

Equities

26 April 2012 | 9 pages

Teradyne Inc (TER)

Market Share Gain Contributes As Much As Fundamental, That is Why 2H Could be Better, Reiterate Buy, Raising Target to \$23

- Company Update
- Target Price Change
- Estimate Change

■ **Stock summary** — TER is up “only” 2.4% today despite posting superb results and guidance, in our view; it’s clear to us there are some profit takings as orders are “peaking” on conventional thinking given the record SOC orders in CQ1. Our analysis shows 1H strong order is as much to do with TER’s 60% share in mobility as fundamentals strength. In CQ4/CQ1, TER SOC orders were 19%/36% higher than Advantest (+VRGY), a clearly indication that market share shift contributes significantly to TER’s strong orders. We see ~\$2 EPS run-rate in the coming qtrs driving stock to low \$20s, and reiterate our Buy rating.

■ **Raising Est/Target** — Given the strong 1H orders and TER’s share gain in mobility, we are raising our FY12/13 EPS from \$1.64/\$1.76 to \$1.90/\$1.90, and increasing our target from \$21 to \$23 applying the same 10x multiple on updated FY12 EPS of 1.90 plus \$4/shr net cash at end-2012.

■ **Highlight 1: 60% Share in Mobility** – This is much higher than 46% overall SOC shr for TER. With majority of SOC orders in 1H are mobility, we argue that TER’s guided ~\$600M SOC rev in 1H indicates only \$2.3B 1H buyrate (55% shr), much lower than the \$2.7B using 46% shr. We believe this is why TER is doing so well but orders have not peaked.

■ **Highlight 2: 2H Upside from Non-mobility Segments** — With analog/MCU running at half the normalized level, and mere ~25% of peak run-rate, 2H upside is likely to come from analog/MCU/auto: a ~\$1B annual average with 1H running at \$300M.

■ **Positives** — 1) 60%+ shr in mobility and growing; 2) analog/MCU running at 50% the normalized level, 25% of peak, could be a big driver in 2H; 3) margin improvement with the addition of accretive LitePoint; 4) \$160M LitePoint rev sounds conservative.

■ **Negatives** — 1) SOC orders at very high level, causing doubts on sustainability; 2) conservative on share buyback given strong cash and FCF; 3) OpEx creeping up.

Buy	1
Price (26 Apr 12)	US\$17.79
Target price	US\$23.00
	from US\$21.00
Expected share price return	29.3%
Expected dividend yield	0.0%
Expected total return	29.3%
Market Cap	US\$3,319M

Price Performance (RIC: TER.N, BB: TER US)



EPS	Q1	Q2	Q3	Q4	FY	FC Cons
2011A	0.38A	0.49A	0.34A	0.15A	1.37A	1.39A
2012E	0.29A	0.60E	0.55E	0.46E	1.90E	1.52E
Previous	0.30E	0.39E	0.50E	0.45E	1.64E	na
2013E	0.32E	0.47E	0.60E	0.52E	1.90E	1.73E
Previous	na	na	na	na	1.76E	na
2014E	na	na	na	na	1.94E	1.75E
Previous	na	na	na	na	na	na

Source: Company Reports and dataCentral, CIR. FC Cons: First Call Consensus.

Wenge Yang
+1-415-951-1732
wenge.yang@citi.com

Terence Whalen
terence.whelen@citi.com

Bin Jiang
bin.jiang@citi.com

See Appendix A-1 for Analyst Certification, Important Disclosures and non-US research analyst disclosures.

Citi Investment Research & Analysis is a division of Citigroup Global Markets Inc. (the “Firm”), which does and seeks to do business with companies covered in its research reports. As a result, investors should be aware that the Firm may have a conflict of interest that could affect the objectivity of this report. Investors should consider this report as only a single factor in making their investment decision.

TER.N: Fiscal year end 31-Dec						Price: US\$17.79; TP: US\$23.00; Market Cap: US\$3,319m; Recomm: Buy					
Profit & Loss (US\$m)	2010	2011	2012E	2013E	2014E	Valuation ratios	2010	2011	2012E	2013E	2014E
Sales revenue	1,609	1,429	1,842	1,850	2,035	PE (x)	8.2	13.0	9.3	9.4	9.2
Cost of sales	-732	-694	-871	-873	-997	PB (x)	3.1	2.4	2.0	1.6	1.3
Gross profit	877	735	971	977	1,038	EV/EBITDA (x)	4.7	5.8	4.0	3.3	2.7
Gross Margin (%)	54.5	51.4	52.7	52.8	51.0	FCF yield (%)	14.1	5.1	10.1	12.9	1.0
EBITDA	572	446	635	656	719	Dividend yield (%)	0	0	0	0	0
EBITDA Margin (%)	35.6	31.2	34.5	35.5	35.3	Payout ratio (%)	0	0	0	0	0
Depreciation	-53	-51	-58	-63	-74	ROE (%)	42.5	27.8	21.8	18.3	15.8
Amortisation	-46	-62	-87	-87	-87	Cashflow (US\$m)	2010	2011	2012E	2013E	2014E
EBIT	473	333	490	506	558	EBITDA	572	446	635	656	719
EBIT Margin (%)	29.4	23.3	26.6	27.3	27.4	Working capital	52	-98	-98	-21	-418
Net interest	-7	-5	-5	-2	24	Other	-57	-74	-64	-78	-122
Associates	0	0	0	0	0	Operating cashflow	567	274	473	557	179
Non-op/Except	0	0	0	0	0	Capex	-76	-86	-99	-93	-142
Pre-tax profit	465	328	484	504	582	Net acq/disposals	-552	5	-27	0	0
Tax	-15	-15	-44	-76	-145	Other	0	0	0	0	0
Extraord./Min.Int./Pref.div.	-71	51	-70	-43	-43	Investing cashflow	-628	-81	-127	-93	-142
Reported net profit	380	364	371	385	393	Dividends paid	0	0	0	0	0
Net Margin (%)	23.6	25.5	20.1	20.8	19.3	Financing cashflow	42	-16	-24	-40	-50
Core NPAT	424	280	398	385	393	Net change in cash	-19	176	322	424	-13
Per share data	2010	2011	2012E	2013E	2014E	Free cashflow to s/holders	491	188	374	464	37
Reported EPS (\$)	1.94	1.77	1.78	1.90	1.94						
Core EPS (\$)	2.16	1.37	1.90	1.90	1.94						
DPS (\$)	0	0	0	0	0						
CFPS (\$)	2.89	1.33	2.26	2.75	0.88						
FCFPS (\$)	2.50	0.91	1.79	2.30	0.18						
BVPS (\$)	5.73	7.28	9.12	11.34	13.20						
Wtd avg ord shares (m)	196	205	209	202	203						
Wtd avg diluted shares (m)	196	205	209	202	203						
Growth rates	2010	2011	2012E	2013E	2014E						
Sales revenue (%)	96.3	-11.2	28.9	0.5	10.0						
EBIT (%)	nm	-29.6	47.1	3.3	10.3						
Core NPAT (%)	nm	-33.8	41.8	-3.2	2.1						
Core EPS (%)	nm	-36.8	39.4	0.0	1.8						
Balance Sheet (US\$m)	2010	2011	2012E	2013E	2014E						
Cash & cash equiv.	807	670	983	1,408	1,395						
Accounts receivables	176	129	247	266	279						
Inventory	118	160	141	152	570						
Net fixed & other tangibles	262	259	295	325	393						
Goodwill & intangibles	123	746	662	575	487						
Financial & other assets	324	209	262	262	262						
Total assets	1,810	2,173	2,591	2,988	3,385						
Accounts payable	82	70	116	125	137						
Short-term debt	2	3	0	0	0						
Long-term debt	150	160	150	150	150						
Provisions & other liab	454	446	419	419	419						
Total liabilities	688	678	685	694	706						
Shareholders' equity	1,122	1,495	1,905	2,294	2,680						
Minority interests	0	0	0	0	0						
Total equity	1,122	1,495	1,905	2,294	2,680						
Net debt	-654	-508	-833	-1,257	-1,244						
Net debt to equity (%)	-58.3	-34.0	-43.7	-54.8	-46.4						

For further data queries on Citi's full coverage universe please contact CIRA Data Services Americas at CIRADatasevicesAmericas@citi.com or +1-212-816-5336
For definitions of the items in this table, please click [here](#).

Figure 1. Estimate Change

(\$ in M, except per share)		F2011 A	Q112A	Q212E	Q312E	Q412E	F2012 E	Q113E	Q213E	Q313E	Q413E	F2013 E
Citi New	Revenue	1,429.1	396.7	505.0	490.0	450.0	1,841.7	390.0	460.0	515.0	485.0	1,850.0
	EPS	\$1.35	\$0.29	\$0.60	\$0.55	\$0.46	\$1.90	\$0.32	\$0.47	\$0.60	\$0.52	\$1.90
Citi Old	Revenue	1,429.1	385.0	415.0	450.0	425.0	1,675.0	390.0	425.0	450.0	435.0	1,700.0
	Proforma EPS	\$1.35	\$0.30	\$0.39	\$0.50	\$0.45	\$1.64	\$0.34	\$0.44	\$0.51	\$0.47	\$1.76
Consensus	Revenue	1,416.6	382.3	412.8	432.1	432.9	1,652.9	412.1	427.6	450.9	462.4	1,747.9
	EPS	\$1.39	\$0.28	\$0.37	\$0.44	\$0.43	\$1.51	\$0.35	\$0.44	\$0.49	\$0.48	\$1.73

Source: Company Report, First Call, Citi Investment Research and Analysis

Figure 2. Segment Revenue Forecast

	(Rev: \$M)	SOC	Memory	Total ATE	System Test	LitePoint	Total
2011	Q1:11	291.0	28.0	319.0	58.2	-	377.2
	Q2:11	304.0	39.0	343.0	68.0	-	411.0
	Q3:11	216.0	25.0	241.0	103.0	-	344.0
	Q4:11	180.0	23.0	203.0	66.0	28.0	297.0
	Total	991.0	115.0	1,106.0	295.2	28.0	1,429.2
2012	Q1:12	246.0	22.0	268.0	98.0	31.0	397.0
	Q2:12E	360.0	30.0	390.0	65.0	50.0	505.0
	Q3:12E	350.0	30.0	380.0	60.0	50.0	490.0
	Q4:12E	320.0	35.0	355.0	50.0	45.0	450.0
	Total	1,276.0	117.0	1,393.0	273.0	176.0	1,842.0
2013	Q1:13E	250.0	30.0	280.0	60.0	50.0	390.0
	Q2:13E	310.0	35.0	345.0	60.0	55.0	460.0
	Q3:13E	350.0	40.0	390.0	60.0	65.0	515.0
	Q4:13E	330.0	40.0	370.0	60.0	55.0	485.0
	Total	1,240.0	145.0	1,385.0	240.0	225.0	1,850.0

Source: Company Report, Citi Investment Research and Analysis

Teradyne Inc

Company description

Teradyne Inc. (TER) is a leading provider of automated test equipment (ATE) and services for the electronics and communications industry. The company has two operating segments: Semiconductor Test and Systems Test. The Semiconductor Test division offers test equipment and services used for wafer level and device package testing for a range of devices including SoCs, memory, analog, RF and logic devices sold into the automotive, communications, consumer, computing and industrial markets. Customers include integrated device manufacturers (IDMs), outsource assembly and test companies (OSATs), wafer foundries, and fabless design companies. The company's Systems Test Group provides circuit board test and inspection, military and aerospace test, automotive diagnostic and test and hard disk drive test products and services. Teradyne was founded in 1960 and is headquartered in North Reading, Massachusetts, with manufacturing, service, and sales facilities throughout the United States, Europe, and Asia.

Investment strategy

We rate TER Buy. With another correction having already happened in 2H:2011, and with TER continue to gain share and the semiconductor cycle remaining favorably positioned, we see significant potential upside during the next leg of the cycle. New normalized analysis suggests a ~\$3B normalized semi test market with ~50% share for TER. TER also looks set to gain share in memory test and particularly NAND which should provide a strong base of spending over the next several years (albeit not growing much off 2011 capex levels). Adding back system test drives ~\$1.525B normalized revs and \$2.00 EPS, suggesting \$20+ value for the stock (with ~\$4 net cash/share).

Valuation

Our target price of \$23 is based on TER's FY12E/FY13E EPS average of \$1.90. Given the historical discount of back-end multiples reflective of their cyclical nature, we apply 10x multiple (vs. 14x S&P average) on TER's FY12E/FY13E EPS average of \$1.90, add ~\$4/share in net cash at end-2012, and arrive at our target price of \$23.

Risks

Risks we see to the stock achieving our target price include the following: 1) TER has heavy exposure to the cyclical semiconductor industry that typically has limited visibility and a high degree of uncertainty regarding the timing and duration of cycles; 2) As fab utilization and capital equipment orders are closely linked to stock price, any material differences to our supply/demand model (e.g., demand drops suddenly, or supply increases more rapidly than we predict) may cause our valuation methodology to be inaccurate; 3) TER's principal market, semiconductor test equipment, is highly competitive and seeing its revenue opportunity decline from cyclical peak to peak, in our opinion. The industry has experienced some consolidation which should help drive a more rational pricing environment. However, should we see a protracted down cycle, significant pressure on pricing is exacerbated by the competitive pricing from smaller competitors could impair TER's profitability. Conversely, if TER sees a faster-than-expected acceleration in mix shift towards its new semi-test product cycle or if further consolidation in the semi test space leads to more rational pricing, there could be upside risk to the stock.

Appendix A-1

Analyst Certification

The research analyst(s) primarily responsible for the preparation and content of this research report are named in bold text in the author block at the front of the product except for those sections where an analyst's name appears in bold alongside content which is attributable to that analyst. Each of these analyst(s) certify, with respect to the section(s) of the report for which they are responsible, that the views expressed therein accurately reflect their personal views about each issuer and security referenced and were prepared in an independent manner, including with respect to Citigroup Global Markets Inc and its affiliates. No part of the research analyst's compensation was, is, or will be, directly or indirectly, related to the specific recommendation(s) or view(s) expressed by that research analyst in this report.

IMPORTANT DISCLOSURES

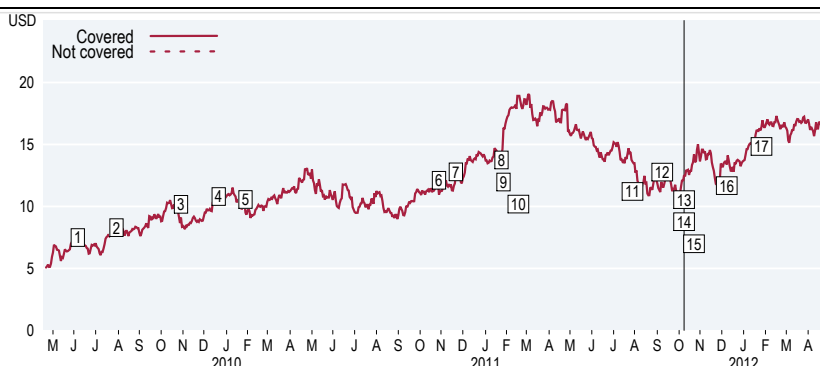
Teradyne Inc (TER)

Ratings and Target Price History

Fundamental Research

Analyst: Wenge Yang

Covered since May 24 2011



	Date	Rating	Target Price	Closing Price
1	5-Jun-09	*2H	*7.50	7.14
2	30-Jul-09	2H	*9.00	7.71
3	29-Oct-09	2H	*9.50	9.10
4	22-Dec-09	2H	*11.50	10.75
5	28-Jan-10	2H	*11.00	9.49
6	28-Oct-10	2H	*13.00	10.95

* Indicates change

	Date	Rating	Target Price	Closing Price
7	21-Nov-10	*1H	*17.00	11.86
8	25-Jan-11	1H	*19.00	14.14
9	27-Jan-11	1H	*20.00	16.35
10	17-Feb-11	1H	*24.00	18.92
11	28-Jul-11	1H	*22.00	13.61
12	8-Sep-11	1H	*21.00	11.70

	Date	Rating	Target Price	Closing Price
13	8-Oct-11	Stock rating system changed		
14	8-Oct-11	*1	21.00	12.05
15	23-Oct-11	1	*18.00	13.56
16	8-Dec-11	1	*20.00	13.38
17	26-Jan-12	1	*21.00	16.41

Rating/target price changes above reflect Eastern Standard Time

Teradyne Inc (TER)

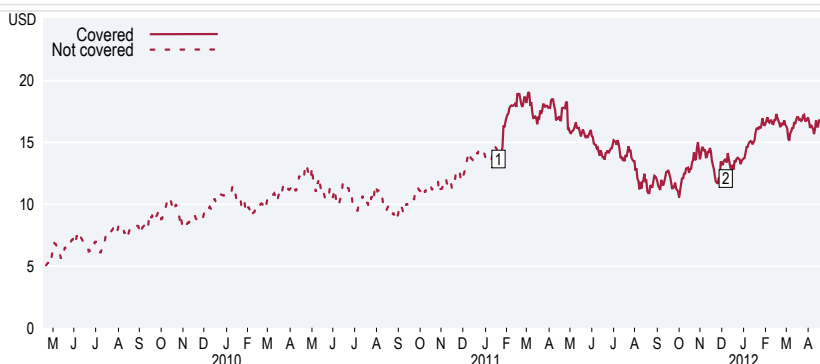
Ratings and Target Price History

Best Ideas Research

Relative Call (3 Month)

Analyst: Wenge Yang

Covered since May 24 2011



	Date	Rating	Target Price	Closing Price
1	20-Jan-11	*ADD MP	-	13.86

* Indicates change

	Date	Rating	Target Price	Closing Price
2	7-Dec-11	*REM MP	-	13.63

Rating/target price changes above reflect Eastern Standard Time

Citigroup Global Markets Inc. or an affiliate received compensation for products and services other than investment banking services from Teradyne Inc in the past 12 months.

Citigroup Global Markets Inc. currently has, or had within the past 12 months, the following as clients, and the services provided were non-investment-banking, non-securities-related: Teradyne Inc.

Analysts' compensation is determined based upon activities and services intended to benefit the investor clients of Citigroup Global Markets Inc. and its affiliates ("the Firm"). Like all Firm employees, analysts receive compensation that is impacted by overall firm profitability which includes investment banking revenues.

For important disclosures (including copies of historical disclosures) regarding the companies that are the subject of this Citi Investment Research & Analysis product ("the Product"), please contact Citi Investment Research & Analysis, 388 Greenwich Street, 28th Floor, New York, NY, 10013, Attention: Legal/Compliance [E6WYB6412478]. In addition, the same important disclosures, with the exception of the Valuation and Risk assessments and historical

disclosures, are contained on the Firm's disclosure website at https://www.citivelocity.com/cvr/eppublic/citi_research_disclosures. Valuation and Risk assessments can be found in the text of the most recent research note/report regarding the subject company. Historical disclosures (for up to the past three years) will be provided upon request.

Citi Investment Research & Analysis Ratings Distribution

<i>Data current as of 31 Mar 2012</i>	12 Month Rating			Relative Rating		
	Buy	Hold	Sell	Buy	Hold	Sell
Citi Investment Research & Analysis Global Fundamental Coverage	52%	37%	11%	10%	79%	10%
% of companies in each rating category that are investment banking clients	44%	42%	40%	47%	42%	43%

Guide to Citi Investment Research & Analysis (CIRA) Fundamental Research Investment Ratings:

CIRA's stock recommendations include an investment rating and an optional risk rating to highlight high risk stocks.

Risk rating takes into account both price volatility and fundamental criteria. Stocks will either have no risk rating or a High risk rating assigned.

Investment Ratings: CIRA's investment ratings are Buy, Neutral and Sell. Our ratings are a function of analyst expectations of expected total return ("ETR") and risk. ETR is the sum of the forecast price appreciation (or depreciation) plus the dividend yield for a stock within the next 12 months. The Investment rating definitions are: Buy (1) ETR of 15% or more or 25% or more for High risk stocks; and Sell (3) for negative ETR. Any covered stock not assigned a Buy or a Sell is a Neutral (2). For stocks rated Neutral (2), if an analyst believes that there are insufficient valuation drivers and/or investment catalysts to derive a positive or negative investment view, they may elect with the approval of CIRA management not to assign a target price and, thus, not derive an ETR. Analysts may place covered stocks "Under Review" in response to exceptional circumstances (e.g. lack of information critical to the analyst's thesis) affecting the company and / or trading in the company's securities (e.g. trading suspension). As soon as practically possible, the analyst will publish a note re-establishing a rating and investment thesis. To satisfy regulatory requirements, we correspond Under Review and Neutral to Hold in our ratings distribution table for our 12-month fundamental rating system. However, we reiterate that we do not consider Under Review to be a recommendation.

Relative three-month ratings: CIRA may also assign a three-month relative call (or rating) to a stock to highlight expected out-performance (most preferred) or under-performance (least preferred) versus the geographic and industry sector over a 3 month period. The relative call may highlight a specific near-term catalyst or event impacting the company or the market that is anticipated to have a short-term price impact on the equity securities of the company. Absent any specific catalyst the analyst(s) will indicate the most and least preferred stocks in the universe of stocks under consideration, explaining the basis for this short-term view. This three-month view may be different from and does not affect a stock's fundamental equity rating, which reflects a longer-term total absolute return expectation. For purposes of NASD/NYSE ratings-distribution-disclosure rules, most preferred calls correspond to a buy recommendation and least preferred calls correspond to a sell recommendation. Any stock not assigned to a most preferred or least preferred call is considered non-relative-rated (NRR). For purposes of NASD/NYSE ratings-distribution-disclosure rules we correspond NRR to Hold in our ratings distribution table for our 3-month relative rating system. However, we reiterate that we do not consider NRR to be a recommendation.

Prior to October 8, 2011, the firm's stock recommendation system included a risk rating and an investment rating. **Risk ratings**, which took into account both price volatility and fundamental criteria, were: Low (L), Medium (M), High (H), and Speculative (S). **Investment Ratings** of Buy, Hold and Sell were a function of CIRA's expectation of total return (forecast price appreciation and dividend yield within the next 12 months) and risk rating. Additionally, analysts could have placed covered stocks "Under Review" in response to exceptional circumstances (e.g. lack of information critical to the analyst's thesis) affecting the company and/or trading in the company's securities (e.g. trading suspension). Stocks placed "Under Review" were monitored daily by management and as practically possible, the analyst published a note re-establishing a rating and investment thesis. For securities in developed markets (US, UK, Europe, Japan, and Australia/New Zealand), investment ratings were: Buy (1) (expected total return of 10% or more for Low-Risk stocks, 15% or more for Medium-Risk stocks, 20% or more for High-Risk stocks, and 35% or more for Speculative stocks); Hold (2) (0%-10% for Low-Risk stocks, 0%-15% for Medium-Risk stocks, 0%-20% for High-Risk stocks, and 0%-35% for Speculative stocks); and Sell (3) (negative total return). For securities in emerging markets (Asia Pacific, Emerging Europe/Middle East/Africa, and Latin America), investment ratings were: Buy (1) (expected total return of 15% or more for Low-Risk stocks, 20% or more for Medium-Risk stocks, 30% or more for High-Risk stocks, and 40% or more for Speculative stocks); Hold (2) (5%-15% for Low-Risk stocks, 10%-20% for Medium-Risk stocks, 15%-30% for High-Risk stocks, and 20%-40% for Speculative stocks); and Sell (3) (5% or less for Low-Risk stocks, 10% or less for Medium-Risk stocks, 15% or less for High-Risk stocks, and 20% or less for Speculative stocks).

Investment ratings are determined by the ranges described above at the time of initiation of coverage, a change in investment and/or risk rating, or a change in target price (subject to limited management discretion). At other times, the expected total returns may fall outside of these ranges because of market price movements and/or other short-term volatility or trading patterns. Such interim deviations from specified ranges will be permitted but will become subject to review by Research Management. Your decision to buy or sell a security should be based upon your personal investment objectives and should be made only after evaluating the stock's expected performance and risk.

NON-US RESEARCH ANALYST DISCLOSURES

Non-US research analysts who have prepared this report (i.e., all research analysts listed below other than those identified as employed by Citigroup Global Markets Inc.) are not registered/qualified as research analysts with FINRA. Such research analysts may not be associated persons of the member organization and therefore may not be subject to the NYSE Rule 472 and NASD Rule 2711 restrictions on communications with a subject company, public appearances and trading securities held by a research analyst account. The legal entities employing the authors of this report are listed below:

Citigroup Global Markets Inc

Wenge Yang; Terence Whalen; Bin Jiang

OTHER DISCLOSURES

The subject company's share price set out on the front page of this Product is quoted as at 26 April 2012 09:54 AM on the issuer's primary market.

For securities recommended in the Product in which the Firm is not a market maker, the Firm is a liquidity provider in the issuers' financial instruments and may act as principal in connection with such transactions. The Firm is a regular issuer of traded financial instruments linked to securities that may have been recommended in the Product. The Firm regularly trades in the securities of the issuer(s) discussed in the Product. The Firm may engage in securities transactions in a manner inconsistent with the Product and, with respect to securities covered by the Product, will buy or sell from customers on a principal basis.

Securities recommended, offered, or sold by the Firm: (i) are not insured by the Federal Deposit Insurance Corporation; (ii) are not deposits or other obligations of any insured depository institution (including Citibank); and (iii) are subject to investment risks, including the possible loss of the principal amount invested. Although information has been obtained from and is based upon sources that the Firm believes to be reliable, we do not guarantee its accuracy and it may be incomplete and condensed. Note, however, that the Firm has taken all reasonable steps to determine the accuracy and completeness of the disclosures made in the Important Disclosures section of the Product. The Firm's research department has received assistance from the subject company(ies) referred to in this Product including, but not limited to, discussions with management of the subject company(ies). Firm policy prohibits research analysts from sending draft research to subject companies. However, it should be presumed that the author of the Product has had discussions with the subject company to ensure factual accuracy prior to publication. All opinions, projections and estimates constitute the judgment of the author as of the date of the Product and these, plus any other information contained in the Product, are subject to change without notice. Prices and availability of financial instruments also are subject to change without notice. Notwithstanding other departments within the Firm advising the companies discussed in this Product, information obtained in such role is not used in the preparation of the Product. Although Citi Investment Research & Analysis (CIRA) does not set a predetermined frequency for publication, if the Product is a fundamental research report, it is the intention of CIRA to provide research coverage of the/those issuer(s) mentioned therein, including in response to news affecting this issuer, subject to applicable quiet periods and capacity constraints. The Product is for informational purposes only and is not intended as an offer or solicitation for the purchase or sale of a security. Any decision to purchase securities mentioned in the Product must take into account existing public information on such security or any registered prospectus.

Investing in non-U.S. securities, including ADRs, may entail certain risks. The securities of non-U.S. issuers may not be registered with, nor be subject to the reporting requirements of the U.S. Securities and Exchange Commission. There may be limited information available on foreign securities. Foreign companies are generally not subject to uniform audit and reporting standards, practices and requirements comparable to those in the U.S. Securities of some foreign companies may be less liquid and their prices more volatile than securities of comparable U.S. companies. In addition, exchange rate movements may have an adverse effect on the value of an investment in a foreign stock and its corresponding dividend payment for U.S. investors. Net dividends to ADR investors are estimated, using withholding tax rates conventions, deemed accurate, but investors are urged to consult their tax advisor for exact dividend computations. Investors who have received the Product from the Firm may be prohibited in certain states or other jurisdictions from purchasing securities mentioned in the Product from the Firm. Please ask your Financial Consultant for additional details. Citigroup Global Markets Inc. takes responsibility for the Product in the United States. Any orders by US investors resulting from the information contained in the Product may be placed only through Citigroup Global Markets Inc.

Important Disclosures for Morgan Stanley Smith Barney LLC Customers: Morgan Stanley & Co. LLC (Morgan Stanley) research reports may be available about the companies that are the subject of this Citi Investment Research & Analysis (CIRA) research report. Ask your Financial Advisor or use smithbarney.com to view any available Morgan Stanley research reports in addition to CIRA research reports.

Important disclosure regarding the relationship between the companies that are the subject of this CIRA research report and Morgan Stanley Smith Barney LLC and its affiliates are available at the Morgan Stanley Smith Barney disclosure website at www.morganstanleysmithbarney.com/researchdisclosures. For Morgan Stanley and Citigroup Global Markets, Inc. specific disclosures, you may refer to www.morganstanley.com/researchdisclosures and https://www.citivelocity.com/cvr/eppublic/citi_research_disclosures.

This CIRA research report has been reviewed and approved on behalf of Morgan Stanley Smith Barney LLC. This review and approval was conducted by the same person who reviewed this research report on behalf of CIRA. This could create a conflict of interest.

The Citigroup legal entity that takes responsibility for the production of the Product is the legal entity which the first named author is employed by. The Product is made available in **Australia** through Citigroup Global Markets Australia Pty Ltd. (ABN 64 003 114 832 and AFSL No. 240992), participant of the ASX Group and regulated by the Australian Securities & Investments Commission. Citigroup Centre, 2 Park Street, Sydney, NSW 2000. The Product is made available in Australia to Private Banking wholesale clients through Citigroup Pty Limited (ABN 88 004 325 080 and AFSL 238098). Citigroup Pty Limited provides all financial product advice to Australian Private Banking wholesale clients through bankers and relationship managers. If there is any doubt about the suitability of investments held in Citigroup Private Bank accounts, investors should contact the Citigroup Private Bank in Australia. Citigroup companies may compensate affiliates and their representatives for providing products and services to clients. The Product is made available in **Brazil** by Citigroup Global Markets Brasil - CCTVM SA, which is regulated by CVM - Comissão de Valores Mobiliários, BACEN - Brazilian Central Bank, APIMEC - Associação dos Analistas e Profissionais de Investimento do Mercado de Capitais and ANBID - Associação Nacional dos Bancos de Investimento. Av. Paulista, 1111 - 11º andar - CEP. 01311920 - São Paulo - SP. If the Product is being made available in certain provinces of **Canada** by Citigroup Global Markets (Canada) Inc. ("CGM Canada"), CGM Canada has approved the Product. Citigroup Place, 123 Front Street West, Suite 1100, Toronto, Ontario M5J 2M3. This product is available in **Chile** through Banchile Corredores de Bolsa S.A., an indirect subsidiary of Citigroup Inc., which is regulated by the Superintendencia de Valores y Seguros. Agustinas 975, piso 2, Santiago, Chile. The Product is made available in **France** by Citigroup Global Markets Limited, which is authorised and regulated by Financial Services Authority. 1-5 Rue Paul Cézanne, 8ème, Paris, France. The Product is distributed in **Germany** by Citigroup Global Markets Deutschland AG ("CGMD"), which is regulated by Bundesanstalt fuer Finanzdienstleistungsaufsicht (BaFin). CGMD, Reuterweg 16, 60323 Frankfurt am Main. Research which relates to "securities" (as defined in the Securities and Futures Ordinance (Cap. 571 of the Laws of Hong Kong)) is issued in **Hong Kong** by, or on behalf of, Citigroup Global Markets Asia Limited which takes full responsibility for its content. Citigroup Global Markets Asia Ltd. is regulated by Hong Kong Securities and Futures Commission. If the Research is made available through Citibank, N.A., Hong Kong Branch, for its clients in Citi Private Bank, it is made available by Citibank N.A., Citibank Tower, Citibank Plaza, 3 Garden Road, Hong Kong. Citibank N.A. is regulated by the Hong Kong Monetary Authority. Please contact your Private Banker in Citibank N.A., Hong Kong, Branch if you have any queries on or any matters arising from or in connection with this document. The Product is made available in **India** by Citigroup Global Markets India Private Limited, which is regulated by Securities and Exchange Board of India. Bakhtawar, Nariman Point, Mumbai 400-021. The Product is made available in **Indonesia** through PT Citigroup Securities Indonesia. 5/F, Citibank Tower, Bapindo Plaza, Jl. Jend. Sudirman Kav. 54-55, Jakarta 12190. Neither this Product nor any copy hereof may be distributed in Indonesia or to any Indonesian citizens wherever they are domiciled or to Indonesian residents except in compliance with applicable capital market laws and regulations. This Product is not an offer of securities in Indonesia. The securities referred to in this Product have not been registered with the Capital Market and Financial Institutions Supervisory Agency (BAPEPAM-LK) pursuant to relevant capital market laws and regulations, and may not be offered or sold within the territory of the Republic of Indonesia or to Indonesian citizens through a public offering or in circumstances which constitute an offer within the meaning of the Indonesian capital market laws and regulations. The Product is made available in **Israel** through Citibank NA, regulated by the Bank of Israel and the Israeli Securities Authority. Citibank, N.A., Platinum Building, 21 Ha'arba'ah St, Tel Aviv, Israel. The Product is made

available in **Italy** by Citigroup Global Markets Limited, which is authorised and regulated by Financial Services Authority. Via dei Mercanti, 12, Milan, 20121, Italy. The Product is made available in **Japan** by Citigroup Global Markets Japan Inc. ("CGMJ"), which is regulated by Financial Services Agency, Securities and Exchange Surveillance Commission, Japan Securities Dealers Association, Tokyo Stock Exchange and Osaka Securities Exchange. Shin-Marunouchi Building, 1-5-1 Marunouchi, Chiyoda-ku, Tokyo 100-6520 Japan. If the Product was distributed by SMBC Nikko Securities Inc. it is being so distributed under license. In the event that an error is found in an CGMJ research report, a revised version will be posted on the Firm's Citi Velocity website. If you have questions regarding Citi Velocity, please call (81 3) 6270-3019 for help. The Product is made available in **Korea** by Citigroup Global Markets Korea Securities Ltd., which is regulated by the Financial Services Commission, the Financial Supervisory Service and the Korea Financial Investment Association (KOFIA). Citibank Building, 39 Da-dong, Jung-gu, Seoul 110-180, Korea. KOFIA makes available registration information of research analysts on its website. Please visit the following website if you wish to find KOFIA registration information on research analysts of Citigroup Global Markets Korea Securities Ltd. <http://dis.kofia.or.kr/fs/dis2/fundMgr/DISFundMgrAnalystPop.jsp?companyCd2=A03030&pageDiv=02>. The Product is made available in **Malaysia** by Citigroup Global Markets Malaysia Sdn Bhd (Company No. 460819-D) ("CGMM") to its clients and CGMM takes responsibility for its contents. CGMM is regulated by the Securities Commission of Malaysia. Please contact CGMM at Level 43 Menara Citibank, 165 Jalan Ampang, 50450 Kuala Lumpur, Malaysia in respect of any matters arising from, or in connection with, the Product. The Product is made available in **Mexico** by Acciones y Valores Banamex, S.A. De C. V., Casa de Bolsa, Integrante del Grupo Financiero Banamex ("Accival") which is a wholly owned subsidiary of Citigroup Inc. and is regulated by Comision Nacional Bancaria y de Valores. Reforma 398, Col. Juarez, 06600 Mexico, D.F. In **New Zealand** the Product is made available to 'wholesale clients' only as defined by s5C(1) of the Financial Advisers Act 2008 ('FAA') through Citigroup Global Markets Australia Pty Ltd (ABN 64 003 114 832 and AFSL No. 240992), an overseas financial adviser as defined by the FAA, participant of the ASX Group and regulated by the Australian Securities & Investments Commission. Citigroup Centre, 2 Park Street, Sydney, NSW 2000. The Product is made available in **Pakistan** by Citibank N.A. Pakistan branch, which is regulated by the State Bank of Pakistan and Securities Exchange Commission, Pakistan. AWT Plaza, 1.1. Chundrigar Road, P.O. Box 4889, Karachi-74200. The Product is made available in the **Philippines** through Citicorp Financial Services and Insurance Brokerage Philippines, Inc., which is regulated by the Philippines Securities and Exchange Commission. 20th Floor Citibank Square Bldg. The Product is made available in the Philippines through Citibank NA Philippines branch, Citibank Tower, 8741 Paseo De Roxas, Makati City, Manila. Citibank NA Philippines NA is regulated by The Bangko Sentral ng Pilipinas. The Product is made available in **Poland** by Dom Maklerski Banku Handlowego SA an indirect subsidiary of Citigroup Inc., which is regulated by Komisja Nadzoru Finansowego. Dom Maklerski Banku Handlowego S.A. ul.Senatorska 16, 00-923 Warszawa. The Product is made available in the **Russian Federation** through ZAO Citibank, which is licensed to carry out banking activities in the Russian Federation in accordance with the general banking license issued by the Central Bank of the Russian Federation and brokerage activities in accordance with the license issued by the Federal Service for Financial Markets. Neither the Product nor any information contained in the Product shall be considered as advertising the securities mentioned in this report within the territory of the Russian Federation or outside the Russian Federation. The Product does not constitute an appraisal within the meaning of the Federal Law of the Russian Federation of 29 July 1998 No. 135-FZ (as amended) On Appraisal Activities in the Russian Federation. 8-10 Gasheka Street, 125047 Moscow. The Product is made available in **Singapore** through Citigroup Global Markets Singapore Pte. Ltd. ("CGMSPL"), a capital markets services license holder, and regulated by Monetary Authority of Singapore. Please contact CGMSPL at 8 Marina View, 21st Floor Asia Square Tower 1, Singapore 018960, in respect of any matters arising from, or in connection with, the analysis of this document. This report is intended for recipients who are accredited, expert and institutional investors as defined under the Securities and Futures Act (Cap. 289). The Product is made available by The Citigroup Private Bank in Singapore through Citibank, N.A., Singapore Branch, a licensed bank in Singapore that is regulated by Monetary Authority of Singapore. Please contact your Private Banker in Citibank N.A., Singapore Branch if you have any queries on or any matters arising from or in connection with this document. This report is intended for recipients who are accredited, expert and institutional investors as defined under the Securities and Futures Act (Cap. 289). This report is distributed in Singapore by Citibank Singapore Ltd ("CSL") to selected Citigold/Citigold Private Clients. CSL provides no independent research or analysis of the substance or in preparation of this report. Please contact your Citigold/Citigold Private Client Relationship Manager in CSL if you have any queries on or any matters arising from or in connection with this report. This report is intended for recipients who are accredited investors as defined under the Securities and Futures Act (Cap. 289). Citigroup Global Markets (Pty) Ltd. is incorporated in the **Republic of South Africa** (company registration number 2000/025866/07) and its registered office is at 145 West Street, Sandton, 2196, Saxonwold. Citigroup Global Markets (Pty) Ltd. is regulated by JSE Securities Exchange South Africa, South African Reserve Bank and the Financial Services Board. The investments and services contained herein are not available to private customers in South Africa. The Product is made available in **Spain** by Citigroup Global Markets Limited, which is authorised and regulated by Financial Services Authority. 29 Jose Ortega Y Gassef, 4th Floor, Madrid, 28006, Spain. The Product is made available in the **Republic of China** through Citigroup Global Markets Taiwan Securities Company Ltd. ("CGMTS"), 14 and 15F, No. 1, Songzhi Road, Taipei 110, Taiwan and/or through Citibank Securities (Taiwan) Company Limited ("CSTL"), 14 and 15F, No. 1, Songzhi Road, Taipei 110, Taiwan, subject to the respective license scope of each entity and the applicable laws and regulations in the Republic of China. CGMTS and CSTL are both regulated by the Securities and Futures Bureau of the Financial Supervisory Commission of Taiwan, the Republic of China. No portion of the Product may be reproduced or quoted in the Republic of China by the press or any third parties [without the written authorization of CGMTS and CSTL]. If the Product covers securities which are not allowed to be offered or traded in the Republic of China, neither the Product nor any information contained in the Product shall be considered as advertising the securities or making recommendation of the securities in the Republic of China. The Product is for informational purposes only and is not intended as an offer or solicitation for the purchase or sale of a security or financial products. Any decision to purchase securities or financial products mentioned in the Product must take into account existing public information on such security or the financial products or any registered prospectus. The Product is made available in **Thailand** through Citicorp Securities (Thailand) Ltd., which is regulated by the Securities and Exchange Commission of Thailand. 18/F, 22/F and 29/F, 82 North Sathorn Road, Silom, Bangrak, Bangkok 10500, Thailand. The Product is made available in **Turkey** through Citibank AS which is regulated by Capital Markets Board. Tekfen Tower, Eski Buyukdere Caddesi # 209 Kat 2B, 23294 Levent, Istanbul, Turkey. In the **U.A.E.**, these materials (the "Materials") are communicated by Citigroup Global Markets Limited, DIFC branch ("CGML"), an entity registered in the Dubai International Financial Center ("DIFC") and licensed and regulated by the Dubai Financial Services Authority ("DFSA") to Professional Clients and Market Counterparties only and should not be relied upon or distributed to Retail Clients. A distribution of the different CIRA ratings distribution, in percentage terms for Investments in each sector covered is made available on request. Financial products and/or services to which the Materials relate will only be made available to Professional Clients and Market Counterparties. The Product is made available in **United Kingdom** by Citigroup Global Markets Limited, which is authorised and regulated by Financial Services Authority. This material may relate to investments or services of a person outside of the UK or to other matters which are not regulated by the FSA and further details as to where this may be the case are available upon request in respect of this material. Citigroup Centre, Canada Square, Canary Wharf, London, E14 5LB. The Product is made available in **United States** by Citigroup Global Markets Inc, which is a member of FINRA and

registered with the US Securities and Exchange Commission. 388 Greenwich Street, New York, NY 10013. Unless specified to the contrary, within EU Member States, the Product is made available by Citigroup Global Markets Limited, which is regulated by Financial Services Authority. Pursuant to Comissão de Valores Mobiliários Rule 483, Citi is required to disclose whether a Citi related company or business has a commercial relationship with the subject company. Considering that Citi operates multiple businesses in more than 100 countries around the world, it is likely that Citi has a commercial relationship with the subject company.

Many European regulators require that a firm must establish, implement and make available a policy for managing conflicts of interest arising as a result of publication or distribution of investment research. The policy applicable to CIRA's Products can be found at https://www.citivelocity.com/cvr/eppublic/citi_research_disclosures.

Compensation of equity research analysts is determined by equity research management and Citigroup's senior management and is not linked to specific transactions or recommendations.

The Product may have been distributed simultaneously, in multiple formats, to the Firm's worldwide institutional and retail customers. The Product is not to be construed as providing investment services in any jurisdiction where the provision of such services would not be permitted.

Subject to the nature and contents of the Product, the investments described therein are subject to fluctuations in price and/or value and investors may get back less than originally invested. Certain high-volatility investments can be subject to sudden and large falls in value that could equal or exceed the amount invested. Certain investments contained in the Product may have tax implications for private customers whereby levels and basis of taxation may be subject to change. If in doubt, investors should seek advice from a tax adviser. The Product does not purport to identify the nature of the specific market or other risks associated with a particular transaction. Advice in the Product is general and should not be construed as personal advice given it has been prepared without taking account of the objectives, financial situation or needs of any particular investor. Accordingly, investors should, before acting on the advice, consider the appropriateness of the advice, having regard to their objectives, financial situation and needs. Prior to acquiring any financial product, it is the client's responsibility to obtain the relevant offer document for the product and consider it before making a decision as to whether to purchase the product. With the exception of our product that is made available only to Qualified Institutional Buyers (QIBs), CIRA concurrently disseminates its research via proprietary and non-proprietary electronic distribution platforms. Periodically, individual CIRA analysts may also opt to circulate research posted on such platforms to one or more clients by email. Such email distribution is discretionary and is done only after the research has been disseminated via the aforementioned distribution channels. CIRA simultaneously distributes product that is limited to QIBs only through email distribution.

The level and types of services provided by CIRA analysts to clients may vary depending on various factors such as the client's individual preferences as to the frequency and manner of receiving communications from analysts, the client's risk profile and investment focus and perspective (e.g. market-wide, sector specific, long term, short-term etc.), the size and scope of the overall client relationship with Citi and legal and regulatory constraints.

CIRA product may source data from dataCentral. dataCentral is a CIRA proprietary database, which includes Citi estimates, data from company reports and feeds from Reuters and Datastream.

© 2012 Citigroup Global Markets Inc. Citi Investment Research & Analysis is a division of Citigroup Global Markets Inc. Citi and Citi with Arc Design are trademarks and service marks of Citigroup Inc. and its affiliates and are used and registered throughout the world. All rights reserved. Any unauthorized use, duplication, redistribution or disclosure of this report (the "Product"), including, but not limited to, redistribution of the Product by electronic mail, posting of the Product on a website or page, and/or providing to a third party a link to the Product, is prohibited by law and will result in prosecution. The information contained in the Product is intended solely for the recipient and may not be further distributed by the recipient to any third party. Where included in this report, MSCI sourced information is the exclusive property of Morgan Stanley Capital International Inc. (MSCI). Without prior written permission of MSCI, this information and any other MSCI intellectual property may not be reproduced, disseminated or used to create any financial products, including any indices. This information is provided on an "as is" basis. The user assumes the entire risk of any use made of this information. MSCI, its affiliates and any third party involved in, or related to, computing or compiling the information hereby expressly disclaim all warranties of originality, accuracy, completeness, merchantability or fitness for a particular purpose with respect to any of this information. Without limiting any of the foregoing, in no event shall MSCI, any of its affiliates or any third party involved in, or related to, computing or compiling the information have any liability for any damages of any kind. MSCI, Morgan Stanley Capital International and the MSCI indexes are services marks of MSCI and its affiliates. The Firm accepts no liability whatsoever for the actions of third parties. The Product may provide the addresses of, or contain hyperlinks to, websites. Except to the extent to which the Product refers to website material of the Firm, the Firm has not reviewed the linked site. Equally, except to the extent to which the Product refers to website material of the Firm, the Firm takes no responsibility for, and makes no representations or warranties whatsoever as to, the data and information contained therein. Such address or hyperlink (including addresses or hyperlinks to website material of the Firm) is provided solely for your convenience and information and the content of the linked site does not in anyway form part of this document. Accessing such website or following such link through the Product or the website of the Firm shall be at your own risk and the Firm shall have no liability arising out of, or in connection with, any such referenced website.

ADDITIONAL INFORMATION IS AVAILABLE UPON REQUEST
