Global

Bond Portfolio Analysis

21 December 2011 | 19 pages

2012 USD Supranational and Non-US Agency Outlook

Continued Spread Volatility Ahead with Positive Net Issuance

Robert Rowe
+1-212-723-1168
robert.rowe@citi.com

Shuo Li
+1-212-723-3193
shuo2.li@citi.com

- Expect spread volatility to remain elevated in the USD supranational and non-US agency markets at least for the first half of 2012 as the Euro crisis continues and the ogre of potential rating agency downgrades loom.
- From the perspective of our market implied probability of default model, the market has delineated which issuers would be most affected by the Euro crisis and a potential downgrade and those that would not. In some instances, the market may have gone too far and spreads should be peaking. We expect that spreads for some issuers should recover barring an unlikely breakup of the Euro.
- Net insurance should be modestly higher in 2012 despite a year over year decline in gross issuance and reduced funding targets for some issuers. We estimate net issuance of $47 billion and $112 billion gross issuance for the top 11 issuers, which represents approximately 70% of the overall USD supranational and non-US agency market.
- In the context of the entire market, we expect net issuance of $74 billion and gross issuance of $168 billion versus $69 billion net issuance and $161 billion gross issuance in 2011.
- For most supranational and non-US agency issuers, spreads are at historical wides and are likely to normalize. We like EIB 2yr bullets to start the year as we think spreads have widened too much relative to any potential downgrade by S&P, the spread recovery could be meaningful, and breakeven spread changes to Treasuries look very attractive especially considering the short duration.

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

The Market Has Spoken

The Euro crisis and the looming threat of potential ratings downgrades have driven spreads wider and elevated volatility. For some issuers, spreads may have widened too much.

Most USD Supranational and non-US agency investors will find themselves in uncharted waters in 2012, as fundamentals for many issuers will continue to be challenged by the Euro crisis and potential ratings downgrades, as perceived government support for these entities comes under question. While we are precluded from opining on a fundamental basis, we can examine how the market has priced in the potential threat from the Euro crisis and the implied downgrades for selected issuers. In some cases, we could see room for some potential outsized returns in the sector given spread recovery for some of these issuers.

USD supranational and non-US agency spreads widened dramatically versus Treasuries and swaps in the last quarter of the year as the Euro crisis worsened and the looming threat of potential rating downgrades came to fruition (Figure 1). In particular, the extreme 7-notch downgrade of Eksportfinans by Moody's to junk status served to alarm the market and propelled spreads for most supranational and non-US agency issuers significantly higher. Additional disappointing news emanating from Europe hastened the spread widening further with announced sovereign ratings downgrades for Belgium and Portugal. Some recovery in spreads for particular issuers actually occurred after the announcement by S&P that they were putting certain issuers on downgrade watch. Naturally, the recovery happened for those specific issuers that were not on watch.

Figure 1. End of Q3 11 and Current Top Issuer Benchmark OAS/UST and 2s5s Slope

	2 Year Benchmark			5 Year Benchmark			2s5s Slope		
Issuer	**9/30/2011**	**12/20/2011**	**Chg**	**9/30/2011**	**12/20/2011**	**Chg**	**9/30/2011**	**12/20/2011**	**Chg**
EIB	32	113	81	44	107	63	12	-6	-18
KFW	29	72	43	35	66	30	6	-6	-12
IBRD	14	17	3	17	23	6	4	6	3
IFC	22	34	12	24	31	6	2	-3	-5
IADB	17	27	11	31	37	6	14	10	-4
ADEV	14	31	17	33	46	13	19	15	-4
LRENT	28	69	42	54	92	38	26	22	-4
JFC	33	48	15	65	86	20	33	38	5
EBRD	24	53	29	26	71	45	2	18	16
NIB	26	42	16	40	76	36	14	34	20
ONTAR	54	63	9	78	92	14	24	29	5

Source: Citi Investment Research and Analysis

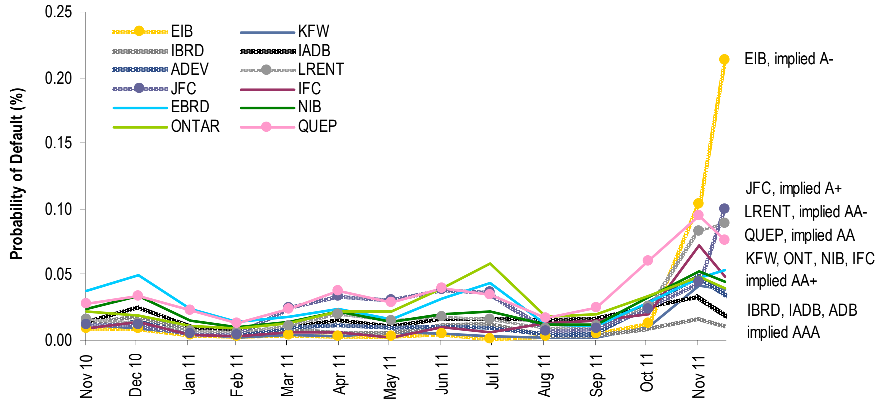
For some issuers such as EIB, spreads widened significantly but also a lot more than other issuers. Clearly, the market was pricing in additional risk premia to those issuers that may be perceived to have more exposure to Europe. But was the market accurately pricing in the risk? Perhaps only time will tell. However, by at least one metric, we think for certain issuers, the market may have priced in more risk premia than may be warranted in the context of potential downgrades.

By using Citi's market implied probability of default model[1], we can better identify the implied rating that the market has priced in. The model attempts to segregate the amount of spread attributable to default by essentially netting out the amount attributable to volatility. Figure 2 shows the current market implied monthly probabilities of default for the top 11 issuers in the sector and Figure 3 provides the

[1] Please see *Market Implied Default Probabilities: Update – Inferring Credit Risk from Bond Prices,* 9 September 2011, Terry Benzschawel, Mike Lee

daily implied probabilities of default for the shorter time period of 11/15/11 to 12/15/11.

Figure 2. Monthly Probability of Default on Top Supranational/non-US Agency Issuers

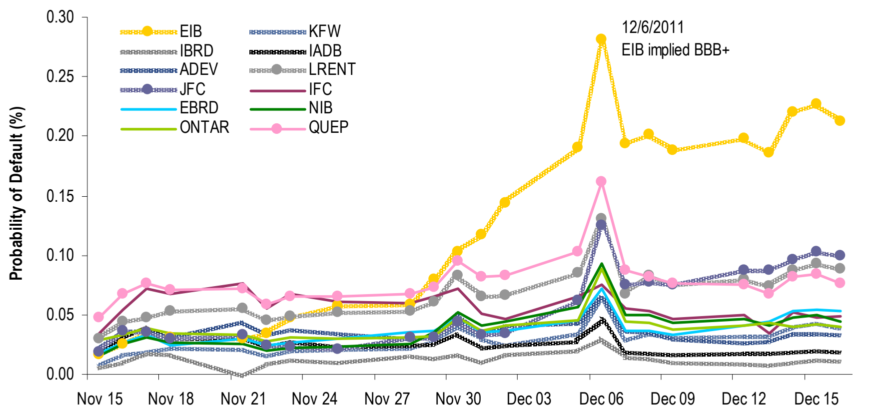


Source: Citi Investment Research and Analysis

Interestingly, as noted with overall spread movements, the implied default probabilities ratcheted higher starting in late November, with EIB leading the way to historic highs. Currently, the model has an implied A- rating for EIB, which is rated AAA. Additionally, with Germany, and associated issuers, being put on negative credit watch, we also witnessed KFW and Rentenbank's implied ratings move lower to AA+ and AA- respectively. Indeed, the only issuers that currently have an implied AAA rating are WorldBank (IBRD), IADB, and ADB. Interestingly, all three issuers are most likely perceived to have the least amount of exposure to Europe and relatively stable support from any underlying sovereigns. JFC's spreads and implied defaults also moved higher in the period, most likely as a result of the S&P negative outlook. JFC is currently rated AA- with the implied model rating of A+.

When we take a look at the daily changes to the implied probabilities of default, we can see how chronologically the last quarter of 2011 provided volatility (Figure 3).

Figure 3. Daily Probability of Default on Top Supranational/non-US Agency Issuers (Post 11/15/2011)



Source: Citi Investment Research and Analysis

Initially, implied probabilities of default started moving higher at the end of November as the market digested the potential contagion of the Eksportfinans' downgrade and the downgrades to Belgium and Portugal. Default probabilities moved much higher on December 6th, after S&P put 15 Euro Union countries on CreditWatch negative. EIB moved to an implied rating of BBB+ before recovering shortly thereafter and eventually settling into its current implied rating of A-.

It seems Canadian provinces are looked upon fondly by the market as market implied ratings are actually higher than their actual ratings. Province of Ontario (ONTAR) is rated AA-/Aa1 Negative while its market implied rating hovers at AA+. Province of Quebec (QUEP) has an implied rating of AA while they get an A+/Aa2 from rating agencies.

Perhaps the market has taken spreads too far. In Figure 4, we compare actual and implied ratings along with notes on S&P and Moody's negative watch and outlooks.

Figure 4. Current Rating and Implied Rating for Top Supranational/non-US Agency Issuers

Issuer	Current Rating (S&P/Moody's)	Possible Downgrade/Comments	Market Implied Rating (as of 12/16/2011)
EIB	AAA NEG/ Aaa Stable	S&P: 1 notch downgrade, if any	A-
KFW	AAA NEG/ Aaa Stable	S&P: Equalize to long-term credit ratings on the Federal Republic of Germany (could be lowered by up to one notch for Germany)	AA+
IBRD	AAA Stable/ Aaa Stable		AAA
IADB	AAA Stable/ Aaa Stable		AAA
ADEV	AAA Stable/ Aaa Stable		AAA
LRENT	AAA NEG/ Aaa Stable	S&P: Equalize to long-term credit ratings on the Federal Republic of Germany (could be lowered by up to one notch for Germany)	AA-
JFC	AA- NEG/ Aa3 Stable	S&P: The negative outlook signals that a downgrade is possible if Japan's public finances weaken further over the next two years in the absence of fiscal consolidation to offset them. We believe that uncertainty over the country's fiscal and economic outlook will lessen over the next six to 24 months	A+
IFC	AAA Stable/ Aaa Stable		AA+
EBRD	AAA Stable/ Aaa Stable		AA+
NIB	AAA Stable/ Aaa Stable		AA+
ONTAR	AA- Stable/Aa1 NEG	Moody's: If a credible plan to address the fiscal imbalance and stabilize the debt burden is not implemented in the next provincial budget, expected in March 2012, downward pressure on the province's Aa1 rating would emerge	AA+
QUEP	A+ Stable/Aa2 Stable		AA

Source: S&P, Moody's, Citi Investment Research and Analysis

For EIB, which has an AAA rating, S&P indicated only a one-notch downgrade if any pending the result of their review, while the market is pricing in an implied rating of A-. Is a two notch downgrade to AA+ as implied by the market plausible for KFW given the indication that the downgrade could follow a one notch downgrade in the event Germany is downgraded or an implied three notch downgrade for Rentenbank? However, the implied downgrade for JFC seems in line with what is potentially suggested by S&P.

While ratings, implied or otherwise, don't tell the entire story playing out in Europe and elsewhere, the implied probability of default approach can give us some context for current spreads. In that light, for risk takers, we think the widening in spreads for EIB are the most overdone barring a dramatic change in the underlying situation in Europe. We would start the year allocating to 2yr EIB as breakeven spread changes to Treasuries are very high given the short duration of a 2yr bullet, which will provide a higher probability of capturing the spread return, especially if spreads normalize post the results of the S&P review.

Issuance Forecast

Figure 5. Top Supranational/non-US Agency Issuer 2011 Debt Issuance and 2012 Funding Estimate

Issuer	2011 Funding Target (bn)	2012 Funding Target (bn)	USD Issuance as % of Total Issuance	2011 USD Debt Gross Issuance (USD bn)	2011 USD Debt Net Issuance (USD bn)	Est. 2012 USD Gross Issuance (USD bn)	Est. 2012 USD Net Issuance (USD bn)
EIB	EUR 75	EUR 60	25%	31.7	8.7	19.5	3.3
KFW	EUR 80	EUR 80	30%	27	7.5	31.2	15.7
IBRD	USD 30	USD 35	63%	18.3	6.1	22.1	12.8
IADB	USD 10	USD 10	46%	4.6	-0.8	4.6	-0.8
ADB	USD 15	USD 15	40%	5.9	3.9	6.0	4.5
RENTEN	EUR 12	EUR 10	36%	5.5	2.8	4.7	1.0
JFC	JPY 640	JPY 640	65%	5.5	2.0	5.5	-0.8
IFC	USD 10	USD 10	65%	6.5	3.9	6.5	5.3
EBRD	EUR 7.0	EUR 7.0	29%	3.3	1.7	2.7	2.7
NIB	EUR 3.0	EUR 3.0	30%	1.1	-2.1	1.2	1.2
ONT[2]	CAD 39.9	CAD 35.0	22%	9.0	6.0	7.7	2.0

Source: Citi Investment Research and Analysis

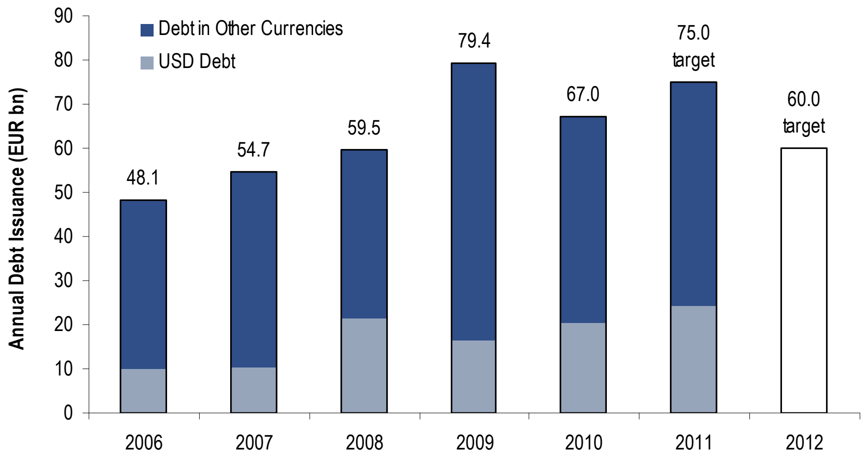
In regard to overall USD issuance we think net issuance will likely be positive and potentially higher than 2011, despite the potential drop in gross issuance year over year as we will experience higher levels of debt maturing in 2012 than we did in 2011. For the top 11 issuers, we expect net issuance of $47 billion versus $39 billion last year, while gross issuance should decline from $118 billion to $112 billion (Figure 5). In the context of the entire market, we expect net issuance of $74 billion and gross issuance of $168 billion versus $69 billion net issuance and $161 billion gross issuance in 2011.

EIB

EIB's guidance for 2012 has total borrowing shrinking to EUR 60 billion from their 2011 target of EUR 75 billion. In 2011, they met their target by November 3rd and remained active in the new issuance market. In 2010, EIB issued $27 billion debt denominated in USD, accounting for 36% of total issuance. 2011 USD debt issuance for EIB now stands at $32 billion. We expect to see around $20 billion USD debt issuance from EIB in 2012 and $3 billion net issuance.

[2] Province of Ontario has fiscal year from July to June. Therefore for year 2012, funding target and estimations are based on period through July 2011 to June 2012.

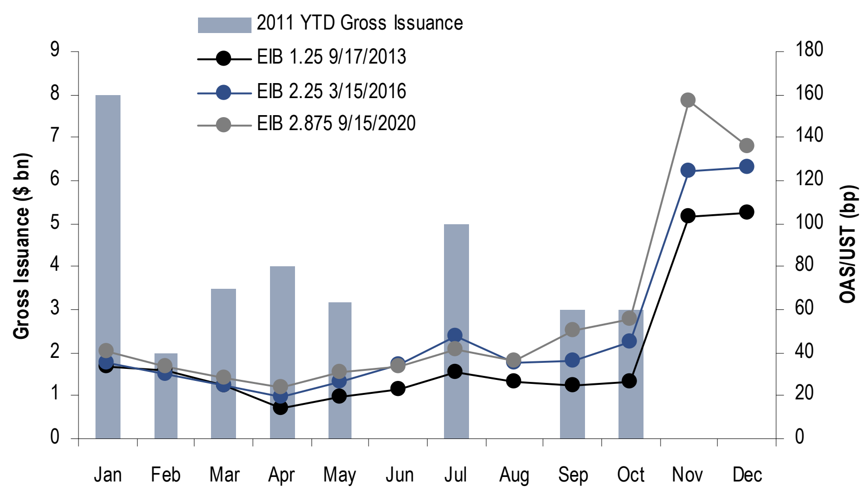
Figure 6. EIB Debt Issuance History and 2012 Funding Target



Source: Citi Investment Research and Analysis

In 2011, EIB spreads widened dramatically in late November due to the crisis in Europe, despite the lack of issuance going into year-end.

Figure 7. 2011 YTD EIB USD Debt Gross Issuance and Benchmark Spreads



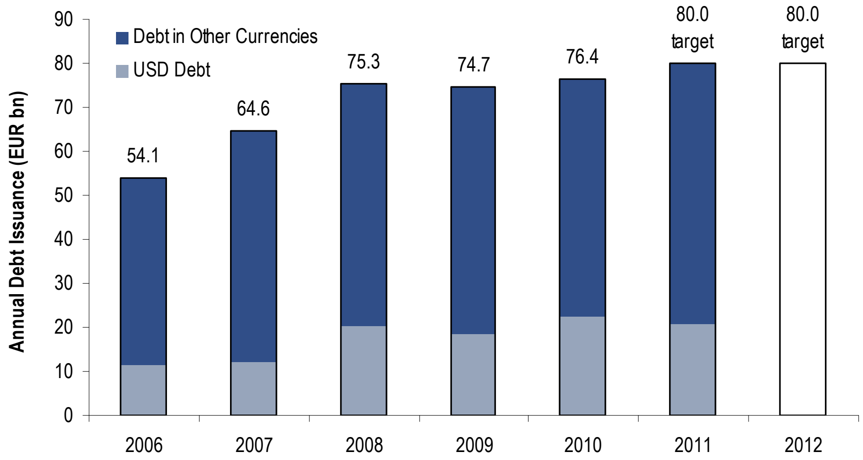
Source: Citi Investment Research and Analysis

KFW

KFW has stated that it will continue its commitment to the German securitization market in 2012, with a special focus on supporting the securitization of SME loans.

As of the end of November 2011, KFW YTD funding volume stood at EUR 78.5 billion, up from the 2010 level of EUR 76.4 billion. 30% of the total funding in 2011 has been denominated in USD, a decline from 36% in 2010. In their outlook for 2012, they target a 2012 funding volume of approximately EUR 80 billion, the same as 2011. We expect approximately $31 billion USD gross issuance from KFW in 2012 and $16 billion in net issuance.

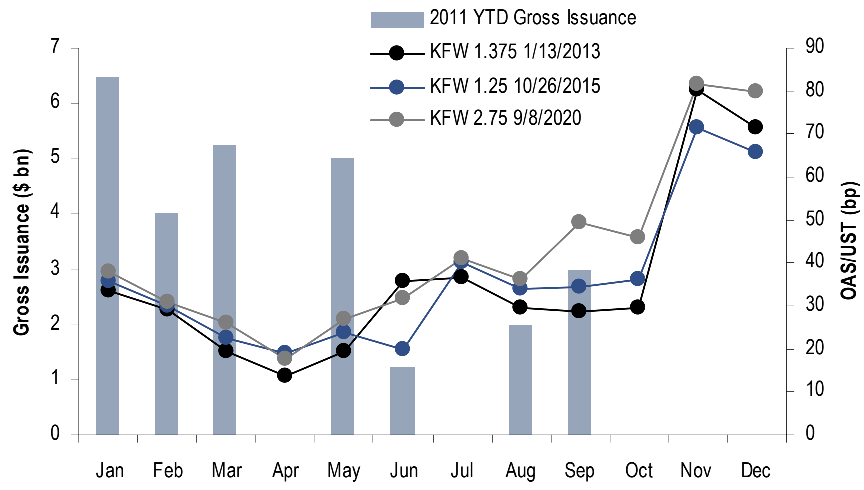
Figure 8. KFW Debt Issuance History and 2012 Funding Target



Source: Citi Investment Research and Analysis

KFW was put on CreditWatch negative by S&P on 7 December to bring it into line with Federal Republic of Germany sovereign debt. Spreads widened in November and current market implied rating on KFW is on the edge between AAA and AA+.

Figure 9. 2011 YTD KFW USD Debt Gross Issuance and Benchmark Spreads



Source: Citi Investment Research and Analysis

IBRD/IFC

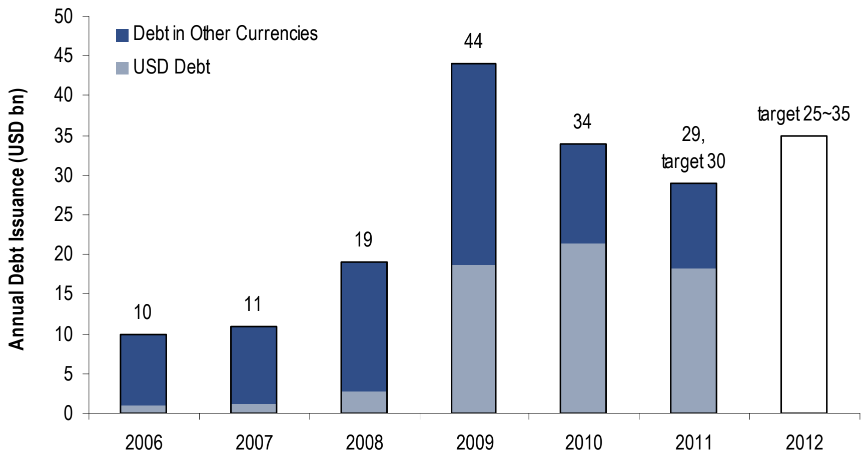
IBRD and IFC are both organizations of the World Bank. IBRD mainly provides financing to states while IFC is more focused on the private sector.

IBRD

The funding target for IBRD in 2011 is $30 billion. They target $25 to $35 billion of funding in 2012. In 2011, YTD total USD debt issuance has been $18 billion (excluding non-USD issuance), down from their 2010 level of $21 billion. Based on the trend, we expect to see approximately $22 billion of USD debt issuance next year and $10 to $13 billion in net issuance.

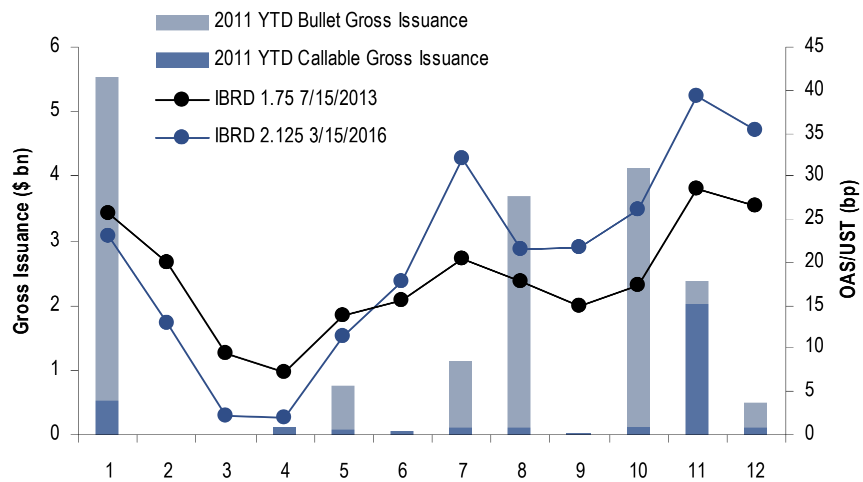
In 2011, besides $15 billion of bullet issuance, IBRD also issued more than $3 billion of callable bonds through the year including four bonds sized above $500 million. In 2010, they also issued a few $1 billion callables with one-year options and two- to three-year tenors. For investors looking into callable bonds, IBRD provides an opportunity to invest in names other than US agencies.

Figure 10. IBRD Debt Issuance History and 2012 Funding Target



Source: Citi Investment Research and Analysis

Figure 11. 2011 YTD IBRD USD Debt Gross Issuance and Benchmark Spreads



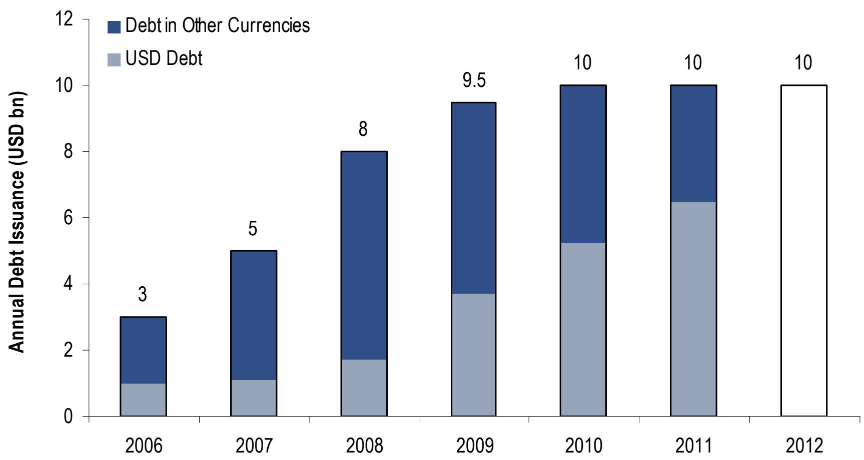
Source: Citi Investment Research and Analysis

IFC

IFC has a $10 billion funding target in 2011, and 59% of the total has been denominated in USD. In 2012, their funding program target remains unchanged at $10 billion. We would expect to see $6 to $7 billion USD issuance from IFC. Net issuance would be $4 to $5 billion.

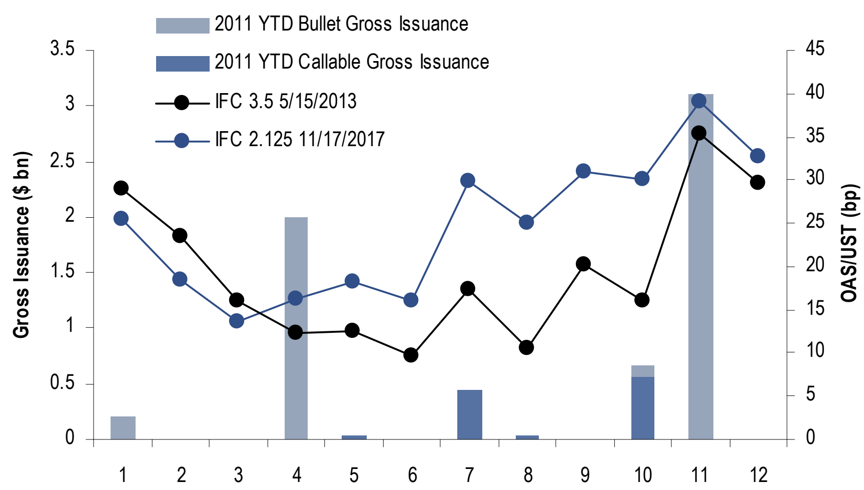
IFC 2011 YTD issuance has been $6.5 billion (again excluding non-USD issuance), including approximately $1 billion in callables. IFC benchmark issues typically have spreads wider than like-maturity IBRD issues, despite also being a member of the World Bank.

Figure 12. IFC Debt Issuance History and 2012 Funding Target



Source: Citi Investment Research and Analysis

Figure 13. 2011 YTD IFC USD Debt Gross Issuance and Benchmark Spreads

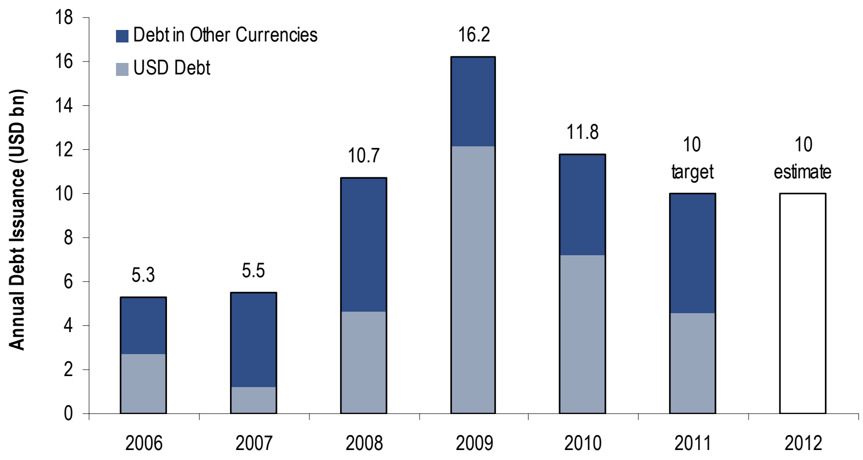


Source: Citi Investment Research and Analysis

IADB

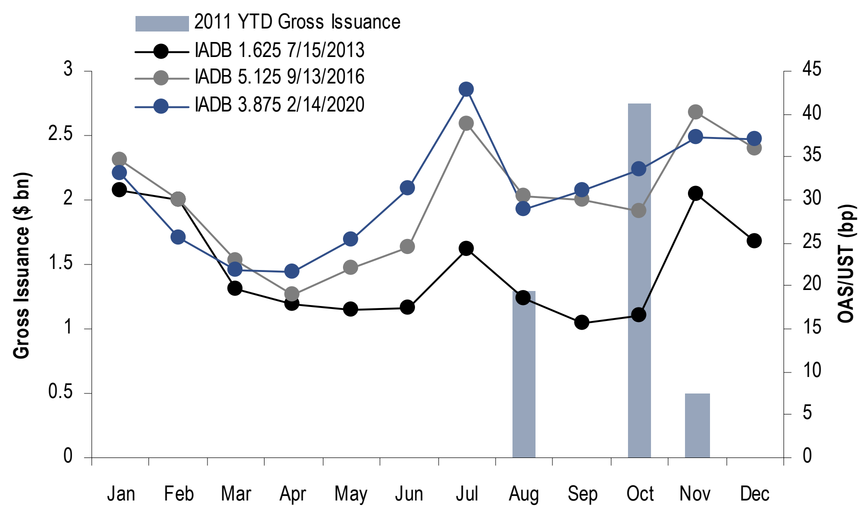
IADB debt is supported by highly-rated non-borrowing countries. 79.7% of non-borrower capital is from the US, Japan and Canada, and another 14% is equally distributed among France, Germany, Italy and Spain. Their 2011 funding target is $8 - $10 billion in ten different currencies, down from a 2010 target of $11.7 billion. Their USD YTD gross issuance now stands at $4.5 billion, $3 billion less than the 2010 FY level. YTD net issuance is at -$0.8 billion. Keeping their 2011 target level $10 billion for next year, we would expect to see approximately $5 billion new USD debt issuance from IADB in 2012 with a similar -$0.8 billion in net issuance. They will issue one global benchmark USD bond per year. Their USD benchmark spreads remained tight, compared to similar Euro-based issuers.

Figure 14. IADB Debt Issuance History and 2012 Funding Target



Source: Citi Investment Research and Analysis

Figure 15. 2011 YTD IADB USD Debt Gross Issuance and Benchmark Spreads

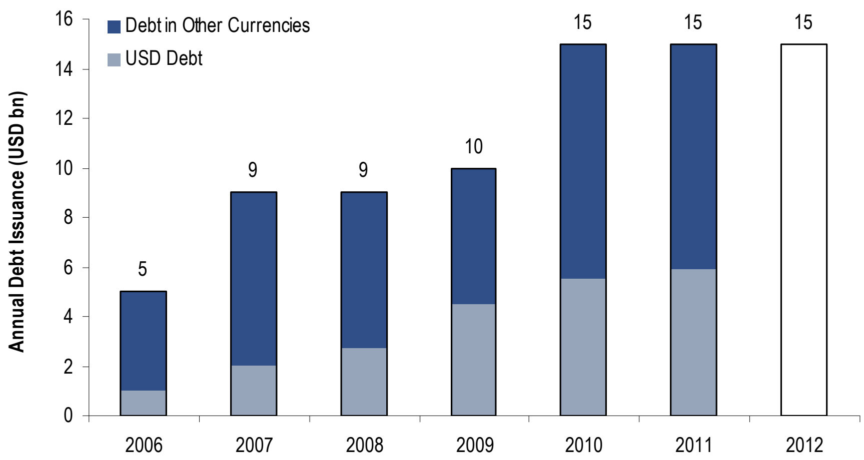


Source: Citi Investment Research and Analysis

ADEV

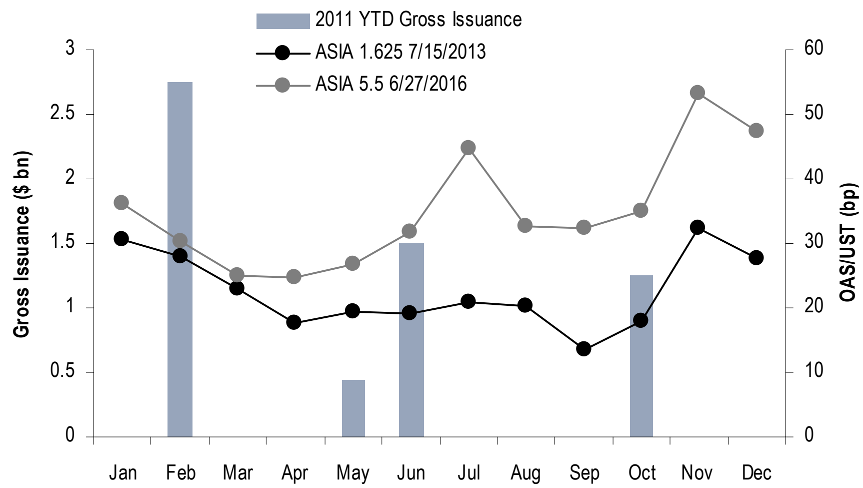
ADEV set their 2011 borrowing target to $13~$15 billion in nine different currencies, compared to their 2010 actual total borrowing of $15 billion. They have consistently had $5 to $6 billion USD issuance each year since 2009. YTD ADEV has issued $6 billion USD debt, exceeding their 2010 level of $5.5 billion. If they keep the same level of $15 billion in issuance in 2012, we would expect to see around $6 billion new issuance from ADEV in USD and $4.5 billion net issuance.

Figure 16. ADEV Debt Issuance History and 2012 Funding Target



Source: Citi Investment Research and Analysis

Figure 17. 2011 YTD ASIA USD Debt Gross Issuance and Benchmark Spreads



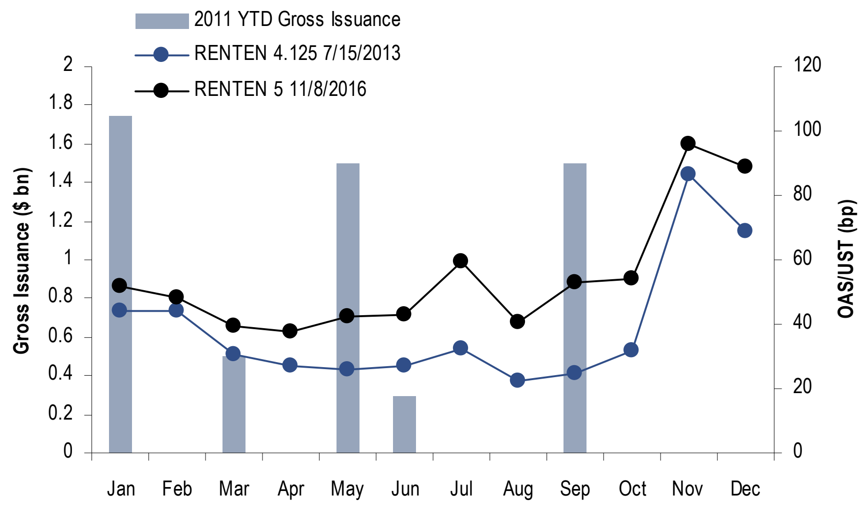
Source: Citi Investment Research and Analysis

RENTEN

Rentenbank had a EUR 12 billion funding target for 2011, and the number has fallen to EUR 10 billion for 2012. Approximately 36% of the total debt issued was denominated in USD. Their 2011 actual YTD issuance is $5.5 billion, around the

same level as in 2010. We expect to see approximately $5 billion or slightly less USD gross issuance in 2012, and net issuance is likely to be flat to up $1 billion.

Figure 18. 2011 YTD RENTEN USD Debt Gross Issuance and Benchmark Spreads

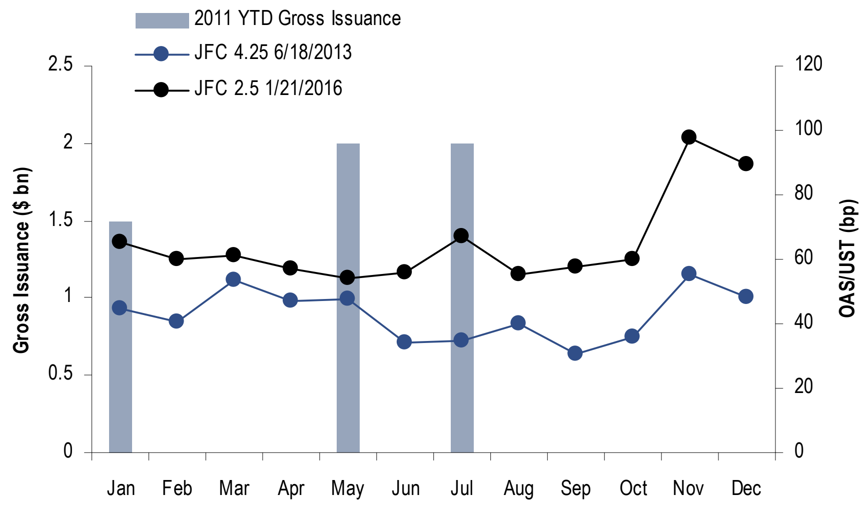


Source: Citi Investment Research and Analysis

JFC

JFC issued $5 to $5.5 billion USD debt every year since 2009. They issued $5.5 billion YTD with a JPY 640 billion funding target. History suggests they will retain their target for 2012 and have another $5 to $5.5 billion in new USD gross issuance. Net issuance would be approximately -$1 billion.

Figure 19. 2011 YTD JFC USD Debt Gross Issuance and Benchmark Spreads

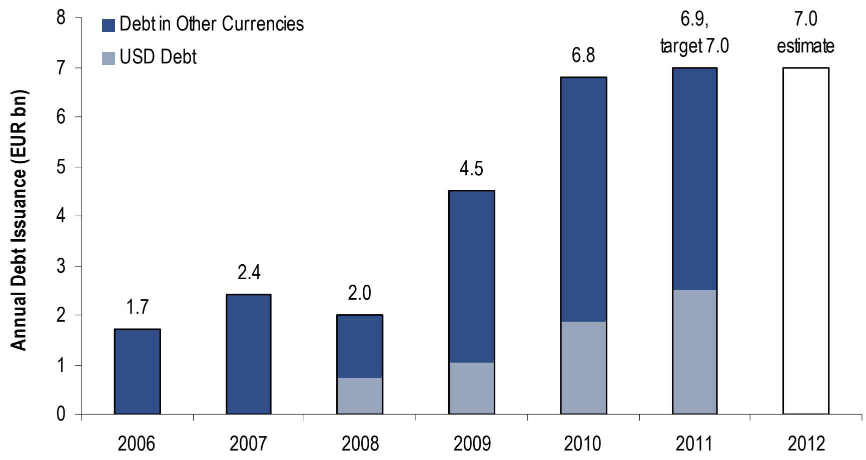


Source: Citi Investment Research and Analysis

EBRD

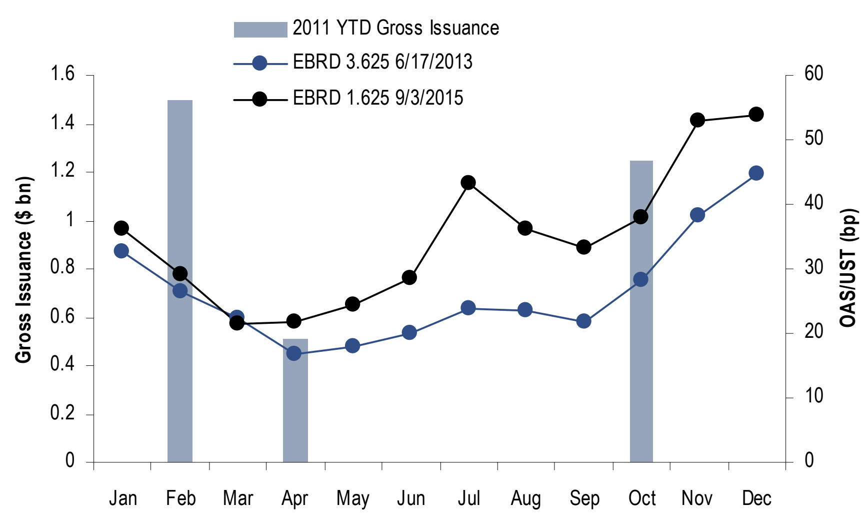
In 2011, EBRD set their funding target to EUR 7 billion, compared with EUR 6.8 billion actually issued in 2010. USD debt accounts for approximately 30% of the total debt issuance. 2011 YTD EBRD USD gross debt issuance is $3 billion, growing from the 2010 level of $2.5 billion. If EBRD were to retain their current funding level in 2012, we estimate USD gross issuance would also remain around $3 billion. They have no USD debt maturing in 2012, so $3 billion would also be the projection for net issuance in 2012.

Figure 20. EBRD Debt Issuance History and 2012 Funding Target



Source: Citi Investment Research and Analysis

Figure 21. 2011 YTD EBRD USD Debt Gross Issuance and Benchmark Spreads

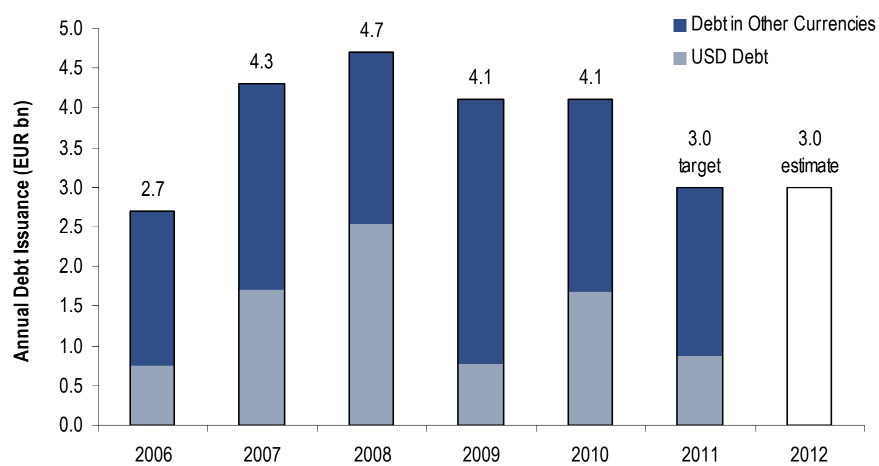


Source: Citi Investment Research and Analysis

NIB

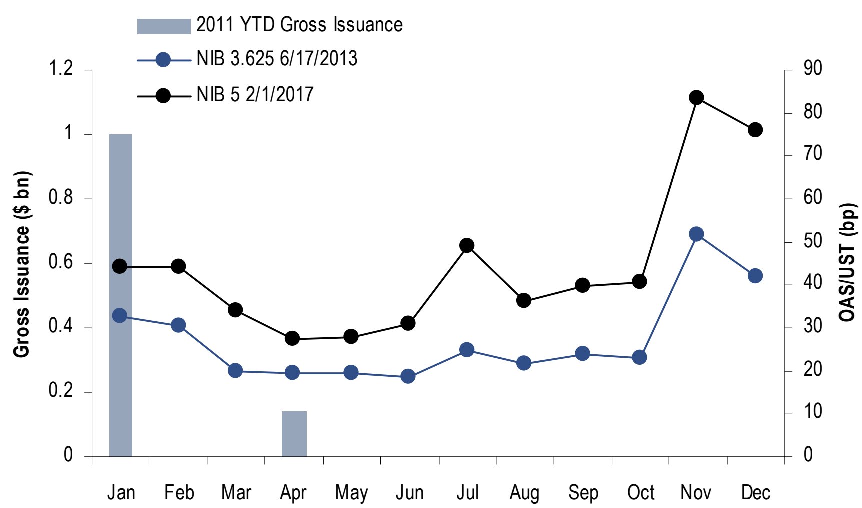
NIB's 2011 funding target is approximately EUR 3 billion, in line with previous years. Their actual 2011 USD debt YTD gross issuance stands at $1 billion, down from $2 billion in 2010. Assuming their funding outlook for 2012 stays at the same level, with around 30% of the total funding denominated in USD, we would expect one or two benchmarks totaling $1 to $2 billion. They had -$2 billion net issuance in USD in 2011. We estimate their net USD issuance in 2012 will be in line with gross.

Figure 22. NIB Debt Issuance History and 2012 Funding Target



Source: Citi Investment Research and Analysis

Figure 23. 2011 YTD NIB USD Debt Gross Issuance and Benchmark Spreads



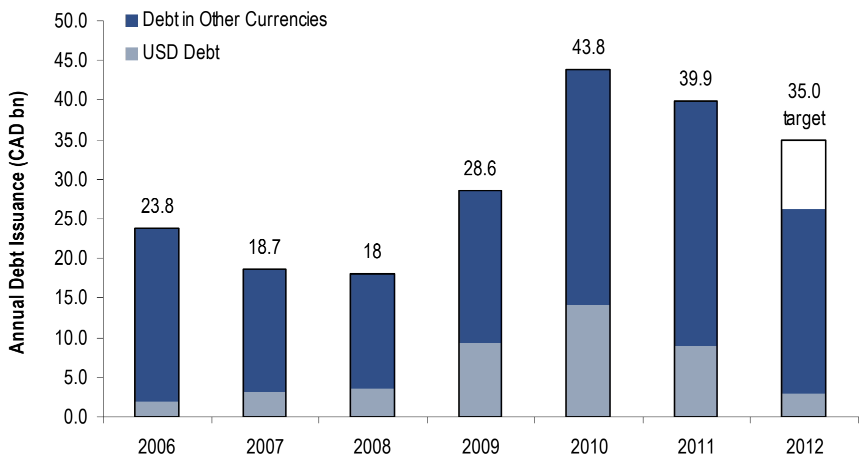
Source: Citi Investment Research and Analysis

Ontario

The Province of Ontario has their fiscal year from July to June. For 2011-12, they have already issued CAD 26.2 billion out of their target of CAD 35 billion, of which $3 billion was denominated in USD. Assuming they meet their target, we would

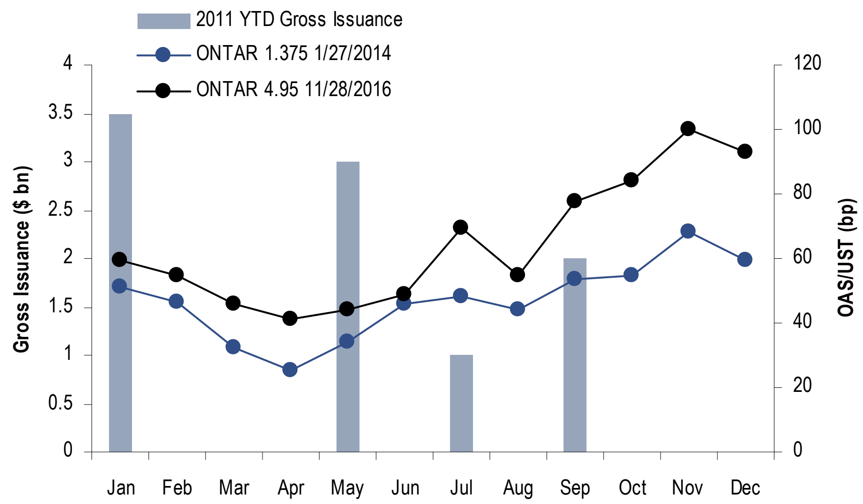
expect another CAD 9 billion through June 2012 with $3 billion to $4 billion in USD. We expect net USD issuance for Ontario of $2 billion for fiscal year 2011-12.

Figure 24. ONTAR Debt Issuance History and 2012 Funding Target



Source: Citi Investment Research and Analysis

Figure 25. 2011 YTD ONTAR USD Debt Gross Issuance and Benchmark Spreads



Source: Citi Investment Research and Analysis

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. 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 Inc	Robert Rowe; Shuo Li

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. 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.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 (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 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 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 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.