

## Developed Market Rates

14 September 2011 | 10 pages

# Interest Rate Strategy Update

## What happens if Greece defaults?

- The risks of a disorderly default or a Greek exit from EMU are rising. While not our base case at the time of writing, we think the risks are significant enough to merit attention.
- We conclude that a combination of sharply downgraded growth expectations and a flight out of risk would mean a lower yielding flatter term-structure in euro.
- Money market and short-end flatteners are probably attractive and we think that being long Europe versus the US would make sense.
- Contagion would likely widen all spreads in EMU and would probably drive short dated German swap spreads wider too.
- Longer dated swap spreads might eventually reverse their widening if fiscal transfers come onto the agenda, although 30yr Bunds could become a beneficiary of a more pervasive financial sector crisis.
- We also take a look at the volatility surface for ways to capture blow-up trades that are a little cheaper than the highly negative carry spread widening trades: Buying forward volatility and bullish risk reversals both fit the bill.

---

### Mark Schofield

+44-20-7986-9224  
mark.schofield@citi.com

### Nishay Patel

+44-20-7986-1007  
nishay.patel@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.

Mark Schofield  
+44 207 986 9224  
mark.schofield@citi.com

The risk of a disorderly default or a country leaving EMU has risen. The most likely trigger, in our view, would be the withdrawal of funding for Greece, should the Troika deem the country to be non-compliant

A theoretical Greek default or EMU exit could happen as early as October, but we see early 2012 as more likely

# Interest Rate Strategy: Focus on EMU

## What happens if Greece defaults?

A break-up of EMU and/or a disorderly default is not our base case scenario but we think that the risks are rising rapidly. In his recent publication: [\*A Greek Exit from the Euro Area: A Disaster for Greece, a Crisis for the World\*](#), Willem Buiter examines the risks, macro economic and structural implications of such an event. In this publication we examine the possible triggers for such an event and the implications for interest rate markets.

We conclude that a combination of sharply downgraded growth expectations and a flight out of risk would mean a lower yielding flatter term-structure in the core markets and the front end of the swap curve. Money market and short-end flatteners would probably make sense and we think that being long Europe versus the US is also attractive.

Contagion would likely widen all spreads in EMU and would probably drive short dated German swap spreads wider too. Longer dated spreads might eventually reverse their widening if fiscal transfers come onto the agenda, although 30yr Bunds might be a beneficiary of a more pervasive financial sector crisis.

We also take a look at the volatility surface for ways to capture blow-up trades that are a little cheaper than the highly negative carry spread widening trades

## Risks of a disorderly default and/or EMU exit are rising

Our core view remains the “you break it, you own it Europe” scenario highlighted in Willem Buiter’s recent publication: [\*The future of the euro area: fiscal union, break-up or blundering towards a “you break it you own it Europe\*](#). This entails a Europe featuring large liquidity facilities to support solvent but liquidity strained sovereigns and banks, significant debt restructuring in insolvent sovereigns and a broad and deep support mechanism for the banking sector.

Nevertheless, a disorderly unraveling is looking an ever increasing risk whether that is through a consensual default that turns ugly, a non-consensual default within EMU or an exit from EMU, the latter coming either from one or more peripheral countries or even a core country. Bail-out fatigue among core European electorates and politicians and austerity fatigue among their counterparts in the economically weaker countries is rising and the policy inertia that this is fuelling is generating increasing frustration at the ECB and the IMF.

The most likely scenario under which a disorderly break-up could happen (although this is not our current base case) is that Greek politicians, under huge pressure from an exasperated electorate, renege on further austerity measures and reforms. As a result the Troika decides to withdraw its funding support under the condition of non-compliance and the ECB no longer purchases Greek government debt or provides liquidity to the banking sector. Faced with a run on the banks and the impossible challenge of financing a still deteriorating debt burden, Greece is then left with little choice but to default on its debt obligations.

If Greece is forced to leave the euro area involuntarily, it does not really matter for the scale of the financial disaster that follows whether it is allowed to or decides to stay in the EU or not. The main driver of systemic financial destruction would be Greek exit from the euro area. Conceivably, a Greek exit from the euro area could happen anytime, including very soon, say, following a refusal by the Troika to disburse the €8bn fifth instalment of the first Greek adjustment programme in September or October this year.

We are not saying that a refusal by the Troika to fund the Greek sovereign (if determined to be wilfully non-compliant) would be tantamount to an expulsion of Greece from the euro area. Only the further refusal by the ECB to permit the Greek banks to be funded by the Eurosystem and by the Greek ELA would amount to a difficult-to-resist 'invitation' to Greece to leave the euro area.

Rather than Greece being found non-compliant in the September 2011 Quarterly Appraisal by the Troika, it is more likely that there will be one or two further quarterly reviews of the Greek adjustment programme, in December 2011 and March 2012, before Greece is declared by the Troika to be wilfully non-compliant with the conditionality of the programme and is cut off from further official funding. This would then, in our view, bring deep restructuring of the claims on the Greek sovereign held by the private sector, the Greek Loan Facility and the EFSF. The IMF is likely to be protected by its preferred creditor status. The treatment of the Greek sovereign debt held by the ECB/Eurosystem could depend on whether the Eurosystem and the Greek ELA remain open to the Greek banks. If Greece's banks remain funded, there would in all likelihood not be a Greek exit from the euro area, although there would be deep PSI and OSI.

## Implications of a Greek default

**A disorderly default would likely entail significant debt write-downs leading to losses in the banking sector of other nations and thus rapid contagion**

If there was a default, we believe widespread public and private sector involvement through debt write-downs seem inevitable. We estimate 65-80% of face value, but this could rise to 90-100% in time as the economy slows further. This is already becoming priced into the Greek curve and so the greater impact is likely to be the contagion effect to the other tier 3 markets with a precedent for non-consensual default having been set. Significant debt write-down is not yet priced into the Portuguese and Irish curves.

Tier 2 spreads would also likely widen significantly. Italy, Spain and Belgium are not insolvent; they suffer from impaired liquidity and risk aversion. A default by an EMU sovereign is, however, highly likely to escalate the risk of huge losses among the banking sectors of these countries on peripheral debt write-down which would exacerbate sovereign debt burden and ratings concerns.

The threat to the banks is an issue that is worrying investors in France. The increased likelihood of fiscal transfers to support the tier two countries in the face of a tier three default would also put pressure on the credit rating of the fiscally weaker tier one countries. Just how bad this could become is unclear, but a ratings downgrade to a large tier one country such as France could jeopardise the rating of the EFSF and undermine the effectiveness of this as a funding tool. This would create a very negative feedback loop. Such a move could possibly force the hand of the ECB to extend its market stability program but, given the above mentioned political frustrations, not before the situation had deteriorated substantially.

**Even tier one countries are vulnerable and with that in mind a pan-European economic slowdown looks likely**

With the banking sector under threat and funding drying up we would expect economic growth in most of Europe to come under further downward pressure. Liquidity injections, monetary easing and possibly even a reversal of fiscal tightening are then all possible. This would probably mean an even flatter money-market curve, as rates would probably have to stay low for a long time. We would expect a further cheapening of government debt against swaps in all but Germany, where flight to quality trades would probably continue to support spreads. German spreads could cheapen if a clear move towards fiscal union was to occur, but we think this would probably be a second or even third round event. Volatility would initially, we think, spike much higher, but we are not convinced that the move would be sustainable, particularly in the top-left of the grid where the ECB may be forced to anchor short rates more transparently.

The cost of leaving EMU would be ruinous for Greece

The implications for the rest of the euro area are also severe with decreased competitiveness, falling confidence and strained liquidity

Yield likely to head lower, predominantly in the long end. Buying 10yr Bunds or receiving in 10yr swaps look like the best trades in the crisis scenario

## Implications of an exit from EMU

The impact on Greece of leaving EMU would be very costly indeed. The new currency introduced would almost certainly collapse, we think by 40-50%. With existing financial contracts denominated in Euro this would trigger a run on the banks and a collapse of the banking system, deep recession and possibly hyper-inflation. Buiter sums it up thus, in *A Greek Exit from the Euro Area: A Disaster for Greece, a Crisis for the World*: “the bottom line for Greece from an exit is therefore a financial collapse and an even deeper recession than the country is already experiencing – probably a depression”.

Trading this scenario in Greek debt is, however, likely to be almost impossible. Default risk around current instruments, a very modest NPV write-down embedded in proposed new securities and the evaporation of liquidity make the market virtually untradeable.

The implications for the rest of the Euro area are also severe. The first key point is that a taboo will have been broken. With precedent set we expect significant contagion in spreads as described above. Higher funding costs on rising perceived default/exit risk and the associated flight from capital and deposits from all but the hardest core currencies would probably weigh heavily on these economies. Core countries would also likely suffer too, however, as a Euro with reduced default risk would likely appreciate sharply, damaging competitiveness. Again, this would probably lead to a significant further injection of stimulus from the ECB...low interest rates for a very long time, a flatter core curve, reduced curvature in mid-curve, further pressure on non-core swap spreads and a spike in volatility.

## Strategy summary:

### Duration

It is tough to imagine how core yields in Europe or shorter dated yields on the Euribor curve can go anywhere but lower in a dis-orderly default or EMU exit scenario. Flight to quality and downgrades to growth expectations would likely engender expectations of low and stable rates for a long time.

The front end of the German curve at 0.55% for the 2yr has limited scope to rally (although we note that 2yr US Treasuries are at 0.20% and JGBs at 0.14%). The 5yr at 1.0%, the 2yr swap at 1.5% and the 5yr swap at 2% do, however, seem to have room to fall further.

Many comparisons to Japan's lost decade are being made, we believe that the slow BoJ policy response in the 1990s makes comparisons harder, but a look at the term structure in Japan between 2002 and 2007 when rates had hit zero and the Rinban was in place, but before the global financial crisis erupted, might be a useful benchmark as to where core EMU yields could go.

Figure 1. Government Bond Yields and Yield Curves

	2yr	5yr	10yr	30yr	2s10s	10s30s	Curvature
Japan 2002-07 Average	0.23	0.66	1.38	2.21	1.15	0.83	0.84
DBR	0.55	1.01	1.85	2.73	1.30	0.88	0.87
Difference	-0.32	-0.35	-0.47	-0.52	-0.15	-0.05	-0.04

Source: Citi Investment Research and Analysis

**We think reds-blues flatteners in Euribor would be the best curve trade. In an extreme crisis the 100bp spread could go to almost zero**

**Buy 5yr Bobls against 5yr UST or**

**Receive 2yr EUR 3yr fwd vs 2yr USD 3yr fwd**

**Sell tier two spreads versus core markets**

**Receive 5yr Bobl spread versus paying 30yr Bund spread**

## Yield curve

However the scenario unwinds, we think the expected impact on growth will be enduring. Rates may have to stay low for a very long time. Flatteners in the money market curve and in the 2-5yr sectors of the core government and the EUR swap curve make sense in this scenario.

The Japan comparison does not bear this out as much as it does the argument for lower yields; however the different central bank mandates and the emergence of deflation in Japan probably lead the market to underestimate just how long short rates could stay at zero. We would expect a faster transmission of the expression of such risks in the case of the euro curve

## Cross-market trades

Growth expectations in Europe are likely to remain under pressure under most scenarios. In the US, meanwhile, economic sentiment appears to be stabilising somewhat.

With further stimulus in Europe likely to come in the form of extra liquidity and lower rates as opposed to the duration extension trades expected in the US, buying 5yr Bobls against 5yr US Treasuries or receiving 5yr EUR swaps against 5yr USD look attractive to us. Similarly receiving EUR 2yr3yr fwd or 2yr 4yr fwd vs USD at a pick up of 48bp and 35bp respectively look like trades with significant scope to move; we think 2yr EUR swaps could trade under 2yr USD swaps over the next few years.

## EMU spread trades

In a disorderly default it is hard to see EMU spreads doing anything but widen. We think this applies across all issuers but we are wary, however, of recommending an aggressive position among AAA names. These spreads have already widened and it is possible that speculation over the burden of fiscal transfer could eventually reverse spreads between Germany and the rest of tier one.

Tier two spreads look very vulnerable despite the presence of the ECB's SMP. The ECB appears very reluctant to stray from its mandate and uncomfortable with its ongoing role as a provider of market stability. In the event of a disorderly crisis we think spread widening would be fast and of significant magnitude and that the ECB would be unlikely to be able to do much about it until the dust settles.

Selling tier two spreads is an expensive trade to carry, but we note that the cost of being short BTPS against Bunds for six months is 20bp while the standard deviation of the spread is 70bp.

## Swap spread wideners

Swap spreads are tough to call as the outcome of the flight-to-quality versus fiscal transfer argument is unclear. We think that 2yr Schatz spreads probably continue widening in a crisis environment, testing the 2008 highs.

## Swap spread flatteners

5yr and 10yr Bobl and Bund spreads are already close to 2008 highs but a large fiscal transfer to support weaker tier 1 and tier 2 countries could reverse this. Alternatively a full-scale financial market collapse could mean that Bunds are the only asset investors will consider, in which case 30yr spreads are probably cheap. We would consider a swap spread flattener in Germany (5s30s bond flattener versus 5s30s swap steepener).

## CDS basis trades

### Receive 5yr BTAN ASW and sell 5yr CDS

The French basis spread (CDS vs ASW) has increased by 120bps over the last 3 months, a sharp move in our view. This has almost entirely been driven by the 5yr CDS leg which has widened by over 110bps during the same period.

In contrast, the basis spread in the Netherlands has widened by approximately 80bps during the last 3 months. Interestingly, this has been a result of 5yr CDS in the Netherlands increasing by 55bps and the ASW level falling by 25bps (bonds outperforming swaps).

At current levels, we see good value in taking advantage of the recent moves in the French basis spread by selling OATs in ASW and selling 5yr France CDS.

## Volatility

### Sell 3m10y EUR ATMF straddle and buy 1y10y ATMF straddle. Cost at time of writing 0.38% net. This rolls up to a 9m10y which currently trades at 0.78%

Volatility may be the toughest call of all. It is hard to see volatility, particularly gamma risk, going lower in an environment where sovereigns are defaulting and the future of EMU is under threat. That said, the Japan experience tells us that the top left of the grid is hugely overpriced for an environment in which short rates are on hold for a long period of time.

As noted above, we think the Greek PSI exchange will probably go through and we expect the Troika to give Greece more time before withdrawing funding. Thus selling short expiries where implied volatilities are unlikely to be realised and using this to get long forward volatility is probably an attractive strategy.

### Sell ATM +10bp payer versus buy ATM -10bp receiver on EUR 6m10yr for zero cost

The skew has understandably moved recently with 6m10yr 10bp OTM receivers richening by about 1.25 vol against 10bp OTM payers. That said, the roll-down on the curve will still offset this. Buying a +/-10bp bullish risk reversal on 6m10yr has breakevens at spot -1.5bp and spot +18.5bp.



## 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

---

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 [www.citigroupgeo.com](http://www.citigroupgeo.com). 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.

### 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 Ltd

Mark Schofield; Nishay Patel; Willem Buiter

### OTHER DISCLOSURES

---

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. Incorporated (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](http://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](http://www.morganstanleysmithbarney.com/researchdisclosures). The required disclosures provided by Morgan Stanley and Citigroup Global Markets, Inc. on Morgan Stanley and CIRA research relate in part to the separate businesses of Citigroup Global Markets, Inc. and Morgan Stanley that now form Morgan Stanley Smith Barney LLC, rather than to Morgan Stanley Smith Barney LLC in its entirety. For Morgan Stanley and Citigroup Global Markets, Inc. specific disclosures, you may refer to [www.morganstanley.com/researchdisclosures](http://www.morganstanley.com/researchdisclosures) and [https://www.citigroupgeo.com/geopublic/Disclosures/index\\_a.html](https://www.citigroupgeo.com/geopublic/Disclosures/index_a.html). 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. Foro Buonaparte 16, 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 Global Equities Online (GEO) website. If you have questions regarding GEO, 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, which is regulated by Malaysia Securities Commission. Menara Citibank, 165 Jalan Ampang, Kuala Lumpur, 50450. 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 Comisión Nacional Bancaria y de Valores. Reforma 398, Col. Juárez, 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 **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 1 Temasek Avenue, #39-02 Millenia Tower, Singapore 039192, 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 Gasset, 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 [www.citigroupgeo.com](http://www.citigroupgeo.com).

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.

---

© 2011 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

---