

NEEDS REPORT

July 2011

Welcome to the Nikkei NEEDS quarterly newsletter for July 2011, providing you with updates on NEEDS services, reports and information on the Japanese economy. In this edition we look at earnings estimates in FinancialQUEST, best execution and trading analysis on the Tokyo Stock Exchange using TickVision and new strategic indices for the Nikkei 225.

We always welcome your comments and suggestions for future issues. If you have any comments please feel free to email them to e-needs@eur.nikkei.com.

[Markets Remain Flat Following Eurozone Uncertainty](#)

[NEEDS BULK Server Migration in September 2011](#)

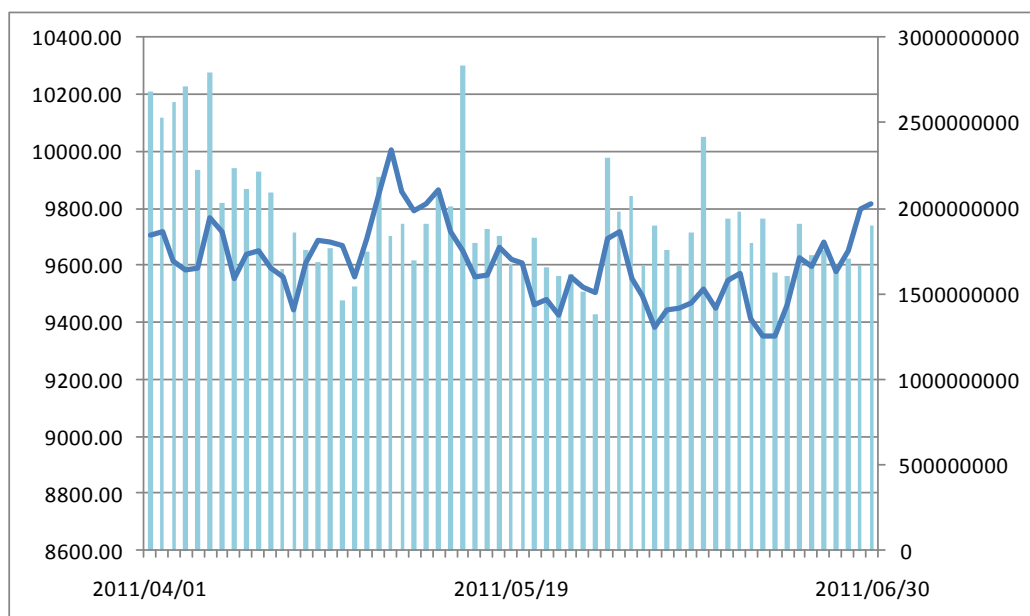
[Earnings Estimates Analysis and Usage in FinancialQUEST](#)

[NEEDS Report: Best Execution Analysis and Trading Performance Testing](#)

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Nikkei 225 Remains Flat Following Eurozone Uncertainty

Nikkei 225 Close: 9816.09 (0.62%)



3 Month High: 10,004.2
3 Month Low: 9,351.4

Largest 1 Day gain: 188.76
(31/5/2011)
Largest 1 Day loss: -154.57
(2/6/2011)

The Nikkei 225 has remained relatively flat over the last quarter, briefly hitting 10,000 before falling. The Nikkei is still 1,000 points lower than pre quake levels and finishes the quarter up 0.62%.

Questions over the possibility of a Greek default

over the last month has affected the markets, coupled with political instability over Prime Minister Kan's administration. The Greek Debt Crisis has weakened the euro against the yen, hurting exporters to Eurozone countries, in particular technology exporters. Analysts at Daiwa Securities told the Nikkei newspaper that the vote on the Greek austerity package could push Nikkei futures above 9,700 if it passes successfully, but also force the price down to 9,300 should the measures fail. The key Tankan report of industrial sentiments and the ISM manufacturing report will be key indicators on the post quake recovery.

NEEDS BULK Distribution Migration in September 2011

Nikkei has announced that there will be a migration of the NEEDS BULK/ FDS distribution servers in order to improve system performance and stability. During this time we would like to ask for NEEDS BULK users cooperation and request that users conduct testing of the new Nikkei server and notify us when this has been completed.

Due to the migration, the domain name of the NEEDS BULK/FDS distribution server will change from "fds.nikkei.co.jp" to "**bulk.nikkei.co.jp**"

We will establish a testing period from 1st September for clients to test their connections to the new server. This will be available for testing until 31st October 2011. After successful testing, we will transfer clients data access to the new server and the recording of new data files will begin.

More information regarding the migration will be released shortly. This migration does not affect Nikkei Index subscribers via MarkIT.

Nikkei 225 and Nikkei 300 Calculation Data Available in Financial QUEST

Data to track and benchmark the performance of the Nikkei 225

Nikkei has launched a data option to allow users to access Nikkei index data for calculating, tracking and benchmarking the Nikkei 225 and Nikkei 300 indices on FinancialQUEST, Nikkei's online data download service. Basic index data is also available via MarkIT and NEEDS BULK, which contains more detailed information for calculation.

The new data available via FinancialQUEST is identical to the data used by Nikkei Digital Media to calculate the value of the indices - making it the most accurate data for fund managers and investment professionals who need to track and balance portfolios linked to the Nikkei indices.

Data access via FinancialQUEST now means that there are three options to obtain calculation data via Nikkei: the first is Nikkei's original FTP data delivery service NEEDS BULK, which provides a daily data feed of the index calculation data, including dividend data for constituents, weighting information, divisors and calculation measures to compute the index or to calculate total return values for the Nikkei 225 and 300.

The second data option is via Nikkei's third party vendors and provides constituent pricing data, index value and divisor data. Third party vendors also provide Nikkei 500 index information and constituent data via a daily data feed.

FinancialQUEST now provides web based ad hoc access to this data via a special subscription. Financial QUEST will provide ad hoc historical calculation data for the indices.

Using the calculation data, the Nikkei 225 index value is created by multiplying the constituent weighting by the stock price. The values are then summed and divided by the Nikkei 225 divisor, which changes during ex-rights and ex dividend events to maintain index continuity. Index data in Financial QUEST dates from 1949 - present and data for calculation is available from 1977.

For more information about access to Nikkei index calculation data, please contact a [Nikkei Representative](#).

		DIN225ISS'PRICE	DIN225ISS'WEIGHT	DIN225ISS'SPRICE	DIN225ISS'EXDIVIDEND		
		Stock Price for Calculation of Index	Weight	Base Price	Dividend		Weight * Price
T1332	NIPPON SUISAN	230	1000	226	5	✓	230000
T1334	MARUHA NICHIRO HOLDINGS	121	1000	120	3	✓	121000
T1605	INPEX	600000	1	616000	3000	✓	600000
T1721	COMSYS HOLDINGS	865	1000	846	10	✓	865000
T1801	TAISEI	192	1000	189	2.5	✓	192000
T1802	OBAYASHI	347	1000	341	4	✓	347000
T1803	SHIMIZU	347	1000	342	3.5	✓	347000
T1812	KAJIMA	235	1000	231	3	✓	235000
T1925	DAIWA HOUSE INDUSTRY	977	1000	973	17	✓	977000

Downloaded Nikkei 225 Index data from Financial QUEST

Using FinancialQUEST: Earnings Estimates Analysis

How to use Earnings Estimates data using NEEDS-Financial QUEST

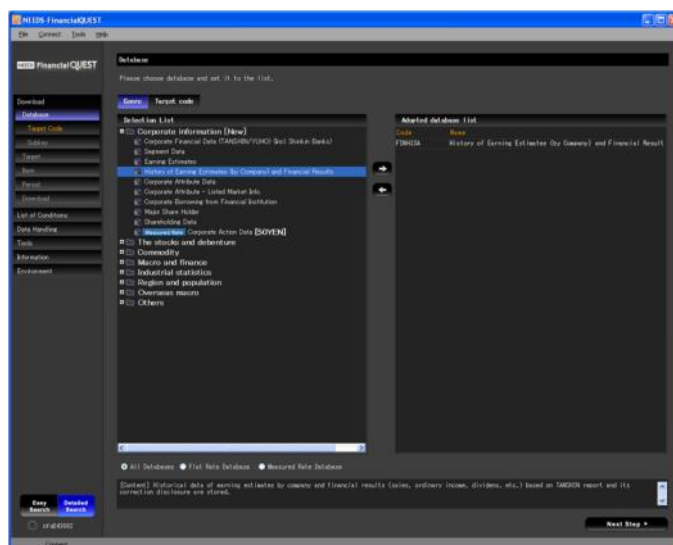
In NEEDS-FinancialQUEST there are two types of Earning Estimates data; “Earning Estimates” and “History of Earning Estimates (by Company) and Financial Results”. The former is estimates based upon facts gathered by Nikkei’s newspaper journalists covering the amount of sales, operating profit, ordinary profit, net income, EPS, dividend etc for listed and JASDAQ companies. These estimates are updated at least quarterly with the publication of the Nikkei company directory. The latter type is on a financial disclosure basis, which every company is required to report quarterly. Both databases have historical changes to estimates together with financial results, however only the “History of Earning Estimates (by Company) and Financial Results” has restatements data which covers changes after regular financial results have been disclosed. This article will look at how to handle this complicated data using NEEDS-FinancialQUEST.

Data Download

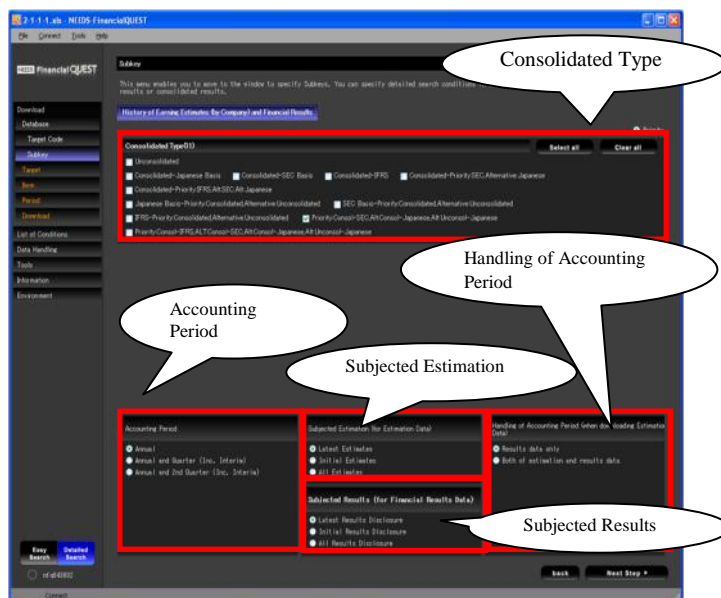
After connecting to NEEDS-FinancialQUEST, select “History of Earning Estimates (by Company) and Financial Results” in the database selection, shown in Screenshot (1). This is in the Corporate Information > History of Earning Estimates (by company) and Financial Results. Click “Next Step” and select from the Target list: Stock Code or Nikkei Company Code. Stock code contains all currently listed companies and the Nikkei Company code contains both listed and retired stocks.

Screenshot(2) shows the next screen - the Subkey page which is used for handling data options such as consolidated type, accounting periods, subjected estimation and subjected results. Lets looks at these in more detail.

Table (1) shows the 11 options regarding consolidated data. Dividend data is available only in an un-



Screenshot (1): Database Selection



Screenshot (2): Subkey page

Item to be Specified	[Internal Code]	Value (Choices)	Definition
Consolidated/ Unconsolidated [SCSECSUB]	[C0]	Unconsolidated	Unconsolidated data
	[C1]	Consolidated-Japanese Basis	Consolidated Japanese standard data
	[C2]	Consolidated-SEC Basis	Consolidated SEC standard data
	[C3]	Consolidated-(Priority: SEC, Alternative: Japanese)	Consolidated SEC data, if not available Consolidated Japanese data
	[C4]	Priority: Consolidated-Japanese, Alternative: Unconsolidated	Consolidated Japanese data, if not available Unconsolidated data
	[C5]	Priority: Consolidated-SEC, Alternative: Unconsolidated	Consolidated SEC data, if not available Unconsolidated data
	[C6] *	Priority: Consolidated-SEC, Alternative: Consolidated-Japanese, Alternative: Unconsolidated	Consolidated SEC data, if not available Consolidated Japanese data, if not available Unconsolidated data
	[C7]	Consolidated-IFRS Basis	Consolidated IFRS standard data
	[C8]	Consolidated-(Priority: IFRS, Alternative: SEC, Alternative: Japanese)	Consolidated IFRS data, if not available Consolidated SEC data, if not available Consolidated Japanese data
	[C9]	Priority: Consolidated-IFRS, Alternative: Unconsolidated	Consolidated IFRS data, if not available Unconsolidated data
	[C10]	Priority: Consolidated-IFRS, Alternative: Consolidated-SEC, Alternative: Consolidated-Japanese, Alternative: Unconsolidated	Consolidated IFRS data, if not available Consolidated SEC data, if not available Consolidated Japanese data, if not available Unconsolidated data

Table(1): Consolidated types - C6 is the default setting in Financial QUEST

		Consolidated (*1)		Unconsolidated	
		Annual	Quarterly	Annual	Quarterly
Estimates	Earnings data	●	●	●	●
	Dividend data (*2)			●	●
Results	Earnings data	●	●	●	●
	Dividend data (*2)			●	●

Table(2): Data Availability

consolidated basis as shown in Table (2).

When a company discloses consolidated data based on both SEC, IFRS and Japanese GAAP, Nikkei records all of the data in NEEDS. Dividends are recorded in unconsolidated data even if the company does not produce unconsolidated reports. For any dividend information, it is important to select C[0] Unconsolidated data.

There are three options for the Accounting Period: 1. Annual, 2: Annual and Quarterly, 3: Annual and Interim (2nd Quarter). The “History of Earning Estimates (by Company) and Financial Results” has three target databases as shown in Table (3).

Financial Estimates Data

There are three options covering estimation data- 1: Latest Estimates; 2: Initial Estimates; 3: All Estimates. To demonstrate these features, we will look at an example downloaded from Financial QUEST.

Options	Explanation and availability among accounting periods
Estimates Database	Earnings and dividend estimates data with historical data of every estimates changes. Data available from financial term ended at the end of Jan/1997 . (* following mm/yyyy means financial term ended at the end of the month) Until Feb/2002 , estimates only for annual and interim are available. Quarterly earnings estimates (1Q, 3Q) are available after Mar/2002 . Quarterly based dividend estimates are available after Dec/2007 .
Result Database	Earnings and dividend result data which is overwritten by the latest value for each financial term when restatement data is disclosed. Data available from financial term ended at Jan/1997 . Quarterly results (1Q, 3Q) are available after Jun/2002 . Quarterly based dividend results are available after Dec/2007 .
Result history database	Earnings and dividend results data with historical data of every result changes. (Complete restatements history available.) Data available from financial term ended at Mar/2008 .

Table(3): Accounting Period

Company A, shown in Table (4) is a virtual company. There are three data items presented: Estimation reporting date, Estimate/ Results Flag and Estimation of Earnings per share. The data shows the latest three fiscal periods with the current fiscal period being March 2010. NEEDS Financial QUEST has a handy function for designating cross time data. As the fiscal year is often very different between companies, you can use the (P) designation to search for data for fiscal year ends. For instance (P) represents the latest fiscal year results, (P-1) is the year prior, and (P+1) is estimates data for the current fiscal year.

The sample data in Table (4) shows that on 14/5/2007, Company A disclosed an estimated end of year EPS value of 69.75. Over the next three periods, July 2007, October 2007 and February 2008 the estimated value for the end of year EPS was revised upwards. Financial QUEST manages the sequence of the estimation data internally and arranges estimates as #0001, #0002, #0003, and #0004 as

Company A

Fiscal Year End	Estimation reporting date	Sequence of estimation	Estimates (0) / Results (1) Flag	Estimation of earnings per share
03/2008 (P-2)	14/05/2007	#0001	0	69.75
	30/07/2007	#0002	0	72.55
	30/10/2007	#0003	0	90.50
	04/02/2008	#0004	0	80.00

Fiscal Year End	Estimation reporting date	Sequence of estimation	Estimates (0) / Results (1) Flag	Estimation of earnings per share
03/2009 (P-1)	16/05/2008	#0001	0	101.50
	28/10/2008	#0002	0	89.24
	14/05/2009	#0003	0	98.77

Fiscal Year End	Estimation reporting date	Sequence of estimation	Estimates (0) / Results (1) Flag	Estimation of earnings per share
03/2010 (P)	12/05/2009	#0001	0	123.66
	31/07/2009	#0002	0	120.60
	29/10/2009	#0003	0	90.25
	08/02/2010	#0004	0	99.45
	11/05/2010	#0005	0	108.67

Fiscal Year End	Estimation reporting date	Sequence of estimation	Estimates (0) / Results (1) Flag	Estimation of earnings per share
03/2011 (P+1)	14/05/2010	#0001	0	106.70
	30/07/2010	#0002	0	100.58
	29/10/2010	#0003	0	98.50
	10/02/2011	#0004	0	100.23
	14/05/2011	#0005	0	110.50

Table(4): Estimation Reporting Example

shown in the table. For the fiscal year end at 03/2009, the EPS estimate was revised twice, 03/2010 four times and 03/2011 four times as well. Note that the Estimates/ Results flag is 0 for estimates.

Setting the estimation to “Latest Estimates” produces data showing the latest estimates only as shown in Table (5). For fiscal year end 03/2008, the fourth revision (#0004) was the latest estimation. For 2009, the third re-

vision was the latest estimate and for 2010-2011, the fifth revision is the latest.

Table (6) shows the first estimates data, all as #0001. All Estimates data will show all updates to the estimated EPS data in sequence, from #0001 to #0005 as shown in Table(7).

Financial Results Data

Similar to the Estimates data, there are three data options, 1: Latest Results Disclosure, 2: Initial Results Disclosure and 3: All Results Disclosure. Data handling of results data is slightly different from the estimates data.

Latest results data (#1001) is available in annual form from January 1997 and from June 2002 for quarterly results. Only the latest value exists in this file, any restatements are overwritten to the file. Initial Results and All Results Disclosure start with (#2001) and are the original results disclosures before any corrections have been made. This data is available from March 2008.

Assuming that Company A discloses results of EPS value with no restatements in the fiscal year 03/2008, modified once for 03/2009 and modified twice for 03/2010, the data will look like Table (8) shown over the page. As we are dealing with results data, the Estimates/ Results flag will be set as 1.

In the first year, fiscal year 2008, there were no changes to the result once it was released, hence the latest results disclosure (#1001) is identical to the initial result value (#2001).

In the fiscal year 2009, there was one change to the results data, meaning that the Initial Result and the Latest Result are recorded differently as #2001 and then #2002, #1001 respectively. Note that the latest result is also sequenced at #2002 as well.

If only the Latest Results disclosure is selected, the reporting date is set as the date that the result was first initially reported, even if there was a subsequent correction of the data as in Table(9). The date of the correction can be found in the All Results option which lists each

	P-2	P-1	P	P+1
Fiscal Year End	03/2008	-	-	-
Reporting Date	04/02/2007	-	-	-
Results/Estimates Flag	0	-	-	-
Earnings Per Share	80.00	-	-	-
Company A :#0004				

	P-2	P-1	P	P+1
Fiscal Year End	-	03/2009	-	-
Reporting Date	-	14/05/2008	-	-
Results/Estimates Flag	-	0	-	-
Earnings Per Share	-	98.77	-	-
Company A :#0003				

	P-2	P-1	P	P+1
Fiscal Year End	-	-	03/2010	03/2011
Reporting Date	-	-	11/05/2010	14/05/2011
Results/Estimates Flag	-	-	0	0
Earnings Per Share	-	-	108.67	110.50
Company A :#0005				

Table(5): Company A -Latest Estimates Data

	P-2	P-1	P	P+1
Fiscal Year End	03/2008	03/2009	03/2010	03/2011
Reporting Date	14/05/2007	16/05/2008	12/05/2009	14/05/2010
Results/Estimates Flag	0	0	0	0
Earnings Per Share	69.75	101.50	123.66	106.70
Company A :#0001				

Table(6): Company A - Initial Estimates Data

	P-2	P-1	P	P+1
Fiscal Year End	03/2008	03/2009	03/2010	03/2011
Reporting Date	14/05/2007	16/05/2008	12/05/2009	14/05/2010
Results/Estimates Flag	0	0	0	0
Earnings Per Share	69.75	101.50	123.66	106.70
Company A :#0001				

	P-2	P-1	P	P+1
Fiscal Year End	03/2008	03/2009	03/2010	03/2011
Reporting Date	30/07/2007	27/10/2008	31/07/2009	30/07/2010
Results/Estimates Flag	0	0	0	0
Earnings Per Share	72.55	89.24	120.60	100.58
Company A :#0002				

	P-2	P-1	P	P+1
Fiscal Year End	03/2008	03/2009	03/2010	03/2011
Reporting Date	30/10/2007	14/05/2009	28/10/2010	29/10/2010
Results/Estimates Flag	0	0	0	0
Earnings Per Share	90.50	98.77	90.25	98.50
Company A :#0003				

	P-2	P-1	P	P+1
Fiscal Year End	03/2008	-	03/2010	03/2011
Reporting Date	04/02/2008	-	08/02/2010	10/02/2011
Results/Estimates Flag	0	-	0	0
Earnings Per Share	80.00	-	99.45	100.23
Company A :#0004				

	P-2	P-1	P	P+1
Fiscal Year End	-	-	03/2010	03/2011
Reporting Date	-	-	11/05/2010	14/05/2011
Results/Estimates Flag	-	-	0	0
Earnings Per Share	-	-	108.67	110.50
Company A :#0005				

Table(7): Company A- All Estimates

amendment to the data in sequence.

The last option on the Subkey page is the Handling of Accounting Period. There are two options, 1: Results data only and 2: Both estimation and results data. When the Results data only option is selected, only results data is extracted when both estimates data and results data are present and if only estimation data exists, then the estimation data is extracted.

Example Data

For the Both Estimates and Results data option, all the data is extracted. For instance in Table (10), which demonstrates the way that results data and estimates data is displayed using the following options in the Subkey menu. The data request is:

Estimation: Latest Estimates

Results: Latest Results

Handling of AP: Results only data

As the data for this is all contained in one sequence number, #1001 and #0001, there are no worksheet splits. Note also that the data is results data except for period P+1, which currently only contains estimates data.

Using these options correctly, it is possible to view whole images of historical changes in estimates values together with any restatements of results. NEEDS provides a wide range of data such as stock and bond prices, corporate action data so that users can combine these estimates data to synthesize certain investment indicators.

For more information please contact our sales representative at s-needs@eur.nikkei.com.

Jun Hirakawa - Director
Nikkei Europe

Company A

Fiscal Year End	Results reporting date	Sequence of restatements	Estimates (0) / Results (1) Flag	Estimation of earnings per share
03/2008 (P-2)	20/05/2008	#1001, #2001	1	80.25

Fiscal Year End	Results reporting date	Sequence of restatements	Estimates (0) / Results (1) Flag	Estimation of earnings per share
03/2009 (P-1)	24/05/2009	#2001	1	65.25
	20/07/2009	#1001, #2002	1	60.22

Fiscal Year End	Results reporting date	Sequence of restatements	Estimates (0) / Results (1) Flag	Estimation of earnings per share
03/2010 (P)	18/05/2010	#2001	1	120.03
	20/07/2010	#2002	1	119.25
	10/08/2010	#1001, #2003	1	118.65

Table(8): Company A Results data

	P-2	P-1	P	P+1
Fiscal Year End	03/2008	03/2009	03/2010	-
Reporting Date	20/05/2008	24/05/2009	18/05/2010	-
Results/Estimates Flag	1	1	1	-
Earnings Per Share	80.25	60.22	118.65	-
Company A :#1001				

Table(9): Company A Latest Results data

	P-2	P-1	P	P+1
Fiscal Year End	03/2008	03/2009	03/2010	03/2011
Reporting Date	20/05/2008	24/05/2009	18/05/2010	14/05/2011
Results/Estimates Flag	1	1	1	0
Earnings Per Share	80.25	60.22	118.65	110.50
Company A				

Table(10): Company A Latest Results data

Change in JR-West Par Value in Nikkei 225

West Japan Railway Company (9021), a constituent in the Nikkei 225 index, has announced a stock split of 1 to 100. On the ex-rights date of June 28th, Nikkei will change the presumed par value for West Japan Railway Company from 50,000 yen to 500 yen in line with the ratio of the split. As the price level in the index will be unaffected, the Nikkei 225 divisor will be unadjusted.

For more information, please contact a Nikkei Representative.

Nikkei Dividend Point Index Set at 175.59 for 2010

Nikkei has announced that the Nikkei Average Dividend Point Index for 2010 is 175.59, up 13.41 from 2009. The index was created last year and is based on the dividends that would be received from the Nikkei 225 index constituents in proportion to their weightings if an investor were to hold the stocks for a year.

The current value of the 2011 Dividend Point Index is 95.31, up 12 points from this time last year.

NEEDS REPORT: Best Execution Analysis and Trading Performance

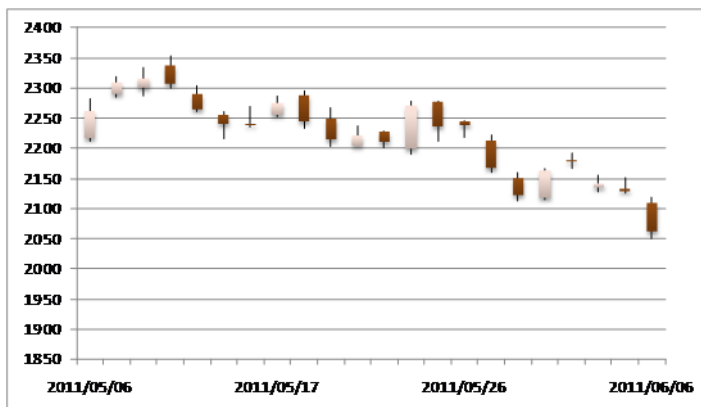
NEEDS-TickVision used to analyse stock price changes in the TSE

Order execution is an important part of the investment management process- the cost of a misplaced order can have dramatic effects on company P/L and in extreme circumstances the market itself. The SEC investigation into the May 2010 “flash crash” found that the initial trigger was an investment firm placing a sell order for a very large quantity of E-Mini S&P 500 contracts at market price. The result was a very rapid fall in the price of the futures. The SEC found that because of initial volatility in the markets due to problems in the Eurozone, the interconnected web of financial products traded and the proliferation of algorithmic trading, the single sell order created the “perfect storm” which resulted in the entire stock market plummeting by 10% in the space of a few minutes.

The Tokyo Stock Exchange experienced a similar crash on March 15th following the Great East Japan Earthquake when investors dumped their shares in anticipation of huge losses due to the earthquake and tsunami. Nearly 6 billion shares changed hands on March 15th but Arrowhead, the TSE’s new order matching system, was able to cope with this level of demand. (For comparison, the average volume per day for 2010 was 1.9 billion shares) In 2005 and 2006, the TSE was forced to cease trading due to high volumes of orders. It was because of this that the TSE introduced a new low latency, high capacity system. Events of March 15th show how prepared Arrowhead is for handling unexpected increases in order quantities.

The amount of tick data generated by the Tokyo Stock Exchange has increased dramatically since the launch Arrowhead in January 2010. Nikkei developed NEEDS TickVision to provide online access to this data and tools to analyse the large volumes of tick data in graphical form.

For an investor, it is very important to make sure



Graph (1): Sony Corp (6758) Candlestick Chart 6/5/2011 to 6/6/2011

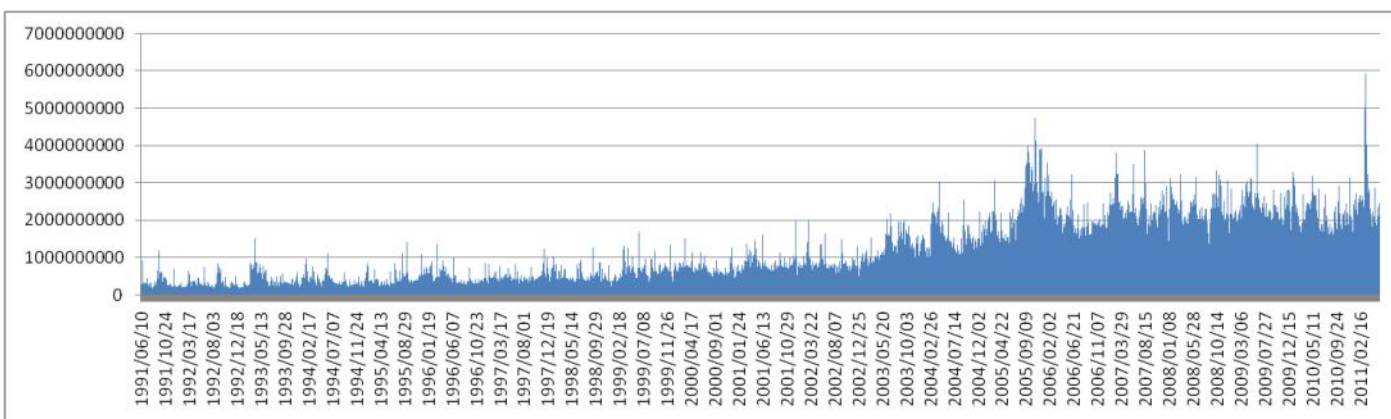
that large orders are broken up in order to ensure that the market impact of the trade does not place the investor at a disadvantage. Brokers often use algorithms to time the trades to get the very best price for the investor.

The most common method of judging trade execution is the VWAP (Volume Weighted Average Price), which provides the average price paid for each share over the course of the trading period.

In the following example we look at Sony Corp (6758) in order to determine the best execution of trades. To reduce the error we will look at 20 days of best bid/ask tick data for Sony Inc using NEEDS Tick-Vision. From the data during the period 6th May 2011-6th June 2011 we can calculate the following statistics:

- Average Bid/Ask Spread: 1.20 yen
- Average best bid/ask price changes per second: 3.32
- Average number of trades per second: 1.75
- Average volatility per minute: 0.65 yen

Daily price changes, Graph (1) indicate that the price has remained steady over the beginning of the pe-



Graph (2) Trading volume for the TSE 1991 - 2011

riod before falling. On the most volatile day, the average volatility per minute was 0.89 yen and on the least, the average volatility per minute was 0.58 yen. The stock was also heavily traded over the period.

Execution Timing

The consequences of placing orders for large volumes of shares can result in a large increase or large decrease in the price of the share depending on whether the investor is buying or selling the security. To prevent this orders are often broken up into smaller sizes and then spread out over the course of several minutes.

The length of time taken to efficiently execute an order can be calculated using tick data. In this example we use Sony Corp (6758) to estimate the length of time to execute a buy order at the best ask price. Graph(3) shows the probability of a change in the best ask price occurring during an update of the order book and the number of shares at the best ask price. The probability is calculated using the total number of order book changes over the 20 day period.

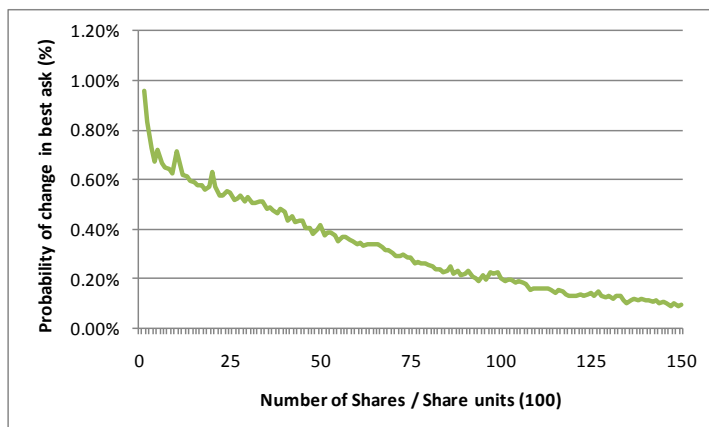
The mean number of shares during this period is 7,373 shares in the ask price. The standard deviation is 7,786.51 shares.

Suppose we wish to purchase 10,000 shares of Sony at the best ask price. How long could we expect to wait before the correct number of shares appear at the best ask price?

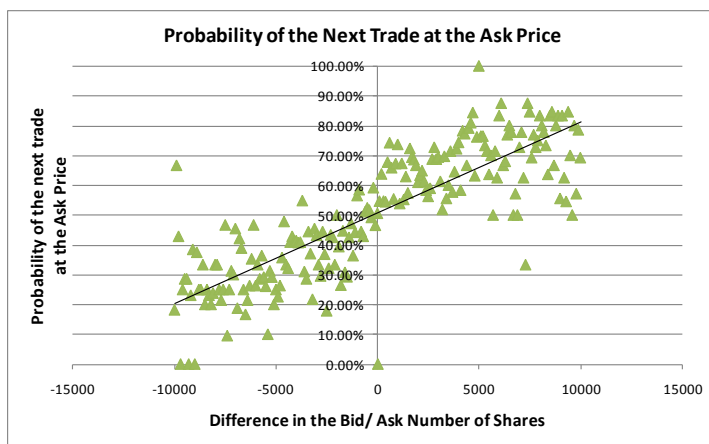
Using the 20 day average, we can see that the probability of the best ask price number of shares is 0.2%. Although the method here is simplified, if we know the probability that an event will occur, 0.2% and the total number of ticks per day - we can calculate that there will be a change to 10,000 shares every 500 ticks based on an average number of ticks per day of 60,574. Over the time period, Sony Corp shares have been very liquid and have experienced a high volume of trading. This means that around 2 minutes is required for efficient execution of 10,000 shares during this time.

Strategic Algorithms vs. Tactical Algorithms

In a report written for Nikkei by President Hiwon Yoon of CMD Laboratories entitled "Tokyo Stock Exchange provides Next Generation Systems", President Yoon makes the distinction between strategic algorithms, which take advantage of historical trends and past patterns to make buy and sell signals, and tactical algorithms which constantly analyse the order book for trading opportunities based on imbalances in the dynamics of the order book. Here we look at an example of both types of algo-



Graph(3) Probability of number of shares (n) at best ask price - 20 day average Sony Inc (6758)



Graph(4) Probability of the next trade at the ask price - Softbank (9984)

ritms using data from NEEDS Tick-Vision to create and analyse strategies, first looking at order book imbalances and then looking at pair trading.

Order Book Imbalances

Tactical algorithms take advantage of imbalances and anomalies in the order book. New trading systems such as Arrowhead on the TSE have allowed algorithmic traders to take advantage of these differences in real time.

By looking at the layout of the entire order book we can make inferences and probabilities of immediate future price directions. For instance, in the next example with Softbank (9984) we see the probability of the next trade occurring at the best bid or best ask based on the spread of best bid and best ask volumes. We find that as the difference in volume between bid and ask widens, the probability that traders will cross the bid/ask spread increases as they want to jump to the front of the queue to get their orders executed immediately.

Graph (4) above shows the probability of this occurring depending on the imbalance between buyers and sellers. The difference is calculated by the bid volume minus the ask volume, indicating that when the bid volume is much higher than the ask volume,

the probability of the price jumping to the ask price is higher.

So for our tactical algorithm constantly monitoring the total bid/ ask volumes, it is possible to take advantage in real time of potential prices increases in the immediate future based upon the probabilities calculated from order book imbalances.

Pair Trading Algorithms

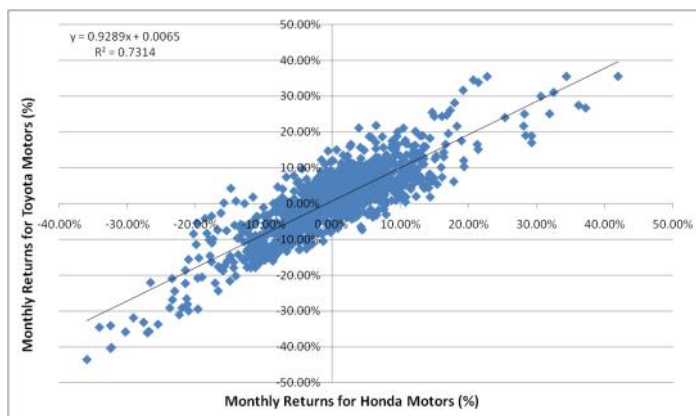
NEEDS-TickVision also makes it possible to analyse and evaluate pair trading. The high frequency trading environment on the TSE has made this form of statistical arbitrage possible on a tick by tick basis to take advantage of tighter spreads and deviations from expected pricings.

The general theory of pairs trading is that two related securities will move together over a period of time. For instance, two companies of relatively equal size operating in the same industry will generally experience the same market conditions, leading to very high correlations in market price. Graph (5) shows the adjusted monthly returns for Honda Motors(7267) and Toyota Motors (7203) over a 5 year period downloaded from NEEDS FinancialQUEST. In pair trading, this relationship can be exploited when the two prices go out of sync for a short period of time by trading in the direction of the mean spread.

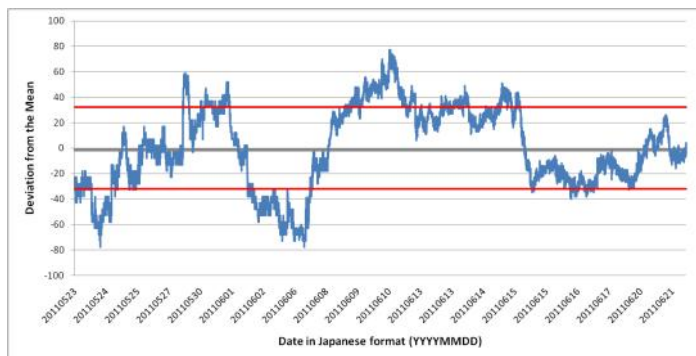
From Graph (5) we can see that the monthly returns have an R^2 of 0.7314 and a correlation coefficient of 0.85, indicating that returns are fairly strongly correlated between the two companies. Using this information, we can now check the tick data using NEEDS TickVision to form a statistical model to look at the spread between the two companies and exploit any pricing deviations.

To analyse the correlation of returns we download 20 day trade ticks for Toyota and Honda between 23rd May and 23rd June. During this period, the average spread (the difference between the two prices) is 272.96 yen with a standard deviation of 32.06. Graph(6) shows the mean reversion graph (converted so that the mean spread is 0) for Toyota and Honda over this period. This is a very simple example of pairs trading to demonstrate the principles of the strategy. In reality the mean reversion will be calculated on a time weighted basis to allow closer spread trading throughout the day and the trend lines will be at an optimum position rather than at 1 standard deviation.

Essentially a trader will buy the lower priced asset relative to the other when the line crosses one of the standard deviation lines and then sell when the spread reverses and crosses the mean line at 0. So for instance on the 8th June, when the spread wid-



Graph(5) Correlation of Monthly returns over a five year period 2006-2011 for Nissan Motors and Mazda Motors



Graph(6) Mean reversion graph for Honda and Toyota

ens above one standard deviation of the mean, the trader will purchase Honda and short Toyota (spread is calculated as the $P_{Toyota} - P_{Honda}$ therefore an increase in the spread is a signal that Honda is uncharacteristically lower than Toyota) in anticipation of a reversal, which it does a few days later. This strategy is an example of a market neutral strategy.

NEEDS TickVision

The Japanese stock market remains an unexploited venue for algorithmic trading and NEEDS TickVision provides the tools needed to create, test and analyse original trading ideas. Best execution analysis is an important facet of trading for all investment professionals and can make a significant difference to returns.

NEEDS TickVision has over 15 years of individual stock order book data, futures and options data, index data and bond data available to download from one consistent source. The analysis tools included allow users to replay the markets tick by tick, and follow market signals throughout the day.

More information can be found about NEEDS TickVision on our website www.nikkeieu.com/needs. For a demonstration or trial, please contact a [Nikkei Representative](#).

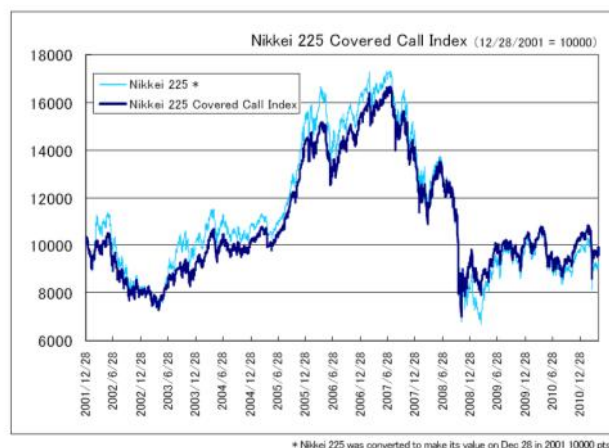
Ben Clarke - E-Media Executive
Nikkei Europe.

Nikkei to Launch New Investment Strategy Indices

Nikkei has announced the launch of four new investment strategy indices based on the Nikkei 225 index to provide investors with new investment tools and opportunities. The four indices “Nikkei Covered Call Index”, “Nikkei 225 Risk Control Index”, “Nikkei 225 Leveraged Index” and “Nikkei 225 Inverse Index” were launched on 6th June and will be calculated on an end of day basis. The newly calculated indices will have a base value set at 10,000 points at 28th December 2001.

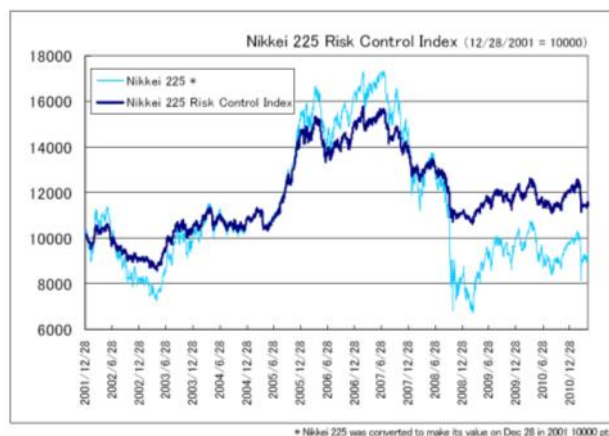
Nikkei 225 Covered Call Index

The Nikkei Covered Call Index uses the performance of a covered call strategy whereby an investor buys the Nikkei 225 index and simultaneously sells a call option for the index. This strategy reduces losses in the event that the index falls due to the option premium collected when selling the call option (which in the event of a decrease in the index would not be exercised). However a covered call strategy also limits profits if the index increases in value more than expected. The index is based on selling a Nikkei 225 near term call option on the Osaka Stock Exchange.



Nikkei 225 Risk Control Index

This index smoothes the volatility of the Nikkei 225 and controls fluctuation in the index. The index has a volatility target of 15% and should the volatility of the Nikkei 225 increase sharply, the index value is controlled so that the index volatility is less than the Nikkei 225. The index is calculated in a similar way to the Covered Call Index, however the Risk Control Index includes a Risk Control Factor. The Nikkei 225 is multiplied by the Risk Control Factor to create the Risk Control Index. The factor is changed daily and based on the volatility of the index over the last 20 business days.



Nikkei 225 Leveraged Index & Nikkei 225 Inverse Index

These two indices are designed to meet the requirements of leveraged and short investors. The Nikkei 225 Leveraged Index represents double the performance of the Nikkei 225. For instance if the Nikkei 225 index rose by 5%, the Leveraged Index will rise by 10%. This index is intended for high risk investors who are heavily leveraged in expectation of a bull market. The Nikkei 225 Inverse Index is designed to match the performance of shorting the index in expectation of a bear market. For instance if the Nikkei 225 index rose by 5%, the Nikkei Inverse Index will fall by 5%.



More information about the calculation methods can be found [here](#). Data options for these indices will be announced at a later date. For more information, please contact a [Nikkei Representative](#).

NEEDS BULK

NEEDS BULK is Nikkei's premium data access service, providing daily updates and historical data from the Nikkei master data files. NEEDS BULK ensures that clients receive timely and accurate data directly to a central database. Popular NEEDS BULK file include Nikkei 225 data, Corporate Actions data, Tick by Tick data and Yuho/ Tanshin Corporate Financials data.



NEEDS FinancialQUEST is Nikkei's online data download service for Japanese economic data; providing over 30 years of historical data covering Japanese corporate reports, securities data, consumer statistics, government and GDP data. Monthly subscription options range from unlimited data access to pay per download to suit all budgetary requirements.



Tick Vision is the latest addition to the NEEDS suite providing online data download and analysis of Tick data from the Japanese stock markets, including over 10 years of individual equity, JGBs, equity options and stock index futures and options data. The software also includes data analysis and simulation tools to chart VWAP, beta, bid ask spreads etc throughout the day.

NEEDS SPOT

NEEDS SPOT provides ad hoc access to data on the Nikkei database to academics and data managers who require a one off set of historical data for client research projects. The data is delivered in a variety of formats to suit the needs of our clients and can be delivered via email or DVD. A subscription is not required and we offer special promotional rates for academic users.



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E-Media Department
Nikkei Europe Ltd, Barnard's Inn, 86 Fetter Lane, London, EC4A 1EN, UK