**

- 1 Unemployment (wages are fixed-dont adjust downward)
- 2 Costly constant downward adjust of price-lists
- 3 Price of goods closed to ZERO !! → GDP closed to ZERO ! → multiple currency denominations : BTC become an index
- 4 Incentives buy-and-hold: About the 85% of the BTC are hoarded !!
BTC is an imperfect store of value !^a

^aHoarding loop:

- larger number of traders to match the orders and maintain the liquidity
- larger nr. traders increases BTC value
- large BTC value increases hoarding
- larger hoarding increases volatility

The Meaning and the Origins of Money

Bitcoin is a Deflationary Currency → Not a Good Type of Money

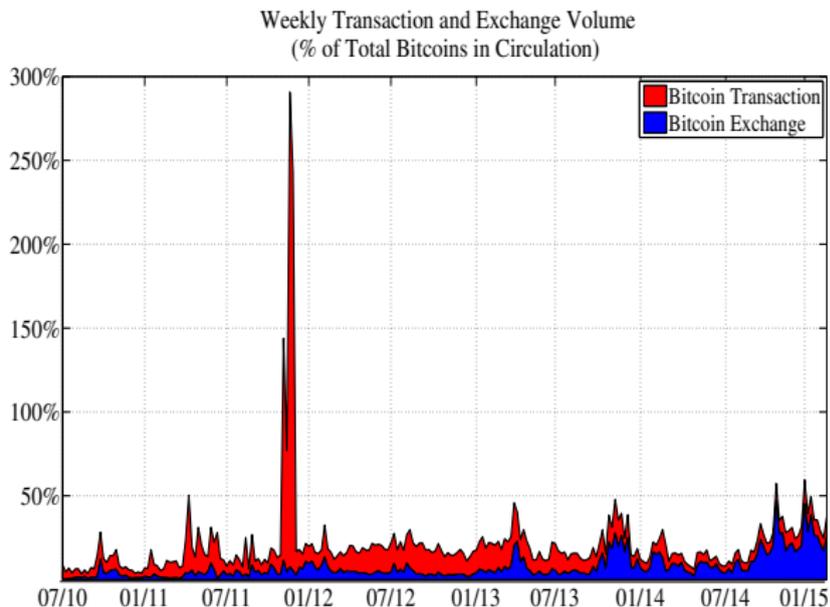


Figure: Relative percentage of the weekly BTC transactions registered in the blockchain and the BTC volume exchanged in the major trading platforms with respect to the BTC monetary base. Data source: Bitcoinity and Blockchain. Internal calculation.

Central Banks and Legal Tender

The Origin of Central Banks

Central Banks are NOT an Emergent phenomenon

If we open a textbook of economics, it is taken for granted that there is an authority which regulates the money supply, and above all that there is no other supplier: the **Central Bank**.^a

^aOnly at the end of the seventeenth century central banks started to be founded: Riksbank 1656-1668, Bank of England 1696.

National Institution supplying money to a closed-borders community

The Origin of Central Banks

Why Central Banks exists ?

- Primary Role: {
- 1) Implement a monetary policy that provides consistent growth and employment
 - 2) Promote the stability of the country's financial system
 - 3) Inform the public of the overall state of the economy by publishing economic statistics
 - 4) Manage the **production and distribution of the nation's currency**

Coordination between Government and Central Bank actions:

- {
- 1) **Fiscal policy**: economic direction a government wishes to pursue regarding **taxation, spending, and borrowing**
 - 2) **Monetary policy** is the set of actions the Central Bank takes to influence the economy in an attempt to achieve its fiscal policy.

The Origin of Central Banks

The Fall of Central Banking in the Future ?

Central Banks have several options they can use to affect monetary policy, but traditionally they set (short-term) interest rates. However, as of 2015 their ability to boost economic growth has stalled.

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Toward a new era of → **Unconventional Monetary Policy**

The Origin of Central Banks

The Fall of Central Banking in the Future ?

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Toward a new era of → **Unconventional Monetary Policy**

Central banks debate whether they should experiment with new measures like [negative interest rates](#) or [direct financing](#) of government and firms.

“Central bankers may need to accept that their good old days of adjusting interest rates to boost employment or contain inflation may be gone for good” Andrew Haldane

The Origin of Central Banks

Central Banks will Issue Digital Currencies

- **Breaking Through the Zero Lower Bound and Electronic Money**
Ruchir Agarwal (International Monetary Fund) and Miles Kimball (University of Michigan)
- **The Macroeconomics of Central Bank-Issued Digital Currency**
John Barrdear (Bank of England) and Michael Kumhof (Bank of England)
- **Balancing Public and Private Provision of Electronic Currencies**
Kenneth Rogoff (Harvard University)
- **Centrally Banked Cryptocurrencies**
George Danezis (University College London) and Sarah Meiklejon (University College London)

The Origin of Legal Tender

In the Seventeenth century the **use of bank notes issued by private commercial banks** as legal tender has gradually been replaced by the issuance of bank notes authorized and controlled by national governments. Each government determines what is legal tender within its own borders.

But **legal tender and money are not necessarily synonymous**:

What is State Money or Money Legal Tender?

Legal tender status only refers to the settlement of debts. Legal tender is **not** a means of payment that must be accepted by the parties to a transaction, but it is a legally defined means of payment that cannot be refused by a creditor in satisfaction of a private but mostly *public* debt.

Regulation and Governance

Characteristics of Digital Currencies

- 1 **Decentralised** → **No central bank or clearing mechanism.** The trust is devoted not to one single entity but to the network.
- 2 **It is not money in virtualised form only.** Paper money (backed by digital currencies) starts circulating in certain Countries with Canada forefront followed by USA.
- 3 **No legal tender.** Digital currencies are not mediums of payment allowed by law or recognised by any legal system to be valid for meeting financial and public (tax) obligations.
- 4 **Deflationary property.** Monetarists: the volatility in the money supply rate of change is also considered to be the major source of boom-bust cycles. BTC total supply is by design finite and their supply rate of change is not volatile and both the current and future growth rate is known.

Digital Currencies are Not Legal Tender

- No mandatory acceptance by the creditor in the fulfilment of payment obligations;
- Not enforcement of acceptance at full face value;
- Absence of governing authority in charge of establishing and governing the rules for:
 - functioning of the payment system;
 - integrity of the ledger;
 - exchange rate stability.

Regulation: Where we stand

- Digital currencies and P2P systems more in general, are challenging existing nation-state legal systems on the definition and classification of those concepts.
- First faint and mis-coordinated steps have been taken.
- Ordinances, financial laws, directives, regulations on Bitcoin-related businesses are so complex and unsteady that an **exhaustive and comprehensive picture of the legal status in different jurisdictions is impossible.**

Regulation: Major Issues

- Anonymity
- Decentralisation
- Irreversibility

According to the adopted approach with respect to those aspects, jurisdictions classified in

- Hostile
- Contentious
- Permissive



Figure: **February 2014**: Global map of BTC legal status. Legal status of digital currencies in different countries. Green: permissive countries, red: hostile countries, yellow: contentious countries, grey: unknown position. Data source: MarkleTree



Figure: **March 2014**: Global map of BTC legal status. Legal status of digital currencies in different countries. Green: permissive countries, red: hostile countries, yellow: contentious countries, grey: unknown position. Data source: MarkleTree

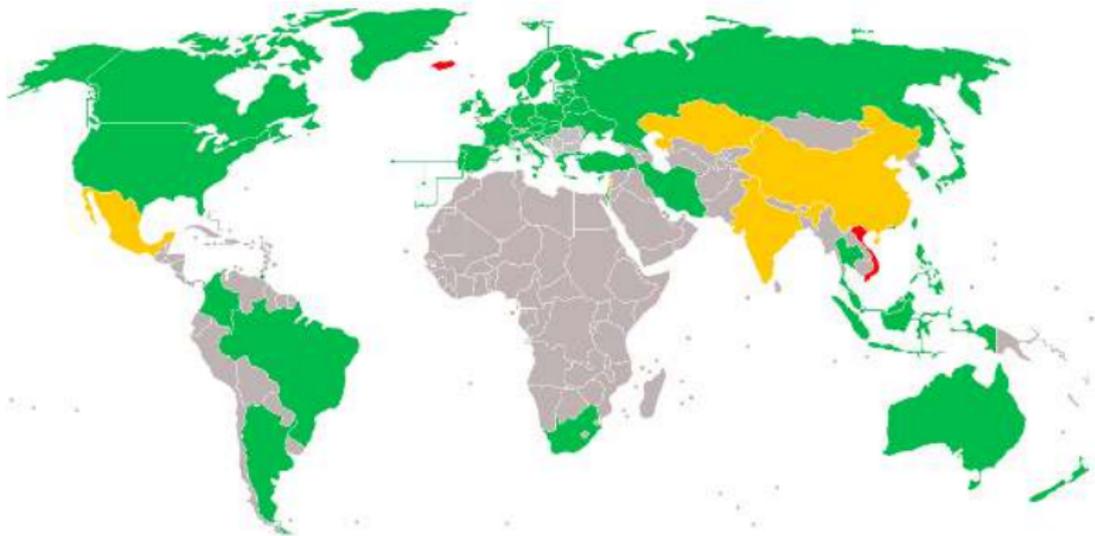


Figure: **April 2014**: Global map of BTC legal status. Legal status of digital currencies in different countries. Green: permissive countries, red: hostile countries, yellow: contentious countries, grey: unknown position. Data source: MarkleTree



Figure: **September 2014**: Global map of BTC legal status. Legal status of digital currencies in different countries. Green: permissive countries, red: hostile countries, yellow: contentious countries, grey: unknown position. Data source: MarkleTree

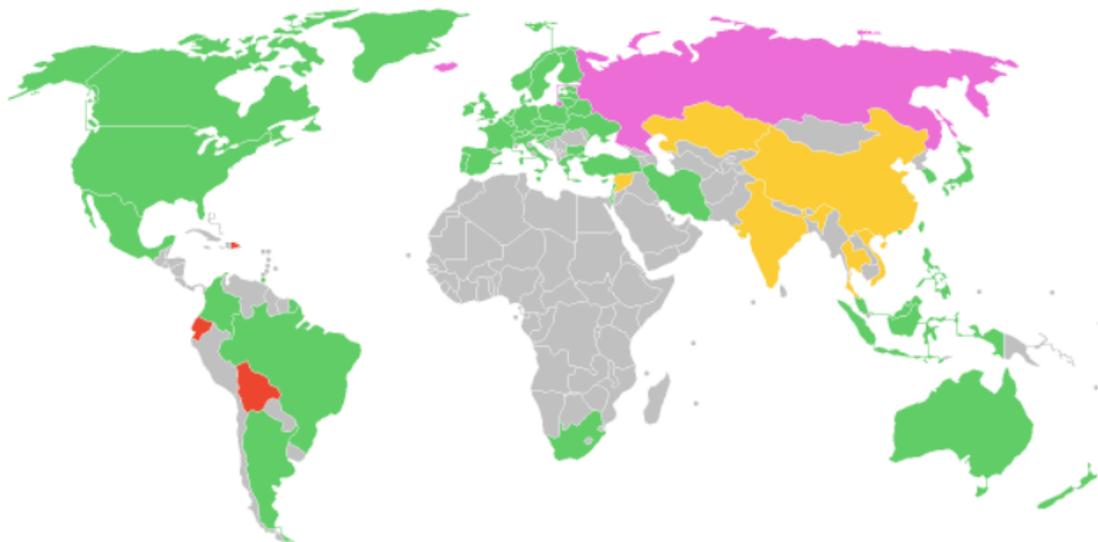


Figure: **May 2016**: Global map of BTC legal status. Legal status of digital currencies in different countries. Green: permissive countries, red: hostile countries, yellow: contentious countries, pink: interpretation of old laws, but bitcoin isn't prohibited directly, grey: unknown position. Data source: MarkleTree

Hostile Jurisdictions

- Bangladesh
- Bolivia
- Kyrgyzstan
- Ecuador
- Iceland

Contentious Jurisdictions

Restrictions on use and exchange of digital currencies. Digital currencies as “Virtual good” of “Money surrogate”.

- China
- Thailand
- Indonesia
- India
- Jordan
- Lebanon
- Russia
- Taiwan
- Vietnam

Permissive Jurisdictions

- USA
- EU
- Canada
- Japan
- Australia

USA

- FinCEN (users, administrators, exchangers) -> MSB
- NYDFS: BitLicense. It is the first ad-hoc regulation applied to:
 - transmission
 - storage, holding, custody
 - C2C and C2F
 - control, administration, issuance

Rules:

- Capital req. and protection of assets
- Record keeping
- AML, KYC reporting
- Cyber security and consumer protection

DATA is quite critics with respect to BitLicense:

- activity areas being regulated is too broad;
- AML req. poses privacy issues and ask for untenable data collection;
- risk of stifling innovations;
- need for transparent, tailored-made and proportionate framework;
- identity verification and effective oversight via blockchain technology.

USA

- California [AB 1326](#): license from the Commissioner of Business Oversight for:
 - custodians
 - exchange (C2C or C2F)
- Rules:
 - Similar to BiLicense
 - Hold a bond or trust account for an amount decided by the CBO.

“Californias BitLicense” has failed to pass in the Legislature before 11 Sept. deadline.

EU

- In EU there is no specific Directive and EU member states do not pass any specific law on digital currencies.
- ECB: “Bitcoin cannot be considered as money or currency from a legal perspective”.
- EBA: “It is unlikely that EU/EEA members will declare a digital currency as legal tender”.
- EU Parliament: “Bitcoin is neither a traditional currency nor is it linked to legal tender. In cases of loss or fraud, no compensation mechanism, such as deposit guarantee funds, exists. There is no redemption mechanism. This problem might not hit only a limited number of users”

EU

In EU, the general orientation is to adopt the current legislation already in place in order to deal with digital currencies.

- The **Electronic Money Directive** 2009/110/EC identifies electronic money according to three criteria
 - 1 electronic storage → every digital currency is monetary value stored on the computer of the participants in the P2P network
 - 2 issuance upon receipt of funds → **mining activity doesnt imply an issuing of digital currencies on receipt of funds**, i.e., miners do not receive funds in return for their activity^a
 - 3 acceptance as a means of payment by a legal or natural person other than the issuer → digital currencies can be used to buy goods and services from third parties outside of the P2P network
- The **Payment Services Directive** 2007/64/EC does not apply to digital currencies: payment institutions defined by the Directive are not allowed to issue electronic money

^aHowever, service providers that issue digital currencies upon payment of fiat currency could be considered e-money issuers

EU

- EBA launches warning alerts to national supervisory authorities:
 - Long-run: harmonised regulatory framework^a
 - Short-run: 70 risks related to digital currencies:
 - risks to users
 - risks to non-users market participants
 - risks to financial integrity
 - risks to payments service providers
 - risks to regulatory authorities.
- EBA recommends national supervisory authorities to discourage credit institutions, payment institutions and e-money institutions from buying, holding or selling Digital Currencies.

^aAuthorised entities should put in place governance mechanisms, capital buffers and separation of business to customer accounts.

EU

- The EU Commission promote the creation of the **Digital Single Market**. It is based on three pillars:
 - **Access**. Better access for consumers and businesses to digital goods and services across Europe
 - **Environment**. Creating the right conditions and a level playing field for digital networks and innovative services to flourish.
 - **Economy & Society**. Maximising the growth potential of the digital economy.

Obstacles:

- EU cross-border online services represent only 4%¹
- only 7% of SMEs in the EU sell cross-border
- Only 59% of Europeans can access 4G, dropping to 15% in rural areas
- Digital data stored in cloud: 2013: 20% - 2020: 40%
- Half the EU population (47%) is not properly digitally skilled, yet in the near future, 90% of jobs will require some level of digital skills

¹The remaining online services are from US providers (54%) or EU national providers (42%).

EU

- Digital Single Market union. Among the other measures that could make it easier for businesses to set up and **operate online** might include:
 - the enabling of **digital currencies** or other innovative payments methods to improve consumer trust and enhance cross-border trade.
 - Pilot projects by (or financed by) the EU about blockchain applications and digital currencies are starting.

EU

The PSD2 main objectives:

- Contribute to a **more integrated and efficient** European payments market
- Improve the level playing field for payment service providers (including new players)
- Make **payments safer and more secure**
- Protect consumers
- **Encourage lower prices** for payments

PSD2 creates the basis for a new global digitised payment system:

- Fintech companies and telcos (TPPs) to join the payments market (a payment initiation services; or account information services)^a
- TPPs to access the banks' infrastructure. Banks have to open up their APIs and TPPs can get info on customers funds^b
- a cap on Multilateral Interchange Fees (MIFs)^c

^aE.g., Sofort, Ideal, Trustly, ApplePay.

^bBanks will act as Account Servicing Payment Service Provider (ASPSP)

^cFees agreed between the acquiring payment service provider and the issuing payment service provider, for each sales transaction made. Maximum amount of 0,2% and 0,3% for a debit- and credit card-transaction respectively.

EU

With TPP services on the rise and their inclusion in PSD2 a fortiori banks run the risk of being increasingly disintermediated and losing transactions to these parties especially if instant and costless blockchain-based payment solutions are emerging.

Digital Currencies: the next step after PSD2 and Instant Payments?

However, a full regulatory framework on Digital Currencies and Blockchain technology is expected to stay on **hold for some more time** because:

- Just after completion of the SEPA implementation in Europe, the PSD2 regulation has yet to be implemented, with the full impact of TPPs, Fintechs and other disruptors starting to reveal themselves.
- A frame for **Global Instant Payments Solutions**, require a coordination among banks and different regulators (not only EBA).

Germany

- 07.2011: The German Federal Financial Supervisory Authority (BaFin) declared Bitcoins to be a “Rechnungseinheiten”. Bitcoins are **unit of account** under the German law but they are not qualified as:
 - e-money (under the Zahlungsdienststeuergesetz) because there is no issuer
 - foreign currency nor as foreign banknotes and coins.
- BaFin considers Bitcoins as **private money** or complementary currency used as a means of payment in settlement accounts by virtue of private-law agreements.

Legal and Tax Implications:

- US regulators have chosen to focus on the obligations of the **exchangers** and **administrators**
- German regulators have concentrated their efforts on regulating the **users** by classifying digital currencies as units of account: 25% capital gains tax if users hold the currencies for less than one year.

France

- Similar approach adopted by Germany. Moreover, ACPR imposes exchanges and payment transmitters to obtain a license as PSP.

Switzerland

- FINMA explicitly considers Bitcoin as a means of payment which means that under Swiss law, Bitcoin is comparable to **foreign currency** even though it is not a legal tender
- Compulsory to comply with the Swiss AML and Banking Acts.

Italy

- The issuance and management of digital currencies, including currency conversion in traditional activities are **not subject to supervision** by Banca d'Italia or of any other Italian authority
- Businesses dealing in digital currencies, including holding them and exchanging them for fiat currencies, are not required to comply with any AML/KYC regulations

UK

- 09.2013: The UK regulators communicated that Bitcoin-based businesses would not be required to register their activities.
- The first orientation among UK regulators was to treat Bitcoin not as money, but instead as **single-purpose vouchers**, which could imply a VAT tax liability on any Bitcoins that are sold.
- The UK tax agency (HM Revenue and Customs) brief treats digital currencies like any other form of payment for tax purposes
- The HMRC set out the rules on the tax treatment of income received from, and charges made in connection with mining, trading, payment processing or services involving digital currencies, specifically for VAT, Corporation Tax, Income Tax and Capital Gains Tax.
- The FCA so far has not issued any guidance or comments on the regulation of digital currencies. No obligation to register or be authorised by FCA.

Unexceptionalists Vs. Exceptionalists

- ① Duality of digital currencies as a commodity (or property) and a currency, which is likely to create a gap between the US and the EU approaches
- ② Conflict between regulatory
 - **Unexceptionalists**. Those who are in favour of full regulation of this new emerging technology
 - **Exceptionalists**. Those who prefer specific circumscribed measures instead of over-regulating the whole emerging technology

Tension between the need of tailor-made regulation for digital currencies or FinTech businesses and the risk of market distortion by being exposed to potentially regulatory alarmisms

In the last years, with respect to Internet-based activities, we have observed an **exceptionalist** approach by lawmakers and regulators.

- Regulatory responses to social networking sites like Facebook are a prime example of Internet exceptionalism. Rather than regulating these sites like other websites, regulators have sanctioned laws specific to social networking sites, e.g., verify users age and data protection.

Risks to Regulatory Authorities

① Reputational risks

- Regulators decide to regulate digital currencies but the chosen regulatory approach fails.
- If regulators do not regulate digital currencies there is the risk that the viability of regulated financial institutions is compromised as a result of their interaction with digital currencies.
- Regulation and supervision of conventional financial activities is circumvented by unregulated “shadow” activities that incur the same risks.

② Legal risks

- Regulator is subject to litigation as a result of introducing regulation that renders pre-existing contracts illegal/unenforceable.

③ Risks to competition objectives

- Trade-off between a regulation that guarantees market stability and a regulation that boosts innovation.

Who will regulate new blockchain-based business models ?

- intermediation;
- clearing and settlement
- post-trade activities of middle-back offices (i.e., messaging, matching, netting, allocations, payments and reconciliations);
- record system (e.g., guns, precious metals, arts)
- rating or voting system
- databases
- distributed storage, authentication, anonymisation of private information
- rewarding and punishing-incentive schemes
- transaction traceability schemes
- refereeing, arbitration
- notarisation (e.g., vehicles registrations)

A mixture between self-regulation and an activity-based exceptionalist regulation may be the right approach.

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Finding the right combination is another story...