Blockchain
Meh, why should I care?

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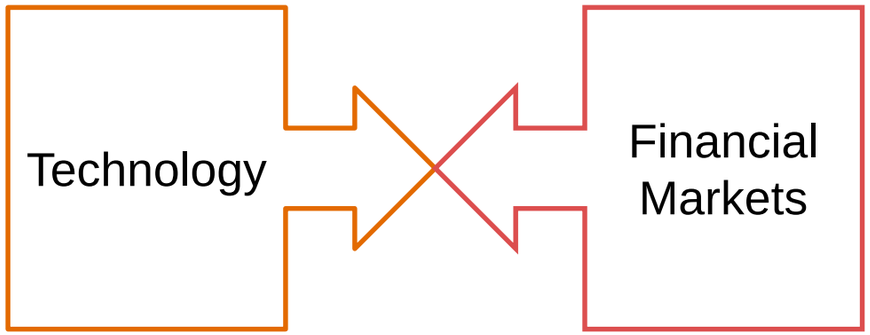
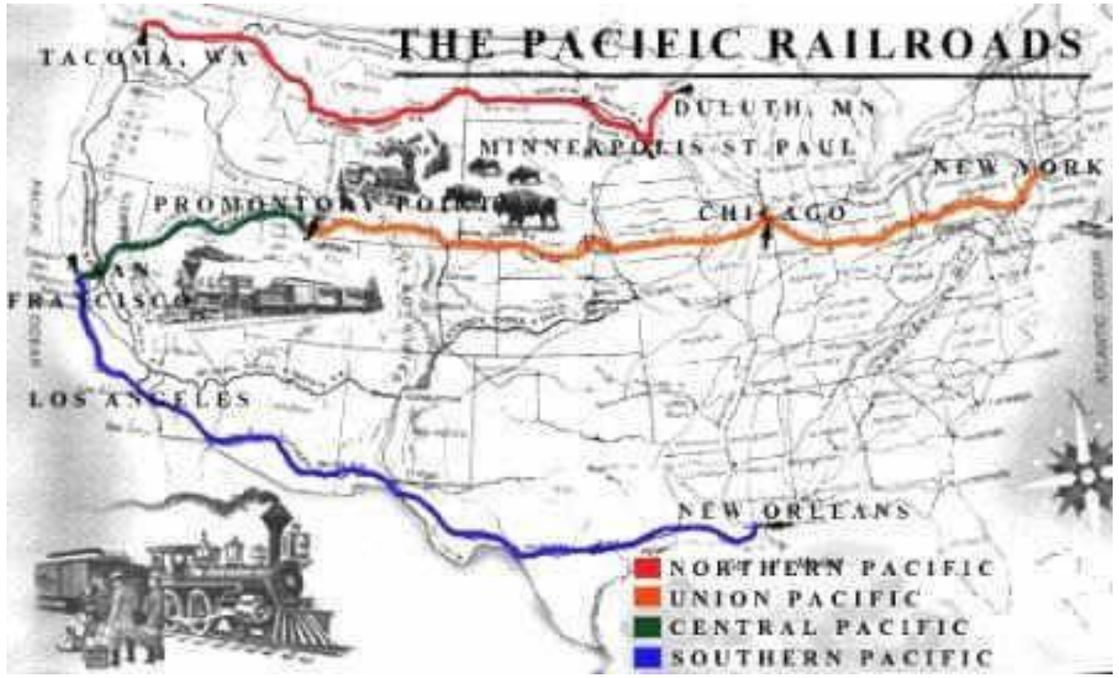
pwc

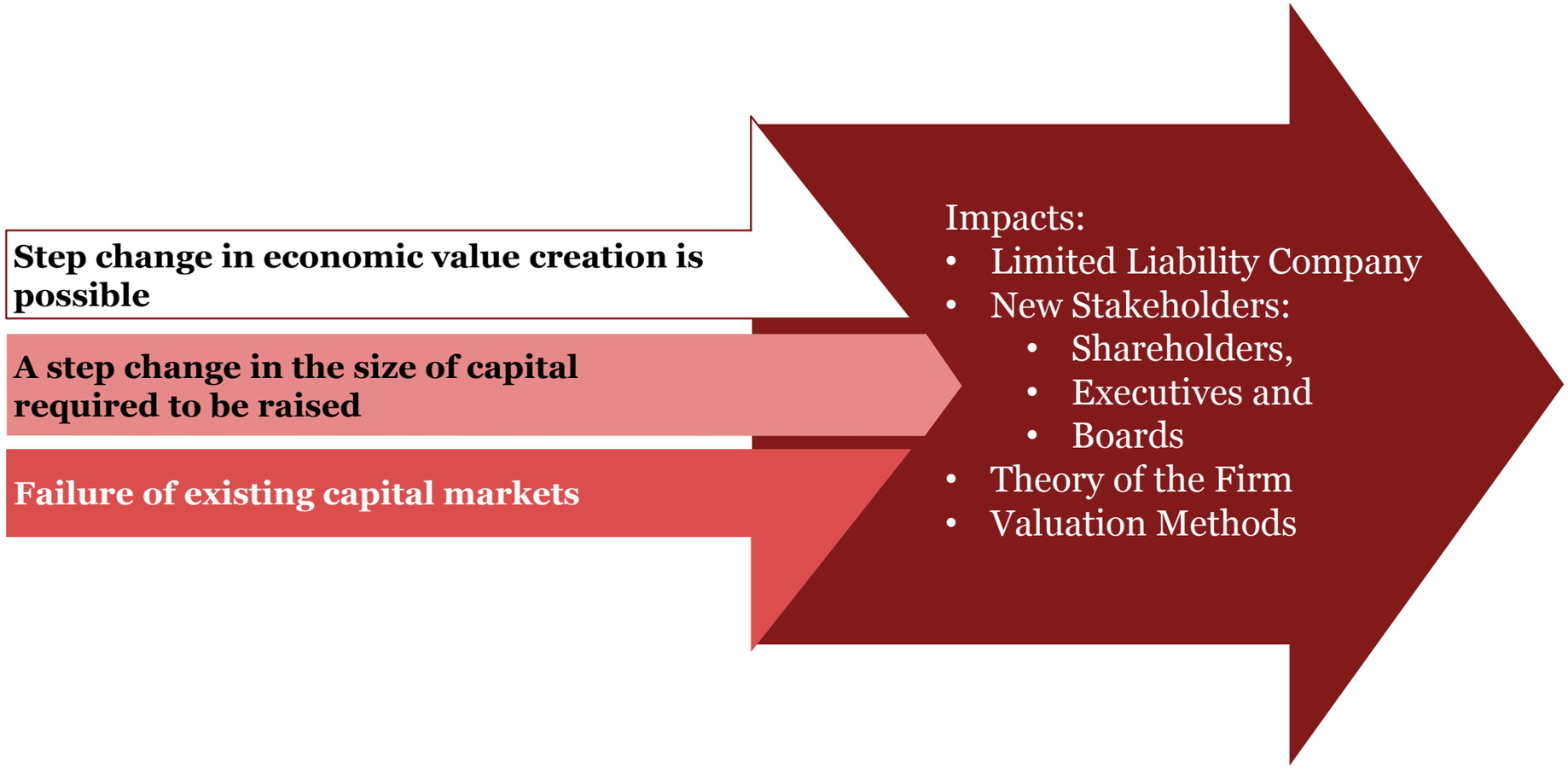
Hypothesis: Technology and Financial Markets are Interrelated



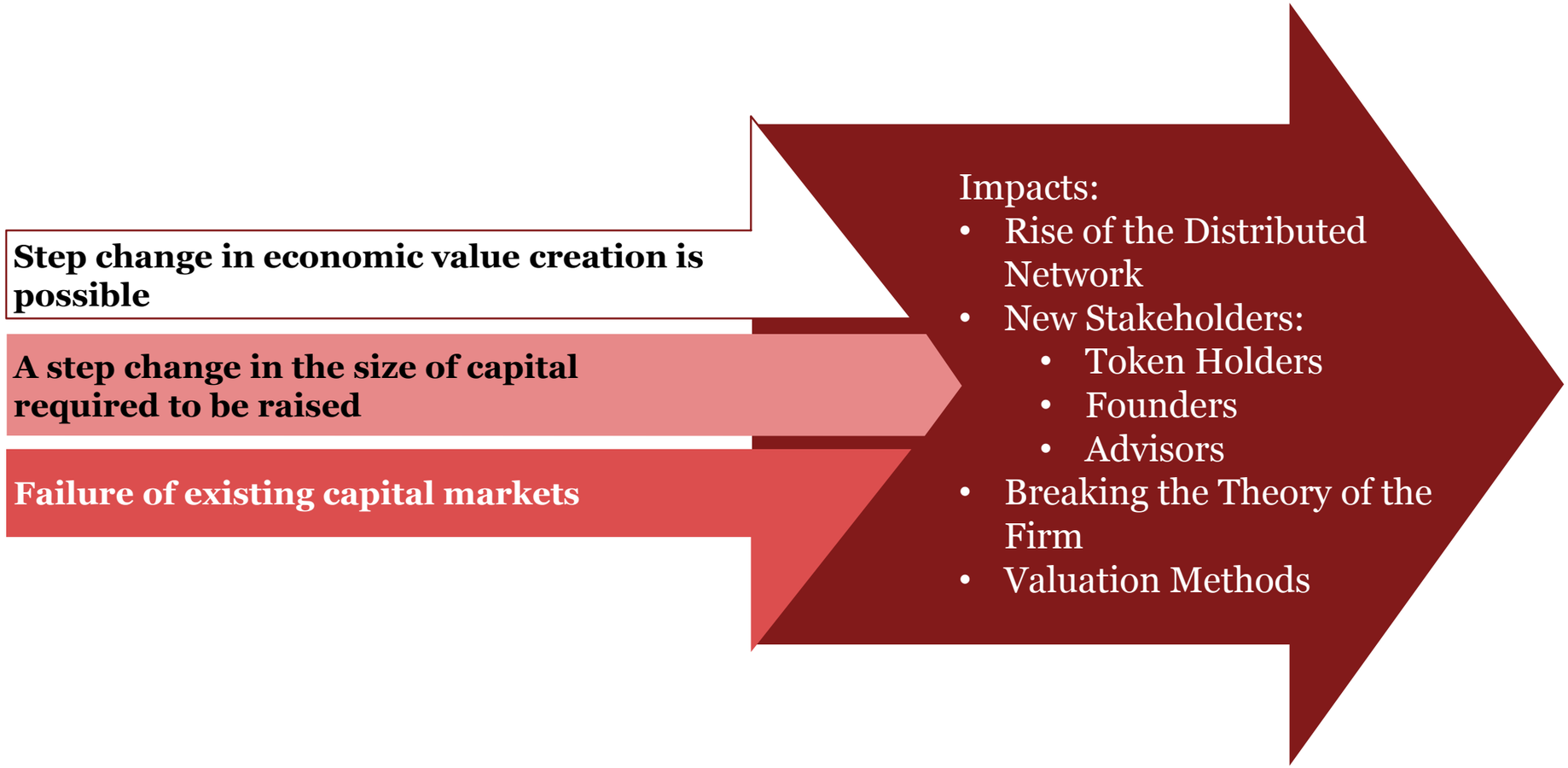
Case Study: Steam Power and the Rise of the Centalised Corporation



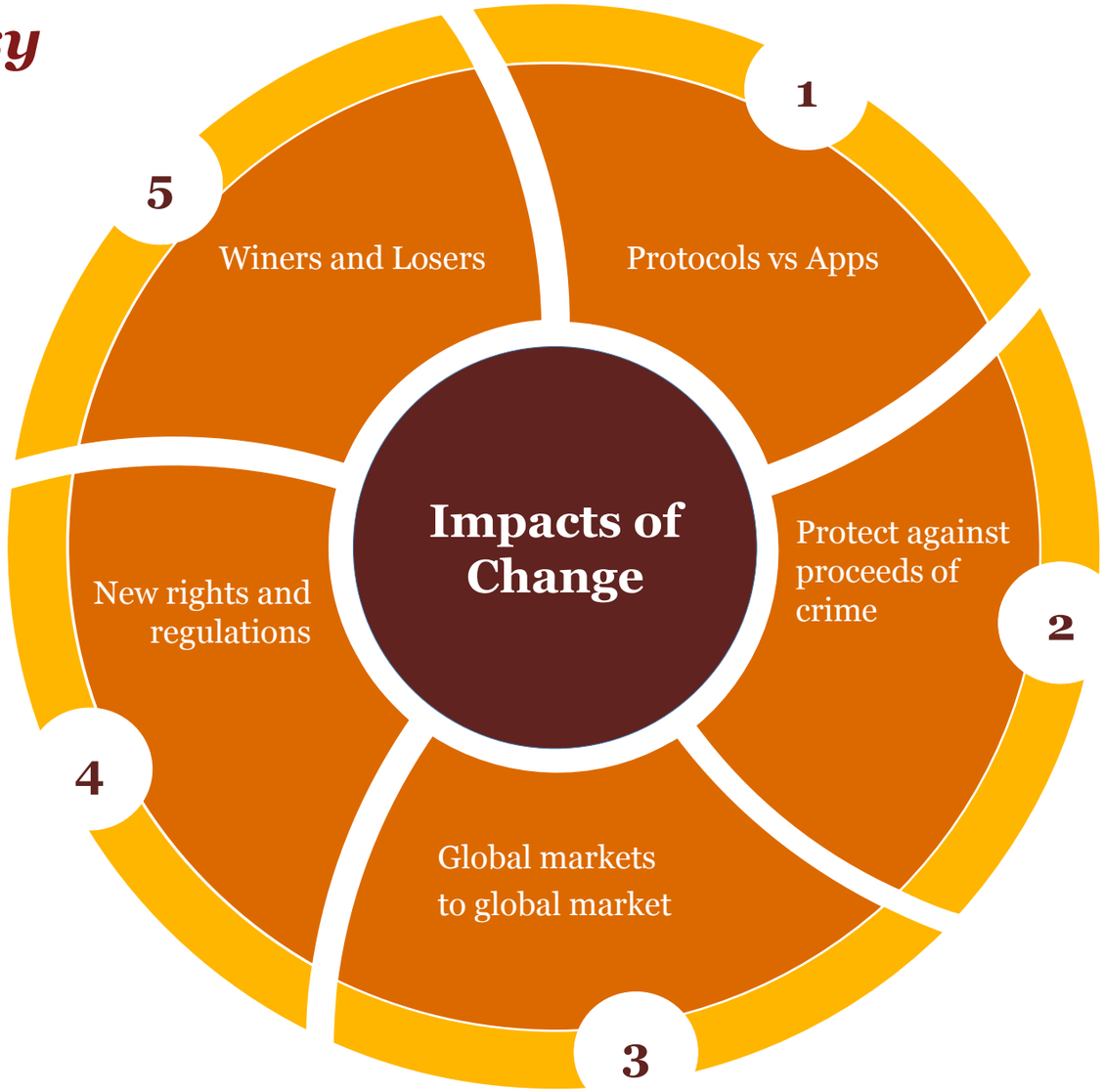
Steam Power and Railroads



Blockchain and Networks



But …. it is going to get messy



Blockchain, Crypto, ICOs

… What are they,
… and how do they work?

What is blockchain?

A decentralised public ledger of all transactions across a peer-to-peer network, essentially blocks of validated and cryptographic transactions chained together by mathematical algorithms.

Blockchain is a type of technology that powers many digital assets, the most famous example being Bitcoin.

Four key concepts of Blockchain technology

Distributed Ledger

Every participant in the network has simultaneous access to a view of the information

Near real-time data availability and transparency that can eliminate the need for reconciliation

Cryptography

Integrity and security of the information on the blockchain are ensured with cryptographic functions

Prevents unwanted intrusion on the network from non-authenticated participants

Consensus

Verification is achieved by participants confirming changes with one another, replacing the need for a third party to authorise transactions

Facility for peers in the network to validate updated information ensuring validity and integrity of the data on the chain

Smart Contracts

The ability to run additional business logic means that agreement on the expected behaviour of financial instruments can be embedded in the blockchain

Facilitates the ability to design and implement shared workflow and enhance automation

What is cryptocurrency?

A digital asset designed to work as a medium of exchange using cryptography to secure transactions and to control the creation of additional units of the currency.

Cryptocurrency is one application of Blockchain technology.

Types of Digital Assets

At present, ICOs typically involve the issuance of utility tokens

Payment currencies

Tokens with an attributed value for exchange/ transactions, asset/ value storage and/ or unit of account

Asset-backed tokens

Tokens that provide underlying exposure to real world assets (e.g. gold, diamond, securities, cash, real estate, etc.). These are often also considered as security tokens.

Security tokens

Tokens with security characteristics, e.g., debt, equity or derivatives, with income generating component or potential rights vis-à-vis the issuer.

Utility tokens

Tokens offering access to platform and often used for supporting services/ functionalities on blockchain-based platform

What is an Initial Coin Offering?

ICOs

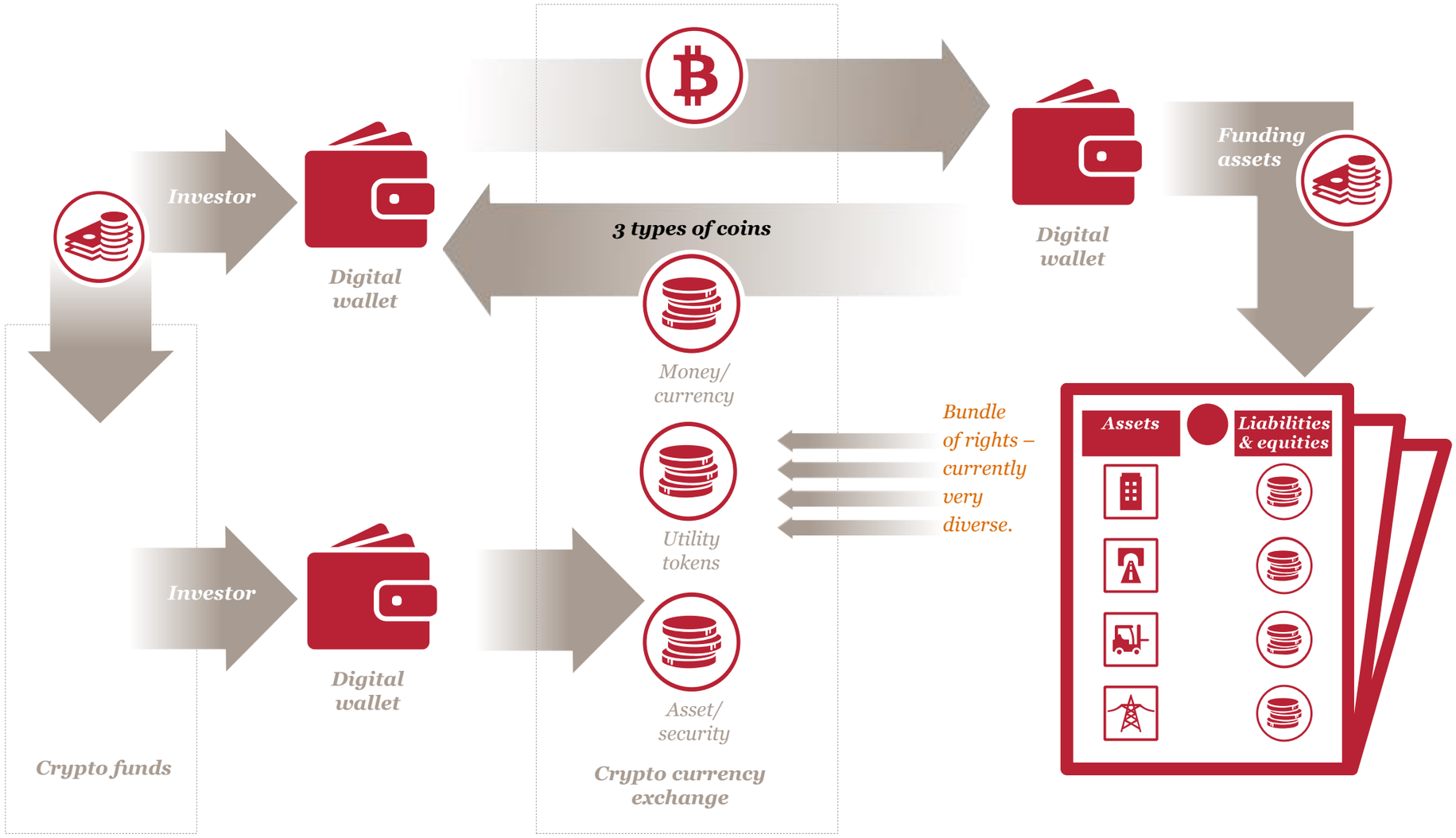
A company, team, or foundation sell a predefined number of *tokens* in a limited time period, typically in exchange for bitcoin or ether.

Tokens

These **tokens** typically provide:

- Certain features or rights
- Can be used or staked in that eco-system
- Be traded on an exchange
- Be held in a user's private wallet

Value flows when issuing an Initial Coin Offering



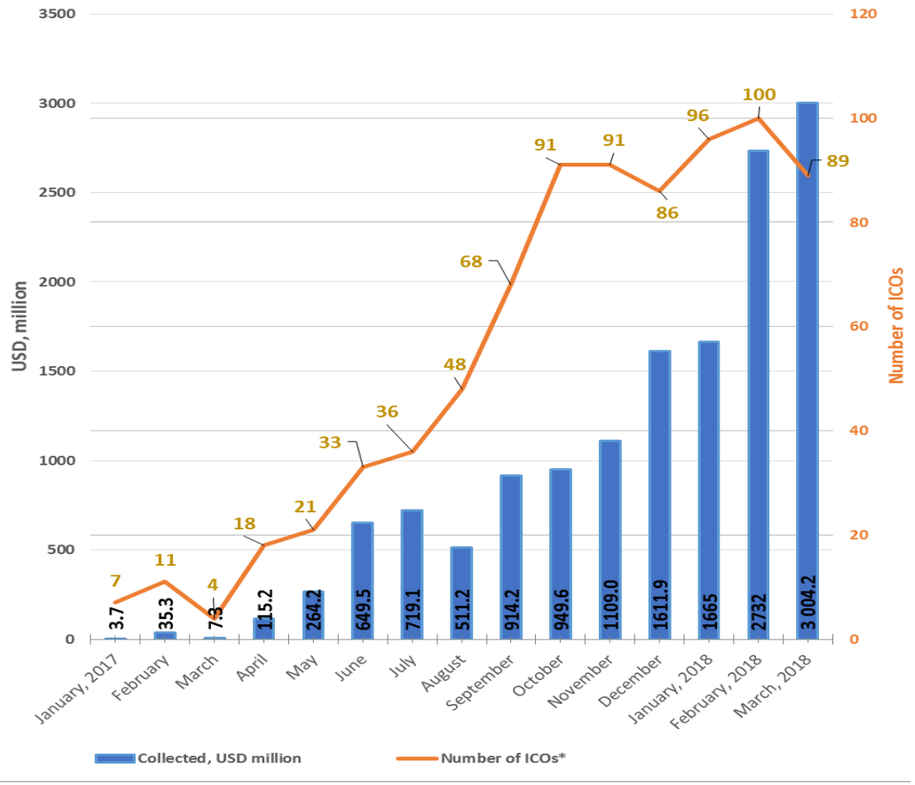
Initial coin offerings are a new capital market funding mechanism

- Recent financial innovation has led Initial Coin Offerings (ICOs) to emerge as a new capital market funding mechanism.
- ICOs initially arose in relation to funding technology start-ups.
- Traditional corporates are forming strategies around how ICOs can be used as an alternative funding mechanism, and also create a step change in engagement for their business.

Typical features of an Initial Coin Offering

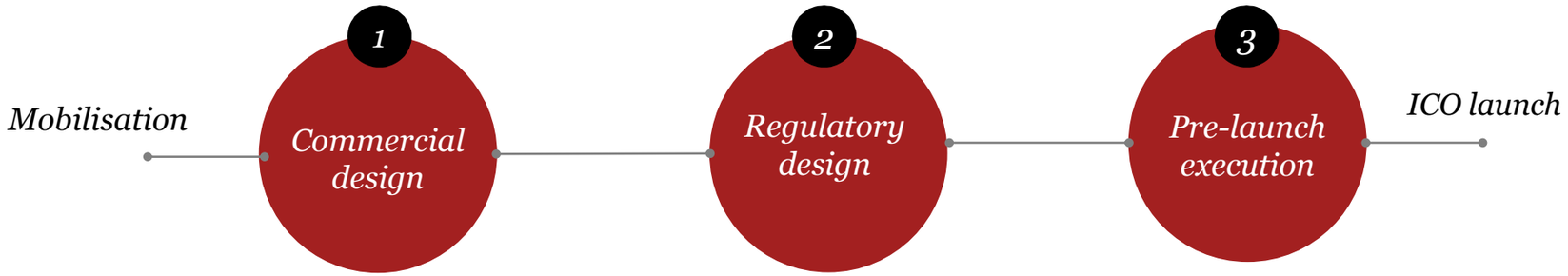
- A company designs, programmes and issues a unique cryptographic token, with various rights that will add value to its network and customers.
- Interested participants will purchase the token. This will provide them with the rights programmed into the token. These could include discounts or access to extra services.
- The company can use the funds raised in the pre-disclosed manner – for example funding a new plane or developing a new service that customers have indicated they wish to use.
- Investors and other ecosystem participants can purchase the token with either NZD or cryptocurrency.

Trends in funds collected and number of ICOs since the start of 2017



ICO Methodology

Our approach involves three phases in which we guide you through commercial design, regulatory design, and launch execution.



*An ICO can be both a **fundraising mechanism** and a means of **driving engagement** with your ecosystem.*

Starting with the commercial design of your token is critical for the ICO to deliver value.

*An ICO launch is a **global process** with **many regulatory design choices** driven by different issuing locations and investor territories.*

We work with our global ICO network to help you select the right combination and then lead you through how to comply with the requirements.

A successful ICO requires management and careful coordination of many pre-launch activities, including:
***ICO lead advisory services** about market timing and pricing, **technical coding** of the token, **cyber security, KYC/AML** and many other matters.*

Initial Coin Offering - Funding + Customer Engagement

Unique features of ICOs

An ICO is a new and disruptive capital raising mechanism. ICOs utilise blockchain technology and smart contract functionality to **create ecosystems** around a cryptographic token.

How Could an ICO Create Value for New Zealand organisations?

Funding benefits and improved profitability through enhanced customer engagement are two potential sources of value creation for New Zealand organisations.

Potential funding benefits	Value through enhanced customer engagement
Ability to diversify funding sources.	Increased user engagement and connection with customer needs.
Sourcing funds at an attractive cost.	Optionality to segment approach to loyalty across B2B and B2C customer sets.
Reducing transaction costs compared with current funding approaches.	Enhanced alignment of brand to innovation and digital excellence.
Possibility of receiving a favourable credit rating agency treatment on a post-ICO basis.	Creates an easier pathway for future blockchain related business model enhancements.

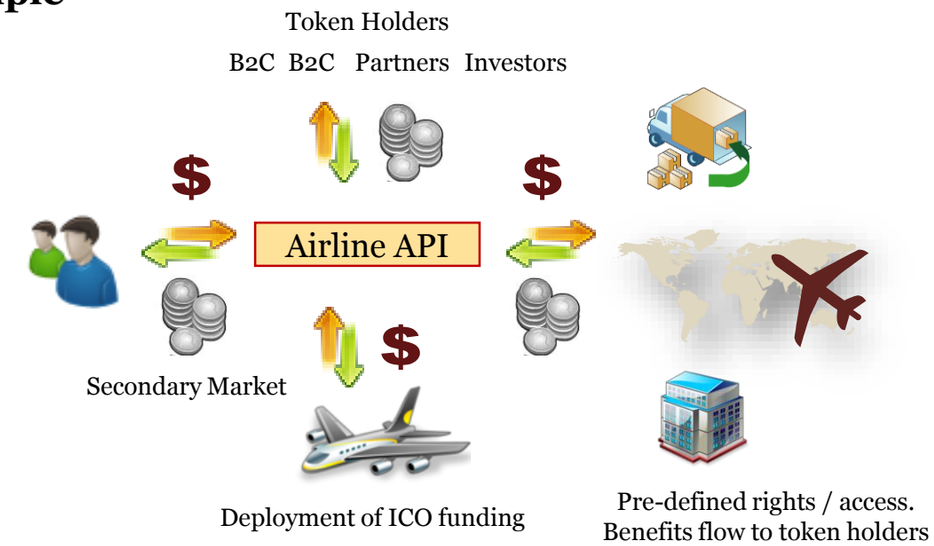
What is a token ecosystem?

The value of an ICO is brought to life by an engaged token ecosystem. The ecosystem brings together the token owners, which can include customers, investors, employees and the company.

The tokens enable participants to securely transfer value, P2P, driven by economic incentives.

Tokens are disruptive in that they can provide consumers with both financial incentives and utility, a concept not previously provided by traditional assets.

An indicative token ecosystem for NZ? Airline industry example

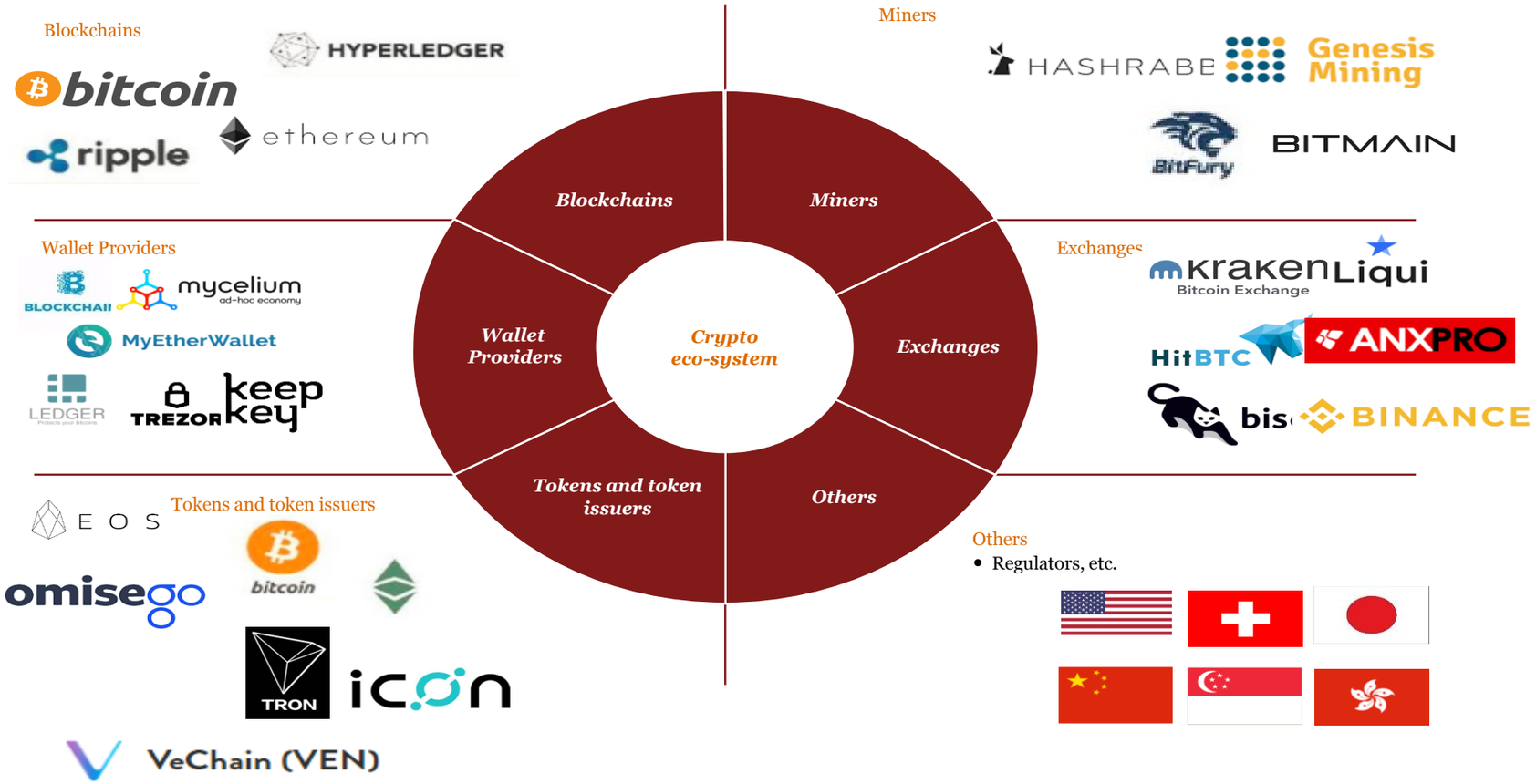


Initial Coin Offerings - Strategic and market considerations

Corporate treasuries should begin to raise awareness and begin to monitor key strategic and market considerations

Strategic and Market Considerations	Current Value	Details
Economic role of ICOs	**Fund raising and ecosystem engagement mechanism**	The key unique characteristic of ICOs are their ability to both be a **fundraising mechanism and a driver of higher engagement levels** impacting both the operating and 'financing' cashflows of a business.
Size of ICO market	**<0.1% of new capital market raises**	The current size of new ICO issuances (c. USD 6bn in 2017) is very small (<0.1%) compared with all other debt and equity issuances.
Size of 90% of deals	**<$50m**	The size of most ICOs are still very small relative to deals done in debt and equity markets.
Industry dominance	**95%+ Blockchain Technology or SaaS**	• Blockchain focused entities initially saturated the ICO issuance landscape. • SaaS companies are now adopting ICOs as a funding mechanism, whilst pivoting towards including Blockchain in their offering. • Limited green shoots of 'traditional' industries Airlines, hotels, city councils.
Cost of issuance	**5% to 10%+ of raised amount**	High total costs due to uniqueness of required skills: token commercial design, regulatory advice, KYC/AML, Cyber security, Marketing and PR, access to investor networks, crypto exchange listing costs.
Treasury and business models	**Nascent**	The token economics of ICOs (aka treasury and business models) are still in an experimental phase with no dominant approach yet emerging.
Cost of funds	**Low, but difficult to independently observe**	The value of the token is a function of the expected value accruing to the token holder discounted by an appropriate cost of funds. Current (arguably) high issuance prices could represent either high expected cash flows and/or a low cost of funds.

Introduction to crypto eco-system



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Crypto & Infrastructure?

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New Zealand Transport Project Pipeline

New Zealand has a number of large transport infrastructure projects in the procurement and pre-procurement phases

Select projects in procurement

Auckland Northern Corridor

Status: Recently closed
Value: $700m
Sector: Road
Region: Auckland, NZ

East West Link

Status: Under review
Value: $800m
Sector: Road
Region: Auckland, NZ

Manawatu Gorge Alternative Route

Status: Announced
Value: $450m
Sector: Road
Region: Manawatu, NZ

Pokeno to Mangatarata

Status: Announced
Value: $280m
Sector: Road
Region: Auckland, NZ

City Rail Link

Status: Under procurement
Value: $3.4bn
Sector: Rail
Region: Auckland, NZ

Select projects in pre-procurement

Auckland light rail

Status: ATAP
Value: $6bn
Sector: Rail
Region: Auckland, NZ

AMETI - Eastern Busway

Status: Pre-construction
Value: $743m
Sector: Road
Region: Auckland, NZ

Southern Links

Status: Prospective pipeline
Value: $600m
Sector: Road
Region: Hamilton, NZ

State highway 20b Eastern airport access upgrade

Status: ATAP
Value: $330m
Sector: Road
Region: Auckland, NZ

Mill road corridor – phase 1

Status: *ATAP*
Value: $500m
Sector: Road
Region: Auckland, NZ

Warkworth to Wellsford road project

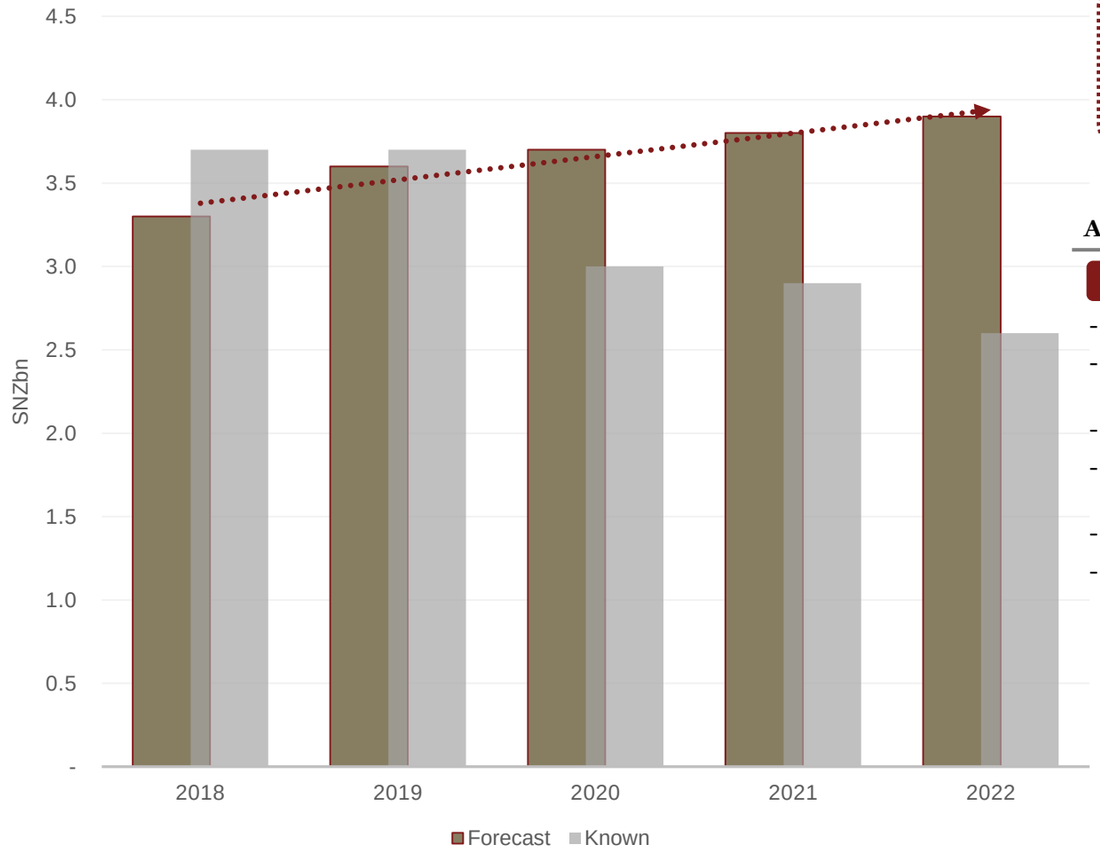
Status: Credibly proposed
Value: $1.5bn
Sector: Road
Region: Auckland, NZ

Source: Australia and New Zealand Infrastructure Pipeline

Auckland 10yr Infrastructure Pipeline

Auckland Council has budgeted $26.2b investment in the city's infrastructure over the next 10yrs, significantly higher than its current funding capacity of ~$20bn

Auckland Forecast Infrastructure Spend 2018 - 2022



ATAP Package consists of **$28bn** to be spent over the next 10yrs, **$16.6bn** on new projects and a large portion relating to transport projects.

This package will partially be funded by central and local government.

Auckland regional projects include:

Procurement / Delivery	Pre-procurement
- **City Rail Link**	- **Auckland Light Rail**
- **Auckland Northern Corridor**	- **Warkworth to Wellsford**
- **East West Link**	- **Penlink**
- Auckland Airport Expansion	- **Mill Road**
- Central Interceptor	- **AMETI**
- Northern Interceptor	

Source: National Construction Pipeline Report 2017

Desired characteristics of a procurement model

There are a number of traditional and more modern methods which could be used to bridge the funding gap. An ICO has a number of advantageous characteristics

User pays model

- ✓ PPP (Revenue risk transfer)
- ✗ PPP (NZ availability)
- ✓ Traditional public funding
- ✓ ICO

In an availability PPP model toll revenue risk remains with the Crown.
ICO – derisks toll revenue as demand ascertained before construction

Enables consortium funding

- ✓ PPP (Revenue risk transfer)
- ✓ PPP (NZ availability)
- ✗ Traditional public funding
- ✓ ICO

PPP model procured through partnership of financers, constructors & operators, but usually <5 parties.
ICO –allows multiple institutional or retail investors to jointly invest

External value capture

- ✓ PPP (Revenue risk transfer)
- ✗ PPP (NZ availability)
- ✗ Traditional public funding
- ✓ ICO

ICO – In an ICO model, toll pricing potentially more elastic as value appreciates with demand and Crown retains control over token supply.

Retention of control

- ✗ PPP (Revenue risk transfer)
- ✗ PPP (NZ availability)
- ✓ Traditional public funding
- ✓ ICO

In a PPP model ownership only transfers back to Crown at the end of the concession period.
ICO – Crown has the ability to retain majority control. Tokens issued by Crown.

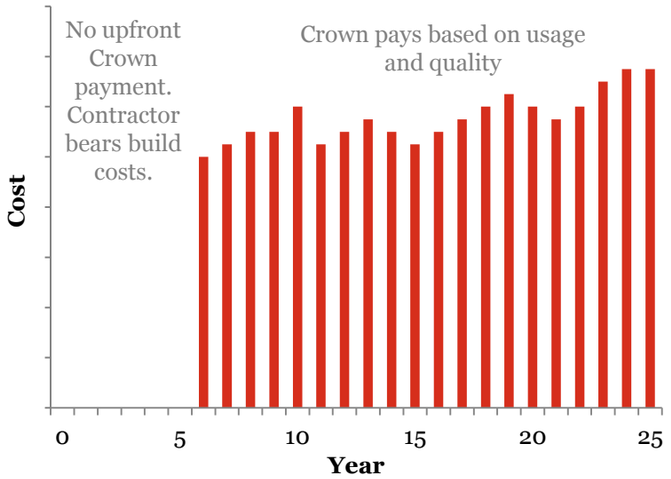
ICO Considerations

- Upfront payment for usage
- Promotes / incentivises a quality asset (alignment of objectives)
- Raised through pre-sale of a % ownership to public / companies through token mechanism
- Retain control (ownership remains with Crown)
- Price appreciation of tokens based on quality
- Creates secondary market for tokens (ie traded as well as used). Capital gain in token with demand for infrastructure
- Ability for infrastructure users to lock in cheaper prices pre asset construction

Desired characteristics of a procurement model

Under an ICO cost model, investment is made upfront with the payoff received from usage. There is also the potential for additional value capture through token appreciation

NZ PPP Cost Model



ICO Cost Model