
Himalaya Labs - Executive Summary

Decentralised Global Capital Markets Platform (DGCAMP)

Author Arifa Khan, Founder, Himalaya Labs - 7 July 2017



*“Companies and investors lose out when businesses float on the stock market because banks and other advisers are charging extra ordinary fees, the **Organisation for Economic Co-operation and Development** has warned. High levels of fees (7-10%) and parallel pricing akin to tacit collusion appear to have increased. This increases the cost of equity and works against long-term productive investment. Reinforcing competitive conditions in these markets could contribute to better outcomes for globalisation” - The Telegraph 30 May 2017*

White Paper is coming soon!

Introduction

Global capital market flows are a complex phenomenon driven by multitudinous factors. They are characterised by several anomalies that contradict the neoclassical theory of economics.

This paper notes the gross inefficiencies in the current state of markets and the presence of a huge swathe of intermediaries, and proposes a decentralised two-sided marketplace platform as a solution. While it is beyond the scope of this paper to comprehensively represent and depict all the forces and factors that influence the markets, it demonstrates that there are inefficiencies, using a few simplistic models that perhaps oversimplify the functioning of the complex markets.

The solution proposed will eventually extract embedded value from intermediaries, by eliminating some if not all information asymmetries, and redistribute the value to the issuers and investors. The theory of “Revenue Equivalence” in Buyer-Seller Markets posits that there are market clearing prices for every state of the market, with and without intermediaries, and revenues remain the same for the seller at market equilibrium in every type of a sale including multi-party auctions of different kinds (single buyer or multi-buyer auctions and for different types of auctions like Dutch or Vickrey). (Mathematical Proof is presented in our White Paper).

Extending the above “Revenue Equivalence” theory to the complicated capital markets in general, it can be deduced that in a market without intermediaries, the surplus enjoyed by erstwhile intermediaries will simply be transferred to the buyers and sellers.

The benefits of the proposed solution are mainly:

- Disintermediation of investment banks (saving on advisory fees that would be paid to investment banks for manual processes that a smart contract platform can deliver much more efficiently)
 - A global trustless platform for investors and capital seekers to transact directly
 - One of the biggest real world applications for legitimising the crypto economy and blockchain technology
 - Decentralisation of innovation

- Foundational infrastructure to a potential App Market Place where asset managers and other intermediaries can build applications on top of our core protocol
- Foundational to disruption of concomitant industries such as Asset Management, Brokerages etc

Access to capital has always been one of the key determinants of corporate survival and growth. Yet, pathways to big investments have historically been systems of privilege. Being located in Silicon Valley, belonging to elite universities, incubators, investor networks and clubs, and being advised by a reputed investment bank - all constitute barriers that hinder democratic access to capital for deserving innovators located away from Superhubs.

Being systems of privilege, Investment Banks have long thrived on these market imperfections to earn abnormal fees.

| Top 10 Banks | Fees (\$m) | Changes in Fees vs. Prev Period* | % of Fees collected by product First Half of 2017 | | | |
|-------------------------------|------------------|----------------------------------|---|-----------|-----------|-----------|
| | | | M&A | Equity | Bonds | Loans |
| JP Morgan | 3,239.23 | +18.85% | 26 | 23 | 32 | 18 |
| Goldman Sachs & Co | 2,798.32 | +12.27% | 41 | 23 | 24 | 12 |
| Bank of America Merrill Lynch | 2,713.50 | +18.64% | 30 | 18 | 31 | 21 |
| Citi | 2,618.64 | +37.97% | 25 | 22 | 34 | 19 |
| Morgan Stanley | 2,310.00 | +10.33% | 32 | 30 | 28 | 10 |
| Barclays | 1,788.20 | +19.80% | 24 | 17 | 37 | 21 |
| Credit Suisse | 1,635.24 | +22.49% | 26 | 23 | 29 | 23 |
| Deutsche Bank | 1,532.33 | +18.95% | 18 | 25 | 36 | 20 |
| RBC Capital Markets | 1,078.08 | +29.88% | 20 | 23 | 32 | 25 |
| Wells Fargo & Co | 1,046.00 | +10.51% | 11 | 21 | 39 | 29 |
| Total | 48,080.53 | +16.50% | 26 | 23 | 30 | 21 |

Data from Jan 1 2017 - Jun 27 2017 and Jan 1 2016 - Jun 27 2016 Data as of Jun 27 2017

Source: FT League Tables

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Inefficiency in Global Capital Markets:

Neoclassical models predict that countries that enjoy higher productivity growth should enjoy new net capital inflows. However, empirical evidence points to the contrary, in what is termed as the “*Allocation Puzzle*” by many researchers. The biggest assumption underlying the theory - one of *perfect capital mobility*, fails to hold in reality.

Some factors that plausibly contribute to the discrepancies in predicted vs actual global capital flows include but are not limited to:

- Heterogeneous degrees of financial development between developed and developing countries
 - Differential rates of growth of economies, driven by macroeconomic factors
 - Differential savings rates due to population trends, demographics, purchasing power, cultural and behavioral savings patterns
 - Idiosyncratic risks of varying degrees
 - Financial frictions in incomplete markets
 - Systemic constraints such as availability of credit and borrowing constraints
 - Information asymmetries (vis-a-vis perfect markets assumed in theory)
 - Different taxation regimes (rates of return on financial capital are kept artificially low in some countries by means of corporate taxation and dividend taxation)

Global Two-Way Capital Flows:

Research points to distinctive demand-supply dynamics for Financial Capital (Savings) vis-a-vis Fixed Capital (Capital Investment in Firms). An empirically observed phenomenon is Financial Capital flowing from savings-rich emerging economies to developed economies, and Fixed capital flowing in the opposite direction to emerging economies where marginal product of capital is high due to capital scarcity. (Supporting literature review in Annexure 1.)

Indeed, the asset management industry is well-developed and sophisticated wherein financial capital flows freely and frictionlessly, as evidenced by frequent global capital flights in response to stock market shocks. However, capital markets of emerging economies are still not sophisticated enough, or integrated adequately with the global markets and therefore suffer from inefficiencies such as scarcity of capital, lack of access to

investors, added costs of hedging foreign currency borrowings etc despite their high growth.

Foreign Exchange is a crucial barrier in international capital mobility as countries have elaborate foreign exchange management rules to safeguard economies from excessive shocks, as financial liberalisation is not uniform.

Country regulations introduce more inefficiencies. Some countries like India, for example, have ceilings imposed by Reserve Bank of India on foreign direct investments in each industry, and caps on cost of borrowing vis-a-vis the horizon.

Agency problems: Commercial Banks in emerging countries that hold household savings often fail to perform their fiduciary duty, and lend to favoured clients who then go on to default wilfully, resulting in huge non-performing assets on banks' balance sheets which indirectly are borne by the tax payers /savers. These conflicts of interest drive down the interest rates on household savings, and drive up the borrowing costs of firms.

Besides the above macroeconomic factors, numerous other qualitative factors specific to each economy also contribute to capital market inefficiencies; ease of doing business, perceived country risks, property rights, recourse to law and enforcement of contracts, uncertainty and volatility in markets, arbitrage opportunities, heterogeneous ability to take advantage of arbitrage, and quantitative factors such as subsidies, taxes, import duties, and mandatory hedging requirements. A combination of these factors further compound the challenge for firms in emerging economies trying to access capital. Investing in these high growth firms is a missed opportunity for global investors.

Intermediaries and conflicts of interest:

Capital markets today are grossly inefficient, with high transaction costs because they are ridden with swathes of intermediaries such as investment banks, who are a major source of value leakage for issuers and investors. Banks serve multiple masters and are torn between their allegiances.

- Do they please their senior management by focusing on bottomline, or do they earn client trust by offering them lower fees?
- Do they please their hedge fund clients by giving priority allocation in IPOs or do they please issuers by keeping away short term suitors?

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- Do they incentivise sales teams with high commission and meet their syndication goals or do they underprice the issue and lower their risk?
 - Do they bait the client with a high initial issue price indication to bag the deal and then lower the price, or do they indicate correct price and lose the deal?

Clients are faced with a Hobson's choice when dealing with banks! One simply does not win against a mighty bank.

(On a lighter note, investment banking is perhaps the only industry where you hire someone and pay them to look down upon you condescendingly!)

Over the past several decades, banks have made fee-income a glorious revenue stream they are loathe to let go, despite availability of advanced technology that renders manual processes obsolete. Organisations such as OECD have lamented the exorbitant fees charged by investment banks. Fees have been consistently high around 7-10% of the issue proceeds, pointing to the presence of a tacit industry-wide collusion, much to the detriment of real wealth creators and investors.

Intermediaries in complex markets thrive on "the theory of opacity" and deliberately propagate the theory to further their own interests. The theory simply states that opacity of a process attracts intermediaries, and the more the opacity of a system or process, the more the intermediary can take away from the buyer or seller surplus.

In some markets, intermediaries are a necessary evil. However, fee income is the *raison de etre* and holy grail of investment banks. Fee income is earned without risking the balance sheet. It can be further argued that there is also no reputation risk involved for banks which would justify a premium, provided they do their due diligence. So, there is a case for fighting high fees and tacit collusion among the banking brethren.

Banks and intermediaries are not incentivised to auto-cannibalise and render themselves redundant, nor build and advocate superior technological platforms for public use.

Several factors have contributed to this "Theory of opacity", to which Wall Street owes its phenomenal success:

- Information asymmetry between those who want to invest capital and those who need capital
- Complexity of relationships, laws and regulation involved
- Belief that the intermediary can achieve better results for the firm by building price tension, than it can do on its own (In reality, this is a myth disproved by research)

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- Economies of scale : Just like manufacturing companies have economies of scale driving down cost of marginal cost of production, intermediaries have economies of scale in acquiring and managing investor relationships, and organising capital markets processes efficiently
 - Perceived need for underwriting the issue risk (In fact banks only soft-underwrite the risk for a period less than 24 hours between book-building and actual subscription)
 - Need to signal market acceptance by aligning with a well known adviser/ brand

The presence of above imperfections, opacities and gross inefficiencies presents a huge opportunity to streamline global capital flows and bring in market efficiencies and network effects. When juxtaposed with technological leaps we have made in data sciences, cryptography and distributed ledgers, this begs for disintermediation and disruption.

Blockchain experiments by banks to date towards achieving operational efficiencies have been closely guarded, kept for proprietary use or for use within a consortium - an extension of the privileges of the elite that were discussed earlier. Platforms that disrupt investment banks would be a public good with enormous benefits for issuers and investors.

A Decentralised Global Capital Markets Platform (DGCAMP) greatly diminishes the need for intermediaries, creates new global opportunities, and disrupts the status quo!

Decentralised Capital Markets Platform for Digitally Represented Assets (DGCAMP)

We propose a technology solution by way of a **Decentralised Global Capital Markets Platform (DGCAMP)** where investors of capital and seekers of capital can interact freely, trustlessly and with minimum friction. The platform can operate with and without intermediaries.

DGCAMP is a blockchain and smart-contract driven platform where issuers (public and private firms, governments, non-profit foundations) can access a broad class of primary market investors (both institutional and retail), complete a variety of automated transactions and processes (such as book building, auctions, syndications, dividend distributions) and can issue a broad array of digital assets to investors. Investors of every type, jurisdiction and financial status can use the platform to learn about investment

opportunities across the globe, their regulatory aspects, risks and expected returns, to access due diligence reports, and to invest directly without having to go through intermediaries. A secondary market layer with buyers, sellers, arbitrageurs can easily complement this system. The system can first be envisaged as a single-country system and then extended to a multi-country global marketplace.

Capital allocation will be made in a cryptographically secure, quick, efficient, trustless way. Such a profound change to the architecture of the world financial markets can only be brought about by adopting a revolutionary technological approach, and would need visionaries and early crypto-adopters to make it a reality.

Real world changes are afoot already. Delaware State passed a Bill recently to legalise corporate authorisation, issuance, transfer and redemption of shares through a distributed ledger. It would also protect companies from lawsuits alleging breach of fiduciary duty for utilising the blockchain. Daimler AG issued €100Mn corporate bonds in a blockchain trial.

A decentralised marketplace can prove a revolutionary approach to raising capital!

If capital is a definitive determinant of success, and access to it is more akin to a global draw of lottery, then this system aspires to a fair meritocracy away from plutarchy, and prospects will have a fairer chance regardless of their pedigree, access to elite education, elite incubators, proximity to oligarchs, and other obscure pathways to privilege.

This can also potentially solve the problem of centralisation of innovation!

Decentralised Global Capital Markets Platform (DGCAMP) - A view of the future!

We propose to build a decentralised open access core protocol for Capital Markets for Generation Crypto. Every participant can freely take part in multiple capital markets transactions with low to zero entry barriers and low capital thresholds, regardless of their knowledge of crypto or capital markets. The open access platform would feature multiple issuers from around the world, along with their offering memorandums and risks, and participants can freely choose to participate in any, limited only by their liquidity and appetite.

The platform would offer multi-tiered transaction suites for managing different sequential, hierarchy-dependent and independent processes:

- Primary issuance of securities and the book-building process
- Replicating a competitive IPO on the blockchain - modify the current IPO process and introduce more competition among banks so as to optimise client outcomes
- Syndicated Loan Issuance
- Government Bond issuance
- Auctions of Government Assets

We can envisage decentralised models both with the presence of intermediaries and without the intermediaries.

A Case Study of Digital Asset Issuance Process:

(A Competitive IPO on blockchain with intermediaries can be further broken down into several steps):

- Beauty Pageant and appointment of Lead Adviser
- Preparation and Research
- Invite pitches from Book Runners
- Collect Indicative Issue Price from each Bank
- Appoint Book Runners (Incentivise them by tying fees to their ability to fetch higher actual Issue Price)
 - Book Building / or Auctions Platform of Choice
 - Collection of Smart-Contract based bids that are opaque to other bidders
 - Optimising the Issue: Deciding the Optimum Strike Price or Tiered Allocation of digitised assets based on algorithms
- Collection of payments automatically from smart contracts or triggering a call function to bidders accounts that collects money from winning bids (eg. ASBA)
 - Allocation of digitised assets determined by algorithms (Prorata or as per Preferential Investor Class or First Come First Served)
- Servicing Digitised Assets with Digitised Coupons and Dividends
- Pairing Digitised Assets with Voting Rights
- Managing Investor communication
- Recording Investor preferences and follow up subscription vs indication of interest for building reputation scores in future
- Rating of issuance process and rating of participants

Direct Benefits to Capital Markets Participants

Top 10 investment banks alone charge nearly USD100 billion in annual fee income, of which equity and bond issuance comprise 50% of fees which can be completely replaced by the platform being proposed.

Issuers can choose among a variety of issuance options such as a fixed price sale, book-building process or different kinds of auctions which can be run entirely on algorithms and smart contracts.

Smart-contract based opaque bidding in auctions and book-building (possible with zero knowledge proofs)

Over time, a reputation system can track investors indication of interest vis-a-vis actual subscriptions to offers.

Parallel reputation scores can be built for issuers based on their track record in disseminating information, transparency, issue management, consistency of results, performance reporting and post-issue governance.

Information costs will diminish over time both for issuers and investors, thus making intermediaries gradually irrelevant.

There will be no need for custodians or depositories of physical securities, as all securities will be delivered on smart contracts signed by cryptographic keys.

Loan Covenants can be embedded into smart contracts which can self-execute and trigger corporate actions, defined by pre-set and mutually agreed parameters. No arbitrators will be required to adjudicate when covenants are breached. Parties will only need to agree on financial standards and dynamic value feeds to calculate covenants from time to time.

Various open standards will emerge for financial terms and smart contracts, so that parties across global systems can interoperate without friction. (Example: ACTUS standard)

Artificial Intelligence algorithms overlaid on blockchain will suggest the perfect

investment opportunities for investors based on risk appetite, and suggest suitable investors for each issue.

AI Algorithm-driven efficient book-building processes will achieve more optimal pricing by finding investors with higher reserve prices and issuers with lower reserve prices.

Counter-party risks can be minimised with smart contracts without any need for escrows. Smart contracts can mitigate settlement risk or delay and default in processing of refunds.

Mis-priced securities and miscreant issuers will be forced out of the market through efficient signalling mechanisms. **Market equilibrium** will be achieved faster and cheaper.

Advisers will be forced to pursue and produce **authentic research** as their bait-and-switch strategy at beauty pageants will no longer work, nor their optimistic guidance will retain any appeal for the now information-armed issuers.

Intermediaries will no longer be able to allocate disproportionate share of securities to their preferred clients like hedge funds (which are against long term interests of issuers).

Issuers can service their investors with quarterly performance and earnings reports, distribute dividends and interest coupons, and dynamically manage their investor base as they come in and go out as they choose through secondary markets.

Because of two-way capital flows, firms might be able to net off foreign currency risks at a decentralised hedging platform and save on substantial hedging costs.

In a not so distant future, we can envisage a marketplace with reduced information asymmetry where buyers and sellers will reach the perfect market equilibrium where payoff is maximised for both.

Indirect Impact on Asset Management Industry

Institutional investors (Limited Partners) and retail investors can pick and choose a portfolio from a global selection of instruments, and easily track or trade their investments in a perfectly transparent marketplace rather than lock-in their money in closed-ended funds managed by General Partners (GPs) for lock-in periods of not less than 7-10 years.

Just as ICOs are disrupting the Venture Capital space, decentralised capital market platforms can disrupt the Private Equity and Asset Management space!

Fund administration costs and set-up fees going to lawyers in fund havens can be eliminated - that is capital funnelled away from investments and not earning returns.

Benefits to Regulators:

Regulation compliant structures and instruments will emerge, as non-compliant issues will be exposed quickly in a free information marketplace. Blockchains will be easily auditable for regulators in realtime so no more “theory of opacity”.

Positive Externalities:

There are further unquantifiable and unknown externalities. Some instruments that could not be transacted on earlier will now be feasible, and new innovations will be possible.

Certain instruments which have had very restricted participation from indigenous investors, may now find new takers from the global marketplace. Infrastructure sector in India , for example, needs trillions of dollars of capital, and can offer attractive returns but not easily accessible by global LPs. With a decentralised platform, now they can take part because there is a better understanding of risk and also greatly reduced friction of doing direct cross-border investments.

Eliminating excessive rent-seeking / corruption:

The benefits of decentralisation are further accentuated in the public sector. The interests of decision makers in public sector entities may not be aligned with shareholder interests, and can impose rents on bidders such as bribes. For example, e-auctions being touted by governments as evidence of technology adoption, are just a misnomer. The e-auctions are in practice just replications of the paper processes with a single change of electronic bid submission. Every other step of the process remains as archaic as before! The e-auctions do not eliminate opacity nor the unbridled rent-seeking behaviour. But, transparent global marketplaces with public scrutiny will dis-incentivise such anti-market behaviour. For instance, if a consistently superior bidder is consistently failing to win an auction or losing

his fair share of allotment, it will be noticed by the decentralised marketplace and an antidote will be introduced.

Markets can find elegant solutions to classic problems such as “Tragedy of the Commons”, where community will be able to decide and allocate the optimal social good.

Welcome to the new utopian capital markets on blockchain!

While building a two-sided marketplace is indeed challenging, investors already participate in capital markets in multiple roles and adoption will be a matter of getting accustomed to a new paradigm. As a case in point, asset management industry was long thought to be a bastion of well-entrenched private bankers. However, the past few years have shown that fintech platforms have disrupted that industry driving management fees down substantially. Clients have welcomed it with warm handshakes extended to robots. Robot-managed funds have crossed over USD500 bn in size, and have fetched returns no inferior to funds managed by pedigreed asset managers. The asset management industry has proved that where benefits of disintermediation are real and convenient, customers are ready to adapt.

A vision for the future of Capital Markets!

White Paper to be released soon... (<http://himalayalabs.com>)

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