

- **Indxx Blockchain Index**

**indxx**

April 2018

# ● What is Blockchain Technology?

Blockchain is a digital, decentralized ledger that keeps a record of all transactions that take place across a peer-to-peer network. It is an interlinked and continuously expanding list of records stored securely across a number of interconnected systems.



## ***BLOCKCHAIN IS NOT BITCOIN***

Blockchain technology was developed as the underlying technology behind the cryptocurrency called bitcoin. Blockchain is the technology that allows Bitcoin to work. This technology has many different applications beyond exchanging virtual currencies.



## ***A DIGITAL LEDGER***

A blockchain is a digital record of transactions, like a traditional ledger. These transactions can be almost anything: transfers of money, goods or secure data—a purchase at a supermarket, for example, or the assignment of a government ID number.



## ***DECENTRALIZED***

Blockchain is a decentralized ledger that keeps a record of all transactions that take place across a peer-to-peer network. Its applications could replace the centralized systems with decentralized ones, where verification comes from the consensus of multiple users.



## ***SECURE***

Blockchain is designed to store information in a way that makes it virtually impossible to add, remove or change data without being detected by other users.

# ● How Blockchain Works?

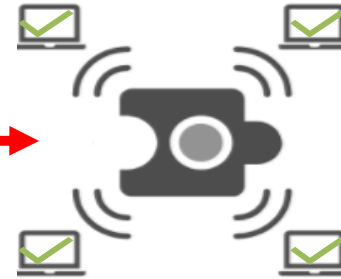
*Someone requests a transaction.*

A wants to send money to B



**Broadcast**

The requested transaction is broadcast to a P2P network consisting of computers, known as nodes.



**Validate**

The network of nodes validates the transaction and the user's status using known algorithms.



**Verify Transaction**

Those in network approve the transaction is valid.



**Add to the Chain**

The block then can be added to the chain, which provides an indelible and transparent record of transactions.



**Create Block**

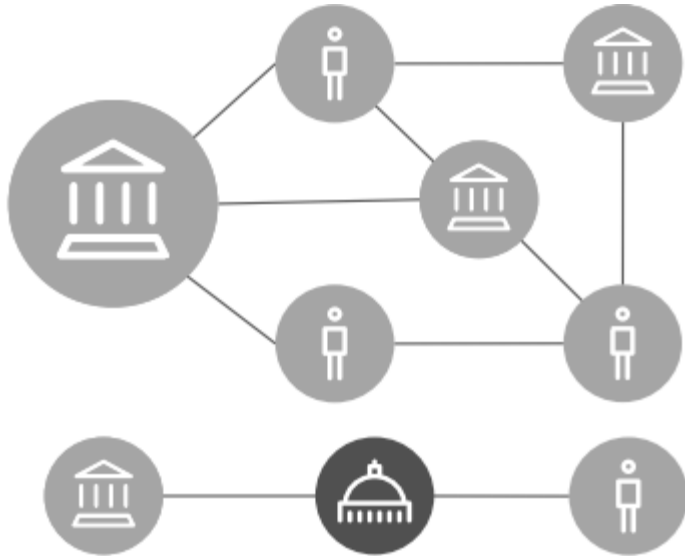
Once verified, the transaction is combined with other transactions to create a new block of data for the ledger.

**The Transaction is Complete**  
Money moves from A to B.

Source: Financial Times

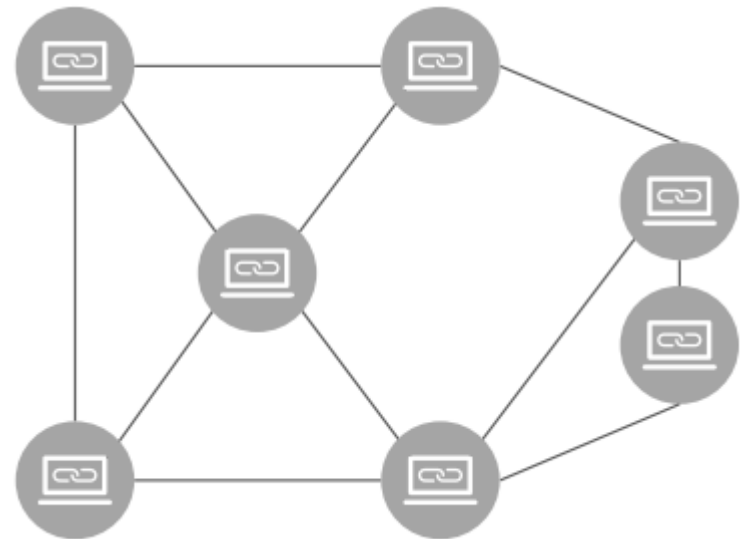
# • Traditional Database vs. Blockchain

## *CURRENT PARADIGM*



- **Central authorities** transfer actual value between two parties.
- **Multiple intermediaries** required to facilitate of assets and create trust.

## *BLOCKCHAIN PARADIGM*



- Distributed nodes that maintain a shared source of information.
- Trust enabled by cryptographic algorithm.

# • The Blockchain Advantage

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## ***SHARED LEDGER***

It is an append-only distributed system shared across the business network, which makes the system resilient by eliminating a 'single point of failure.'



## ***IMMUTABILITY***

Records are indelible and cannot be tampered with once committed to the shared ledger, thereby making all information trustworthy.



## ***CONSENSUS***

A transaction is only committed when all parties agree to a network verified transaction.



## ***FINALITY***

Once a transaction is completed over a blockchain, it can never be reverted.



## ***PROVENANCE***

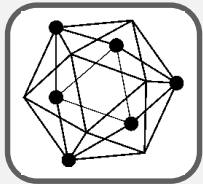
The entire history of an asset is available over the blockchain.



## ***SMART CONTRACTS***

Code is built within a blockchain that computers/nodes execute based on a triggering event. Essentially, an 'if this then that' statement which can be auto-executed.

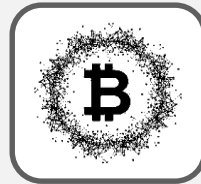
# • Projected Growth of Blockchain Technology



*According to Santander, a Spanish banking group, by 2022, distributed ledgers could cut the industry's bills by up to \$20 billion a year.*



*According to the World Economic Forum, a reputed Swiss non-profit foundation, by 2027, 10% of the global GDP will be stored in the blockchain technology.*



*According to Forbes magazine, 90% of major North American and European banks are exploring blockchain technology.*



*According to CEB insights, blockchain technologies attracted \$1 billion of venture capital in 2015.*



*According to a Bain report, international payments, which has \$150 billion - \$200 billion in bank deposits, and trade finance, which has \$23 billion bank revenue pool, have the strongest potential for distributed ledgers.*

# • Blockchain is Disrupting Industries

The following is a broad list of use cases where blockchain could have an impact:

## Healthcare

- Blockchain technology could revolutionize public health by creating a secure and flexible ecosystem for exchanging electronic health records (EHRs).
- This technology could also make the space more transparent by creating provenances for critical drugs, blood, organs.

## Education

- Student records, faculty records and educational certificates can be maintained with the application of blockchain technology.
- Blockchain can also simplify certificate attestation and verification.

## Supply Chain

- Track individual components across an entire supply chain from the source to the final destination, increasing transparency, reducing complexity and cost.
- Reduces the amount of time needed to trace issues as diverse as foodborne illnesses and product quality back to the source.

## Security

- Blockchain technology can be leveraged to provide consensus-based access for modifying data and distributing access over multiple system resources such as networks, data centres and hardware equipment.

## Governance

- Blockchain technology can be used to break the silos, check government corruption (if any), increase efficiency and transparency.

## Property Ownership

- Can be used to track rent or mortgage payment histories and property ownership information over time.
- Identifies the true owner of a property instantly, thereby reducing time and intermediaries.

## Financial Transactions

- Numerous financial institutions are already using blockchain technology to make monetary transfers faster, more secure and traceable than the existing, antiquated SWIFT code system.
- Exchanges are also implementing blockchain in custody, clearing and settlement.

Source: PwC

A horizontal bar spanning the width of the page, divided into a red section on the left and a grey section on the right. A small red circle is positioned at the boundary between the two sections.

## **Indxx Blockchain Index**



## ● Indxx Blockchain Index

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### Definition:

*The Indxx Blockchain Index tracks the performance of listed common stocks of companies with their primary listing in Developed or Emerging market countries that are either actively using, investing in, developing, or have products that are poised to benefit from blockchain technology.*

# ● Portfolio Construction Framework

Indxx analyzes each company in the Master List via the following research process:

## STEP 1

The first step in the process is to research each company's products, services, and any use or test cases related to blockchain technology.

## STEP 2

The second step is to research each company's latest annual reports and press releases in the last one year. Any publicly available resources from the company, including investor presentations related to blockchain technology, are analyzed as well.

## STEP 3

The third step is to research various news outlets and industry reports describing the extent of each company's exploration into blockchain technology. These sources can include details of blockchain technology's impact on a company, reports that describe a company's future plans on blockchain, and any use or test cases on blockchain.

## 3 – Tiered Scoring System

### TIER 1: ACTIVE ENABLERS

1. Are actively developing blockchain technology products or systems for their own use internally, but also for sale and support for other companies.
2. Are direct service providers for blockchain technology.
3. Have business models that rely on delivering products or services that utilize blockchain technology.

### TIER 2: ACTIVE USERS

1. Are using blockchain technology which is generally supported by an Active Enabler.
2. Have at least one use or test case of using blockchain technology.

### TIER 3: ACTIVE EXPLORERS

1. Have publicly disclosed that they are active in exploring the incorporation of blockchain technology into their business.
2. Have a press release on their website or a news article stating that they have started working on the blockchain technology space.

# • Methodology Construction

## Index Methodology

The Indxx Blockchain Index tracks the performance of exchange-listed companies across the globe that are either actively using, investing in, developing, or have products that are poised to benefit from blockchain technology.

Each security in the index must meet certain eligibility criteria based on liquidity, size and trading minimums.

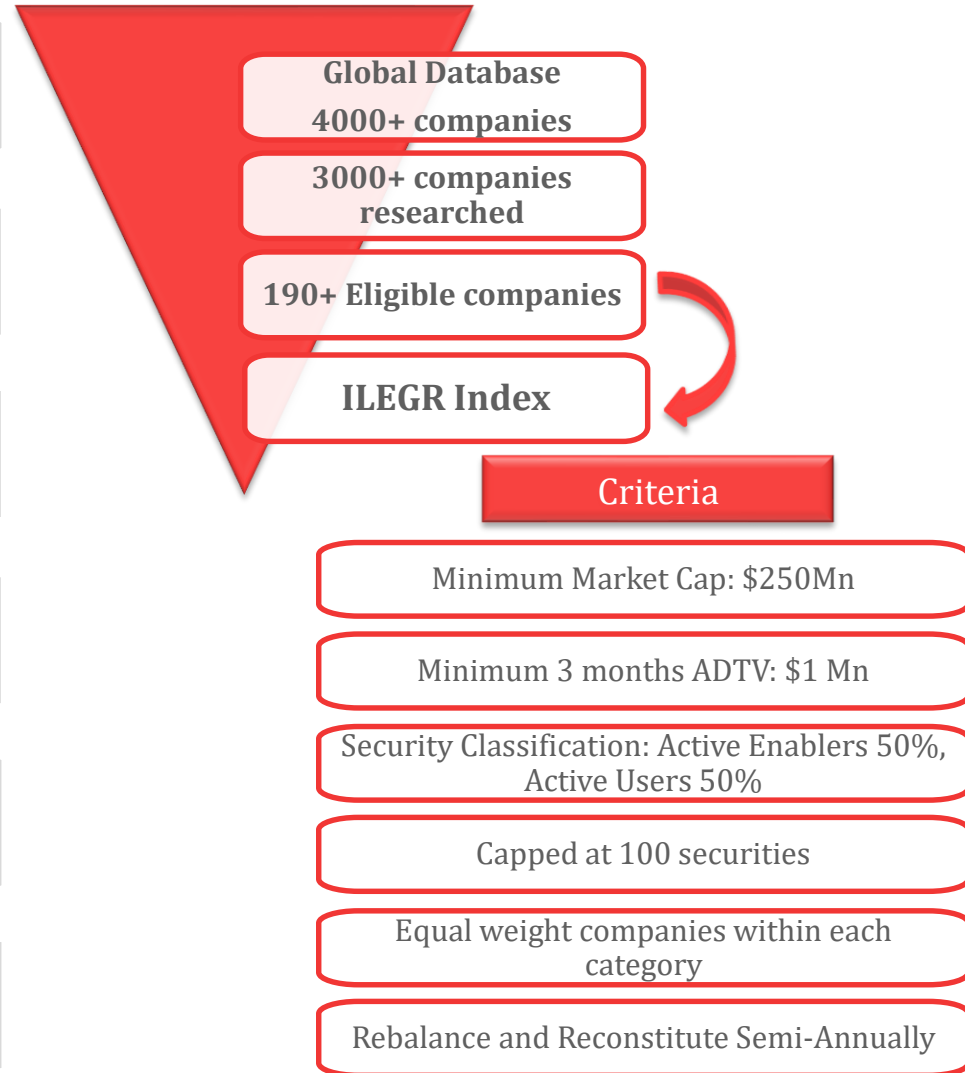
Eligible securities are classified into the following three categories:

- Tier 1: Active Enablers - 20 companies
- Tier 2: Active Users - 62 companies
- Tier 3: Active Explorers - 112 companies

Companies with a score of 1 or 2 are selected for the index and weighted with Active Enablers receiving 50% and Active Users receiving 50%. The selected companies are weighted equally within each category. The index is capped at 100 constituents.

A maximum weighting of 0.50% is applied to constituents in the Active Enabler category with a market cap of less than \$500 million, as well as a 20 day and 3 month average daily turnover volume of less than \$3 million.

The Index is rebalanced and reconstituted semi-annually on the third Friday of March and September.



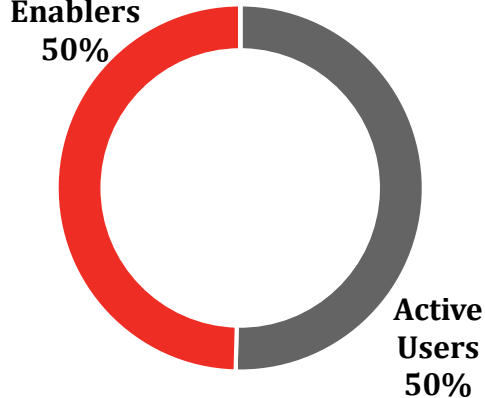
# •Tiered Scoring System

## Tier 1: Active Enablers

Active Enablers are the companies that:

- Are actively developing blockchain technology systems for their own use or for sale and support to other companies.
- Are direct service providers of blockchain technology.
- Have business models that rely on delivering products or services that utilize blockchain technology.

Active Enablers  
50%



Active Users  
50%

## Tier 2: Active Users

Active Users are companies that:

- Are using blockchain technology which is generally supported by an Active Enabler.
- Have at least one use or test case of using blockchain technology.

All data on this slide as of 03/31/2018



**● Indxx Blockchain Index Characteristics**

# Return & Risk – Indxx Blockchain Index

## Index Basics\*\*

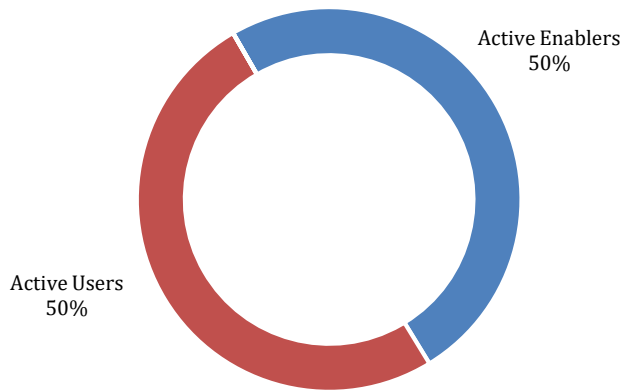
Period	Indxx Blockchain Index
Base Date	3/18/2016
No. of Constituents	82
Total Market Cap (USD Million)	6,347,037
Average Market Cap (USD Million)	77,403
Median Market Cap (USD Million)	39,290
Largest Constituent (USD Million)	702,760
Smallest Constituent (USD Million)	258

\*\*Security level market capitalization has been used

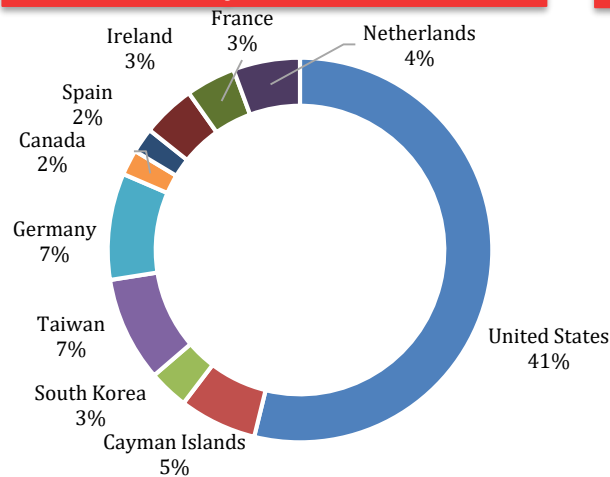
## Index Characteristics

Characteristic	Indxx Blockchain Index
Dividend Yield	1.76%
Beta vs MSCI ACWI Index (TR)*	1.18
Correlation vs. MSCI ACWI Index (TR)*	0.77
52 Week High/Low	2,168/1,517

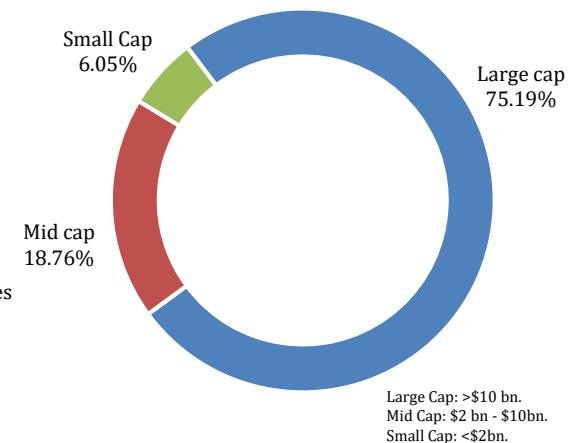
## Breakdown between Tier 1 & Tier 2



## Country Breakdown



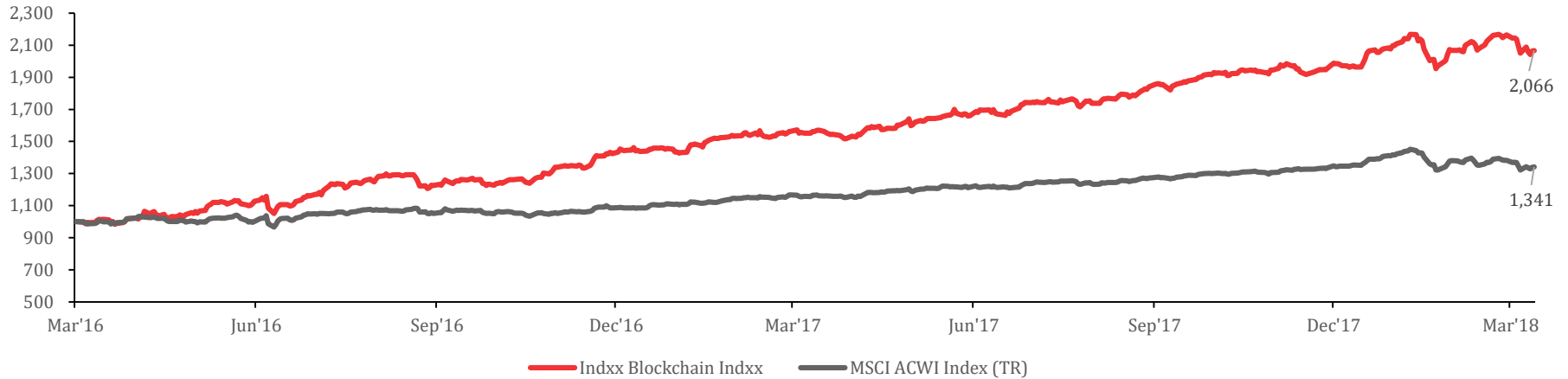
## Size Exposure



\* Since base date  
All data on this slide as of 03/31/2018

# Return & Risk – Indxx Blockchain Index

## Performance Graph



### Annualized Returns

Annualized Returns	Indxx Blockchain Index	MSCI ACWI Index (TR)
YTD	5.20%	-0.84%
1 Year	31.70%	14.96%
Since Base Date*	42.89%	15.52%

### Calendar Year Returns

Calendar Year	Indxx Blockchain Index	MSCI ACWI Index (TR)
2016	43.84%	8.51%
2017	36.55%	24.62%
2018	5.20%	-0.84%

### Annualized Volatility

Volatility	Indxx Blockchain Index	MSCI ACWI Index (TR)
YTD	17.75%	13.63%
1 Year	12.69%	8.37%
Since Base Date*	14.25%	9.24%

\*Since 3/18/2016  
Unless specified, all data on slide as of 03/31/2018

# ● Indxx Blockchain Index- Holdings

## Tier 1: Active Enablers

#	Company Name	Country
1	Intel Corp	United States
2	Asustek Computer Inc	Taiwan
3	Gemalto	Netherlands
4	Taiwan Semiconductor-Sp Adr	Taiwan
5	Intl Business Machines Corp	United States
6	Alibaba Group Holding-Sp Adr	Cayman Islands
7	Accenture Plc-Cl A	Ireland
8	Cognizant Technology Soluti Cl A	United States
9	Microsoft Corp	United States
10	Software Ag	Germany
11	Sap Se	Germany
12	Nvidia Corp	United States
13	Nordic Semiconductor Asa	Norway
14	Xilinx Inc	United States
15	Texas Instruments Inc	United States
16	Micron Technology Inc	United States
17	Oracle Corp	United States
18	Baidu Inc - Spon Adr	Cayman Islands
19	Advanced Micro Devices	United States
20	Asrock Inc	Taiwan

Holdings as of 03/31/2018



# ● Indxx Blockchain Index- Holdings

## Tier 2: Active Users

#	Company Name	Country
1	Nex Group Plc	United Kingdom
2	Qivi Plc-Sponsored Adr	Cyprus
3	Recruit Holdings Co Ltd	Japan
4	Samsung Sdi Co Ltd	South Korea
5	Ntt Data Corp Ord	Japan
6	Hdfc Bank Ltd-Adr	India
7	Aeon Credit Service Co Ltd Ord	Japan
8	Foxconn Technology	Taiwan
9	Nasdaq Inc	United States
10	Walmart Inc	United States
11	Genpact Ltd	Bermuda
12	Samsung Electronics Co Ltd	South Korea
13	Sk Holdings Co Ltd	South Korea
14	Postal Savings Bank Of China C	China
15	Deutsche Boerse	Germany
16	Barclays Plc	United Kingdom
17	Royal Bank Of Canada	Canada
18	Boc Hong Kong Holdings Ltd Ord	Hong Kong
19	Cgi Group Inc - Class A	Canada
20	Visa Inc-Class A Shares	United States
21	Mastercard Inc-Class A	United States
22	Bank Of Ireland Group Plc	Ireland
23	Red Hat Inc	United States
24	Severstal Pao	Russian Federation
25	Virtusa Corp	United States
26	Cisco Systems Inc	United States
27	American International Group Inc	United States
28	Banco Santander Sa	Spain
29	Bhp Billiton Ltd	Australia
30	Banco Bilbao Vizcaya Argentaria Sa	Spain
31	Airbus Se	Netherlands

Holdings as of 03/31/2018

# ● Indxx Blockchain Index- Holdings

## Tier 2: Active Users

#	Company Name	Country
32	Allianz Se	Germany
33	Capgemini Sa	France
34	Asx Ltd Ord	Australia
35	Icici Bank Ltd-Spon Adr	India
36	Natixis Sa	France
37	Cme Group	United States
38	Jpmorgan Chase & Co	United States
39	Northern Trust Corp	United States
40	Societe Generale	France
41	China Life Insurance Co-Adr	China
42	Bnp Paribas Sa	France
43	Barloworld Ltd	South Africa
44	Ing Groep N.V.-Sponsored Adr	Netherlands
45	Ubs Group Ag	Switzerland
46	Wipro Ltd-Adr	India
47	Bangkok Bank Pcl	Thailand
48	Goldman Sachs Group Inc	United States
49	Dell Technologies Inc	United States
50	Kbc Groep Nv	Belgium
51	Sony Corp-Sponsored Adr	Japan
52	Mitek Systems Inc	United States
53	Softbank Group Corp	Japan
54	Nokia Oyj	Finland
55	Hewlett Packard Enterprise Company	United States
56	Bank Of New York Mellon Corp	United States
57	Salesforce.Com Inc	United States
58	Zte Corp	China
59	Citigroup Inc	United States
60	Ncr Corp	United States
61	Reply Spa	Italy
62	Overstock.Com Inc	United States

Holdings as of 03/31/2018

## ● Contact Information

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