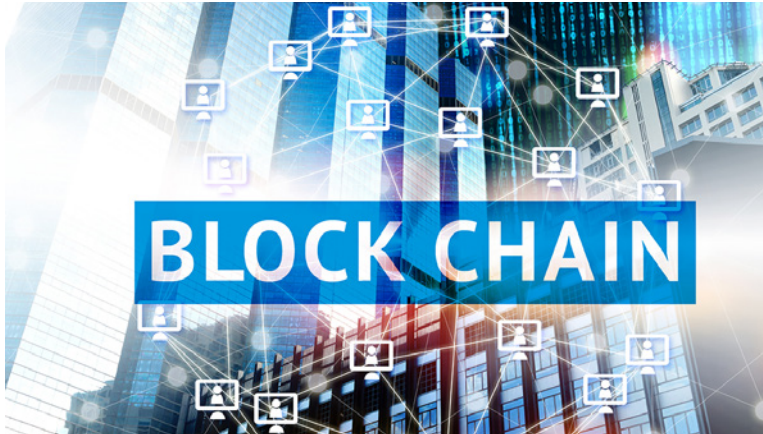


1.75 (54.69)	10.01 (+48.30)	9.67 (-3.40)	9,383.69 (+6.79)	9,680.80 (+3.17)	11,502.33 (+18.82)	14,556.6 (+26.55)
1.62 (47.27)	0.62 (-61.73)		159.55 (+16.75)	174.76 (+9.53)	214.43 (+22.70)	185.89 (-13.31)
0.19	0.31 (+63.16)		1,641.04 (+24.43)	1,409.65 (-14.10)	1,100.76 (-21.91)	1,133.09 (+2.94)
0.07		0.07	5,273.24 (+85.70)	4,404.28 (-16.48)	5,068.33 (+15.08)	6,675.00 (+31.70)
2.05 (49.38)	1.14 (-44.39)	0.97 (-14.91)	10,940.23 (-8.02)	17,134.63 (+56.62)	17,245.03 (+0.64)	15,330.2 (-11.10)
1.27 (7.97)	1.21 (-4.72)	1.07 (-11.57)	1,092.99 (+11.12)	1,287.47 (+17.79)	1,395.47 (+8.39)	1,524.51 (+9.25)
0.52 (36.84)	0.58 (+11.54)	0.07 (-87.93)	3,015.16 (+22.51)	4,350.61 (+44.29)	5,068.11 (+16.49)	5,499.97 (+8.52)
0.25	0.09 (-64.00)			3,461.94	4,235.78 (+22.35)	4,441.44 (+4.86)
0.03	0.02 (-33.33)				792.03	863.59 (+9.04)
7.74 (43.07)	3.19 (-58.79)	2.58 (-19.12)	4,835.38 (+5.59)	4,188.06 (-13.39)	6,023.23 (+43.82)	6,651.55 (+10.43)
		0.01	6,573.71 (+5.19)	5,286.59 (-19.58)	5,452.36 (+3.14)	6,545.55 (+20.05)
0.14 (0.00)	0.04 (-71.43)			1,751.18	1,650.36 (-5.76)	1,869.92 (+13.30)
0.12 (20.00)	0.12 (0.00)	0.14 (+16.67)	283.46	363.82 (+28.35)	492.08 (+35.25)	547.99 (+11.36)

## BLOCKCHAIN AND CAPITAL MARKETS



## Blockchain and Capital Markets



### Benefits of implementing Blockchain technology

Blockchain technology has sparked interest among various industries and sectors, especially in financial services industry. While banks were among the first to test and consider blockchain in their processes, stock exchanges (a fundamental part of capital markets) were quick to keep pace. In fact, some of the most established stock exchanges around the world are looking at ways of how they can benefit from blockchain technology in order to fundamentally overhaul their current traditional processes.<sup>1</sup>

As one might expect, the operation of stock exchanges includes complex processes that can be costly, time consuming, onerous, and susceptible to risks. The multi-layered processes (which include the pre-trade, trade, post-trade and custody, and securities servicing) is extremely complex. This makes a case for research and experimentation with blockchain technology in order to streamline the process.<sup>2</sup>

Blockchain technology could result in savings for the participants involved by minimising replication of processes, settlement time, collateral requirements and operational costs. This, in turn, would minimise the need to set aside financial resources to cover any counterparty risks.<sup>3</sup> Other benefits may include higher AML standards and reduced risk exposure.



### Initiatives taken by global stock exchanges

- **Nasdaq** - Nasdaq has been at the forefront of the blockchain revolution. At the turn of 2015, Nasdaq unveiled the use of its blockchain technology to successfully complete and record private securities transactions. Last May, Nasdaq and Citi announced an integrated payment solution using a distributed ledger to record and transmit payment instructions based on blockchain technology.<sup>4</sup>
- **India's National Stock Exchange Nasdaq** - Early this year, India's National Stock Exchange coordinated a blockchain trial involving the country's leading banks. The blockchain trial related to KYC verifications.<sup>5</sup>
- **Deutsche Börse** - In November 2016, Deutsche Börse (one of the largest exchange organisations worldwide) and Deutsche Bundesbank presented a practical model for the blockchain technology based settlement of securities.<sup>6</sup> Further progression over the next few months is expected to help them analyse the technical performance and the scalability of this kind of blockchain-based application.
- **The London Stock Exchange** - As part of the Post-Trade Distributed Ledger (PTDL) Group, an initiative launched last year by banks, clearing houses and stock exchanges, the London Stock Exchange is involved in ways to improve the post-trade space using the Blockchain technology.<sup>7</sup>

<sup>1</sup> <http://www.nasdaq.com/article/how-stock-exchanges-are-experimenting-with-blockchain-technology-cm801802>

<sup>2</sup> <http://www.nasdaq.com/article/how-stock-exchanges-are-experimenting-with-blockchain-technology-cm801802>

<sup>3</sup> <https://bitnewsbot.com/page/11/?s=nasdaq>

<sup>4</sup> <http://ir.nasdaq.com/releasedetail.cfm?releaseid=948326>

<sup>5</sup> <https://www.coindesk.com/india-stock-exchange-blockchain-kyc/>

<sup>6</sup> [https://www.bundesbank.de/Redaktion/EN/Downloads/Press/Pressenotizen/2016/2016\\_11\\_28\\_blockchain\\_prototype.pdf?\\_\\_blob=publicationFile](https://www.bundesbank.de/Redaktion/EN/Downloads/Press/Pressenotizen/2016/2016_11_28_blockchain_prototype.pdf?__blob=publicationFile)

<sup>7</sup> <http://www.ptdlgroup.org/news.html>



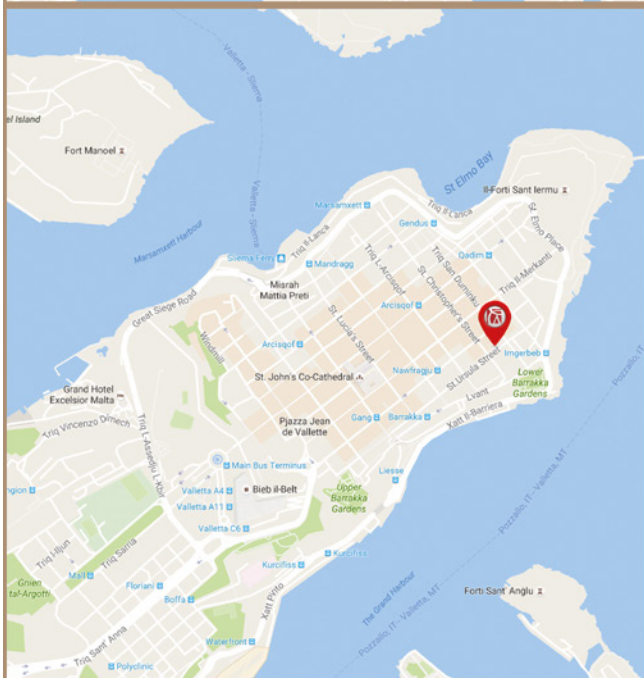
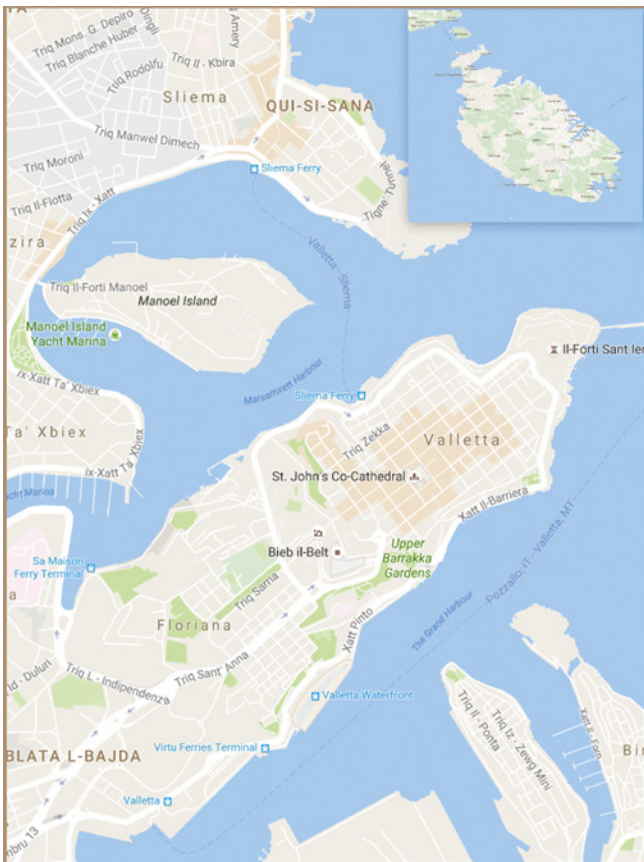
## Conclusion

As there is a lot of potential for those stock exchanges that invest in blockchain technology such as, efficient trading and settlement processes and a reduction in costs and complexity, currently there are a number of big companies in the capital markets sector experimenting with blockchain technology.<sup>8</sup>

The path to its acceptance will require the resolution of certain issues such as scalability, common standards, and regulation. However, notwithstanding the resistance that lie ahead, it is broadly assumed that blockchain technology could transform the infrastructure of capital markets around the globe, in a way to bring in greater efficiency and transparency.

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<sup>8</sup> <http://www.nasdaq.com/article/how-stock-exchanges-are-experimenting-with-blockchain-technology-cm801802>



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2.75 (54.69)	10.01 (+48.30)	9.67 (-3.40)	9,383.69 (+6.79)	9,680.80 (+3.17)	11,502.33 (+18.82)	1
1.62 (7.27)	0.62 (-61.73)		159.55 (+16.75)	174.76 (+9.53)	214.43 (+22.70)	
0.19	0.31 (+63.16)		1,641.04 (+24.43)	1,409.65 (-14.10)	1,100.76 (-21.91)	1
0.07		0.07	5,273.24 (+85.70)	4,404.28 (-16.48)	5,068.33 (+15.08)	6
2.05 (9.38)	1.14 (-44.39)	0.97 (-14.91)	10,940.23 (-8.02)	17,134.63 (+56.62)	17,245.03 (+0.64)	1
1.27 (7.97)	1.21 (-4.72)	1.07 (-11.57)	1,092.99 (+11.12)	1,287.47 (+17.79)	1,395.47 (+8.39)	1
0.52 (6.84)	0.58 (+11.54)	0.07 (-87.93)	3,015.16 (+22.51)	4,350.61 (+44.29)	5,068.11 (+16.49)	5
0.25	0.09 (-64.00)			3,461.94	4,235.78 (+22.35)	4
0.03	0.02 (-33.33)				792.03	
1.14 (3.07)	3.19 (-58.79)	2.58 (-19.12)	4,835.38 (+5.59)	4,188.06 (-13.39)	6,023.23 (+43.82)	6
		0.01	6,573.71 (+5.19)	5,286.59 (-19.58)	5,452.36 (+3.14)	6
0.14 (0.00)	0.04 (-71.43)			1,751.18	1,650.36 (-5.76)	1
0.12 (0.00)	0.12 (0.00)	0.14 (+16.67)	283.46	363.82 (+28.35)	492.08 (+35.25)	

