

## 1. Introduction

The adjective “Intra-day”, according to the [on-line Merriam-Webster online dictionary](#), is another way of saying “within a day”. Accordingly, intra-day trading of futures, by definition and design, conforms to the risk management policy of not carrying over a position overnight. This is a general policy of many proprietary firms to completely avoid exposing themselves to any adverse risk that might occur while the firm partners are asleep.

Futures is a derivative that is marked-to-market. Though highly leveraged from the standpoint of notional amount, counter-party risk is virtually absent since a regulated exchange acts as the intermediary between buyers and sellers. Anyone can start an intra-day futures trading business as the barrier of entry is as low as forex trading.

It is hoped that you treat this project as if you are to start a trading business. Obviously, you need a few trading strategies that can make money consistently, so that you can at least stay in the trading business. Therefore, it is imperative that you need to *find* these strategies, and to back-test them thoroughly.

## 2. Futures and Teams

The futures we are interested in and the project team members are as follows:

$\alpha$ JPX mini Nikkei (NO)	Wang Jiahui, Xi Zichao, Xu Jiawen
$\beta$ SGX Nikkei (NI)	Aggarwal Shivani, Lin Yujie, Tsai Chengjung
$\gamma$ CME mini S&P (ES)	Chong Siang Wei, Lim Yi Min, Louis Lim, Zachary Milhard
$\delta$ CME JPY-USD futures (JY)	Lam Wang Kwan, Dhillon Poh, Rachael Ramachandran
$\epsilon$ CME EUR-USD futures (EC)	Damian Ang, Selina Wong, Xu Leyi
$\zeta$ SGX's China A50 (XU)	Vo Van Quoc Toan, Yang Xiaotian
$\eta$ Eurex DAX futures (GX)	Gerald Chiam, Fredrik Melin, Adriel Ho, Wouter Swan

## 3. Trading Strategies

You first conduct in-sample “training” of your trading strategy (machine learning!) on all the 2016 data given to you. (The out-of-sample data will be given to you later) You can use any technical indicator such as stochastic oscillator as a start. In other words, the project is basically doing the same analysis of “back-testing” assignment. The difference is that we are dealing with intra-day 1-minute periods and the restriction of “buy-first” is eliminated. Also, you need to pay commission for every contract traded.

Obviously, we are encouraged to try as many different indicators as your time permits. You are also encouraged to invent your own indicator, especially combining it with the order flow.

## 4. Data Fields

1. First column: Time period
2. ST: Time of the first trade in the time period
3. ET: Time of the last trade in the time period
4. sidx and eidx are not used (but for me to refer to the original data) in your project.
5. bB: Bid price before the time period
6. bBS: Corresponding bid size before the time period
7. bA: Ask price before the time period
8. bABS: Corresponding ask size before the time period
9. O: Opening price of the time period
10. H: Highest price of the time period
11. L: Lowest price of the time period
12. C: Closing price of the time period
13. V: Total number of contracts trade during the time period
14. OF: Order flow for the time period
15. eB: Bid price immediately after the time period
16. eBS: Corresponding bid size after the time period
17. eA: Ask price immediately after the time period
18. eAS: Corresponding ask size after the time period

When a buying signal is generated at period  $t$ , it can be assumed that you can buy 1 contract at the ask price eA of the same  $t$ , or sell 1 contract at the bid price eB of the same  $t$ .

## 5. Commissions

On the per contract and per trade basis, the commissions are as follows:

Bloomberg ticker	NO	NI	ES	JY	EC	XU	GX
Price multiplier	¥100	¥500	\$50	\$1,250	\$125,000	\$1	€25
Interactive Broker's Commission	¥40	¥225	\$0.85	\$0.5	\$0.5	\$2.85	€2

Suppose on a round trip, you make 0.1 point with one JY futures contract (according to Bloomberg's scaling). Your net profit is  $\$1,250 \times 0.1 - \$0.5 \times 2 = \$124.00$ .