

Lowering risk and saving money: Part II

A CFO's roadmap for foreign currency debt

J.P.Morgan

Published by Corporate Finance Advisory

For questions or further information, please contact:

Marc Zenner marc.zenner@jpmorgan.com (212) 834-4330

Mark De Rocco mark.de.rocco@jpmorgan.com (212) 270-2153

Kapil Dilwali kapil.a.dilwali@jpmorgan.com (212) 834-5340

1. Introduction

The second half of 2016 brought considerable volatility to FX and interest rate markets, heightening companies' focus on risk management and financing strategies. Following the historic Brexit referendum vote,¹ and more recently Trump's election victory, global markets are experiencing an increase in both FX and interest rate volatility. The U.S. Dollar (USD) is surging against almost all currencies and the interest rate differentials between USD and other key markets such as Euro (EUR) and Sterling (GBP) are growing. Although U.S. Treasury yields have risen a fair bit since the U.S. elections, rates in the developed world and especially Europe and Japan remain near historic lows. Together, these developments should lead management teams to ask the following key questions: How can we capitalize on the lower interest-rate environment overseas? How can we best mitigate unwanted FX exposures?



In our July 2014 report *Lowering risk and saving money? A CFO's roadmap for foreign currency debt issuance,* we recommended that U.S. firms consider foreign currency debt markets, in particular the EUR, both to hedge long-term natural exposures and to increase EPS via lower nominal yields.² At that time, firms were conscious of their FX exposures and funding in EUR was inexpensive. U.S. firms capitalized on the opportunity, and foreign currency debt issuance by U.S. firms (henceforth "Reverse Yankee" issuance) accelerated tremendously, increasing by 40% from 2014 into 2015. Foreign currency issuance by U.S. firms has continued at a strong pace year-to-date in 2016 (Figure 1).

Figure 1



Note: USD value of non-USD issuance using the spot rate as of the issuance date

¹ Please find our July 2016 report *Corporate finance post-Brexit: Financial policies for a lower growth, more uncertain environment* at https://www.jpmorgan.com/global/JPMorgan CorporateFinanceAdvisory CorporateFinancePostBrexit.pdf

² Please find our July 2014 report *Lowering risk and saving money? A CFO's roadmap for foreign currency debt issuance* at http://www.jpmorgan.com/directdoc/JPMorgan_CorporateFinanceAdvisory_LoweringRiskandSavingMoney.pdf

The issuance trend that started in 2011 has expanded to encompass firms across all sectors. In recent years, numerous U.S. firms have accessed the EUR markets for the first time. **Though many firms have taken the opportunity to raise foreign currency debt since 2014, a large proportion of firms with foreign currency earnings have not issued foreign debt and may remain exposed to FX shocks.**³ Furthermore, certain firms *without* natural foreign currency exposure should re-examine the merits of issuing foreign currency debt and swapping it back to USD.

Compared to 2014, conditions today remain equally, if not more, supportive for management teams to re-examine foreign currency debt:

- i. Foreign currency debt continues to provide an avenue for corporate clients to reduce transactional, translational, and economic currency risk
- ii. Nominal interest rates in a number of currencies still remain lower than equivalent-maturity USD rates. These historic low rates continue to incentivize U.S. corporate clients either (1) to issue foreign currency debt directly, or (2) to swap USD debt to foreign currency via cross-currency swaps (creating synthetic foreign currency debt)
- iii. Technical factors such as the ECB's corporate bond purchase programs have further driven corporate borrowing spreads lower in Europe. The strength of USD, as well as a crosscurrency basis favoring USD, warrants further discussion on synthetic foreign currency debt
- iv. Some U.S. firms also enjoy the investor diversification benefits of issuing organic foreign currency debt

In this report, we address several questions around FX, interest rates, and foreign currency debt:

- A brief refresher: How are firms exposed to FX risk?
- How has the foreign currency debt market evolved since 2014?
- Should firms be raising debt in foreign currencies?
- How does the analysis differ for firms (i) with foreign earnings and net investment exposure and (ii) firms without foreign currency exposure?
- How should firms think about organic vs. synthetic foreign currency debt?
- What are the key accounting considerations?
- What are the leverage and liquidity considerations...notably, at the time of refinancing?

FX risk is top-of-mind among management teams and market participants, given the notable strengthening of the USD and elevated FX volatility (Figure 2). The average negative EPS impact due to FX headwinds was 5 cents to 12 cents in recent quarters, versus the industry standard management objective of "less than 1 cent."⁴ Managing FX exposure has never been more important, and foreign currency debt can have a key role to play.

We use EUR as an example throughout this paper; however, the takeaways from this report can be applied to other currencies with a similar fact pattern.





EXECUTIVE TAKEAWAY

For companies with foreign currency exposure (net investment and earnings), most of the benefits discussed in our 2014 report are still present today. Into 2017, Brexit, a stronger USD, and negative rates may be perceived as headwinds. However, today's market environment continues to provide compelling opportunities to lower FX risk and interest expense, both for firms that have yet to pursue such a strategy and for firms that have additional exposures to manage.

2. A brief refresher: U.S. firms and foreign currency risk

U.S. firms with global operations and often even those without global operations routinely face foreign exchange exposures,⁵ which can be separated into three broad categories:

- **Transaction exposure:** Cash flow and earnings volatility arising from booked items such as receivables, payables and cash or forecasted foreign currency denominated revenues, expenses and financing related transactions
- **Translation exposure:** Balance sheet and earnings volatility coming from the end of each reporting period's currency translation of a foreign subsidiary's balance sheet (net investment) and income statement
- **Economic exposure:** Economic currency exposure more generally, which includes the risks previously noted. It also includes threats to otherwise purely domestic firms that compete with firms that produce goods and/or services in another currency

EXECUTIVE TAKEAWAY

Foreign currency risk is as impactful today as it was in 2014. Matching currencies of assets and liabilities including issuing foreign currency debt to match foreign cash inflows can help reduce transaction, translation, and economic exposure.

⁵ For further reading on foreign currency risk management, please see our report *Who's worrying about FX? Corporate finance strategies for a strong U.S. Dollar environment* located at http://www.jpmorgan.com/directdoc/JPMorgan_CorporateFinanceAdvisory_WhosWorryingAboutFX.pdf

3. Developments in the foreign-currency issuance markets since 2014

In 2014, we remarked on the accelerating pace of Reverse Yankee issuance from 2011 through mid-2014. This trend has continued into the third quarter of 2016, and U.S. issuers have become the single largest source of Euro-denominated investment grade corporate issuance.

So, what specifically has changed since our last assessment in July 2014?

- **Issuance:** Foreign currency issuance by U.S. firms increased 40% from 2014 to 2015, and Euro-denominated issuance increased 26%. 2016 issuance is tracking 2015 volumes (Figure 1)
- **Yields:** Nominal corporate credit yields in both EUR and USD have declined, but EUR credit yields have declined more significantly (Figures 3 and 6)
- Rates: Benchmark interest rates (swap rates) have declined globally in tandem (Figure 4)
- Spreads: USD spreads have increased but EUR spreads have not (Figures 5 and 6)
- **EUR debt advantage:** Organic and synthetic EUR yields are both still compelling relative to USD yields (Figure 6)
- FX: EUR has depreciated 11% against USD (Figure 6)



Figure 3

Source: J.P. Morgan DataQuery; ASW spread of iBoxx Corps € Bonds and the ASW Spread of \$ Corporate bonds in the JULI index.





Figure 5



Source: J.P. Morgan DataQuery; ASW spread of iBoxx Corps € Bonds and the ASW Spread of \$ Corporate bonds in the JULI index.

Figure 6

2014 vs. 2016: Summary of market developments

	THEN Q3 2014	NOW Q3 2016	CHANGE
USD 5-Year Bond Yield ¹	2.41%	2.12%	-29 BPS
EUR 5-Year Bond Yield ¹	1.00%	0.16%	-84 BPS
USD 5-Year Bond Swapped to EUR ²	0.64%	0.12%	-52 BPS
USD 5-Year Credit Spread ¹	48 BPS	94 BPS	+46 BPS
EUR 5-Year Credit Spread ¹	58 BPS	31 BPS	-27 BPS
EUR/USD Spot FX Rate	1.26	1.12	-0.14

¹ Source: J.P. Morgan, Bloomberg; reflects BBB+ Industrial 5-Year Bond Composite coupons and credit spreads over swap rates as of 9/30/2014 and 9/30/2016

²Reflects mid-market swap rate of above USD bond coupon swapped to a EUR fixed rate

EXECUTIVE TAKEAWAY

Foreign currency issuance by U.S. corporates has increased significantly from 2014 to 2015, especially Euro-denominated issuance, which can be primarily attributed to favorable European corporate bond yields and spreads compared to the U.S. markets.

4. Foreign currency debt for USD functional firms

Firms that consider foreign currency debt can be split into two groups: those with natural EUR exposure and those without it.

For **firms with natural EUR exposure**, market conditions remain compelling to issue in EUR to better match assets and liabilities. Matching assets and liabilities reduces FX exposure. Low nominal yields and spreads offer an opportunity to lock in EUR debt at historically attractive costs, thus providing potential EPS benefits.

For **firms without natural EUR exposure**, the currency basis is paramount when evaluating the relative cost of foreign debt issuance on a USD-equivalent basis. As the basis becomes more negative, all else being equal, it becomes more advantageous to swap a USD bond to EUR, and less advantageous to swap a EUR bond to USD. Basis markets have become more negative since July 2014 (Figure 7), owing to greater demand for USD funding amid continuing instability in the eurozone political landscape.



Figure 7

Despite the move in currency basis favoring swaps to EUR, a number of issuers in EUR debt markets have swapped back to USD. This trend has largely occurred because certain issuers have been able to achieve funding in the EUR markets below their USD funding levels once the EUR debt is swapped back to USD. The reduction of EUR credit spreads relative to USD spreads in these cases has outweighed the negative movement in basis.

Additionally, even if EUR bond pricing swapped to USD has become less attractive than organic USD debt, firms may achieve other benefits by issuing in EUR. Many Reverse Yankee issuers, including those without natural EUR exposure, **perceive investor diversification**, **establishment of a EUR "benchmark" bond for future issuance**, and greater maturity flexibility to be more compelling than a modest coupon reduction associated with organic USD issuance (Figure 8).

Figure 8

Benefits of issuing non-USD debt for U.S. firms

Denents of issuing non-usb debt for u.s. mins				
BENEFIT	DESCRIPTION	FIRMS WITH NATURAL FOREIGN CURRENCY EXPOSURE	FIRMS WITH NO FOREIGN CURRENCY EXPOSURE	
INVESTOR DIVERSIFICATION	For U.S. issuers with a large outstanding stock of USD debt, incremental USD issuance can put pressure on their existing spreads. This pressure could be alleviated by issuing in a another currency in which an issuer is relatively "undersupplied." In addition, by creating a new benchmark in a new market, an issuer improves its market options for future issuances, creating additional flexibility	✓	✓	
LIABILITY PROFILE MANAGEMENT	The option of tenors available in the U.S. corporate bond market is most often limited to the specific benchmark treasuries (2, 3, 5, 10, and 30 years). In contrast, Euro denominated bonds are marketed over the continuous Euro swaps curve, allowing issuers much greater flexibility in issuing "off-the-run" maturities such as 7-, 8-, 9-, 11-, 12-, 13-, 14-, 15-, or 20-year maturities	✓	✓	
LOWER COST FINANCING	Firms can capitalize on lower headline Euro yields; however, economic comparisons on a dollar-equivalent basis will depend on the cross currency basis and issuer-specific credit spreads	✓	?	
REDUCED FX RISK	Matching assets and liabilities can help mitigate unwanted FX exposures	\checkmark	N/A	

Source: J.P. Morgan

The combination of a foreign bond issuance and a cross-currency swap to USD allows firms to **diversify their investor base** and better manage the maturity towers in their debt portfolios. Companies should monitor the USD equivalent cost (usually in 3-month USD LIBOR terms) of a new issuance, in both the U.S. and foreign bond markets, to evaluate optimal relative pricing.

When U.S. firms find that they do not have sufficient EUR net investment exposure to support full hedge accounting treatment of a given EUR bond issuance, they can consider **swapping a portion** of the EUR debt to USD. Even if the cost of EUR debt swapped to USD is higher than organic USD debt, a company often does not need a large amount of net investment hedge capacity before the blended coupon of organic EUR debt and synthetic USD debt (from swapping a portion of EUR bonds to USD) is lower than the USD coupon the company would otherwise pay to access the USD bond market. The swap could also achieve favorable hedge accounting as long as the EUR bond is issued out of an entity whose functional currency is USD.

Implications from the European Central Bank (henceforth ECB) corporate bond repurchase program

A significant development in European markets since our last report has been the commencement of purchases of Euro-denominated corporate bonds by the ECB (the ECB's Corporate Sector Purchase Program). The program is broad in scope and is not limited to European companies; non-European companies (such as those from the U.S.) can also achieve access to the program. Access to the program can potentially result in stronger secondary market performance and improved new issue pricing. The key criteria are that the debt needs to (i) be from a corporate, (ii) be from an entity domiciled in the Euro area, (iii) have a European listing, and (iv) have at least one investment grade rating (Moody's, S&P, Fitch, or DBRS).

EXECUTIVE TAKEAWAY

Firms with natural foreign currency exposure can capitalize on historically attractive EUR cost of debt to match assets and liabilities, and reduce FX exposure. Firms without natural foreign currency exposure can consider the benefits of investor diversification and debt maturity flexibility, in conjunction with comparing financing costs on a USD-equivalent basis.

5. Organic vs. synthetic debt and execution considerations

As discussed in Section 4, firms may access the EUR debt market because they have EUR exposure, or because they can swap EUR debt to USD at an attractive rate. Investor diversification and debt profile management are also key determinants in the decision to borrow in the EUR markets (Figure 9). When a U.S. firm establishes the need to borrow EUR, it is crucial that management teams ask the right questions to understand execution options and subsequent corporate finance implications.



Below we list a non-exhaustive series of questions that warrant internal discussion when considering foreign currency debt.

Organic vs. Synthetic:

- Should the firm issue in EUR ("organic debt") or issue in the USD bond/loan markets and swap to EUR ("synthetic debt")?
- How should the firm compare pricing, repayment flexibility, and accounting treatment of organic debt to that of synthetic debt?
 - Even if organic EUR yields are higher than synthetic EUR yields, do the benefits of investor diversification and/or maturity profile management by issuing in EUR markets outweigh higher relative cost?

- What are the implications on leverage and liquidity for organic vs. synthetic debt?
 - Furthermore, what are the implications at maturity of the debt or termination of the swap? (see section 7)
- With synthetic debt, does engaging in a cross-currency swap meaningfully impact balance sheet capacity with relationship banks?
- Issuing entity and location of funds (regardless of organic vs. synthetic)
 - Where are funds required?
 - Where should the debt be located: U.S. parent or foreign sub?
 - If funds are required at the foreign sub:
 - Is it more efficient to borrow at the parent and lend intercompany to the sub, considering the tax implications of an intercompany loan?
 - Should the parent contribute equity to the sub?
 - Can the sub borrow directly? (may raise parent guarantee considerations)

Finally, firms may be curious as to how they can take advantage of negative rates in the foreign currency debt markets. Investors are not keen to "pay" companies to borrow money, though European companies have indeed priced negative-yielding bonds. While this is unlikely to become broad practice, certain companies may still be able to achieve negative yields via issuing in USD and swapping to a foreign currency.

EXECUTIVE TAKEAWAY

Firms that seek to hedge with foreign currency debt can issue organic foreign currency debt or issue USD debt and swap it to the foreign currency. Alternatively, firms that desire USD funding may find economic efficiencies in borrowing EUR and swapping to USD. Regardless, it is key for management teams to ask the right questions and subsequently assess considerations around investor diversification, maturity profile management, location of funding needs, and implications for leverage and liquidity.

6. U.S. GAAP accounting considerations

Organic or synthetic debt can be used to hedge either an intercompany loan or a net investment exposure.

Organic debt can be an economic hedge of an intercompany loan, providing an offset to the earnings impact, while a swap of the same intercompany loan is not only an identical economic hedge, but also an accounting hedge. In contrast, both organic and synthetic debt can be an accounting hedge of a net investment exposure. The key differences between a swap used as an accounting hedge of an intercompany loan and one used in a net investment hedge are the way in which earnings are affected and how the benefit of the lower coupon inherent in the swap is reflected in the financial statements.

- Organic debt or a swap as a hedge of an intercompany loan (a cash flow hedge) can provide for lower interest expense in earnings without any P&L volatility (see Figure 10)
- Organic debt as a net investment hedge provides the same benefit, but in contrast, the use of a swap as a net investment hedge does not generate the same benign accounting results (see Figure 11)



Hedge of an intercompany loan

While there are numerous considerations related to intercompany loans, the potentially favorable economics and accounting outcome associated with designating a swap as a hedge of a foreign currency intercompany loan can be a compelling alternative to organic debt.

Finally, recall that swaps can be used to convert foreign debt to USD. In this case, cash flow hedge accounting can also be applied as outlined above in Figure 10.

Hedge of a net investment exposure

Figure 11

Comparison of net investment hedge accounting for organic debt versus net investment hedge accounting for a swap



* Synthetic debt: swap accounting doesn't duplicate organic debt results - the interest paid and other swap revaluation will either be reported in equity or earnings Source: J.P. Morgan

Other issues arise in hedge accounting when considering whether to hedge a net investment exposure:

- Is the foreign currency functional sub owned directly by a USD functional parent?
 - An intervening sub with a different functional currency would prevent the application of net investment hedge accounting for debt or a swap at the parent when hedging the currency risk of the second-tier sub
- Is there a constraint in terms of the size of the net investment exposure versus the desired hedge notional?
 - Has the company considered applying the "tax gross-up" provision of ASC 815 to designate a larger amount of organic or synthetic debt as a hedge over and above the net investment book value?

EXECUTIVE TAKEAWAY

Depending on the format (organic vs. synthetic), varying impacts to the income statement and the balance sheet will arise when using organic debt vs. synthetic debt via a swap. The accounting impact therefore remains an important factor in funding decisions made by management teams.

7. Considerations related to the maturity of organic or synthetic debt

Executing the aforementioned strategies means that a company will eventually be faced with the maturity of the organic or synthetic debt. A change in FX rates and/or refinancing rates may impact leverage, liquidity and the refinancing decision of foreign currency debt (Figure 12).



FX rate impact

We use an example below to compare the impact at maturity of the foreign currency debt (organic vs. synthetic) designated as a net investment hedge, assuming different FX scenarios (Figure 13). We then briefly discuss concerns relating to changes in coupon rates when planning for a foreign currency debt refinancing.



Figure 13

Source: J.P. Morgan

If the amount of the foreign debt is geared to the desired amount of leverage for a given amount of foreign EBITDA, leverage at maturity may be unchanged if the FX rate is higher (stronger EUR). However, one consideration that can arise is the impact on parent company liquidity, particularly if the benefit in higher EUR EBITDA results in higher USD value of EUR cash trapped offshore.

Refinancing rate impact

What are the considerations at maturity if interest rates (and, in line with historical relationships, refinancing coupons) are higher in the foreign currency compared to those in the U.S.?

From a risk management perspective, refinancing foreign currency debt with new foreign currency issuance (organically or synthetically) may still remain the prudent course of action. Although a company might be reluctant to pay a higher interest rate relative to USD debt, it should be indifferent because the return from the foreign operation should be higher as well. Therefore, hedging the currency exposure with organic or synthetic debt would bring the foreign return on the investment back to a USD return.

Nonetheless, companies traditionally find themselves analyzing the cost/benefits of paying a higher coupon to hedge foreign currency risk when this situation arises. The same thought process applies if foreign interest rates fall and the coupon on the foreign currency debt used to refinance the existing debt is lower.

EXECUTIVE TAKEAWAY

Foreign currency debt, whether organic or synthetic, will have potential liquidity and leverage considerations at maturity. If the debt is properly sized against EBITDA, leverage at maturity could be neutral. However, some thought should be given to potential liquidity implications at the parent when the debt comes due. Moreover, rolling the debt over at maturity may make sense even in a higher foreign rate environment in order to keep the hedge benefits in place.

8. Conclusion

As noted throughout this report, firms can utilize foreign currency debt to both lower risk and save money.

For firms that have not engaged in foreign currency debt issuance, we encourage management teams to assess their existing position around this topic: Would their firm benefit from hedging and/or from accessing the international debt markets?

For firms that have engaged in these transactions previously, we reiterate the importance of asset-liability matching and leverage/liquidity considerations at maturity. Management teams should be armed with the right questions to ask, notably in the context of refinancing, which will help guide future firm decisions.

Regardless, it remains paramount in times like these to re-evaluate foreign currency debt, both to ask the right questions and to evaluate the corporate finance implications of this potentially value-enhancing opportunity.

KEY EXECUTIVE TAKEAWAYS

- Decision makers have the opportunity to create shareholder value by accessing the EUR market if they have the right profile and wish to achieve the objectives outlined in this report of lower economic risk, higher EPS and a more diversified investor base
 - Moreover, companies that have USD funding needs may find a foreign currency issuance (EUR or another currency) swapped back to USD a cheaper way to borrow, depending on relative credit spreads and currency basis in each market
- The economic objectives that can be achieved for companies with the right EUR profile can also be achieved in other currencies where foreign currency yields, credit spreads and basis are also favorable
- While real value can be created for shareholders by accessing foreign issuances-notably the EUR in today's environment-decision makers need to be cognizant of and manage the corporate finance, accounting, and political risks accompanying this economic and EPS value creation:
 - Leverage ratio risk if the foreign currency appreciates
 - Liquidity risk at maturity-if company decides not to roll over the foreign currency debt
 - Accounting risk that can create P&L volatility or no P&L benefit from lower foreign interest rates
 - Political risk arising from Brexit, the European migrant crisis, and other political winds buffeting the EUR area
- Two situations may warrant further discussion:
 - Companies executing large M&A transactions (whether cross-border or not), or addressing activist pressure to increase leverage, should also consider the benefits that could accrue from any additional debt in a foreign currency
 - Firms that may not have a current use of proceeds, or are concerned with incurring additional leverage, may find a compelling opportunity to take advantage of the benefits outlined in this paper in a leverage-neutral fashion by issuing lower-cost EUR debt and repurchasing higher-cost legacy USD debt
- In sum, the opportunity to utilize foreign currency debt (either organically or synthetically) remains as compelling in today's market environment as it was at the time of our 2014 report

Notes

Members of the Corporate Derivative Marketing team (who are Associated Persons) and Chris Abbott of the Debt Capital Markets team have contributed to this report. We thank them for their invaluable insights and suggestions. We also thank Ram Chivukula for his comments and Sarah Farmer, Gino Bulanhagui, Cheryl Molnar and the Creative Services group for their support through the editorial and publication process. We are particularly grateful to Aman Gupta and Soumya Chauhan for their tireless contributions to the analytics in this report. This material is not a product of the Research Departments of J.P. Morgan and is not a research report. Unless otherwise specifically stated, any views or opinions expressed herein are solely those of the authors listed, and may differ from the views and opinions expressed by J.P. Morgan's Research Departments or other departments or divisions of J.P. Morgan and its affiliates.

RESTRICTED DISTRIBUTION: Distribution of these materials is permitted to investment banking clients of J.P. Morgan. Distribution of these materials to others is not permitted unless specifically approved by J.P. Morgan. These materials are for your personal use only. Any distribution, copy, reprints and/or forward to others is strictly prohibited. Information has been obtained from sources believed to be reliable but J.P. Morgan does not warrant its completeness or accuracy. Information herein constitutes our judgment as of the date of this material and is subject to change without notice. Actual events or conditions are unlikely to be consistent with, and may differ materially from, those assumed. Accordingly, actual results will vary and the variations may be material.

This material is not intended as an offer or solicitation for the purchase or sale of any financial instrument. In no event shall J.P. Morgan be liable for any use by any party of, for any decision made or action taken by any party in reliance upon, or for any inaccuracies or errors in, or omissions from, the information contained herein and such information may not be relied upon by you in evaluating the merits of participating in any transaction. J.P. Morgan makes no representations as to the legal, tax or accounting consequences of a transaction. The recipient should consult their own legal, regulatory, investment, tax, accounting and other professional advisers as deemed necessary in connection with any purchase of a financial product. This material is for the general information of our clients and is a "solicitation" only as that term is used within CFTC Rule 1.71 and 23.605 promulgated under the U.S. Commodity Exchange Act. Questions regarding swap transactions or swap trading strategies should be directed to one of the Associated Persons of J.P. Morgan's Swap Dealers.

JPMorgan Chase and its affiliates do not provide tax, legal or accounting advice. This material has been prepared for informational purposes only, and is not intended to provide, and should not be relied on for, tax, legal or accounting advice. You should consult your own tax, legal and accounting advisors before engaging in any transaction.

J.P. Morgan is a marketing name for investment banking businesses of JPMorgan Chase & Co. and its subsidiaries worldwide. Securities, syndicated loan arranging, financial advisory and other investment banking activities are performed by a combination of J.P. Morgan Securities LLC, J.P. Morgan Limited, J.P. Morgan Securities plc and the appropriately licensed subsidiaries of JPMorgan Chase & Co. in EMEA and Asia-Pacific. Lending, derivatives and other commercial banking activities are performed by JPMorgan Chase Bank, N.A. J.P. Morgan deal team members may be employees of any of the foregoing entities.

© 2016 JPMorgan Chase & Co. All rights reserved



