

The MSCI logo consists of the letters "MSCI" in a white, serif font, centered within a dark blue rectangular box.

MSCI

# **MSCI Market Open Index Product Overview**

**December 2010**



# Outline

- Overall Market Open Index Product Use Case
- Index Unit and Index Divisor Definition and Usage
- Corporate Events Using the MSCI Market Open Index Product
- Index Reviews Using the MSCI Market Open Index Product
- Dividend Reinvestment and the MSCI Market Open Index Product

# Overall Market Open Index Product Use Case

## Objective:

- The Market Open Index Product is intended for use by clients seeking to price and/or replicate an MSCI Index at any time (intraday/end of day).

## Use case:

- The client receives two types of information: 1) the intraday file, containing pre-open information to be used during market hours and 2) the recap file, containing information to be used after the close of the market to consolidate any differences that may have occurred during market hours.
- A client can calculate the value of the index throughout the day by feeding in current constituent prices and FX rates. Corporate events which use Price Adjustment Factors (PAFs) will now be shown explicitly by the creation of a temporary constituent that explicitly shows the impact of the event in the index.
- A client wanting to replicate the index intraday can use the field Intraday Index Unit NOS as the exact number of shares they would need to buy intraday.
- The MSCI Market Open Index files can also be used to anticipate any transaction needed to be made on T + 1.

- Index Unit and Index Divisor Definition and Usage

# Index Calculation and Portfolio Valuation

- The traditional way of calculating an index is to calculate the weighted average performance of its constituents and multiply it by the previous index value

$$Index_t = Index_{t-1} \times \left( 1 + \sum_i \omega_i \times Perf_{i,t-1 \rightarrow t} \right)$$

- The traditional way of valuing a portfolio is to add up the value of its constituents

$$Value_t = \sum_i quantity_i \times price_{i,t}$$

- The MSCI Market Open Index Product allows calculating an index using the traditional way of valuing a portfolio
  - An **Index Unit** is defined as a set of index constituents having the same weight as their index weight and with a value equal to the current index level. For example, if the MSCI World Index level in USD is 1000, the MSCI World Index Unit is described by the quantities of MSCI World constituents corresponding to a total value of 1000 USD.
- Note that the MSCI Index Calculation methodology is not changing: MSCI is just providing additional data to allow clients to more easily replicate its indices intraday

# Index Divisor

- An Index Divisor is the ratio of the index market capitalization and the index level in a given day t. For example, if the index market capitalization is 1tn and the index level is 1000, then the index divisor is 1bn.

$$Divisor_t = \frac{IndexMcap_{t_{initial}}}{Index_{t-1}}$$

- IndexMcap( $t_{initial}$ ) is known after the close of t-1 and is calculated using constituent information as of t and prices as of the close of t-1
- The Intraday Index Unit NOS of a constituent is defined as the ratio of the inclusion factor adjusted number of shares outstanding, called Intraday Index NOS, and the divisor

$$intraday\_idx\_unit\_nos_t = \frac{intraday\_idx\_nos_t}{Divisor_t}$$

- On day t, at any time, the index level can then be calculated as a simple sum-product

$$Index_t = \sum intraday\_idx\_unit\_nos_t \times price_t$$

- The Index Divisor needs only to be adjusted when the index market capitalization and the index level change in different proportions, e.g., in the case of corporate events and index additions and deletions

# Calculating an index using the index divisor

- Using the MSCI Market Open Index File, to calculate the index level at any time, it is sufficient to compute the value of the index unit
- Intraday Index Unit NOS, multiplied by their prices, allow valuing the index both intraday and at the close
- Consider the example of the MSCI Austria Index Unit on October 27, 2009:

Divisor (As of Date) 21,413,261

A	B	C	D	E	F	I	J	K
Calculation Date	As of Date	Security Name	Idx Incl Flag (as of date)	Intraday Index NOS MM	Intraday Idx Unit NOS	Price (As of Date)	FX (As of Date)	Mcap in Idx Unit D*F*I/J
10/26/2009	10/27/2009	ERSTE GROUP BANK	1	174.36	8.14	28.50	0.67	344
10/26/2009	10/27/2009	OMV AG	1	150.00	7.01	29.03	0.67	301
10/26/2009	10/27/2009	TELEKOM AUSTRIA	1	322.00	15.04	11.88	0.67	265
10/26/2009	10/27/2009	VOESTALPINE	1	117.53	5.49	23.83	0.67	194
10/26/2009	10/27/2009	VERBUND OESTERR ELEK A	1	77.05	3.60	31.80	0.67	170
10/26/2009	10/27/2009	RAIFFEISEN INT'L BANK	1	54.13	2.53	42.50	0.67	159
10/26/2009	10/27/2009	VIENNA INSURANCE GROUP	1	38.40	1.79	41.10	0.67	109

\* Columns A-F come from the MSCI Market Open Index File  
The file will be distributed after the close of October 26 for use on October 27

Index (USD) 1,541.96



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- Corporate Events Using the MSCI Market Open Index Product

# Interim Constituents\*

- On days with certain corporate events, the index can contain “interim index constituents” that influence the performance but that are currently not explicitly shown as part of the index in any of MSCI’s products. Instead, their performance is accounted for by applying a Price Adjustment Factor (PAF)
- For some other events, the index calculation formula requires the use of the previous day’s number of shares for a constituent on the ex date which differs from the actual number of a shares in an index. This discrepancy is reconciled by again applying a PAF
- The MSCI Market Open Index Product will show all constituents explicitly, including interim constituents, and will not require using price adjustment factors to calculate an index level
- Examples:
  - Capital Repayment: The calculation assumes that cash is received in the index and held until the close when it is finally reinvested in the index. Currently, cash is not shown as part of the index and is incorporated in the calculation using a price adjustment factor applied on the stock that repaid capital. This cash will now be shown in the MSCI Market Open Index Product as an explicit constituent of the index on the ex-date
  - Spin-off when the spun-off company is not eligible for the index: The calculation assumes that the spun-off company is received in the index on the ex-date and is held until the close when it is finally sold and the proceeds reinvested back in the index. Currently, the spun-off company is not shown as part of the index and its performance is captured by applying a price adjustment factor on the parent company. It will now appear explicitly as a constituent of the index in the MSCI Market Open Index product

# Capital Repayment Example

- Consider the repayment of EUR 0.4 per share by ELISA A effective October 26, 2009
- According to the MSCI Calculation Methodology, the cash amount is reinvested in the index at the close of the ex date, on October 26
  - On October 26, 2009, the index unit holds some cash intraday
  - As the cash is reinvested at the close, the divisor changes at the close only

Divisor (As of Date) 249,175,772

Divisor (As of Date + 1) 249,001,078

A	B	C			D	E	F	G	H	I	J	L	M	N	O
Calculation Date	As of Date	Security Name	Interim constituent type	Interim const. trading status	Idx Incl Flag (as of date)	Intraday Index NOS MM	Intraday Idx Unit NOS	Idx Incl Flag (as of date + 1)	End of Day Index NOS MM	Price (As of Date)	FX (As of Date)	Mcap (As of Date) D*E*I/J	Initial Mcap (As of Date + 1) G*H*I/J	End of Day Idx Unit NOS	Idx Unit NOS Change (N-F)
10/25/2009	10/26/2009	ELISA A			1	133	0.53	1	133	13.90	0.67	2,763	2,763	0.53	0.0004
10/25/2009	10/26/2009	ELISA A (INTERIM 1)*	CASH	FIXED	1	133	0.53	0		0.40	0.67	80	0	0.00	-0.5339
10/25/2009	10/26/2009	NOKIA CORP			1	3,745	15.03	1	3,745	8.78	0.67	49,129	49,129	15.04	0.0105
10/25/2009	10/26/2009	FORTUM CORP			1	444	1.78	1	444	16.65	0.67	11,050	11,050	1.78	0.0013
10/25/2009	10/26/2009	SAMPO A			1	420	1.69	1	420	16.76	0.67	10,521	10,521	1.69	0.0012
10/25/2009	10/26/2009	UPM-KYMMENE			1	520	2.09	1	520	8.11	0.67	6,301	6,301	2.09	0.0015
10/25/2009	10/26/2009	KONE B			1	154	0.62	1	154	26.30	0.67	6,040	6,040	0.62	0.0004
10/25/2009	10/26/2009	STORA ENSO R			1	582	2.33	1	582	5.29	0.67	4,598	4,598	2.34	0.0016
10/25/2009	10/26/2009	METSO CORP			1	128	0.51	1	128	18.74	0.67	3,572	3,572	0.51	0.0004
10/25/2009	10/26/2009	WARTSILA B			1	84	0.34	1	84	25.83	0.67	3,235	3,235	0.34	0.0002

Subset of the MSCI Finland

- The index divisor decreases as the index market capitalization goes down
- The difference between the End of Day Index Unit NOS and the Intraday Index Unit NOS describes the adjustment needed to one index unit at the close of October 26, 2009 to replicate this corporate event: the index unit reinvests the cash in order to increase share holdings in every constituent



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# Spin-off Example (Spun-off Trading on the Ex-date)

- Consider the spin off of GAM HOLDING by JULIUS BAER HOLDING (1:1) effective October 1, 2009. The spun-off is leaving the MSCI Switzerland Large Cap index
  - On the ex date (October 1), the spun-off is still part of the index intra day. It leaves the index at the close of the ex-date
  - The index divisor changes at the close of the ex date only (for October 2)

Divisor (As of Date) 861,052,729

Divisor (As of Date + 1) 857,954,025

A	B	C	D	E	F	G	H	I	J	L	M	N	O			
Calculation Date	As of Date	Security Name	Interim constituent type	Underlying Asset Description	Interim const. trading status	Idx Incl Flag (as of date)	Intraday Index NOS MM	Intraday Idx Unit NOS	Idx Incl Flag (as of date + 1)	End of Day Index NOS MM	Price (As of Date)	FX (As of Date)	Mcap (As of Date) D*E*I/J	Initial Mcap (As of Date + 1) G*H*I/J	End of Day Idx Unit NOS	Idx Unit NOS Change (N-F)
9/30/2009	10/1/2009	JULIUS BAER HOLDING				1	211	0.25	1	211	38.30	1.04	7,765	7,765	0.25	0.0009
9/30/2009	10/1/2009	JULIUS BAER HOLDING (INTERIM 1)*	OTHER ASSET DISTRIBUTED	<b>GAM HOLDING</b>	TRADED	1	211	0.25	0		12.00	1.04	2,433	0	0.00	<b>-0.2451</b>
9/30/2009	10/1/2009	NESTLE				1	3,639	4.23	1	3,639	43.96	1.04	153,656	153,656	4.24	0.0153
9/30/2009	10/1/2009	ROCHE HOLDING GENUSS				1	703	0.82	1	703	166.30	1.04	112,240	112,240	0.82	0.0029
9/30/2009	10/1/2009	NOVARTIS				1	2,115	2.46	1	2,115	51.65	1.04	104,937	104,937	2.47	0.0089
9/30/2009	10/1/2009	UBS NAMEN				1	3,558	4.13	1	3,558	18.39	1.04	62,859	62,859	4.15	0.0149
9/30/2009	10/1/2009	CREDIT SUISSE				1	1,125	1.31	1	1,125	57.45	1.04	62,111	62,111	1.31	0.0047
9/30/2009	10/1/2009	ABB LTD				1	2,207	2.56	1	2,207	20.46	1.04	43,372	43,372	2.57	0.0093
9/30/2009	10/1/2009	ZURICH FINL SERVICES				1	147	0.17	1	147	244.80	1.04	34,552	34,552	0.17	0.0006
9/30/2009	10/1/2009	SYNGENTA				1	97	0.11	1	97	229.90	1.04	21,404	21,404	0.11	0.0004
9/30/2009	10/1/2009	HOLCIM				1	245	0.28	1	245	68.50	1.04	16,143	16,143	0.29	0.0010

- The index divisor decreases as the index market capitalization goes down
- The Index Unit is rebalanced at the close of Oct 1, 2009: the index unit number of shares of GAM HOLDING decrease by 0.2451 by increasing the index unit number of shares for all other constituents
- Note that there is no divisor change for MSCI Switzerland (Large + Mid) Index, as GAM HOLDING is added to the Switzerland Mid Cap Index



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# Spin-off Example (Spun-off Not Trading on the Ex-date)

- Consider the spin off of SONAE CAPITAL by SONAE SGPS effective January 4, 2008
- Given that the spun-off company is not trading on the ex-date, MSCI creates a “detached” security to represent it
  - Its price is calculated so that the ‘parent + spun-off’ aggregate has 0 performance on the ex-date (both intra day and at the close)
  - The detached security is then carried at that price until the day it starts trading

Divisor (As of Date) 216,755,858

Divisor (As of Date + 1) 216,755,858

A	B	C	D	E	F	G	H	I	J	L	M	N	O				
Calculation Date	As of Date	Security Name	Interim constituent type	Underlying Asset Description	Interim const. trading status	Pricing Formula	Idx Incl Flag (as of date)	Intraday Index NOS MM	Intraday Idx Unit NOS	Idx Incl Flag (as of date + 1)	End of Day Index NOS MM	Price (As of Date)	FX (As of Date)	Mcap (As of Date) D*E*/J	Initial Mcap (As of Date + 1) G*H*/J	End of Day Idx Unit NOS	Idx Unit Change (N-F)
1/3/2008	1/4/2008	SONAE SGPS					1	800	3.69	1	800	1.65	0.68	1,950	1,950	3.69	0.0000
1/3/2008	1/4/2008	SONAE SGPS (INTERIM 1)*	OTHER ASSET DISTRIBUTED	SONAE CAPITAL	Calculated	1.91 - SONAE SGPS P(t)	1	800	3.69	0		0.26	0.68	307	0	0.00	-3.6908
1/3/2008	1/4/2008	SONAE SGPS (DETACHED)					0			1	800	0.26	0.68	0	307	3.69	3.6908
1/3/2008	1/4/2008	EDP ENERGIAS DE PORTUGAL					1	2,011	9.28	1	2,011	4.54	0.68	13,490	13,490	9.28	0.0000
1/3/2008	1/4/2008	PORTUGAL TELECOM SGPS					1	790	3.65	1	790	8.70	0.68	10,157	10,157	3.65	0.0000
1/3/2008	1/4/2008	BCP BANCO COMERCIAL					1	1,806	8.33	1	1,806	2.72	0.68	7,256	7,256	8.33	0.0000
1/3/2008	1/4/2008	BANCO ESPIRITO SANTO					1	225	1.04	1	225	14.45	0.68	4,804	4,804	1.04	0.0000
1/3/2008	1/4/2008	BRISA					1	300	1.38	1	300	10.00	0.68	4,432	4,432	1.38	0.0000
1/3/2008	1/4/2008	PT MULTIMEDIA SERVIC COM					1	235	1.09	1	235	9.25	0.68	3,216	3,216	1.09	0.0000
1/3/2008	1/4/2008	CIMPOR CIMENTOS DE PORT					1	202	0.93	1	202	6.03	0.68	1,796	1,796	0.93	0.0000
1/3/2008	1/4/2008	BANCO BPI					1	228	1.05	1	228	4.97	0.68	1,674	1,674	1.05	0.0000
1/3/2008	1/4/2008	JERONIMO MARTINS SGPS					1	189	0.87	1	189	5.59	0.68	1,559	1,559	0.87	0.0000
1/3/2008	1/4/2008	SONAE INDUSTRIA SGPS					1	63	0.29	1	63	6.11	0.68	569	569	0.29	0.0000

## Subset of the MSCI Portugal Index Unit

- Given that the “detached” security is added to the index, the divisor does not change and no adjustment is needed to the index
- If the spun-off company is not eligible for the index, it will be deleted at the close of its first trading day (the divisor will change at the close of that day).



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# Private Placement Example

- Consider the private placement of NOBLE GROUP effective November 11, 2009
- To replicate this event, an adjustment to the index is needed at the close of November 10, 2009
- The composition of one index unit prior to the event is described by the Intraday Idx Unit NOS (column F)
- To calculate the composition of the index unit post the event, the new divisor needs to be calculated (as of Nov 11). The divisor change is given by the ratio of the new index capitalization to the old one, using closing prices from November 10, 2009

Divisor (As of Date) 41,186,955

Divisor (As of Date + 1) 41,294,945

A	B	C	D	E	F	G	H	I	J	L	M	N	O
Calculation Date	As of Date	Security Name	Idx Incl Flag (as of date)	Intraday Index NOS MM	Intraday Idx Unit NOS	Idx Incl Flag (as of date + 1)	End of Day Index NOS MM	Price (As of Date)	FX (As of Date)	Mcap (As of Date) D*E*I/J	Initial Mcap (As of Date + 1) G*H*I/J	End of Day Idx Unit NOS	Idx Unit NOS Change (N-F)
11/9/2009	11/10/2009	NOBLE GROUP	1	<b>1,353</b>	32.86	1	<b>1,532</b>	2.80	1.39	<b>2,728</b>	<b>3,088</b>	37.10	4.24
11/9/2009	11/10/2009	DBS GROUP HOLDINGS	1	1,711	41.55	1	1,711	13.94	1.39	17,173	17,173	41.44	-0.11
11/9/2009	11/10/2009	SINGAPORE TELECOM	1	7,964	193.35	1	7,964	2.94	1.39	16,856	16,856	192.85	-0.51
11/9/2009	11/10/2009	UNITED OVERSEAS BANK	1	1,219	29.60	1	1,219	18.40	1.39	16,150	16,150	29.52	-0.08
11/9/2009	11/10/2009	OCBC BANK	1	2,501	60.73	1	2,501	7.97	1.39	14,352	14,352	60.57	-0.16
11/9/2009	11/10/2009	CAPITALAND	1	2,547	61.85	1	2,547	4.03	1.39	7,390	7,390	61.68	-0.16
11/9/2009	11/10/2009	KEPPEL CORP	1	1,275	30.94	1	1,275	8.16	1.39	7,487	7,487	30.86	-0.08
11/9/2009	11/10/2009	WILMAR INTERNATIONAL	1	1,277	31.01	1	1,277	6.56	1.39	6,032	6,032	30.93	-0.08
11/9/2009	11/10/2009	SINGAPORE AIRLINES	1	534	12.96	1	534	14.26	1.39	5,481	5,481	12.93	-0.03

\* Subset of the MSCI Singapore Index Unit

- The index divisor increases as the index market capitalization goes up
- The End of Day Index Unit NOS is calculated as the ratio of the End of Day Index NOS and the new divisor (As of Date + 1)
- The difference between the End of Day Index Unit NOS and the Intraday Index Unit NOS describes the adjustment needed to one index unit at the close of November 10, 2009 for this corporate event: 4.24 additional shares of NOBLE GROUP are added to the index unit by decreasing the index unit number of shares for all other constituents



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# Early Index Inclusion (IPO) Example

- Consider the IPO of BC SANTANDER BRASIL UNIT added to the index effective October 22, 2009
- To replicate this event, an adjustment to the index is needed at the close of October 21, 2009
- At the close of October 21, 2009, the new divisor is calculated and the end of day index unit NOS for each constituent is derived from it

Divisor (As of Date) 142,324,185

Divisor (As of Date + 1) 144,319,620

A	B	C	D	E	F	G	H	I	J	L	M	N	O
Calculation Date	As of Date	Security Name	Idx Incl Flag (as of date)	Intraday Index NOS MM	Intraday Idx Unit NOS	Idx Incl Flag (as of date + 1)	End of Day Index NOS MM	Price (As of Date)	FX (As of Date)	Mcap (As of Date) D*E*I/J	Initial Mcap (As of Date + 1) G*H*I/J	End of Day Idx Unit NOS	Idx Unit Change (N-F)
10/20/2009	10/21/2009	BC SANTANDER BRASIL UNIT	0			1	525	23.19	1.74	0	7,017	0.16	0.16
10/20/2009	10/21/2009	PETROBRAS PN	1	3,146	22.10	1	3,146	36.70	1.74	66,538	66,538	21.80	-0.31
10/20/2009	10/21/2009	PETROBRAS ON	1	2,283	16.04	1	2,283	43.00	1.74	56,582	56,582	15.82	-0.22
10/20/2009	10/21/2009	VALE PNA	1	2,109	14.82	1	2,109	40.77	1.74	49,549	49,549	14.61	-0.20
10/20/2009	10/21/2009	ITAU UNIBANCO PN	1	2,053	14.43	1	2,053	36.00	1.74	42,608	42,608	14.23	-0.20
10/20/2009	10/21/2009	VALE ON	1	1,440	10.12	1	1,440	46.11	1.74	38,272	38,272	9.98	-0.14
10/20/2009	10/21/2009	BANCO BRADESCO PN	1	1,535	10.78	1	1,535	36.00	1.74	31,849	31,849	10.64	-0.15
10/20/2009	10/21/2009	CSN SIDERURGICA NAC'L ON	1	397	2.79	1	397	63.50	1.74	14,519	14,519	2.75	-0.04

\* Subset of the MSCI Brazil Index Unit

- The index divisor increases as the index market capitalization goes up
- The difference between the End of Day Index Unit NOS and the Intraday Index Unit NOS describes the adjustment needed to one index unit at the close of October 21, 2009 to replicate this corporate event: 0.16 shares of BC SANTANDER are added to the index unit by decreasing the index unit number of shares for all other constituents



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# Merger Example

- Consider the merger of MEIJI DAIRIES CORP (constituent of the MSCI Japan Index) with MEIJI SEIKA KAISHA (constituent of the MSCI Japan Small Cap Index) effective March 26, 2009. The historical price link was made on MEIJI DAIRIES CORP.
- On March 26 the MSCI Japan Index Unit will be already exposed to the new (merged) entity with an increased weight
  - The index adjustment and the divisor change happen at the close of March 25

Divisor (As of Date) 931,691,815

Divisor (As of Date + 1) 932,419,814

A	B	C	D	E	F	G	H	I	J	L	M	N	O
Calculation Date	As of Date	Security Name	Idx Incl Flag (as of date)	Intraday Index NOS MM	Intraday Idx Unit NOS	Idx Incl Flag (as of date + 1)	End of Day Index NOS MM	Price (As of Date)	FX (As of Date)	Mcap (As of Date) D*E*I/J	Initial Mcap (As of Date + 1) G*H*I/J	End of Day Idx Unit NOS	Idx Unit Change (N-F)
3/24/2009	3/25/2009	MEIJI DAIRIES CORP	1	264	0.28	1	587	410	97.72	1,106	2,463	0.63	0.3469
3/24/2009	3/25/2009	TOYOTA MOTOR CORP	1	2,758	2.96	1	2,758	3,200	97.72	90,328	90,328	2.96	-0.0023
3/24/2009	3/25/2009	mitsubishi UFJ FIN GRP	1	10,990	11.80	1	10,990	532	97.72	59,831	59,831	11.79	-0.0092
3/24/2009	3/25/2009	HONDA MOTOR CO	1	1,651	1.77	1	1,651	2,335	97.72	39,459	39,459	1.77	-0.0014
3/24/2009	3/25/2009	CANON INC	1	1,067	1.15	1	1,067	2,865	97.72	31,282	31,282	1.14	-0.0009
3/24/2009	3/25/2009	TOKYO ELECTRIC POWER CO	1	1,218	1.31	1	1,218	2,620	97.72	32,645	32,645	1.31	-0.0010
3/24/2009	3/25/2009	NINTENDO CO	1	99	0.11	1	99	30,600	97.72	31,054	31,054	0.11	-0.0001
3/24/2009	3/25/2009	TAKEDA PHARMACEUTICAL	1	815	0.87	1	815	3,770	97.72	31,448	31,448	0.87	-0.0007
3/24/2009	3/25/2009	SUMITOMO MITSUI FINL GRP	1	671	0.72	1	671	3,880	97.72	26,631	26,631	0.72	-0.0006

## Subset of the MSCI Japan Index Unit

- The divisor increases as the index market cap goes up
- 0.3469 shares of MEIJI DAIRIES CORP are added to the index unit by decreasing the index unit number of shares for the rest of the constituents as of the close of March 25
- No action is needed on March 26: the change in the Index Unit NOS will happen organically according to the event terms



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# Rights Issue Example

- Consider the 3:7@1.8 rights issue for BALFOUR BEATTY effective October 8, 2009
- On the ex-date, the index unit is exposed to both the stock and to the rights
  - The rights exposure is calculated theoretically
  - The weight increase in the stock (conversion of the rights) occurs at the close of the ex-date
- The divisor changes at the close of the ex-date (for October 9)

Divisor (As of Date) 2,020,072,842  
 Divisor (As of Date + 1) 2,020,659,252

A	B	C	D	E	F	G	H	I	J	K	L	M	N	O			
Calculation Date	As of Date	Security Name	Interim constituent type	Interim const. trading status	Pricing Formula	Idx Incl Flag (as of date)	Intraday Index NOS MM	Intraday Idx Unit NOS	Idx Incl Flag (as of date + 1)	End of Day Index NOS MM	Price (As of Date)	FX (As of Date)	Mcap in Idx Unit D*F*/J	Mcap (As of Date) D*E*/J	Initial Mcap (As of Date + 1) G*H*/J	End of Day Idx Unit NOS	Idx Unit Change (N-F)
10/7/2009	10/8/2009	BALFOUR BEATTY				1	478	0.24	1	683	2.80	0.62	1	2,152	3,074	0.34	0.1013
10/7/2009	10/8/2009	BALFOUR BEATTY (INTERIM 1)*	THEO RIGHT - NEW UNDERLYING SHRAES	CALCULATED	BALFOUR BEATTY P(t) - 1.8	1	205	0.10	0	0	1.00	0.62	0	329	0	0.00	-0.1014
10/7/2009	10/8/2009	HSBC HOLDINGS (GB)				1	17,315	8.57	1	17,315	7.12	0.62	98	198,497	198,497	8.57	-0.002
10/7/2009	10/8/2009	BP				1	18,738	9.28	1	18,738	5.46	0.62	81	164,556	164,556	9.27	-0.003
10/7/2009	10/8/2009	VODAFONE GROUP				1	52,487	25.98	1	52,487	1.35	0.62	56	113,736	113,736	25.98	-0.008
10/7/2009	10/8/2009	GLAXOSMITHKLINE				1	5,188	2.57	1	5,188	12.35	0.62	51	103,157	103,157	2.57	-0.001
10/7/2009	10/8/2009	ROYAL DUTCH SHELL A				1	3,546	1.76	1	3,546	17.68	0.62	50	100,892	100,892	1.75	-0.001
10/7/2009	10/8/2009	ROYAL DUTCH SHELL B				1	2,696	1.33	1	2,696	17.18	0.62	37	74,561	74,561	1.33	0.000

## Subset of the MSCI UK Index Unit

- The divisor increases as the index market cap goes up
- The index unit converts 0.1014 rights for BALFOUR BEATTY into 0.1013 shares of BALFOUR BEATTY as of the close of October 8
- Given the rights value is calculated theoretically, a 1 share stock exposure can be synthetically modeled as a combination of 1 right and cash corresponding to the right's subscription price



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- Index Reviews Using the MSCI Market Open Index Product

# Index Reviews using the MSCI Market Open Index Product

- An index review has impacts on the index which are similar to several corporate events happening at the same time
- During a review, an index composition will change. The following parameters are typically updated:
  - Index constituents (additions / deletions)
  - Number of shares and Inclusion factors such as the foreign inclusion factor (FIF) which jointly influence the index number of shares
- An index review is typically effective on the first business day of a month.

# Index Review Example

- Consider the May 2009 MSCI Austria Index review
- The review was effective June 1<sup>st</sup> 2009, meaning that the index was rebalanced as of the close of May 29, 2009
- The divisor changes at the close of the rebalancing date (May 29, 2009)

Divisor (As of Date) **24,307,823**

Divisor (As of Date + 1) **21,362,677**

A	B	C	D	E	F	G	H	I	J	K	L	M	N	O
Calculation Date	As of Date	Security Name	Idx Incl Flag (as of date)	Intraday Index NOS MM	Intraday Idx Unit NOS	Idx Incl Flag (as of date + 1)	End of Day Index NOS MM	Price (As of Date)	FX (As of Date)	Mcap in Idx Unit D*F*I/J	Mcap (As of Date) D*E*I/J	Initial Mcap (As of Date + 1) G*H*I/J	End of Day Idx Unit NOS	Idx Unit Change (N-F)
5/28/2009	5/29/2009	OMV AG	1	165	6.79	1	150	28.65	0.71	275	6,691	6,083	7.02	0.234
5/28/2009	5/29/2009	TELEKOM AUSTRIA	1	345	14.19	1	322	10.90	0.71	219	5,323	4,968	15.07	0.880
5/28/2009	5/29/2009	ERSTE GROUP BANK	1	190	7.82	1	174	17.01	0.71	188	4,580	4,198	8.16	0.337
5/28/2009	5/29/2009	VERBUND OESTERR ELEK A	1	77	3.17	1	77	37.99	0.71	170	4,143	4,143	3.61	0.437
5/28/2009	5/29/2009	VOESTALPINE	1	115	4.74	1	115	20.31	0.71	136	3,309	3,312	5.39	0.658
5/28/2009	5/29/2009	RAIFFEISEN INT'L BANK	1	54	2.23	1	54	29.71	0.71	94	2,276	2,276	2.53	0.307
5/28/2009	5/29/2009	VIENNA INSURANCE GROUP	1	38	1.58	1	38	30.00	0.71	67	1,631	1,631	1.80	0.218
5/28/2009	5/29/2009	WIENERBERGER	1	84	3.45	0	0	9.93	0.71	49	1,180	0	0.00	-3.454
5/28/2009	5/29/2009	STRABAG SE	1	51	2.11	0	0	15.80	0.71	47	1,147	0	0.00	-2.110

**MSCI Austria Index Unit**

- The divisor decreases as the index market cap goes down: two stocks are deleted and float-adjusted shares for 3 other stocks are revised downwards
- The index unit number of shares of WIENERBERGER and STRABAG increase and the index unit number of shares for all other stocks decrease



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- Dividend Reinvestment and MSCI Market Open Index Product\*

# Index Dividend Points

- Index dividend points express dividends paid by an index unit as a fraction of the index level
- They are calculated both at the dividend level and at the index level (aggregation of the dividend level index points)
- Two types of dividend points are calculated
  - Gross and net dividend points for price indices that represent the amount of dividends that “leave” the price index unit as a fraction of the price index level
  - Reinvestment dividend points for net and gross indices that represent the amount of dividends that are reinvested in the net or gross index as a fraction of the net and gross index level, respectively
- To provide advance notice, two kinds of index dividend points are calculated:
  - Preliminary index dividend points for the next day file using the exchange rate of the reinvestment date – 1
  - Final index dividend points, delivered after the close of the reinvestment date, which are using the exchange rate of the reinvestment date (used for the index calculation), and containing intraday dividend corrections, if any

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