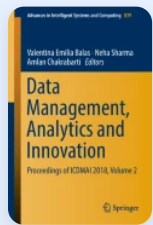


[Home](#) > [Data Management, Analytics and Innovation](#) > Conference paper


# Big Data Analytics: A Trading Strategy of NSE Stocks Using Bollinger Bands Analysis

Conference paper | First Online: 08 September 2018



pp 143–154 | [Cite this conference paper](#)



## [Data Management, Analytics and Innovation](#)

[Gokul Parambalath](#), [E. Mahesh](#), [P. Balasubramanian](#) & [P. N. Kumar](#) 



 Part of the book series: [Advances in Intelligent Systems and Computing](#) ((AISC, volume 839))

 1692 Accesses  10 Citations

## Abstract

The availability of huge distributed computing power using frameworks like Hadoop and Spark has facilitated algorithmic trading employing technical analysis of Big Data. We used the conventional Bollinger Bands set at two standard deviations based on a band of moving average over 20 minute-by-minute price values. The Nifty 50, a portfolio of blue chip companies, is a stock index of National Stock Exchange (NSE) of India reflecting the overall market sentiment. In this work, we analyze the intraday trading strategy employing the concept of Bollinger Bands to identify stocks that generates maximum profit. We have also

examined the profits generated over one trading year. The tick-by-tick stock market data has been sourced from the NSE and was purchased by Amrita School of Business. The tick-by-tick data being typically Big Data was converted to a minute data on a distributed Spark platform prior to the analysis.

 This is a preview of subscription content, [log in via an institution](#)  to check access.

## Access this chapter

[Log in via an institution](#) →

### ^ Chapter

**EUR 29.95**

Price includes VAT (Poland)

- Available as PDF
- Read on any device
- Instant download
- Own it forever

[Buy Chapter](#) →

### ^ eBook

**EUR 117.69**

Price includes VAT (Poland)

- Available as EPUB and PDF
- Read on any device
- Instant download
- Own it forever

[Buy eBook](#) →

### ^ Softcover Book

**EUR 160.49**

Price includes VAT (Poland)

- Compact, lightweight edition
- Dispatched in 3 to 5 business days
- Free shipping worldwide - [see info](#)

[Buy Softcover Book](#) →

Tax calculation will be finalised at checkout

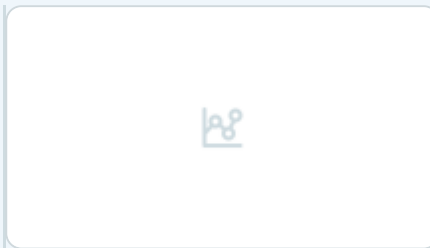
**Purchases are for personal use only**

## Similar content being viewed by others



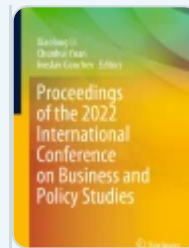
### **Bulk Price Forecasting Using Spark over NSE Data Set**

Chapter | © 2016



### **Big data framework for quantitative trading system**

Article | 31 March 2017



### **Quantitative Research About Chinese Financial Market**

Chapter | © 2022

## References

1. Kabasinskas, A., & Macys, U. (2010). Calibration of Bollinger Bands parameters for trading strategy development in the Baltic stock market. *Inzinerine Ekonomika-Engineering Economics*, 21(3), 244–254.  
[Google Scholar](#)
2. Shleifer, A. (2000). *Inefficient markets: An introduction to behavioral finance*. Oxford University Press.  
[Google Scholar](#)
3. Bollinger, J. (1992). "Using Bollinger", Bands. *Stocks & Commodities*, 10/2, 47–51.  
[Google Scholar](#)
4. Bollinger, J. (2001). *Bollinger on Bollinger Bands*. New York: McGraw-Hill.  
[Google Scholar](#)

5. Fama, E. (1965). The behavior of stock market prices. *Journal of Business*, 38, 34-105.

[Article](#) [Google Scholar](#)

6. Fama, E., & Miller, M. H. (1972). *The theory of finance*. New York: Holt, Rinehart and Winston.

[Google Scholar](#)

7. Baltussen, G. (2009). *Behavioral finance: An introduction*.

<http://ssrn.com/abstract=1488110>.

8. Mandelbrot, B. B. (1963). The variation of certain speculative prices. *Journal of Business*, 36, 394-419.

[Article](#) [Google Scholar](#)

9. Mandelbrot, B. B. (1963). New methods in statistical economics. *Journal of Political Economy*, 71, 421-440.

[Article](#) [Google Scholar](#)

10. Mandelbrot, B. B. (1964). The variation of certain speculative prices. In P. Cootner (Ed.), *The random character of stock prices*. Cambridge: MIT Press.

[Google Scholar](#)

11. Nair, B. B., & Mohandas, V.P. (2015). Artificial intelligence applications in financial forecasting—a survey and some empirical results. *Intelligent Decision Technologies*, 9, 99-140. <https://doi.org/10.3233/idt-140211> (IOS Press).

12. Nair, B. B., & Mohandas, V. P. (2015). An intelligent recommender system for

stock trading. *Intelligent Decision Technologies*, 9, 211–220.

<https://doi.org/10.3233/idt-140220> (IOS Press).

13. Kumar, P. N., Rahul Seshadri, G., Hariharan, A., Mohandas, V. P., & Balasubramanian, P. (2011). Financial market prediction using feed forward neural network. In *International Conference on Technology Systems and Management*. Communications in Computer and Information Science, CCIS (Vol. 145, pp. 77–84).

[Google Scholar](#)

14. Lai, H. C., Tseng, T. C., & Huang, S. C. (2016). Combining value averaging and Bollinger Band for an ETF trading strategy. *Applied Economics*, 48(37), 3550–3557.

[Google Scholar](#)

15. Lento, C., Gradojevic,\* N., & Wright, C. S. (2007). Investment information content in Bollinger Bands. *Applied Financial Economics Letters*, 3, 263–267.

[Google Scholar](#)

16. Leung, J. M. J, & Chong, T. T. L. (2003). An empirical comparison of moving average envelopes and Bollinger Bands. *Applied Economics Letters*, 10, 339–341.

[Google Scholar](#)

17. Harris, L. (2003). *Trading and exchanges: Market microstructure for practitioners*. Oxford University Press.

[Google Scholar](#)

## Acknowledgements

---

The authors would like to thank Amrita School of Business for providing the tick-by-tick trade data and the Centre of Excellence in Computational Engineering & Networking (CEN), Amrita University for support of Spark platform to handle the Big Data of stock prices.

## Author information

---

### Authors and Affiliations

**Department of Economics, Christ University, Bengaluru, India**

Gokul Parambalath & E. Mahesh

**Amrita School of Business, Amrita University, Coimbatore, India**

P. Balasubramanian

**Department of Computer Science and Engineering, Amrita University, Coimbatore, India**

P. N. Kumar

### Corresponding author

Correspondence to [P. N. Kumar](#).

## Editor information

---

### Editors and Affiliations

**Department of Automatics and Applied Software, Aurel Vlaicu University of Arad, Arad, Romania**

Valentina Emilia Balas

**Adyogik Tantra Shikshan Sanstha's IICMR, Pune, Maharashtra, India**

Neha Sharma

**Faculty of Engineering and Technology, A.K. Choudhury School of Information Technology, Kolkata, India**

Amlan Chakrabarti

## 1.1 R Program Implementation of Trading Strategy Employing Bollinger Bands

### 1.1.1 Intraday Profits

The R program for calculating the intraday profits generated using the Bollinger Band algorithm and volatility are given below:

```
main_intraday.R
```

```
setwd("C:\\Users\\Desktop\\bb\\yearfullsorted")
```

```
stock_list<-dir();
```

```
for(i in 1:49)
```

```
{rm(stock);
```

```
work<-stock_list[i]
```

```
setwd("C:\\Users\\Desktop\\bb\\yearfullsorted");
```

```
stock1<-read.csv(work)
```

```
stock<-stock1[1:350,];
```

```
names(stock)[1]<-“stock”;
```

```
names(stock)[2]<-“date”;names(stock)[3]<-“time”
```

```
names(stock)[4]<-“price”;
```

```
names(stock)[5]<-“qty”;
```

```
setwd("C:\\Users\\Desktop\\bb\\work")
```

```
source(“bollinger.R”);
```

```
setwd("C:\\Users\\Desktop\\bb\\yearfullsorted")
```

```
}
```

### 1.1.2 5.4.2 One-Year Profits

The R program for calculating the 1-year profits generated using the Bollinger Band algorithm and the volatility calculated are given below:

```
main - full - year.R
```

```
setwd("C:\\Users\\Desktop\\bb\\yearfullsorted")
```

```
stock_list<-dir();
```

```
for(i in 1:49)
```

```
{
```

```
rm(stock)
```

```
work<-stock_list[i];
```

```
setwd("C:\\Users\\Desktop\\bb\\yearfullsorted")
```

```
stock<-read.csv(work);names(stock)[1]<-"stock";
```

```
names(stock)[2]<-"date";names(stock)[3]<-"time";
```

```
names(stock)[4]<-"price";names(stock)[5]<-"qty";
```

```
setwd("C:\\Users\\Desktop\\bb\\work")
```

```
source("bollinger.R");
```

```
setwd("C:\\Users\\Desktop\\bb\\yearfullsorted")
```

```
}
```

```
bollinger.R
```

```
library("TTR");
```

```
stock[6]=round(SMA(stock[4],n=20,na.rm=TRUE),digits=2)
```

```
names(stock)[6]<-"SMA";k=19;p=nrow(stock)-k;
```

```
for (i in 1:p)
```

```
{r=k+i;
```



```

stock[,7]=round(sd(stock$SMA[i:r]),digits=2)};

names(stock)[7]<-"SD"

stock[,8]=round((stock[,6]+2*stock[,7]), digits=2);

stock[,9]=round((stock[,6]-2*stock[,7]), digits=2);

names(stock)[8]<-"UB";names(stock)[9]<-"LB"

volatility<- round(mean(stock$SD,na.rm="true")*4, digits=2)

avg_qty<-round(mean(stock$qty, digits=2));

tot_rows=nrow(stock);qty_bought<-0; qq<-0;

sold_amt<-0.0; buy_amt=0.0;sold<-0.0;

invest_fund=100000; for(i in 40:tot_rows)

{if ((stock$price[i]<stock$LB[i]) && (stock$qty[i] > (avg_qty)))

{qty_bought=qty_bought + round((invest_fund/stock$price[i]),digits=0);

bb<-round(invest_fund/stock$price[i], digits=0);

qq<- qq+bb; buy_amt<-buy_amt+invest_fund;}

if ((stock$price[i]>stock$UB[i])&& (stock$qty[i] >avg_qty))

{sold<-(stock$price[i]*qty_bought);sold_amt<-sold_amt+sold;

qty_bought=0;}}

invest_amt_bal=(qty_bought*max(stock$price))

tot_sale=sold_amt+invest_amt_bal; intraday_profit=tot_sale-buy_amt;

profit<-round(intraday_profit/buy_amt*100, digits=2);

result<-c(qq,tot_sale,buy_amt,intraday_profit,profit,volatility)

print(result);

```

## Rights and permissions

## Copyright information

---

© 2019 Springer Nature Singapore Pte Ltd.

## About this paper

---

### Cite this paper

Parambalath, G., Mahesh, E., Balasubramanian, P., Kumar, P.N. (2019). Big Data Analytics: A Trading Strategy of NSE Stocks Using Bollinger Bands Analysis. In: Balas, V., Sharma, N., Chakrabarti, A. (eds) Data Management, Analytics and Innovation. Advances in Intelligent Systems and Computing, vol 839. Springer, Singapore. [https://doi.org/10.1007/978-981-13-1274-8\\_11](https://doi.org/10.1007/978-981-13-1274-8_11)

[.RIS↓](#) [.ENW↓](#) [.BIB↓](#)

DOI	Published	Publisher Name
<a href="https://doi.org/10.1007/978-981-13-1274-8_11">https://doi.org/10.1007/978-981-13-1274-8_11</a>	08 September 2018	Springer, Singapore
Print ISBN	Online ISBN	eBook Packages
978-981-13-1273-1	978-981-13-1274-8	<a href="#">Engineering</a>
		<a href="#">Engineering_(R0)</a>

## Publish with us

---

[Policies and ethics](#) 

## Search

Search by keyword or author



# Navigation

[Find a journal](#)

---

[Publish with us](#)

---

[Track your research](#)

---

