Private Investment Fund Fee Structure and Blockchain Applications

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Outline

A.INNOVATION – DATA / TRENDS

B.BLOCKCHAIN TECHNOLOGY

C. BLOCKCHAIN APPLICATIONS IN PRIVATE INVESTMENT FUNDS D.IMPLICATION FOR FEE STRUCTURE

Innovation

LINEAR VS. EXPONENTIAL GROWTH



Linear vs. Exponential: Linear growth is steady; exponential growth becomes explosive Source: Third Source, http://www.thethirdsource.org/media/charts-and-graphs/#.VVEYbKljOLs How do you anticipate the pace of technology will change in your industry over the next three years?



Accenture Technology Vision: Global Survey of 3,100 business and IT executive across 11 countries



70% of executives are making significantly more investments in Artificial Intelligence than in 2013.



Connecting Consumers and Producers

81% of executives say platform-based business models will be core to their growth strategy within three years.

TOTAL NUMBER OF PLATFORM BUSINESSES IN THE S&P 500 (BY YEAR)





82% say industry boundaries are being erased and new paradigms are emerging for every industry.



Patent Applications





CONSUMPTION SPREADS FASTER TODAY





Source: Asymco

BLACKROCK



Source: Time, http://content.time.com/time/interactive/0,31813,2048601,00.html



Source: Singularity.com http://www.singularity.com/charts/page70.html



Source: FurtureTimeline.net http://www.futuretimeline.net/21stcentury/2020.htm#.VVEZB6ljOLs



Figure 3. Bandwidth cost-performance (1999–2012)

Figure 1. Computing cost-performance (1992–2012)

Graphic: Deloitte University Press | DUPress.com

BIG Data

A new style of IT emerging



Source: PracticalAnalytics, https://practicalanalytics.wordpress.com/2012/10/

THE SPHERES OF BIG DATA ARE CONVERGING

billion pieces of data are added to Facebook each month

hours of video are added to YouTube

\$600

buys you a disk that stores all music on Earth

of the world's data was created in the past 2 years

DATA AGGREGATED BY GONGOS RESEARCH



- The data volumes are exploding, <u>more data</u> has been created in the past two years than in the entire previous history of the human race.
- Data is growing faster than ever before and by the year 2020, about <u>1.7 megabytes</u> of new information will be created every second for every human being on the planet.
- By then, our accumulated digital universe of data will grow from 4.4 zettabytes today to around <u>44</u> <u>zettabytes</u>, or 44 *trillion* gigabytes.
- Every second we create new data. For example, humans perform 40,000 search queries every second (on <u>Google alone</u>), which makes it 3.5 searches per day and 1.2 trillion searches per year.

- For a typical Fortune 1000 company, just a 10% increase in data accessibility will result in more than <u>\$65 million additional net income</u>.
- Retailers who leverage the full power of big data could increase their operating margins by as much as <u>60%</u>
- <u>73% of organizations</u> have already invested or plan to invest in big data by 2016
- BUT, currently less than <u>0.5%</u> of all data is ever analyzed and used - <u>Potential</u>?

What is Blockchain Technology ?

What is a blockchain?

- Blockchains are consensus protocols that come to consensus through compromise
 "Fork choice rule"
- "Fork-choice rule"

Definition What is Blockchain Technology?

- An information technology
 - A software protocol; email (SMTP) runs on TCP/IP, Bitcoin runs on underlying blockchain software
 - Decentralized: each network node keeps the ledger (giant 'Google doc spreadsheet' of transactions); blocks (batches) of transactions posted sequentially to a ledger or chain
- Implication: secure network where any transaction can be independently confirmed as unique and valid without an intermediary



Blockchain - another definition

"A blockchain is a magic computer that anyone can upload programs to and leave the programs to self-execute, where the current and all previous states of every program are always publicly visible, and which carries a very strong cryptoeconomically secured guarantee that programs running on the chain will continue to execute in exactly the way that the blockchain protocol specifies." — Vitalik Buterin (founder of Ethereum)





Figure 1: High-level Blockchain concepts

Source: EY analysis

Blockchain in a nutshell



Broader participation, lower cost, increased efficiency

Distributed Ledger - Components



Blockchain Explained by William Mougayar

What it enables



- * Creation and real-time movement of digital assets
- Embedding trust rules inside transactions and interactions
- * Time-stamping, rights and ownership proofs
- Identity ownership and representation
- * Resistance to single points of failure or censorship
- Creation of crypto-currency markets
- * Self-execution of business logic with self-enforcement
- Running decentralized services
- Selective transparency and privacy



Meta technology on the Internet Decentralized database Decentralized computers Peer to peer network Shared, distributed ledger Trust layer for the Web Software development environment



- 1. Reengineering processes
- 2. Rethinking roles of intermediaries
- 3. Bundling of services
- 4. New flows of value
- 5. Decentralized governance
- New legal and regulatory frameworks



...across industries

Financial services Government services Healthcare Energy markets Supply chains Smart things World trade

www.startupmanagement.org



Database vs Blockchain data storage





Blockchain network, security by sharing





Blockchain





Current payment systems require third-party intermediaries that often charge high processing fees but machine-to-machine payment using the Bitcoin protocol could allow for direct payment between individuals, as well as support micropayments.







4. What's worse, he'd have to do it all **before** everybody else in the Bitcoin network finished **just the one block (number 91)** that they're working on.

Bitcoin

Governance
SmartProperty
Voting SmartContracts
Name Registration
Identity
Crowdfunding
IOT

Climate



BLOCKTECH in FINANCIAL SERVICES Landscape

APPLICATIONS & SOLUTIONS



Blockchain use cases list by industry

Financial

Trading Deal origination POs for new securities Equities Fixed income Derivatives trading Total Return Swaps (TRS) 2nd generation derivatives The race to a zero middle office Collateral management Settlements Payments Transferring of value Know your client (KYC) Anti money laundering Client and product reference data. Crowd Funding Peer-to-peer lending Compliance reporting Trade reporting & risk visualizations Betting & prediction markets

Insurance

Claim filings MBS/Property payments Claims processing & admin Fraud prediction Telematics & ratings

Media

Digital rights mgmt Game monetization Art authentication Purchase & usage monitoring Ticket purchases Fan tracking Ad click fraud reduction Resell of authentic assets Real time auction & ad placements

Computer Science

Micronization of work (pay for algorithms, tweets, ad clicks, etc.) Expanse of marketplace Disbursement of work Direct to developer payments API platform plays Notarization & certification P2P storage & compute sharing DNS

Medical

Records sharing Prescription sharing Compliance Personalized medicine DNA sequencing

Asset Titles

Diamonds Designer brands Car leasing & sales Home Mortgages & payments Land title ownership Digital asset records

Government

Voting Vehicle registration WIC, Vet, SS, benefits, distribution Licensing & identification Copyrights

Identity

Personal Objects Families of objects Digital assets Multifactor Auth Refugee tracking Education & badging Purchase & review tracking Employer & Employee reviews

IoT

Device to Device payments Device directories Operations (e.g. water flow) Grid monitoring Smart home & office management Cross-company maintenance markets

Payments

Micropayments (apps, 402) B2B international remittance Tax filing & collection Rethinking wallets & banks

Consumer

Digital rewards Uber, AirBNB, Apple Pay P2P selling, craigslist Cross company, brand, loyalty tracking

Supply Chain

Dynamic ag commodities pricing Real time auction for supply delivery Pharmaceutical tracking & purity Agricultural food authentication Shipping & logistics management

Gross value added, Current prices	od Statos	uropean Union	na qa L	United	Australia	Mexico	tz er land	Sweden	Poland	Norway	Denmark	Chile	Czech Republic	Hungary	Iceland	Total	Blockcl	hain'able' hetration i	portion, rate:
OECD, \$m	Unito			-			M				-		-				Low	le di um	High
Agriculture, forestry and fishing	223,859	263,155	53,509	18,194	33,861	40,419	5,114	6,965	14,194	7,494	2,859	8,820	5,022	5,194	1,247	689,913		~	
Mining and quarrying	436,008	117,115	3,233	42,334	98,047	87,751	842	2,647	8,593	99,058	4,203	28,870	1,522	267	20	930,522			
Manufacturing	2,068,080	2,571,458	851,347	283,035	92,456	217,632	128,979	82,655	89,979	34,999	37,635	27,579	49,357	27,354	2,527	6,565,089			
Electricity, gas, steam and air conditioning supply	260,644	312,942	90,955	39,911	35,609	19,741	-	12,155	16,201	9,130	3,980	5,786	7,153	2,370	835	817,462			
Water supply, sew erage, waste management	41,866	157,969	-	27,724	-	5,426	-	3,410	6,122	2,645	2,042	-	2,085	1,211	207	250,758			
Construction	664,001	889,622	279,195	165,742	119,666	90,583	36,271	30,454	35,952	25,903	11,485	19,503	10,368	5,065	1,119	2,384,983			
Wholesale and retail trade, repair of motor vehicles	1,675,586	1,822,123	647,629	286,138	123,679	205,104	97,927	54,979	88,834	32,021	30,397	22,085	19,135	11,845	1,871	5,119,412	12.5%	25%	50%
Transportation and storage	542,582	840,117	230,445	121,202	68,963	79,818		27,498	30,985	24,454	13,681	11,109	10,597	7,385	1,170	2,010,067			
Accommodation and food service activities	446,343	469,314	-	77,541	36,137	27,455	12,031	8,820	5,911	5,815	3,873	4,728	3,627	1,941	573	1,104,176	12.5%	25%	50%
Information and communication	1,035,296	810,853	251,856	164,537	38,469	28,340		28,442	18,877	17,123	11,869	4,113	9,134	6,023	950	2,425,953			
Financial and insurance activities	1,190,501	911,125	199,164	217,874	125,628	45,871	66,679	23,234	21,502	22,949	16,470	12,553	8,365	4,286	1,575	2,867,856	37.5%	75%	100%
Financial service activities	486,523	-	-	116,681	-	38,128	38,125	-	16,486	-	-	-	6,458	3,258	1,313	707,053			
Insurance, reinsurance and pension funding	460,938	-	-	67,217	-	4,250	28,554		2,977	-	-	-	1,245	353	173	565,788			
Auxiliary activities	243,039	-	-	33,976	-	3,493	-	-	2,039	-	-	-	662	675	89	284,056			
Real estate activities	2,076,838	1,845,942	531,750	299,340	172,100	137,797		42,887	25,187	29,844	26,377		15,374	9,209	1,978	5,214,707	12.5%	25%	50%
Administrative and support service activities	659,756	698,695	-	126,770	39,659	45,383	-	17,385	10,595	12,395	8,737	-	3,305	3,855	592	1,627,225	25%	50%	75%
Rental and leasing activities	181,934	-	-	25,191	-	5,501	-	-	2,060	-	-	-	876	900	251	216,812			
Employment activities	-	-	-	27,541	-	29,347	-		2,684	-	-	-	142	868	6	60,688			
Public admin and defence, compulsory social security	1,500,551	1,081,252	280,902	137,214	76,458	53,626	73,459	25,067	27,285	26,934	14,152	11,965	11,598	9,748	1,092	3,331,409	10%	20%	50%
Education	935,475	878,251	-	164,898	69,537	52,918	3,758	28,397	23,208	21,688	16,734	12,858	7,959	5,417	1,252	2,222,458			
Human health and social work activities	1,225,883	-	-	180,380	95,853	28,699	51,911	56,152	21,557	45,572	28,015	10,698	7,881	5,070	1,608	1,759,387			
Arts, entertainment and recreation	160,935	229,567	-	42,087	12,018	5,595	-	6,981	3,408	4,217	4,020	6,975	1,772	1,527	315	479,531			
Total activity	32,083,680	13,899,501	4,546,774	4,584,493	1,517,282	2,524,803	548,763	496,655	842,871	564,014	279,354	222,695	347,831	213,368	33,701	62,705,786	5.2%	10.4%	18.3%

Figure 57: Adoption scenarios for Global Gross Value Added migration to blockchain

Source: OECD, Credit Suisse estimates







BANK OF ENGLAND

OSF

OCC

CFTC

FIDCA

BSIF

Monetary Authority of Singapore

Bank spending on blockchain is expected to surge (US\$ millions)



Source: Aite Group

Blockchain in Private Investment Funds

Several private investment funds have spearheaded the implementation of blockchain technology and smart contracting in their business model:

- Trading bitcoin and other cryptocurrencies to avoid market fluctuations
- Invest in and/or acquire companies that use blockchain technology to provide synergies to their other portfolio companies
- Fully automating a hedge fund secured by blockchain technology
- Using blockchain technology to improve administrative procedures of private equity deal making
- Using cryptocurrencies as incentives for data scientists' competitive models that facilitate investment analysis efficiencies.

Blockchain Applications in Private Investment Funds

- The dataset comprises a representative sample of private investment funds that utilize blockchain technology in either their strategy or operations (N=[98])
- Author and a team of two research assistants handcoded individual use of blockchain technology for each fund in the dataset.
- The dataset was compiled through various sources:
 - Individual web searches to identify funds operating on the Ethereum network
 - Searches on multiple databases including Westlaw, Bloomberg, and Google to identify funds that were not operating on the Etherium blockchain.

Contact Method n=70











Cluster Graph n=74





Responses to Fee Structure n=59



Implications for Fee Structure

- Majority of private fund advisers that use blockchain technology, artificial intelligence, and big data in different aspects of their operations or strategy charge their investors lower fees.
- Prominent examples of lower fee structures driven by the use of blockchain technology:
 - Numerai
 - LendingRobot's LendingRobot Series
 - Logos Fund
 - Platforms for blockchain-enabled fund management, such as those offered by Melonport or Drago, among many others.

Per-Transaction Fees

- Traditional settlement and calculation of fees in a per-transaction model that created a prohibitive amount of work making such operations very difficult to execute and prone to errors due to manual reconciliation or settlements
- Blockchain technology facilitates a seamless and efficient calculation of management fees per transaction.
- Blockchain Technology enables the fully automated allocation of the appropriate fee to the correct executed trade and associated client account without any manual reconciliation or settlement
- Errors are removed through the use of blockchain technology which performs the required calculations and settlement procedures automatically and seamlessly.
- The blockchain enabled per-transaction fee can be pre-determined or modified by the manager in cooperation with clients.
 - Publicly available which allows the private fund adviser to determine the applicable fee in a competitive market.
 - Clients who invest in a more transaction-prone strategy will be able to agree upfront to higher fees whereas clients who invest in a less transaction-rich strategy will pay overall lower fees.

Examples

- Northern Trust in cooperation with IBM, Numerai, LendingRobot, and Intellisys Capital LLC, Melonport, among many others.
- Polychain Capital, <u>https://angel.co/polychain-capital</u> (last visited Apr. 17, 2017).
- Northern Trust, <u>https://www.northerntrust.com/</u> (last visited Apr. 17, 2017).
- Numerai, <u>https://numer.ai/</u> (last visited Apr. 17, 2017).
- LendingRobot, https://www.lendingrobot.com/#/ (last visited Apr. 17, 2017).
- Intellisys Capital LLC, http://www.intellisys.ai/ (last visited Apr. 17, 2017).
- Melonport, <u>https://melonport.com/</u>, (last visited Apr. 17, 2017).

Lending Robot

- Investors in LendingRobot's Lending Robot Series, the fully automated hedge fund secured by blockchain technology, unlike investors in traditional hedge funds, can withdraw funding on a weekly basis at no additional cost to the investor.
- Because LendingRobots' business model removes the investment adviser, overhead costs, and legal fees associated with each investor agreement, LendingRobot is able to charge a mere 1% management fee and a maximum 0.59% fund expense fee per year.
- Other factors that help keep the fee low include the increased transparency that allows LendingRobot to expense fewer resources on auditing the fund. LendingRobot claims an average performance of from 6.86% to 9.66% depending on the investment strategy selected by the clients.
- As of March 2017 an analysis of a broad range of traditional hedge funds shows an average of 8.89% annualized return.
- The increased transparency, reduced costs, and competitive performance enabled by LendingRobot's use of blockchain technology may give it a competitive advantage in the private fund industry that could continue to exert pressure on fees charged by competitor funds.

IBM & Northern Trust

- In February 2017, Northern Trust and IBM entered into a partnership for the commercial use of blockchain in the private fund industry.
- The partnership provides an enhanced and efficient approach to private equity administration.
- The implementation of the Northern Trust and IBM blockchain is intended to increase the efficiency, transparency, and speed of private equity transactions, improve security, and bring innovation to the private equity market by simplifying the complex and labor-intensive transactions in the private equity market.
- While the current legal and administrative processes that support private equity are time-consuming, expensive, lack transparency, and involve lengthy, duplicative, and fragmented investment and administrative processes, the partnership's solution delivers an enhanced and efficient approach to private equity administration.
- More specifically, unlike the current deal practice in private equity, which requires parties to reconcile multiples copies of the documents that form the deals to understand the greater picture, the blockchain program announced by Northern Trust and IBM allows all involved parties in an equity deal to look at a single compiled version of the transaction and all other data relating to the deal.

Numerai

- Numerai is a private investment fund with a global equity strategy that will go live on the blockchain later this year.
- Numerai operates on the Ethereum blockchain, utilizing a cryptocurrency called "Numeraire." Numerai uses artificial intelligence to convert financial data into machine learning problems for data scientists.
- On February 21, 2017, Numerai, announced: "[Today] 12,000 data scientists were issued 1 million crypto-tokens to incentivize the construction of an artificial intelligence hedge fund."
- Using data scientists for investment analysis creates efficiency through a synthesis of data. Data scientists working in this model work to solve the same problems in their own unique way with different strategies.
- Numerai synthesizes these models to create a meta-model out of all the predictions from the data scientists. In the Numerai model, the use of artificial intelligence ultimately helps achieve the goal of efficiency and optimum capital allocation by reducing overhead costs because there is no cost of human capital.
- In addition, Numerai eliminates barriers to entry because users do not need capital or any special finance or data knowledge.

Logos Fund

- The Logos Fund is an alternative investment fund that invests in blockchain and cryptocurrency-related investments.
- It aims to make blockchain-based currencies accessible to professionals and a broad range of investors by investing in the mining of blockchain-based cryptocurrencies as well as into such currencies directly. T
- o cover base costs and administration, the Logos Fund charges an administrative fee of between 1.2% and 1.92% depending on the size of the investment.
- The fund management also charges a performancerelated fee of from 9% to 21% plus investment surcharges and redemption surcharges in accordance with market practices.

Melonport

- Blockchain-enabled platforms for setting up a private investment fund cause significant pressure on the existing fee structure of the private investment fund industry.
- Platforms such as Melonport or Drago enable competitive gains for their clients through fewer costs and time barriers to setting up and running a private investment fund.
- While such competitive gains will benefit the majority of private investment fund managers and investors, the lower operating costs enabled by the platform models will especially enable new and future managers to enter the market because the start-up costs and compliance costs can be significantly reduced. By enabling low set-up requirements and low costs of running a portfolio, platform models may be able to create an unprecedented competitive environment for asset management strategies.
- The cost of running a private fund adviser portfolio on the blockchain equals the core usage fees, modular commissions, and the infrastructure costs to be paid on the Ethereum platform.
- The usage fees are determined by the protocol, and the modular fees are set by the module developers and are a fraction of a cent or a fraction of the trade volume for each usage. "The costs and complexity of setting up a portfolio using the Melonprotocol are lower than they are with traditional asset management [funds], seconds and cents versus months and millions."

Thank You !

Join the Conversation!



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