February 13, 2014

Goldman Sachs

United States

The Mortgage Analyst

Credit Strategy Research

Forecasting the mortgage basis

For the exclusive use of QYANG@SPMLLC.COM

OAS and mortgage basis have pros and cons as valuation metrics

Two valuation measures commonly used by MBS investors are the option adjusted spread (OAS) and the mortgage basis. The two metrics have offsetting advantages and disadvantages. The basis – defined as the spread between a par 30-year mortgage yield and a par Treasury yield – has the advantage of simplicity: its calculation does not require the use of a complex prepayment model. A disadvantage of the basis, though, is that it does not account for the fact that the duration and convexity of a current coupon mortgage changes over time. While today it may be reasonable to calculate mortgage basis as the spread between a mortgage rate and a 10-year Treasury rate, in earlier time periods a comparison to a 5-year or shorter maturity Treasury rate was more appropriate. In our study, we analyze and forecast the mortgage basis, taking into account changes to mortgage duration and convexity as well as other fixed income market benchmarks.

Mortgage basis looks close to fair given tight swap spreads…

The mortgage basis currently appears roughly in line with long run patterns. While the raw basis is tighter than historical average levels, this is largely explained by tightening of other financial variables such as swap spreads and rates volatility. After adjusting for these factors, mortgage basis appears just a few basis points tight, an effect possibly due to the combination of low supply and high Federal Reserve demand for MBS. A similar result obtains for option adjusted spreads, which also look close to expected levels vs. long run relationships with other fixed income spreads.

…but a widening of swap spreads could imply a widening basis

While mortgage spreads look close to the level we would expect given the currently tight level of swap spreads, if swap spreads gradually widen from here, as we expect, we would predict that the mortgage basis would also have to widen in sympathy.

Charles P. Himmelberg
(917) 343-3218 charles.himmelberg@gs.com
Goldman, Sachs & Co.

Marty Young
(917) 343-3214 marty.young@gs.com
Goldman, Sachs & Co.

Hui Shan
(212) 902-4447 hui.shan@gs.com
Goldman, Sachs & Co.

Chris Henson
(801) 741-5755 chris.henson@gs.com
Goldman, Sachs & Co.

This research is focused on investment themes across markets, industries and sectors. It does not attempt to distinguish between the prospects or performance of, or provide analysis of, individual companies within any industry or sector we describe. Investors should consider this research as only a single factor in making investment decisions. For Reg AC certification and other important disclosures, see the Disclosure Appendix, or go to www.gs.com/research/hedge.html.

Mortgage basis vs. OAS: competing valuation measures

Mortgage backed securities investors typically evaluate bond yields as a spread relative to a benchmark rate such as Treasuries or swaps. Two common spread measures are the option adjusted spread (OAS), and the basis (defined as the simple difference between a par mortgage yield and a par Treasury yield). Exhibit 1 shows the historical trends in mortgage basis and mortgage OAS over the past 15 years, and Exhibit 2 shows the difference between these measures. The broad trends in the OAS and the basis are similar, though, per Exhibit 2, the series do not move exactly in parallel[1].

OAS has a number of potential conceptual advantages to the mortgage basis.

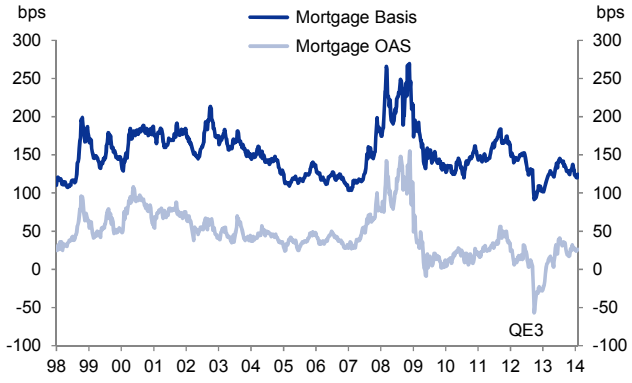
1. Basis compares mortgage yields to an arbitrarily chosen Treasury yield (e.g., the 10-year yield, or the 5-year yield, or the average of the two), whereas OAS automatically accounts for the timing of MBS cash flows.

2. OAS modeling accounts for interest rate volatility while basis does not. For example, a decline in expected rate volatility will typically cause mortgage rates and thus basis to compress. The tight basis in this case could be mis-interpreted as a signal that mortgages are too rich, whereas in fact it is a proper reflection of the reduced option costs associated with mortgages in a low volatility environment.

While OAS enjoys potential theoretical advantages over the mortgage basis as a valuation measure, the basis has strong offsetting advantages: namely, the basis is simple to compute, and is not dependent on complex prepayment and yield curve models. Exhibit 3 shows current coupon mortgage OAS time series from three different industry models; the differences across the series highlights the sensitivity of OAS to modeling assumptions.

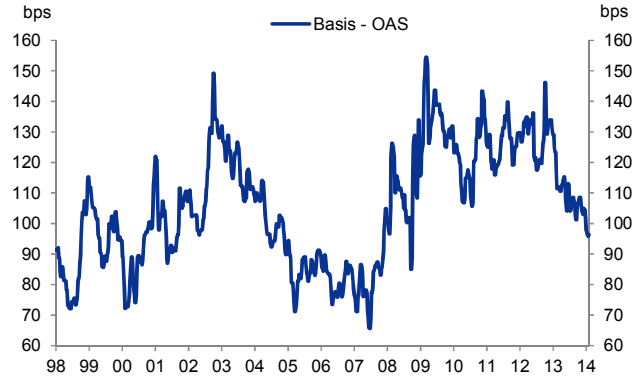
For these reasons the mortgage basis remains a popular series for MBS investors. In this note, we develop a model of the mortgage basis, accounting for market factors such as swap spreads and rates volatility. We find that, relative to these drivers, the basis, like the OAS, now appears close to fair or expected value. However, if these drivers of basis widen gradually during 2014, as we expect, then mortgage spreads could widen as well.

Exhibit 1: Mortgage basis and mortgage OAS are now slightly below long run average levels
30-year mortgage-vs.-Treasury OAS and mortgage-vs.-Treasury basis (par mortgage yield minus average of 5- and 10-year Treasury yields)



Source: Haver and Goldman Sachs Global Investment Research

Exhibit 2: The spread between mortgage OAS and mortgage basis has varied over time
Spread between 30-year mortgage OAS and mortgage basis

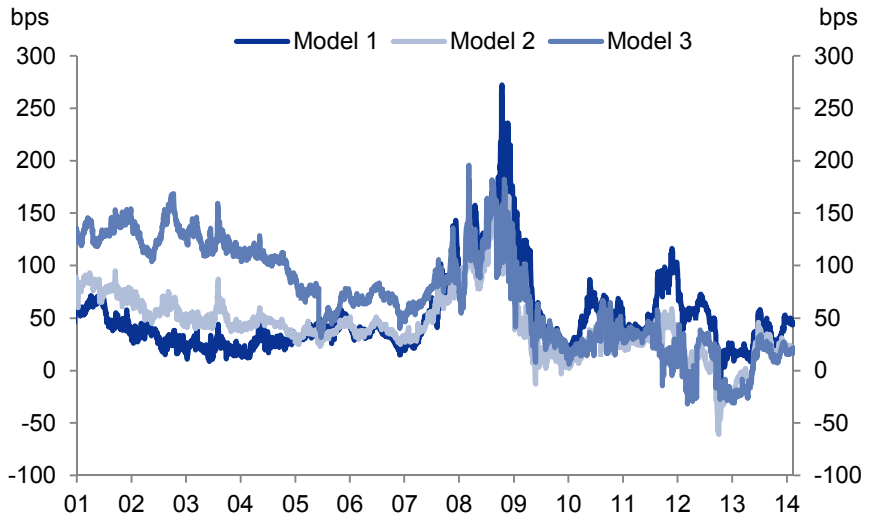


Source: Haver and Goldman Sachs Global Investment Research

[1] For a more detailed description of mortgage OAS, see, e.g., "What is negative mortgage OAS telling us", The Mortgage Analyst, February 21, 2013, https://360.gs.com/gs/portal?action=action.doc&d=14532974.

For the exclusive use of QYANG@SPMLLC.COM

Exhibit 3: OAS estimates from different industry prepay models show similar but not identical long-run trends
30-year current coupon mortgage option adjusted spread to treasuries



Source: Haver, Bloomberg and Goldman Sachs Global Investment Research

For the exclusive use of QYANG@SPMLLC.COM

Mortgage basis is simpler than OAS, but comes with a cost

A key advantage of the mortgage basis is that it does not require the use of complex prepayment and interest rate diffusion models. However, this simplicity comes at cost, as the basis does not account for changes in the rates environment or in mortgage prepay behavior. We describe some of the specific potential biases in the mortgage basis measure, and identify controls that can be used in a basis model.

The optimal Treasury rate for calculating basis changes over time

In Exhibit 1, basis was calculated as the mortgage rate minus the average of the 5- and 10-year Treasury rates. Other analysts have defined the basis as just the mortgage rate minus the 10-year Treasury rate. Which is the right Treasury rate for benchmarking mortgages? In principal, we want to choose the Treasury instrument which has a duration comparable to a mortgage duration, but this choice has varied significantly over time. Thus, some of the variation in a mortgage basis calculated as mortgage rate minus 10-year Treasury rate will come from the fact that, in certain periods, a mortgage and a 10-year Treasury instrument may have very different durations.

Exhibit 4 shows that Treasury bond durations have increased over time as Treasury rates have fallen. The reason for this pattern is that, as coupons decline, the final principal payment at year 10 becomes a larger fraction of total bond cashflow. Exhibit 5 shows that mortgage durations have also varied over time, but not nearly in parallel with Treasury durations. In addition to the coupon effect, which influences MBS as well as Treasuries, mortgage durations change due to changes in borrower prepay behavior and curve slope.

By interpolating between the 2-year, 5-year and 10-year Treasury durations, we can estimate the effective Treasury maturity that matches a current coupon mortgage maturity; this is shown in Exhibit 6. The effective maturity was 5 years in 2003, a time when borrowers refinanced quickly and mortgage durations were short. Currently the effective

maturity is above 8 years. There is clearly no single definition of the basis that will match mortgage vs. Treasury durations in all time periods; we have chosen the 5- and 10-year blended Treasury rate as a compromise that will be reasonable in most but not all periods.

Mortgage convexity and option cost change over time

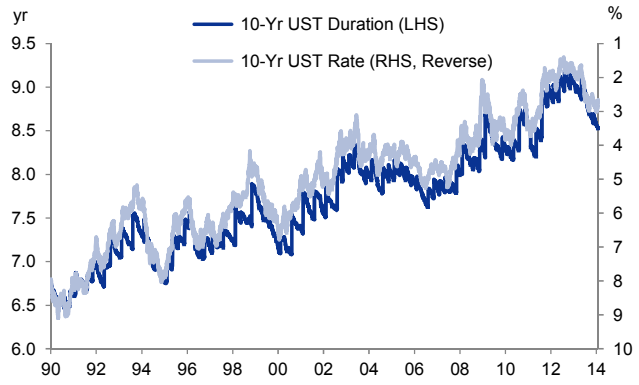
A large fraction of the spread between mortgage rates and Treasury rates reflects compensation for the negative convexity of mortgages. This convexity, too, changes over time, for two reasons: (a) interest rate volatility varies over time and (b) borrower behavior with respect to exercising the prepayment option varies over time.

Exhibit 7 shows implied interest rate volatilities; the 2y10y vol varied from less than 70 bp to more than 150 bp over this period. Higher volatility, of course, raises the cost of the prepay option, which should flow through to a wider mortgage basis. Exhibit 8 shows the change in borrower refinance rates from 2003 to 2013. In 2003, borrowers 150-200 bp in the money to refinance prepaid at 74 CPR, vs. 38 CPR for borrowers in 2013. The slower prepayments in 2013 should make option costs smaller than in pre-crisis periods, which would tighten mortgage basis. An OAS model can, in principal, account for these changes to the value of the refinance option over time, while a simple mortgage basis does not.

Mortgage basis vs. mortgage OAS: A case study

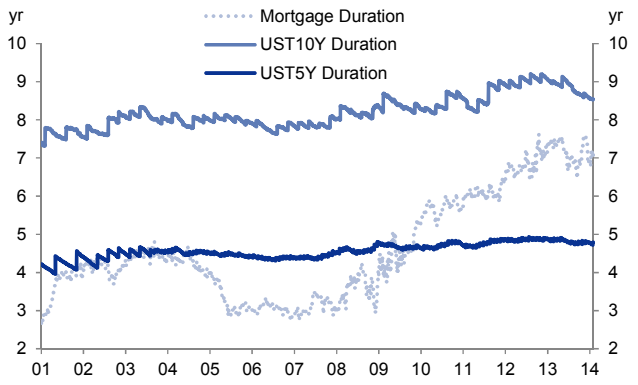
A sample time period when OAS sent a clearer pricing signal than mortgage basis was late 2012-early 2013, in the early months of QE3. Exhibit 1 shows that OAS reached historically unprecedented negative levels at that time, a strong indication that pricing may have been rich. By comparison, the mortgage basis post-QE3 was comparable to 2006 basis levels, possibly suggesting to some observers that mortgage prices were still within a historically normal range. This basis comparison, though, fails to account for the low rate volatilities and flat yield curve of 2006. After accounting for these factors, mortgage spreads in 2006 look normal, but they look too tight post-QE3.

Exhibit 4: 10-year Treasury bond duration increases as 10-year Treasury coupon rates decrease
10-year Treasury duration vs. 10-year Treasury rate



Source: Goldman Sachs Global Investment Research

Exhibit 5: Mortgage durations have not moved in parallel with Treasury durations
5-year Treasury duration, 10-year Treasury duration, and current coupon mortgage duration



Source: Goldman Sachs Global Investment Research

For the exclusive use of QYANG@SPMLLC.COM

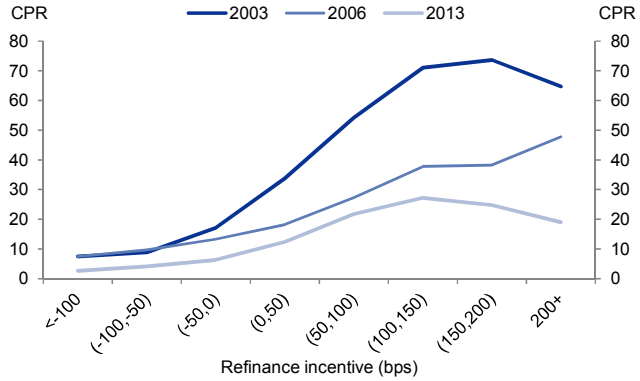
Exhibit 6: The optimal Treasury maturity for benchmarking mortgages has increased
Estimated effective Treasury maturity matching a 30-year current coupon mortgage duration

Source: Goldman Sachs Global Investment Research

Exhibit 7: Interest rate volatility varies over time…
Implied normal ATM swaption volatilities

Source: Goldman Sachs Global Investment Research

Exhibit 8: … as does borrower refinance behavior
Annualized conditional prepayment rate vs. refinance incentive, 2003, 2006, and 2013 exposure years, 30-year conventional mortgages, 12-30 WALA



Source: eMBS, Freddie Mac and Goldman Sachs Global Investment Research

Forecast model suggests basis close to fair, but may widen in 2014

Model of the mortgage basis suggests spreads now close to fair…

Mortgage spreads are driven by, among other factors, the returns on competing spread products. Exhibit 9, for example, shows the general tendency of mortgage basis to widen and tighten along with swap spreads. Swap spreads have been interpreted as a liquidity

For the exclusive use of QYANG@SPMLLC.COM

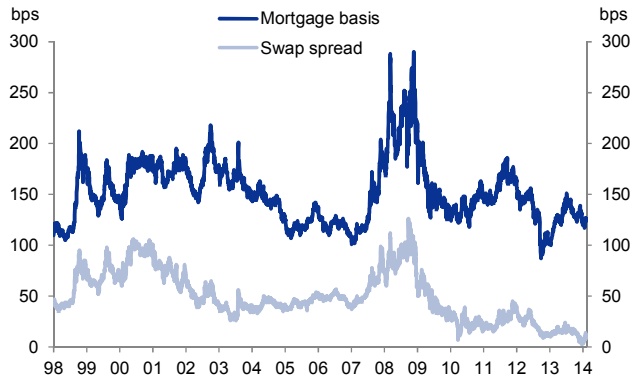
premium[2]: in crisis periods such as 1998 or 2009, investors have high demand for liquid Treasury bonds, and both swap-vs.-Treasury and mortgage-vs.-Treasury spreads widen.

Exhibit 10 shows the results of a regression model that predicts mortgage basis, using a model incorporating 5-year swap spreads, IG credit spreads, 2s10s Treasury curve slope, 1y x 2y swaption volatility, and MBA refinance index levels. The curve slope, volatility, and refinance index measures were included to help correct for the potential limitations of the mortgage basis discussed above.

The regression model was fit using data through 6/2007, and then applied out-of-sample to data beyond that time period. The in-sample adjusted R-squared for the regression is 94%. All the predictor variables are positively correlated with mortgage basis: as swap spread or credit spread widens, or as the yield curve steepens, or as rates volatility or the refi index increase, the mortgage basis is predicted to widen.

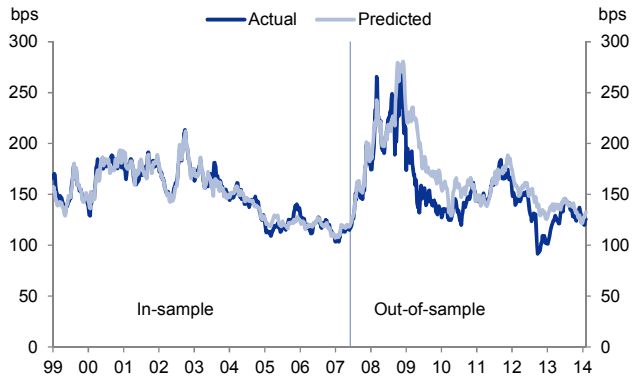
Actual basis was tighter than predicted basis in the months after the QE1 and QE3 announcements, suggesting that the Fed MBS purchases lowered mortgage rates, as intended. As of the most recent data point, though, the regression model suggests actual basis is only 5bp tighter than model predicted basis. Alternative model specifications and estimation time periods generally point to the same conclusion, that basis is now just a few bp tight to the level one would predict given the current market environment.

Exhibit 9: Mortgage basis has been correlated with swap vs. Treasury spreads
Mortgage basis (mortgage yield minus average of 5- and 10-year Treasury yields) and 5-year swap spread (5-year swap rate minus 5-year Treasury rate)



Source: Goldman Sachs Global Investment Research

Exhibit 10: Mortgage basis appears close to level predicted by regression model vs. swap spreads, credit spread, curve slope, swaption volatility, and refinance index
Actual mortgage basis vs. regression model predicted basis



Source: Goldman Sachs Global Investment Research

…but the model implies basis would widen if swap spreads widen

While mortgage basis looks close to expected levels conditional on current swap spreads, Exhibit 9 shows that these swap spreads are themselves unusually low now by historical standards. In the December 2013 Fixed Income Monthly[3], our rates strategists describe swap spreads as currently being low relative to what would be predicted based on present macro-economic conditions, citing market technical factors that could be driving tight swap

[2] M. Grinblatt, "An Analytic Solution for Interest Rate Swap Spreads", *International Review of Finance*, September 2001.

[3] "Key Questions for the Macro Rates Investor", December 2013 Fixed Income Monthly, https://360.gs.com/gs/portal/?action=action.doc&d=16195178.

For the exclusive use of QYANG@SPMLLC.COM

spreads. Their macro model implies about 30 bp of widening in 10-year swap spreads through 2016 from current levels.

From Exhibit 9, each upturn in swap spreads appears to be correlated with a larger magnitude upturn in mortgage basis. Regression models suggest that mortgage basis tends to widen 1.2 bp for every 1.0 bp widening of swap spreads. Combining this 1.2x regression coefficient with a 30 bp projected widening of swap spreads would imply 36 bp widening of mortgage basis over the next few years, a large move. However, there are potentially offsetting factors which work in the opposite direction. For example, credit spreads are positively correlated with mortgage basis, and we are projecting a tightening of credit spreads going forward ("Growth fears are an opportunity to get long CDX IG", Credit Notes, February 6, 2014). We also expect a flattening of the Treasury 2s10s curve from 250 bp today to 125 bp by 2016, which, according to the regression model, should also contribute to tightening of the mortgage basis. Taking all factors into account, a gradual mortgage basis widening of 10-20 bp is suggested.

Of course, historical regression models can never be treated as conclusive, and this is particularly the case in the present context, given the large changes that have occurred in the MBS market over the past decade. Thus, predictions from the model above should necessarily be interpreted with a wide confidence interval around the point forecast. Nevertheless, the model can be useful in highlighting the observations that (a) mortgage spreads now appear close to fair value relative to market fundamentals, but (b) mortgage spreads are highly correlated with other market spreads, and thus could be vulnerable to a cheapening across competing spread products.

Marty Young

For the exclusive use of QYANG@SPMLLC.COM

Disclosure Appendix

Reg AC

We, Charles P. Himmelberg, Marty Young, Hui Shan and Chris Henson, hereby certify that all of the views expressed in this report accurately reflect our personal views about the subject company or companies and its or their securities. We also certify that no part of our compensation was, is or will be, directly or indirectly, related to the specific recommendations or views expressed in this report.

Disclosures

Regulatory disclosures

Disclosures required by United States laws and regulations

See company-specific regulatory disclosures above for any of the following disclosures required as to companies referred to in this report: manager or co-manager in a pending transaction; 1% or other ownership; compensation for certain services; types of client relationships; managed/co-managed public offerings in prior periods; directorships; for equity securities, market making and/or specialist role. Goldman Sachs usually makes a market in fixed income securities of issuers discussed in this report and usually deals as a principal in these securities.

The following are additional required disclosures: **Ownership and material conflicts of interest:** Goldman Sachs policy prohibits its analysts, professionals reporting to analysts and members of their households from owning securities of any company in the analyst's area of coverage. **Analyst compensation:** Analysts are paid in part based on the profitability of Goldman Sachs, which includes investment banking revenues. **Analyst as officer or director:** Goldman Sachs policy prohibits its analysts, persons reporting to analysts or members of their households from serving as an officer, director, advisory board member or employee of any company in the analyst's area of coverage. **Non-U.S. Analysts:** Non-U.S. analysts may not be associated persons of Goldman, Sachs & Co. and therefore may not be subject to NASD Rule 2711/NYSE Rules 472 restrictions on communications with subject company, public appearances and trading securities held by the analysts.

Additional disclosures required under the laws and regulations of jurisdictions other than the United States

The following disclosures are those required by the jurisdiction indicated, except to the extent already made above pursuant to United States laws and regulations. **Australia:** Goldman Sachs Australia Pty Ltd and its affiliates are not authorised deposit-taking institutions (as that term is defined in the Banking Act 1959 (Cth)) in Australia and do not provide banking services, nor carry on a banking business, in Australia. This research, and any access to it, is intended only for "wholesale clients" within the meaning of the Australian Corporations Act, unless otherwise agreed by Goldman Sachs. **Brazil:** Disclosure information in relation to CVM Instruction 483 is available at http://www.gs.com/worldwide/brazil/area/gir/index.html. Where applicable, the Brazil-registered analyst primarily responsible for the content of this research report, as defined in Article 16 of CVM Instruction 483, is the first author named at the beginning of this report, unless indicated otherwise at the end of the text. **Canada:** Goldman, Sachs & Co. has approved of, and agreed to take responsibility for, this research in Canada if and to the extent it relates to equity securities of Canadian issuers. Analysts may conduct site visits but are prohibited from accepting payment or reimbursement by the company of travel expenses for such visits. **Hong Kong:** Further information on the securities of covered companies referred to in this research may be obtained on request from Goldman Sachs (Asia) L.L.C. **India:** Further information on the subject company or companies referred to in this research may be obtained from Goldman Sachs (India) Securities Private Limited; **Japan:** See below. **Korea:** Further information on the subject company or companies referred to in this research may be obtained from Goldman Sachs (Asia) L.L.C., Seoul Branch. **New Zealand:** Goldman Sachs New Zealand Limited and its affiliates are neither "registered banks" nor "deposit takers" (as defined in the Reserve Bank of New Zealand Act 1989) in New Zealand. This research, and any access to it, is intended for "wholesale clients" (as defined in the Financial Advisers Act 2008) unless otherwise agreed by Goldman Sachs. **Russia:** Research reports distributed in the Russian Federation are not advertising as defined in the Russian legislation, but are information and analysis not having product promotion as their main purpose and do not provide appraisal within the meaning of the Russian legislation on appraisal activity. **Singapore:** Further information on the covered companies referred to in this research may be obtained from Goldman Sachs (Singapore) Pte. (Company Number: 198602165W). **Taiwan:** This material is for reference only and must not be reprinted without permission. Investors should carefully consider their own investment risk. Investment results are the responsibility of the individual investor. **United Kingdom:** Persons who would be categorized as retail clients in the United Kingdom, as such term is defined in the rules of the Financial Conduct Authority, should read this research in conjunction with prior Goldman Sachs research on the covered companies referred to herein and should refer to the risk warnings that have been sent to them by Goldman Sachs International. A copy of these risks warnings, and a glossary of certain financial terms used in this report, are available from Goldman Sachs International on request.

European Union: Disclosure information in relation to Article 4 (1) (d) and Article 6 (2) of the European Commission Directive 2003/126/EC is available at http://www.gs.com/disclosures/europeanpolicy.html which states the European Policy for Managing Conflicts of Interest in Connection with Investment Research.

Japan: Goldman Sachs Japan Co., Ltd. is a Financial Instrument Dealer registered with the Kanto Financial Bureau under registration number Kinsho 69, and a member of Japan Securities Dealers Association, Financial Futures Association of Japan and Type II Financial Instruments Firms Association. Sales and purchase of equities are subject to commission pre-determined with clients plus consumption tax. See company-specific disclosures as to any applicable disclosures required by Japanese stock exchanges, the Japanese Securities Dealers Association or the Japanese Securities Finance Company.

Ratings, coverage groups and views and related definitions

Credit Research assigns ratings to designated on-the-run ("OTR") debt securities of issuing companies. **Definitions of Ratings: OP = Outperform.** We expect the total return to outperform the median total return for the analyst's coverage group over the next 6 months. **IL = In-Line.** We expect the total return to perform in line with the median total return for the analyst's coverage group over the next 6 months. **U = Underperform.** We expect the total return to underperform the median total return for the analyst's coverage group over the next 6 months.

NR = Not Rated. The investment rating, if any, has been removed pursuant to Goldman Sachs policy when to Goldman Sachs is acting in an advisory capacity in a merger or strategic transaction involving this company and in certain other circumstances. **NC = Not Covered.** Goldman Sachs does not cover this company. **RS = Rating Suspended.** Goldman Sachs Research has suspended the investment rating for this credit, because there is not a sufficient fundamental basis for determining, or there are legal, regulatory or policy constraints around publishing, an investment rating. The previous investment rating is no longer in effect for this credit and should not be relied upon. **CS = Coverage Suspended.** Goldman Sachs has suspended coverage of this company. **NA = Not Available or Not Applicable.** The information is not available for display or is not applicable.

For the exclusive use of QYANG@SPMLLC.COM

Coverage views: The coverage view represents each analyst's or analyst team's investment outlook on his/her/their coverage group(s). The coverage view will consist of one of the following designations: **Attractive (A).** The investment outlook over the following 6 months is favorable relative to the coverage group's historical fundamentals and/or valuation. **Neutral (N).** The investment outlook over the following 6 months is neutral relative to the coverage group's historical fundamentals and/or valuation. **Cautious (C).** The investment outlook over the following 6 months is unfavorable relative to the coverage group's historical fundamentals and/or valuation.

Global product; distributing entities

The Global Investment Research Division of Goldman Sachs produces and distributes research products for clients of Goldman Sachs on a global basis. Analysts based in Goldman Sachs offices around the world produce equity research on industries and companies, and research on macroeconomics, currencies, commodities and portfolio strategy. This research is disseminated in Australia by Goldman Sachs Australia Pty Ltd (ABN 21 006 797 897); in Brazil by Goldman Sachs do Brasil Corretora de Títulos e Valores Mobiliários S.A.; in Canada by Goldman, Sachs & Co. regarding Canadian equities and by Goldman, Sachs & Co. (all other research); in Hong Kong by Goldman Sachs (Asia) L.L.C.; in India by Goldman Sachs (India) Securities Private Ltd.; in Japan by Goldman Sachs Japan Co., Ltd.; in the Republic of Korea by Goldman Sachs (Asia) L.L.C., Seoul Branch; in New Zealand by Goldman Sachs New Zealand Limited; in Russia by OOO Goldman Sachs; in Singapore by Goldman Sachs (Singapore) Pte. (Company Number: 198602165W); and in the United States of America by Goldman, Sachs & Co. Goldman Sachs International has approved this research in connection with its distribution in the United Kingdom and European Union.

European Union: Goldman Sachs International authorised by the Prudential Regulation Authority and regulated by the Financial Conduct Authority and the Prudential Regulation Authority, has approved this research in connection with its distribution in the European Union and United Kingdom; Goldman Sachs AG and Goldman Sachs International Zweigniederlassung Frankfurt, regulated by the Bundesanstalt für Finanzdienstleistungsaufsicht, may also distribute research in Germany.

General disclosures

This research is for our clients only. Other than disclosures relating to Goldman Sachs, this research is based on current public information that we consider reliable, but we do not represent it is accurate or complete, and it should not be relied on as such. We seek to update our research as appropriate, but various regulations may prevent us from doing so. Other than certain industry reports published on a periodic basis, the large majority of reports are published at irregular intervals as appropriate in the analyst's judgment.

Goldman Sachs conducts a global full-service, integrated investment banking, investment management, and brokerage business. We have investment banking and other business relationships with a substantial percentage of the companies covered by our Global Investment Research Division. Goldman, Sachs & Co., the United States broker dealer, is a member of SIPC (http://www.sipc.org).

Our salespeople, traders, and other professionals may provide oral or written market commentary or trading strategies to our clients and our proprietary trading desks that reflect opinions that are contrary to the opinions expressed in this research. Our asset management area, our proprietary trading desks and investing businesses may make investment decisions that are inconsistent with the recommendations or views expressed in this research.

We and our affiliates, officers, directors, and employees, excluding equity and credit analysts, will from time to time have long or short positions in, act as principal in, and buy or sell, the securities or derivatives, if any, referred to in this research.

Any trading recommendation in this research relating to a security or multiple securities within an industry or sector is reflective of the investment theme being discussed and is not a recommendation of any such security in isolation.

This research is not an offer to sell or the solicitation of an offer to buy any security in any jurisdiction where such an offer or solicitation would be illegal. It does not constitute a personal recommendation or take into account the particular investment objectives, financial situations, or needs of individual clients. Clients should consider whether any advice or recommendation in this research is suitable for their particular circumstances and, if appropriate, seek professional advice, including tax advice. The price and value of investments referred to in this research and the income from them may fluctuate. Past performance is not a guide to future performance, future returns are not guaranteed, and a loss of original capital may occur. Fluctuations in exchange rates could have adverse effects on the value or price of, or income derived from, certain investments.

Certain transactions, including those involving futures, options, and other derivatives, give rise to substantial risk and are not suitable for all investors. Investors should review current options disclosure documents which are available from Goldman Sachs sales representatives or at http://www.theocc.com/about/publications/character-risks.jsp. Transaction costs may be significant in option strategies calling for multiple purchase and sales of options such as spreads. Supporting documentation will be supplied upon request.

In producing research reports, members of the Global Investment Research Division of Goldman Sachs Australia may attend site visits and other meetings hosted by the issuers the subject of its research reports. In some instances the costs of such site visits or meetings may be met in part or in whole by the issuers concerned if Goldman Sachs Australia considers it is appropriate and reasonable in the specific circumstances relating to the site visit or meeting.

All research reports are disseminated and available to all clients simultaneously through electronic publication to our internal client websites. Not all research content is redistributed to our clients or available to third-party aggregators, nor is Goldman Sachs responsible for the redistribution of our research by third party aggregators. For research or data available on a particular security, please contact your sales representative or go to http://360.gs.com.

Disclosure information is also available at http://www.gs.com/research/hedge.html or from Research Compliance, 200 West Street, New York, NY 10282.

© 2014 Goldman Sachs.

No part of this material may be (i) copied, photocopied or duplicated in any form by any means or (ii) redistributed without the prior written consent of The Goldman Sachs Group, Inc.

For the exclusive use of QYANG@SPMLLC.COM