ARC

ARC RESERVE CURRENCY

RESEARCH ROAD MAP

ARC Reserve Currency ("ARC") is an intrinsic-value stablecoin. It is an ERC20 compliant token, whose price is related to a pool of underlying assets held by a special purpose vehicle[1] ("SPV").

This note sets out the results of research undertaken so far to facilitate the launch of ARC (which is not covered elsewhere) and explores further work including areas for improvements.

Note: this is one of a series of papers that describe the nature and purpose of the ARC Reserve Currency. Please see www.arccy.org for further details, including the rationale for ARC.

ARC is a work in progress. Please contact us at hello@arccy.org for comment and suggestions.

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[1] ARC Foundation Ltd ("SPV") is an entity set out to hold the underlying assets of ARC

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1 Overview

Through development work to create of ARC we have identified some limitations, which require further work, and we have also overcome some important steps.

One of the main limitations of ARC is the degree of decentralisation. There are elements of ARC which are centralised, that, where possible, we would like to decentralise through further investigation and as the ecosystem develops. In particular the investment allocations and governance of the SPV.

We start this paper with a review of the importance of decentralisation and consider how it can be assessed and improved upon.

We have adopted a minimum viable product ("MVP") approach for the investment allocation aspects of the SPV, which will apply when the net asset value ("NAV") of the SPV is relatively small and during ARC's earlier periods.

Prior to the launch of ARC, we conducted a review of cryptocurrency regulations in leading jurisdictions to establish an appropriate approach that should enable ARC to be widely accepted. This regulatory review has also framed the analysis which led to the key financial features of ARC, as set out in the ARC Primer and Overview document[2].

Please note: the domicile for the SPV is still being considered, and the relevant sections in this note will be updated once the jurisdiction has been decided upon.

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[2] See www.arccy.org for details.

2   Decentralisation

"[One of] the strongest cases for the existence of cryptocurrencies…[includes]…allowing for a decentralized Internet…"[3]

- Mark Suster, Upfront Ventures

One of the primary benefits and attractions of blockchain and its related crypto-currency applications is its decentralised nature. No single central authority controls the blockchain. We are exponents of this decentralised framework.

We recognise that ARC has some centralised elements at the outset. It is our goal to decentralise these over time, as soon as the broader ecosystem is ability to support and supply sufficient tools and opportunities to demonstrate the stability that ARC requires in these areas.

Where ARC is unable to operate in a completely decentralised and trust-less way from the outset, and until decentralisation of ARC has been achieved in full, we will use a combination of automated centralised actions, strong governance and transparency to provide the opportunity for peer oversight to foster trust.

2.1.1   How Decentralised Is ARC?

There isn't a commonly accepted methodology for assessing the degree of centralisation present in a blockchain or cryptocurrency application.

Here, we considered Balaji Srinivasan's blog post on Quantifying Decentralisation[4] as a useful framework to measure and quantify the level of decentralisation in a blockchain system, identify areas for improvement, and then optimise the overall system for decentralisation over time.

In our implementation of Srinivasan's model, we consider the six subsystems most relevant to ARC's decentralisation as:
- **Primary purchasers of ARC**
- **Wallet providers**
- **Development decentralisation**
- **Exchange decentralisation**
- **Investment allocation decentralisation**
- **Ownership decentralization**

We discuss each of these in turn, and focus on the two areas which are most centralised at the outset: *development centralisation* and *investment allocation*. We've not sought to quantify these in our here, but we do intend to quantify these from time to time, and publicise the results on www.arccy.org

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[3] https://bothsidesofthetable.com/the-case-for-against-cryptocurrencies-101-c8d71c444fe0
[4] https://news.21.co/quantifying-decentralization-e39db233c28e

2.1.2   Decentralised Features

2.1.2.1   Primary Purchasers of ARC

There are no limitations imposed upon who can purchase newly minted coins from www.arccy.org. It may even be argued that there is a lower barrier to purchase ARC than the infrastructure requirements to mine Bitcoin (for example).

The sale price for new issues is set transparently by reference to the NAV of the SPV, and new ARC coins can only be minted by the ARC Foundation and at price equal to NAV per coin at the time of issuance.

2.1.2.2   Wallets

ARC can be held in any ERC20 compliant digital wallet (or equivalent) that the holder chooses to use, subject to the technology limitations of each digital wallet provider, and any regulatory constraints for each holder with respect to transferring their ARC holding from an exchange (or otherwise).

2.1.2.3   Exchange Decentralisation

ARC is freely tradable, either through exchanges or directly peer-to-peer. We intend to work with all bona fide exchanges.

Other than any regulatory constraints (e.g. AML /KYC), ARC is freely transferable.

2.1.2.4   Ownership of ARC

The ownership of ARC is stored on the Ethereum blockchain. It is fully decentralised and is difficult for ARC (and its operators) to amend the record of ownership.

ARC can be sold at any time by any holder to any other buyer for a price they agree between themselves. ARC, or the SPV, is not required to validate, price or otherwise engage in the transaction for it to complete and be recorded on the Ethereum blockchain.

2.1.3   Centralised Features

As noted above, we recognise that some aspects of ARC are centralised form the outset. Where possible we have sought to make these autonomous, transparent and predictable. Our ambition is to fully decentralise the elements over time.

2.1.3.1   Development Decentralisation

The development of ARC from a technical perspective is relatively trivial compared to many other blockchain and cryptographic initiatives.

Therefore, it only requires a limited number of coders and programmers to implement the solution. This results in ARC having a relatively high centralisation score from a development perspective.

We will solicit feedback regarding the scope and breadth of the asset allocation methodologies and approaches (which may be considered part of the dev framework), and will note contributors to these efforts.

2.1.3.2   Investment Allocation – Currency Diversification

The currencies used and allocation amongst these is effectively a centralised activity, overseen and implemented by the directors of the SPV. To mitigate this, the target allocations are set out in this

white paper and are driven by a transparent, third-party data sources – the Bank of International Settlements and Bank of England[5].

Immediately following the ICO the currency allocations will be publicly accessible at www.arccy.org. To the extent there are any material amendments to these allocations, an explanation by the SPV members will be shared on the www.arccy.org website.

2.1.3.3   Investment Allocation – Investing in Loans and Fixed Income

The choice of the lending and fixed income as an asset class is central to ARC Coin. However, this represents a large and heterogeneous investment market which necessitates some choices and management to deploy capital effectively.

The underlying loans and fixed income investments will be sourced through a diverse set of lending partners – the SPV does not intend to lend directly to borrowers at the outset, and perhaps never, to avoid any origination risk.

The underlying investment positions will be set out on the www.arccy.org and updated on a continuing basis.

We will continue to seek out an appropriate index, algorithm or third-party framework to deliver greater transparency and predictability, and automate investment allocations.

2.2   Section Summary

We feel that it is a limitation that we are not yet able to fully decentralise all aspects of ARC. However, we have sought to identify the necessary limitations upfront and will work to decentralise all aspects of the currency over time.

We will solicit input from the community to ensure we can make ARC as decentralised as possible and provide confidence to all ARC currency holders with respect to any centralised activities through transparency and a consistency of execution.

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[5] BIS triennial survey of foreign exchange and over-the-counter interest rate derivatives markets.

3   Product Road Map

3.1   Long-run Road Map

We will endeavour to ensure that centralised activities of the SPV are decentralised over time wherever possible. In particular, the two biggest areas for ARC, as noted in the section above, are:

- **Investment allocation:** establishing a method for allocating capital into lending investment opportunities without central oversight. In the long run this may include truly peer-to-peer lending, which should become possible as the blockchain ecosystem grows.

- **Governance of SPV**: we are exploring DAO possibilities, but we consider that there is further work to be done in the blockchain ecosystem to facilitate DAOs[6]. Further, we anticipate that a suitable DAO framework could only be adopted once the appropriate currency and investment allocation algorithms are fully implemented.

3.2   Starting with a Minimum Viable Product (MVP)

The proceeds from the ICO and rate of increase in demand are not known, or fixed. Establishing an effective multi-currency and investment allocation as set out in the *ARC Primer and Overview* paper is not instantaneous or friction-free (although it is not overly complex).

To address this, ARC will start with a *minimum viable product* (MVP), with a simplified investment and currency allocation and then trend toward the targeted investment allocations. A helpful corollary of this, is that it may be easier for the SPV to outperform the Target Return for ARC – increasing the return to early holders of ARC and building up reserves in the buffer account.

3.2.1   Initial Currency Splits

Immediately following the ICO, the SPV may have less than $100M to invest. Whilst the SPV has smaller sums to allocate, it will undertake a simplified investment allocation to reduce transaction costs.

Once the SPV has $2.5BN or more in net assets the currency and investment allocations will be as set out in the *ARC Primer and Overview* paper:

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[6] We will look to contribute to DAO efforts and collaborate on initiatives in this area.

The path from the MVP to the target weighting allocation is as follows:

NAV of SPV: Currency	0-$50M	$50.1M-100M	$100M-$500M	$500m-$2.5BN	$2.5BN+
USD	45.0%	50.0%	53.0%	53.0%	53.0%
EUR	10%	15%	19.0%	19.0%	19.0%
JPY	-	-	5.0%	10.0%	13.1%
GBP	45%	35%	21.0%	14.5%	7.7%
AUD	-	-	1.0%	2.0%	4.2%
CAD	-	-	1.0%	1.5%	3.1%
CHF[7]	-	-	-	-	-%
Total	**100%**	**100%**	**100%**	**100%**	100%

The splits will be prescriptive – it is intended that the SPV will follow these closely, when reviewed at each quarterly rebalancing period[8].

In simple terms, there will be an allocation to fewer currencies and an over-allocation to GBP, when the NAV of the SPV is smaller. The reflects the current infrastructure of the main supplier and access to exclusive direct lending opportunities in the United Kingdom. As NAV increases the currency allocations trend toward the target allocation by reference to the trade weighting of currencies.

3.2.2   Initial Investment Allocation Splits

As with the currency allocations. When the SPV has a smaller amount of NAV, the investment allocation split will be simplified to reduce transaction costs, but to also facilitate a premium return over the Target Return:

Investment[9]	0-$50M	$50.1M-100M	$100M-$500M	$500m-$2.5BN	Target Weighting $2.5BN+
Cash	40%	25%	25%	20%	15%
Direct Lending	60%	50%	40%	20%	10%
Corporate bonds	-	25%	20%	30%	35%
Gilts & treasuries	-	-	10%	15%	20%
Other fixed income	-	-	5%	5%	5%
Total	**100%**	**100%**	**100%**	**100%**	**100%**
Maximum exposure to single underlying loan	*1.0%*	*0.75%*	*0.50%*	*0.25%*	*0.25%*

Unlike the currency allocations, these splits are illustrative. The intention is to find an allocation index that can be used to set the proportions against each lending and fixed income asset class.

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[7] CHF is included here as it would have been present in historical allocations, and may make a reappearance in the future.
[8] Within a tolerance of +/-2.0%
[9] In some cases ETFs may be used to enable these investment allocations. We do not consider an ETF as an allocation in its own right, and their use may be limited overall.

4   Regulatory Environment and Domicile for ARC

We undertook a detailed review of the regulatory implications of ARC and its construct to ensure that it is isn't subject to domestic challenges from regulatory bodies and can be adopted internationally in accordance with other regulators. We've include a summary here of the regulatory treatment of blockchain and crypto-currencies to illustrate the current considerations and set the context for ARC's regulatory positioning.

Blockchain and its implementations are nascent. Regulatory bodies are taking differing approaches when considering the impact of blockchain on regulated markets. There is a mixed level of support and/or 'a watching brief' in relation to crypto-currencies and distributed ledger technologies ("DLT") by leading financial regulators and government bodies. We expect to see more blockchain related activities being defined within regulatory oversight in the coming months and years. Accelerated in response to any scandals that may force the regulators to take action.

Most of the focus of the regulators attention is on the Initial Coin Offering (ICO) or Token Generating Event (TGE), and the nature of the coin or token – whether it may constitute a security and therefore be subject to security regulations.

In our view, the existence of blockchain in an application should not be an excuse for regulatory arbitrage, in either direction. This is a view held by the leading regulators:

- if a token issue relating to an application has the substance of a regulated security it should fall within the existing security laws; however
- just because an application utilises blockchain, it shouldn't necessarily be regulated. Each application must be judged on its merits and with respect to the domestic regulatory framework.

We prioritised our review of regulations and regulators around the jurisdictions for the main currencies that will constitute the allocation of investment from the SPV, and associated regions.

4.1.1.1   General Overview

The US-regulator, the SEC, notes that whether tokens are securities will depend upon the facts and circumstances in each case, and that "*the existence of blockchain technology does not remove conduct from the purview of the U.S. federal securities laws*".[10]

The UK-regulator, the FCA, has so far signalled enthusiasm for blockchain[11] [12] and its reluctance to regulate crypto-currencies – at one point they asked an issuer of crypto-currency to remove themselves from the FCA register as they do not consider the activity to be regulated. However, it does recognise that ICOs can present high-risks and that each must be considered on its merits.[13]

George Osborne (former UK chancellor of exchequer): "[we] will look at whether regulation of the sector is required, so that virtual currency businesses can continue to be set up in the UK, and people and businesses can use [cryptocurrencies] safely."[14]

The European Securities and Markets Authority (ESMA) considers that Regulating Blockchain would be premature. ESMA "*believes that DLT could bring a number of benefits to securities markets*" but

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[10] http://fortune.com/2017/07/26/sec-icos/
[11] https://www.coindesk.com/uk-financial-regulator-calls-caution-cryptocurrency-investing/
[12] https://www.fca.org.uk/publication/discussion/dp17-03.pdf
[13] https://www.fca.org.uk/news/statements/initial-coin-offerings
[14] https://www.coindesk.com/george-osborne-unveils-uk-plans-explore-bitcoin/

notes importantly that *"the presence of DLT does not liberate users from the need to comply with the existing regulatory framework"*. [15]

ESMA notes that its own "*role is to ensure that the regulatory framework provides relevant safeguards to investor protection, financial stability and orderly markets*" and that the regulatory environment is likely to adapt and change as result of DLT: "*some regulatory requirements could become less relevant, while on the other hand, additional requirements may need to mitigate emerging risks. … ESMA has not identified major impediments in the EU regulatory framework that would prevent the emergence of DLT in the short term*". [16]

Although ESMA are aware that virtual currencies may give rise to payment risks, the focus of ESMA's recent report and review is solely on the application of the technology to securities markets.

The Swiss regulator is clear in its definition of what constitutes a security: As long as the token is not directly linked to a debt or share, it need not be classified as a security and is therefore not subject to Swiss securities laws. [17] In detail, Swiss law the Tokens qualify as securities or financial instruments if they fit into one of the categories outlined in Art. 3 of the draft Federal Law for Financial Services [18].

Switzerland's Federal Council, the country's head executive office, called for an easing of regulatory frameworks regarding financial technology at a November 2, 2016 meeting, in order to reduce barriers to market entry for fintech companies. [19]

In its strategic goals for 2017-2020, FINMA is *adopting a more pro-innovation approach to regulation and supervision and will push for the removal of unnecessary regulatory obstacles for innovative business models*. [20]

Regulatory bodies in offshore jurisdictions have a broad set of approached, with some more forward-looking in their approach to regulating crypto-currencies, perhaps recognising the value of this ecosystem and the statelessness (flexibility) that many executives have when determining where to base their blockchain activities.

4.1.1.2   Domicile for ARC Coin
[redacted] [21]

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[15] "The Distributed Ledger Technology Applied to Securities Markets", 7 February 2017, ESMA, page 2
[16] "The Distributed Ledger Technology Applied to Securities Markets", 7 February 2017, ESMA, page 2
[17] https://cryptovalley.swiss/legalities-of-tokenization-in-switzerland-and-the-us/
[18]   http://www.wengervieli.ch/getattachment/3237d5af-0a8a-4b54-b7ef-cace021e9b22/Initial-Coin-Offering-(ICO)-Co-–-A-Swiss-Law-Persp.aspx
[19] https://www.ethnews.com/zug-switzerlands-crypto-valley
[20] https://www.finma.ch/en/news/2016/11/20161116-mm-strategische-ziele/
[21] At the time of writing discussions are continuing with various jurisdictions to determine the preferred location for the SPV. The white paper will be updated in due course once the jurisdiction has been determined.