

Research Report

European Infrastructure Strategic Outlook

February 2018

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1 Executive Summary¹

- The European economy continues to point to strong momentum, implying a potential period of growth ahead of us, and supporting infrastructure investment fundamentals in the region. The political outlook is gradually stabilising compared with our expectations a year ago. In the short term, we continue to see political uncertainty in the United Kingdom, although the outlook remains one of moderate economic growth.² Notwithstanding the prospect of leaving the European Union in 2019, resulting in an increase in country risk, the United Kingdom still has a predictable regulatory framework for infrastructure investment in our view.³
- Europe represents a key market for global infrastructure investment,⁴ offering opportunities that range from the mature Western European markets to the fast growing economies of Eastern Europe.⁵ We believe that the most relevant European markets for infrastructure investment remain core markets like the United Kingdom, Germany, the Netherlands, the Nordics and France, as well as Italy and Spain, both of which combine slightly higher risk/return potential with relatively strong market fundamentals. The aforementioned markets offer a mature investment environment, a transparent institutional framework, and a long history of private infrastructure ownership. These factors are important for core/core plus investment strategies targeting inflation-hedged, long-term income return stability, relatively low cash-flow volatility, and some capital growth potential.⁶
- The European private infrastructure investment pipeline remains solid, and infrastructure increasingly plays a key role in governments' agenda to boost economic growth.⁷ Eurozone bond yields are set to increase, but to remain below their long-term historical average. Inflation is forecast to pick-up gradually, supporting the performance of assets with inflation-linked tariffs.⁸ Although returns vary by country, sector and asset, we estimate that levered, unlisted equity infrastructure entry return assumptions for core assets in mature European markets may be in the range of 7% to 8% (IRR⁹) in 2018.¹⁰ We continue to see a sound premium over government bond yields, but in the core space we expect returns to remain compressed, particularly for regulated networks. Moreover, returns remain capped by material dry powder targeting core strategies¹¹, especially for larger deals.
- In the core plus space¹², particularly the middle market¹³, we see the opportunity for investors to acquire assets at a risk-adjusted premium over core strategies. Levered, unlisted equity entry return assumptions are estimated in the range of 9% to 11% (IRR) in 2018, and active asset management can mitigate the effect of rising interest rates on valuations in the long term. Transportation is set to remain an outperformer, supported by the favourable medium-term economic outlook. We see traffic volumes improving, particularly across European airports and toll roads. The outlook for European ports is stabilising on the back of accelerating global trade, but we see ports in strategic locations proving more resilient in the medium term.
- Electricity demand should remain weak across Europe due to rising energy efficiency. Energy prices are above recent lows, but should remain soft, with thermal generation challenged by renewables. Market conditions, falling equipment costs for renewables and energy storage, as well as climate change policies will continue to drive renewables capacity and to incentivise utilities to dispose of non-strategic assets, targeting industrial and financial partnerships to redefine their business models.¹⁴ We believe that this trend will likely offer investment opportunities in the medium term.

¹ Any forecasts provided herein are based on Deutsche Asset Management's opinion at time of publication and are subject to change.

² Oxford Economics, 15 January 2018

³ Based on Deutsche Asset Management proprietary methodology for ranking unlisted infrastructure markets as at 31.12.2017, 10 January 2018

⁴ Preqin, "2017 Private Capital Fundraising Update", January 2018

⁵ Includes countries in Central and Eastern Europe (CEE)

⁶ Based on Deutsche Asset Management proprietary methodology for ranking unlisted infrastructure markets as at 31.12.2017, 10 January 2018

⁷ Preqin, "2017 Private Capital Fundraising Update", January 2018

⁸ Oxford Economics, 15 January 2018

⁹ IRR = Internal Rate of Return

¹⁰ Based on Deutsche Asset Management proprietary methodology for ranking unlisted infrastructure sectors as at 31.12.2017. Valuations for 2018 are based on a ten year dividend discount model and a terminal value calculated as a ten year annuity. Dividend yields, leverage, growth, exit assumptions and discount rate vary by country and sector, 10 January 2018

¹¹ Core infrastructure includes brownfield assets in geographically mature markets, with returns predominantly based on income return. Income return is predictable in the long term, based on regulation or contractual structure, while capital appreciation potential is more limited. Core assets provide essential services in economically and demographically mature areas, are often fully regulated, and technological obsolescence risk is minimal, contributing to low return volatility

¹² Core plus infrastructure includes brownfield assets in geographically mature markets, often with some development risk. Income return visibility is supported by regulation or contractual structure, providing long-term income return visibility, but capital return contributes to return expectations more than for core assets, and total return volatility is potentially higher than for core assets

¹³ The middle market includes assets requiring equity checks in the range of EUR 250 million to EUR 500 million, offering a value proposition that is less competitive than the market for large-scale core assets. Opportunities in the middle market often enable acquirers to compete on factors other than price, including, such as business plan strength and asset management/ industry expertise

¹⁴ Based on Bloomberg data, as at 10 December 2017

- From a long-term investor perspective, we recognise that in Europe, fading subsidies for renewables can expose investors to excessive tail risks. Therefore, at the moment, we see renewables more as a potential target in the United States, where a market for power purchase agreements (PPA) is developing quickly,¹⁵ improving long-term return visibility.

Today, U.S. infrastructure can offer the opportunity for long-term investors to diversify their European portfolios globally, particularly across the core plus, contracted energy space, a sector where opportunities in Europe are somewhat more limited in the short term due to market dynamics. The U.S. private infrastructure market is relatively mature and represents one of the largest globally in terms of transaction volumes¹⁶. In the medium term, the renewed policy focus on infrastructure should offer more opportunities for long-term investors to build diversified infrastructure portfolios beyond the energy sector.¹⁷

- We view the telecom networks space favourably, as digitalisation continues to generate unprecedented data demand growth. Technological change represents an accelerating and highly disruptive driver for the infrastructure industry, with battery storage, smart grids and electric mobility triggering new synergies among utilities, telecoms and networks.¹⁸ We believe that as these technologies mature in the coming years, investment opportunities for long-term investors may emerge in this space.

2 Strategic Themes¹⁹

Infrastructure fundraising has maintained strong momentum in 2017, and investors' appetite positions the sector for further growth in 2018.²⁰ However, with the investment cycle entering its ninth year, it is no surprise that the task to deploy capital has become more sophisticated. We believe that investors looking to allocate to infrastructure may consider the following strategic themes when looking at infrastructure investment:

Strategic Themes for Unlisted Infrastructure Investment and Portfolio Management		
Target Investment ²¹	1	Mature markets: Focus on Germany, United Kingdom, Netherlands, Nordics, France, Italy and Spain. These markets offer a relatively predictable investment environment, a transparent legal and regulatory framework, and a track-record of private infrastructure ownership. These factors are important for core and core plus investment strategies looking to benefit from long-term income return stability. ²²
	2	Core/core plus strategy: An accelerating economic environment offers a strong base for the implementation of active asset management initiatives. These can create value in an investment, capitalizing on core plus investment strategies that target assets providing income yield, but that may benefit from the prospect of greater capital appreciation compared to core assets over time. Core infrastructure remains a key strategy to complement and stabilize income return in a core plus portfolio. ²³
	3	Transportation positioned for growth: The economic outlook positions transportation favorably. Improving traffic volumes, particularly for airports and toll roads, offer revenue growth potential in the medium term. ²⁴
	4	Brownfield with development potential: Focus mainly on brownfield assets with some development potential. Brownfield infrastructure may offer relatively low income return volatility, due to regulated or contracted revenue streams, while development potential may enhance returns through asset management initiatives.
	5	Megatrends: Several long-term trends, including digitalisation, urban, demographic, environmental and technological changes are influencing infrastructure investment. Investors may decide to target assets positioned favourably to capitalise on these megatrends which may create value in the long term.
	6	Sustainability: Infrastructure is a capital intensive industry, is essential to society, and has direct impact on individuals' quality of life. Investors should target assets that comply with transparent ESG criteria and responsible investment guidelines, as evidence increasingly demonstrates that there is a high level of correlation between sustainability and positive long-term financial performance. ²⁵

¹⁵ Bloomberg, "Amazon battles Google for renewable energy crown", 19 October 2017

¹⁶ Preqin, January 2018

¹⁷ Deutsche Asset Management proprietary model for ranking unlisted infrastructure markets as at 31.12.2017, 10 January 2018

¹⁸ Based on Bloomberg data, as at 10 December 2017

¹⁹ Any forecasts provided herein are based on Deutsche Asset Management's opinion at time of publication and are subject to change.

²⁰ Preqin, "2017 Private Capital Fundraising Update", January 2018

²¹ No assurance can be given that investment objectives will be achieved.

²² Deutsche Asset Management proprietary methodology for ranking unlisted infrastructure markets as at 31.12.2017, 10 January 2018

²³ Deutsche Asset Management proprietary methodology for ranking unlisted infrastructure sectors as at 31.12.2017, 10 January 2018

²⁴ Based on Oxford Economics, Eurostat and Bloomberg data, as at December 2017

²⁵ Deutsche Asset Management, University of Hamburg, "ESG and Corporate Financial Performance", December 2015

Risk Awareness	1	Brexit uncertainty: Understand asset specific implications of Brexit negotiations over the next 12-18 months, before committing capital to the United Kingdom, particularly for non-regulated assets.
	2	Energy transition: Avoid exposure to baseload thermal generation, particularly in Europe, and if revenues are not backed by long-term power purchase agreements (PPA). These assets will increasingly be pushed out of the merit order due to growing renewables and rising CO ₂ prices from 2021 onwards. ²⁶
	3	Avoid style drift: Higher yielding strategies at this point in the cycle may lead to underperformance, as downsides are most acute. Core and core plus infrastructure investment strategies focusing on income generating assets have the potential to provide stronger risk-adjusted returns in the long term. ²⁷
Portfolio Optimisation	1	U.S.: U.S. infrastructure is an established market, and can offer the opportunity for long-term investors to diversify globally their portfolios of European investments, particularly across the long-term contracted energy space, a sector where today, opportunities in Europe are somewhat more limited. ²⁸
	2	Middle market: We believe that the middle market offers opportunities for investors to acquire assets at reasonable valuations, where there can be less competition. Furthermore, opportunities requiring structuring or a differentiated approach present the opportunity to create value through operational, strategic and financial expertise in the medium-to-long term.
	3	Selective greenfield: Greenfield opportunities remain a valuable strategy in more stable core countries, and offer the possibility to generate alpha. Such opportunities can complement a portfolio with higher returns while many of the increased risks associated with early stage investing can be mitigated. ²⁹
	4	Infrastructure debt: Private infrastructure debt supports strategies looking for illiquidity premia over corporate bond spreads, enhanced lender protections, and portfolio diversification from fixed income securities. Allocating a larger share to debt also has the potential to lower a portfolio's interest rate sensitivity. ³⁰

3 Macroeconomic Outlook

In late 2016, when we undertook our previous European Infrastructure Outlook, the forecast for Eurozone GDP growth in 2017 and 2018 was 1.5% per annum – a figure which is now over 2.0%. Importantly, this is consistent with recent economic indicators, which continue to point to positive momentum, implying a period of economic growth ahead of us.

Despite higher inflation, consumer spending is performing better than expected, supported by employment growth, and there is little sign that the appreciation of the euro is having an adverse effect on the industrial sector, which continues to support the recovery. Looking to our five year forecast period, Spain and Sweden continue to be the top performers in Western Europe, while we note that economic growth in France and Italy has accelerated compared with our previous expectations.

During 2017, the European political landscape was beset with hurdles; elections in the Netherlands, Austria, France and Germany were all poised to potentially cause the economy to stumble. However, as we sit here at the beginning of 2018, the outlook is somewhat changed. Confidence is higher, growth is accelerating, and with the election of Emmanuel Macron in France, not only have political risks reduced but reform is an increased possibility.

For 2018, challenges remain on the political front, but the medium-term political outlook in the Eurozone seems to be gradually stabilising, with Germany heading towards a coalition government³¹ and Italian elections in March likely to yield a similar result³².

In contrast, sentiment in the United Kingdom has turned. Having performed better than expected since last year's vote to leave the European Union, the anticipated economic impact is starting to materialise. With uncertainty looming over the Brexit negotiations, it's reasonable to expect that firms in the United Kingdom take a cautious stance on investment.³³

²⁶ Based on Bloomberg and DNV GL data, as at November 2017

²⁷ Based on Deutsche Asset Management proprietary methodology for ranking unlisted infrastructure sectors as at 31.12.2017. Valuations for 2018 are based on a ten-year dividend discount model and a terminal value calculated as a ten year annuity. Dividend yields, leverage, growth, exit assumptions and discount rate vary by country and sector, 10 January 2018

²⁸ Based on InfraNews data, as at December 2017

²⁹ Deutsche Asset Management proprietary model for ranking unlisted infrastructure markets and sectors as at 31.12.2017, 10 January 2018

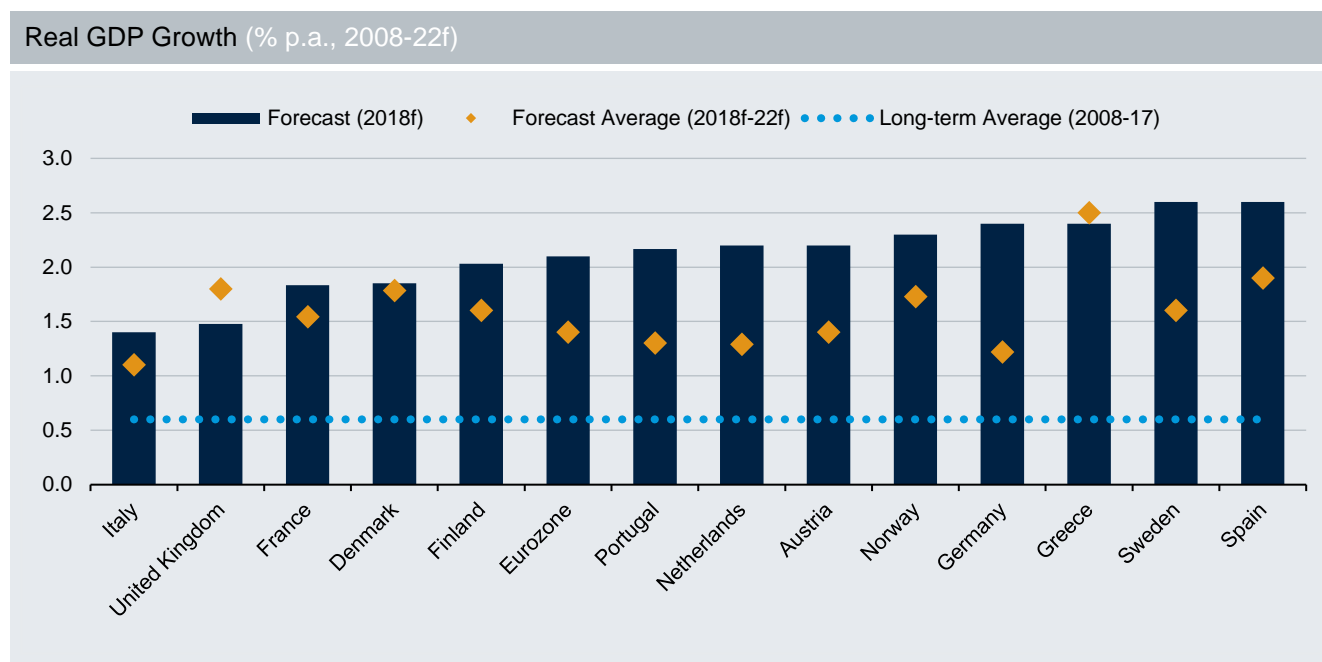
³⁰ Based on Deutsche Asset Management proprietary database of private debt infrastructure transactions benchmarked against Markit iBoxx infrastructure corporate debt indices, as at December 2017, and on Deutsche Asset Management research report, Understanding Infrastructure Debt, July 2017

³¹ Reuters, "German SPD leaders aim to improve on coalition deal with Merkel, 14 January 2017

³² Reuters, "Centre-right coalition rises in polls ahead of Italian vote", 10 January 2018

³³ Based on Oxford Economics data, as at 12 December 2017

While current forecasts suggest the downturn in the United Kingdom shouldn't be overstated – the outlook remains one of modest growth – the signing of Article 50 in March 2017, which started the two year countdown to Brexit, has focused attention on the potential disruption. With the general election in June resulting in a weak coalition government, there are certainly concerns over the strength and stability of the government as it progresses in the complex withdrawal from the European Union.



Source: Oxford Economics, 23 January 2018. Notes: f = forecast, e = expected. Past performance is not a guide for future results. There is no guarantee the forecast shown will materialise

The positive European economic outlook suggests that infrastructure performance should remain robust over the coming years. In particular, economic growth represents a good opportunity for GDP-linked infrastructure – including airports and toll roads – to gain from improving economic fundamentals and sustained demand, as historically low oil prices represent an additional benefit to traffic growth.³⁴

In recent years, we have observed a reduction of public investment in European infrastructure, and as fiscal constraints will continue to put pressure on public budgets, European countries with high deficit levels will activate alternative measures to reduce debt burdens, including the privatisation of state owned infrastructure.

Accelerating economic activity, supported by resilient economic growth in China and firming emerging market growth, is now more supportive for global port operations compared to our expectations a year ago.

There has been much discussion over increasing inflation and its potential impact on interest rates; however, with employment levels still recovering in countries such as Spain, France and Italy, inflation risks seem low. In contrast, the weaker sterling and robust job market are likely contributing to slightly higher inflation in the United Kingdom, although even here inflation is forecast to gradually normalise during the course of 2018 once the currency base effect begins to fade.

With the passage of time and improving economic conditions, we expect long-term interest rates to rise gradually across Europe, as the ECB asset purchase program contracts. In the United Kingdom, until politics and Brexit negotiations become clearer, the Bank of England is expected to respond to inflation risks cautiously and gradually.³⁵

Infrastructure will remain a critical asset class during the part of the cycle where inflationary pressures are forecast to pick-up. The quasi-monopolistic nature of infrastructure assets supports inflation hedging in the long term as the inelasticity of demand allows for increased tariffs and fees with a high probability that inflation can be passed on to the end customer.³⁶

³⁴ Deutsche Asset Management proprietary methodology for ranking unlisted infrastructure sectors as at 31.12.2017, 10 January 2018

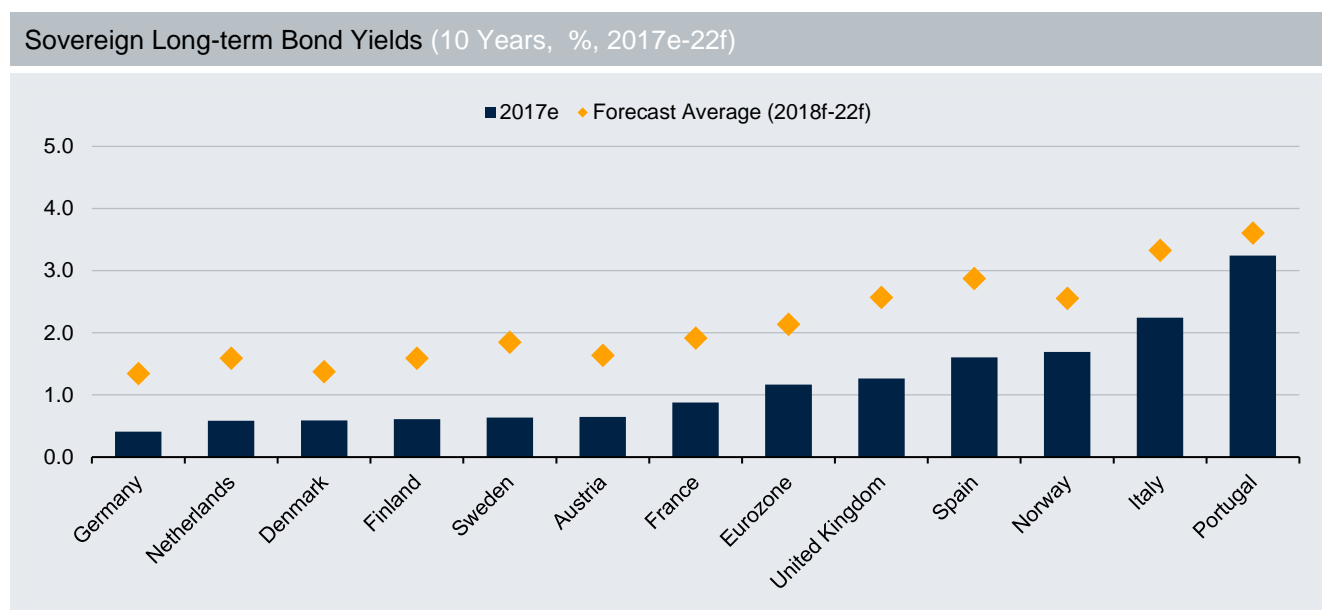
³⁵ Based on Oxford Economics data, as at 12 December 2017

³⁶ OECD, November 2017

There are risks to the macroeconomic outlook. A material increase in oil prices, potentially related to an upsurge in geopolitical tensions, could lead to higher costs and rising inflation, moderating the outlook for growth.

A second risk would stem from substantially tighter monetary policies causing short rates rise relative to longer term rates. For the reasons stated, this risk remains low.

A further risk could stem from restrictive trade policies impacting the goods and labour markets. Restrictive trade policies combined with increased tariffs could lead to a negative impact on inflation and economic growth. In this regard, the Brexit negotiations will need to be carefully watched to determine the impact on the United Kingdom market. Still, if talks were to result in unfavourable terms for the United Kingdom, it's reasonable to expect that it would move quickly to bilateral discussions with the United States and other countries.



Source: Oxford Economics, 12 December 2017. Notes: f = forecast, e = expected. There is no guarantee the forecast shown will materialise

4 Infrastructure Outlook³⁷

4.1 Industry Update

Transportation: In 2017, the European transportation industry continued to expand on the back of supportive macroeconomic fundamentals.³⁸

We expect this trend to carry on in 2018. The airport sector is forecast to expand further, while toll roads will continue their process of gradual recovery. Rail will remain on its long-term growth path, supported by capacity increases, while rail freight seems to be benefitting from the strengthening Eurozone recovery. We forecast average traffic growth to be above GDP growth for airports and toll roads.³⁹ In 2018, oil prices are forecast to average around USD 65 per barrel,⁴⁰ remaining below historical long-term average and supporting traffic performance.

The outlook for European ports is stabilising, supported by firming global trade, but remains exposed to potential volatility, particularly for ports with less diversified operations, as the shift from bulk to containerisation – which has driven growth in the past – is gradually maturing.⁴¹ Moreover, in the medium term we see the risk of restrictive trade policies looming over port operations, particularly in the United Kingdom, where a no-deal Brexit, although less likely in our base case, may have material consequences on current customs arrangements.⁴²

³⁷ Any forecasts provided herein are based on Deutsche Asset Management's opinion at time of publication and are subject to change.

³⁸ Based on Bloomberg and Eurostat data, as at December 2017

³⁹ Based on Bloomberg, Eurostat and Moody's Investors Service data, as at December 2017

⁴⁰ Oxford Economics, 17 January 2018

⁴¹ Based on Bloomberg, Eurostat and Moody's Investors Service data, as at December 2017

⁴² Bloomberg, "Brexit Threatens Major Border Disruptions, United Kingdom Lawmakers Say", 16 November 2017

Positive traffic volumes and a gradual return to inflation will translate into a moderate improvement in financial performance across the transportation industry, supported by inflation-linked tariffs, as well as stronger operating margins. Investment is forecast to continue to accommodate required capacity increases, particularly in the airport sector.⁴³

Energy, Utilities & Networks: The energy sector is experiencing an unprecedented shift amid sluggish energy demand, a move towards renewables, stricter climate regulation and historically low power prices. The outlook for energy demand remains subdued due to expanding energy efficiency, while dark and spark spreads⁴⁴ will remain weak, but provide some short-term relief to baseload power generation. Our long-term outlook for thermal generation remains negative. Growing use of renewables, weak demand and the effect of increased battery storage capacity on electricity peak price shaving will increasingly put pressure on power prices.⁴⁵

In 2018, we are expecting installation of renewables to see further growth, but to moderate compared with the levels observed in previous years due to fading subsidy regimes. Overcapacity will still affect European utilities, as energy transition continues to force them to adapt their business profiles.⁴⁶

As such, utilities are expected to focus on networks and increasingly to shift to digital technologies, including battery storage and demand-response services. Utilities will act more and more as aggregators for growing distributed energy generation,⁴⁷ seek industrial and financial partnerships to restructure their operations and to accommodate investment needs, particularly at municipal level.⁴⁸

The financial performance of the European energy sector is forecast to remain fairly stable throughout 2018.⁴⁹ Network utilities have seen a gradual reduction in regulated returns since 2010 due to a steady decrease in allowed cost of debt, and we see this trend continuing in 2018.

In the medium term, we believe that utilities will continue to experience a trend of narrowing EBITDA⁵⁰ margins, particularly as they expand into lower-margin services, despite the emergence of capacity markets stabilising energy generation profitability somewhat. We expect investment levels to remain high to support changing business profiles, and to trigger a new wave of consolidation in the industry in the long term.

Telecommunications: The 2018 outlook for European telecommunications remains positive, as the sector continues to benefit from a long-term trend of stronger consumer spending and digitalisation. Technological evolution is generating unprecedented data demand growth, while consumer trends suggest that demand for high speed data will accelerate, also driven by an expansion of data centres and cloud computing, particularly at corporate level.⁵¹ This supports the case for future telecom infrastructure transaction opportunities across fibre optics, telecom towers and data centres.

Capital spending is expected to remain high in the industry, while consolidation and M&A activity should continue, particularly as mobile operators seek to integrate with fixed-line operators or cable companies.⁵²

4.2 Equity Market Update⁵³

In the current financial environment, dominated by comparatively lower returns from traditional investments, long-term investors continue to look at unlisted infrastructure as an asset class that can match their long duration needs and one that has historically produced strong risk-adjusted returns. Therefore, we expect investor interest in unlisted infrastructure to be sustained in 2018.

⁴³ Bloomberg, Deutsche Asset Management internal database of European listed infrastructure peer companies, 17 January 2018

⁴⁴ The theoretical gross margin of a coal-fired (dark) or gas-fired (spark) power plant from selling a unit of electricity, having bought the fuel required to produce this unit of electricity

⁴⁵ Bloomberg New Energy Finance, December 2016

⁴⁶ Based on Bloomberg, Eurostat and Moody's Investors Service data, as at December 2017

⁴⁷ Roland Berger, March 2017

⁴⁸ Based on Bloomberg and Moody's Investors Service data, as at December 2017

⁴⁹ Based on Bloomberg data, as at December 2017

⁵⁰ EBITDA = Earnings Before Interest, Taxes, Depreciation and Amortization

⁵¹ Based on Bloomberg data, as at December 2017

⁵² Based on Oxford Economics, Bloomberg and Moody's Investors Service data, as at December 2017

⁵³ Any forecasts provided herein are based on Deutsche Asset Management's opinion at the time of publication and are subject to change.

Fundraising Trends: In 2017, unlisted infrastructure investment enjoyed another strong year. Over the course of the year, 69 funds closed globally, raising a total of USD 65 billion in aggregate. In line with the previous year, Europe and North America continued to lead the global fundraising market. Europe led in the number of funds closed, but we note that North America made up the largest proportion of infrastructure fundraising, with 28 funds securing USD 35 billion, accounting for 54% of the aggregate capital raised. Investors increasingly look at North America as a region that can offer diversification opportunities to their global infrastructure portfolios, particularly in the energy sector.⁵⁴

In 2017, the trend towards fundraising concentration has become more pronounced, with investors continuing to commit larger sums of capital to a smaller number of funds. Infrastructure fundraising was faster in 2017, with average time taken to reach final close reducing to 18 months, compared with 26 months in 2016. The proportion of investors active in infrastructure that are planning to deploy USD 500 million or more in the next 12 months increased from 3% in the third quarter of 2016 to 15% in the third quarter of 2017, while the proportion looking to commit to fewer than three funds also rose from 70% to 78% over the same period.⁵⁵

Beyond core strategies, where we continue to observe a decline in viable opportunities, opportunistic investment strategies seem to be gaining traction and becoming more popular than core plus strategies.⁵⁶

Transaction Trends: Europe still represents the leading market globally for core/core plus unlisted infrastructure investment strategies in terms of market size, portfolio diversification opportunities, market longevity, track record and secondary market liquidity.⁵⁷

- **Europe:** European infrastructure has the potential to match well with infrastructure investment strategies focusing on long-term income yield stability with some capital growth potential. For example, Europe provides access to numerous investment opportunities in transportation, such as airports governed by mature and tested concessions, which have historically provided long-term income return visibility as well as potential for long-term business expansion.

European infrastructure regulation is relatively transparent when compared to other markets around the globe. Mature European countries can offer an established investment environment, a transparent legal and regulatory framework, and a history of private infrastructure ownership.⁵⁸ In our view, the most relevant markets in Europe include the United Kingdom, Germany, France, the Nordics, Italy and Spain.⁵⁹

In 2017, 632 private infrastructure equity transactions closed in Europe for a total of EUR 89 billion. Brown-field transactions accounted for 73% of the total volume, while greenfield projects remained strong at 27%. Greenfield transactions took mainly place across renewables, and off-shore wind in particular.⁶⁰

Within Europe, the United Kingdom maintained its position as the leading infrastructure investment market, accounting for 33% of closed transactions. Southern Europe accounted for 14.5% of the total, in line with France (13.9%) and Germany (12.6%), while the Netherlands accounted for 5% and the Nordics for 4.1%.⁶¹ After the June 2016 referendum on EU membership, we observed a slow-down in U.K. infrastructure transaction volumes, but this effect now seems to have faded despite ongoing uncertainty. We recognise the short-term risks related to Brexit, but the United Kingdom still has a transparent regulatory framework in our view, and remains a core market for infrastructure investment. However, investors should understand the asset-specific implications of the Brexit negotiations over the next 12-18 months before committing capital to the United Kingdom, particularly for non-regulated assets.⁶²

⁵⁴ Preqin, "2017 Infrastructure Deals", January 2018

⁵⁵ Preqin, "2017 Infrastructure Deals", January 2018

⁵⁶ Preqin, July 2017

⁵⁷ Based on Infrastructure Journal database as at 31.12.2017, 12 January 2018. Figures include all European projects in the database that have been listed with the status "Financial Close". This figure reflects both infrastructure project financing and non-project financing deals

⁵⁸ Based on Deutsche Asset Management proprietary methodology for ranking unlisted infrastructure markets as at 31.12.2017, 10 January 2018

⁵⁹ Based on Deutsche Asset Management proprietary methodology for ranking unlisted infrastructure markets as at 31.12.2017, 10 January 2018

⁶⁰ Based on Infrastructure Journal database as at 31.12.2017, 12 January 2018. Figures include all European projects in the database that have been listed with the status "Financial Close". This figure reflects both infrastructure project financing and non-project financing deals

⁶¹ Based on Infrastructure Journal database as at 31.12.2017, 12 January 2018. Figures include all European projects in the database that have been listed with the status "Financial Close". This figure reflects both infrastructure project financing and non-project financing deals

⁶² Based on Deutsche Asset Management proprietary methodology for ranking unlisted infrastructure markets as at 31.12.2017, 10 January 2018

Looking at transactions by sector, energy-related deals formed the most active segment of the infrastructure market during 2017, accounting for 52% of closed deals by volume, although this share was split between oil & gas (14%), renewables (20%), and power (18%).⁶³ Transportation accounted for 29% of the total volume, with 7% in social infrastructure and closely followed by telecommunications on 5%.

Social infrastructure represents a slow but steadily growing sector, as a framework for Public Private Partnerships (PPP) is gradually maturing across Europe. These partnerships represent a structured way of raising private sector capital to fund social infrastructure projects and provide private investors with a return on investment.⁶⁴

- **North America:** The U.S. private infrastructure market is mature, and represents one of the largest globally in terms of transaction volumes.⁶⁵ Country risk is low, and regulation is transparent and predictable, but does not always have the same track record of mature European markets and tends to change by state.⁶⁶

In 2017, 209 private infrastructure equity transactions closed in North America for a total of USD 68 billion, 85% of which were in the United States, with 15% in Canada. Greenfield transactions accounted for 44% of the total, a level materially higher than Europe, with transactions taking place across the energy and renewables sectors in particular. Social infrastructure and PPPs accounted for 1% of the closed transaction volume.⁶⁷

In the United States, the transportation sector, which today represents the majority of the U.S. infrastructure investment requirements, has traditionally been largely state owned. Municipal finance has represented the main funding source, and the sector has therefore seen limited private sector involvement historically.⁶⁸

The penetration of PPPs, as an alternative to limited government finances, has also been relatively limited. The U.S. PPP industry has seen numerous challenges since each of the 50 states has a unique legislative and regulatory regime. While PPPs have been instrumental in getting a number of projects over the line, only a few states have used the procurement method to date, including Virginia, Texas, Florida and Indiana, as well as more recently Pennsylvania, North Carolina and Ohio.⁶⁹

In our view, the limited availability of transportation and PPP transaction opportunities somewhat limits the possibility for investors targeting the United States to adequately diversify their portfolios across energy, transportation and concession-based assets. Today, U.S. infrastructure opportunities exist, as do core plus/value-add energy opportunities, for investors seeking to diversify their portfolios of European assets globally, and in recent years transportation assets seem to be slowly regaining momentum.⁷⁰

Going forward, infrastructure investment represents one of the key policy areas of the new administration to perform stimulus spending and boost economic growth. The United States will have to spend roughly USD 3.6 trillion by 2020 to maintain its existing infrastructure, according to conservative estimates.⁷¹ Moreover, more than 20 states have adopted PPP-enabling legislation, and we expect faster progress on the government side, as they recognise that this instrument can represent an efficient investment delivery mechanism with superior outcomes in terms of service quality.⁷²

For this reason, we expect an increase in private sector involvement in U.S. infrastructure projects looking ahead, and believe that the renewed policy focus on infrastructure will gradually offer more opportunities for investors to build diversified infrastructure portfolios beyond the energy sector.⁷³

⁶³ Based on Infrastructure Journal database as at 31.12.2017, 12 January 2018. Figures include all European projects in the database that have been listed with the status "Financial Close". This figure reflects both infrastructure project financing and non-project financing deals

⁶⁴ Deutsche Asset Management, "Why Invest in Infrastructure?", May 2015

⁶⁵ Preqin, January 2018

⁶⁶ Based on InfraNews, and Deutsche Asset Management proprietary methodology for ranking unlisted infrastructure markets as at 31.12.2017, 10 January 2018

⁶⁷ Based on Infrastructure Journal database as at 31.12.2017, 12 January 2018. Figures include all North American projects in the database that have been listed with the status "Financial Close". This figure reflects both infrastructure project financing and non-project financing deals

⁶⁸ Based on Infrastructure Journal database as at 31.12.2017, 12 January 2018. Figures include all North American projects in the database that have been listed with the status "Financial Close". This figure reflects both infrastructure project financing and non-project financing deals

⁶⁹ Based on InfraNews data, as at December 2017

⁷⁰ Based on Infrastructure Journal database as at 31.12.2017, 12 January 2018. Figures include all North American projects in the database that have been listed with the status "Financial Close". This figure reflects both infrastructure project financing and non-project financing deals

⁷¹ American Society of Civil Engineers (ASCE), March 2017

⁷² Based on InfraNews data, as at December 2017

⁷³ PwC, "Trump's USD 1 trillion infrastructure plan: finding the right funding for the right projects", as at January 2018

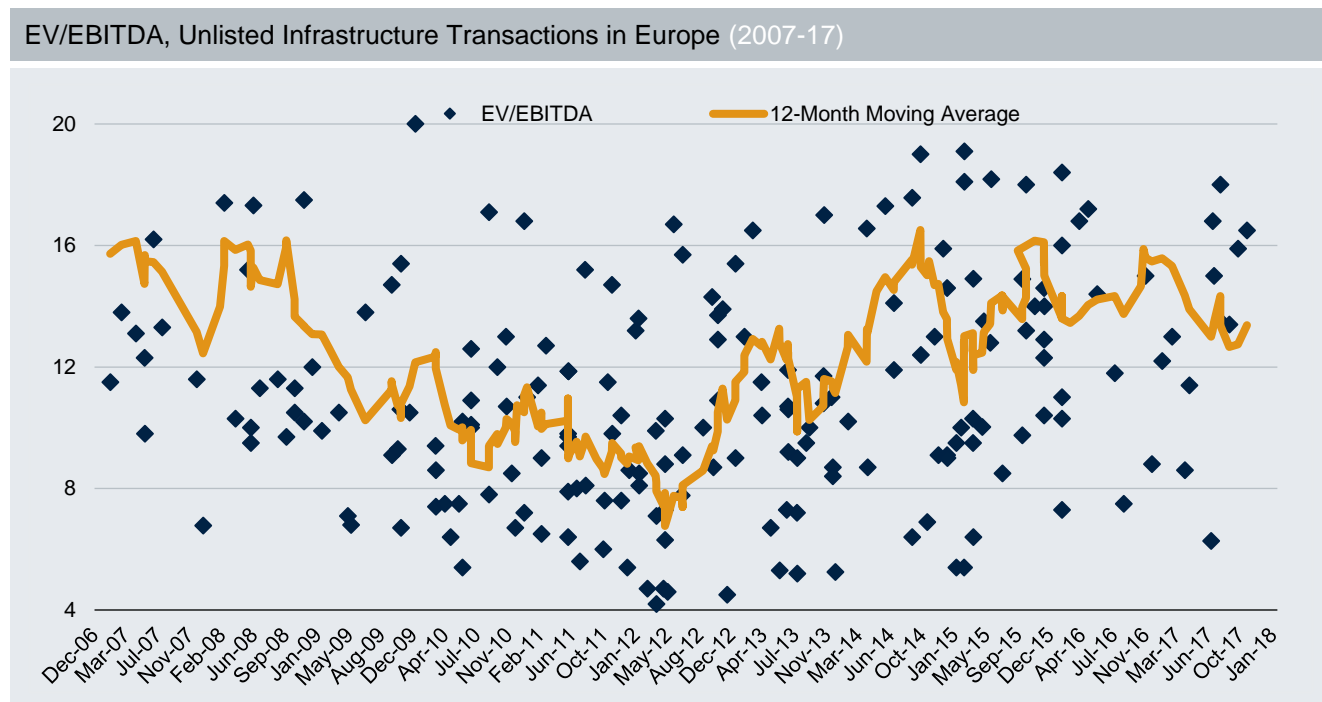
Valuations: In 2017, unlisted infrastructure transaction multiples were at 14x on average, continuing their long-term trend of gradual increase, but broadly in line with the levels of 2016. This was due to the combination of a limited deal pipeline for larger core infrastructure assets, and high levels of dry powder targeting the asset class. That said, we believe that valuations are still below 2007 peaks, particularly considering that interest rates in 2007 were materially higher.⁷⁴

Competition in the sector remained high, but we observed that valuations tended to be higher for core infrastructure assets, and particularly at the direct end of the market, for larger investors with pressure to deploy capital.⁷⁵ At the same time, we continue to note that valuations in the mid-market remained comparatively lower, particularly for more complex situations, offering investors access to a comparatively less competitive landscape.⁷⁶

In 2018, we believe that the European infrastructure investment cycle will mature further, particularly for core infrastructure. Nevertheless, we expect that certain drivers will continue to provide some support to valuations of European unlisted infrastructure, including dry powder levels, the availability of debt financing at historically low interest rates, and a large number of investors looking to invest in the asset class.

In our view, regulated infrastructure might be increasingly exposed to tighter regulation across Europe, an element that we do not necessarily always see fully factored into valuations for recent transactions. Valuations of transportation assets will continue to reflect the favourable industry outlook and supportive macroeconomic fundamentals, while valuations in the unregulated energy sector will factor in the potential volatility related to structural changes taking place in the industry.⁷⁷

In the medium term, we see supply constraints fading gradually, supported by a growing pipeline of potential opportunities. Moreover, rapidly maturing technologies – particularly transport electrification, renewables and battery storage – will increasingly broaden the investable universe across the higher end of the risk/return spectrum.



Source: Deutsche Asset Management proprietary database, based on publicly available transaction data. Past performance is not a guide for future results, 15 December 2017.

⁷⁴ ECB monetary policy rates for main refinancing operations were at 4% at year end 2007, compared with 0% at year end 2017

⁷⁵ Based on Infrastructure Journal database as at 31.12.2017, 12 January 2018. Figures include all European projects in the database that have been listed with the status "Financial Close". This figure reflects both infrastructure project financing and non-project financing deals

⁷⁶ Deutsche Asset Management proprietary database of European unlisted infrastructure transactions, based on publicly available transaction information from various sources, including Infrastructure Journal, InfraNews, Reuters, 17 January 2018

⁷⁷ Based on Deutsche Asset Management proprietary methodology for ranking unlisted infrastructure sectors, as at 31.12.2017. Valuations for 2018 are based on a ten year dividend discount model and a terminal value calculated as a ten year annuity. Dividend yields, leverage, growth, exit assumptions and discount rate vary by country and sector, 10 January 2018

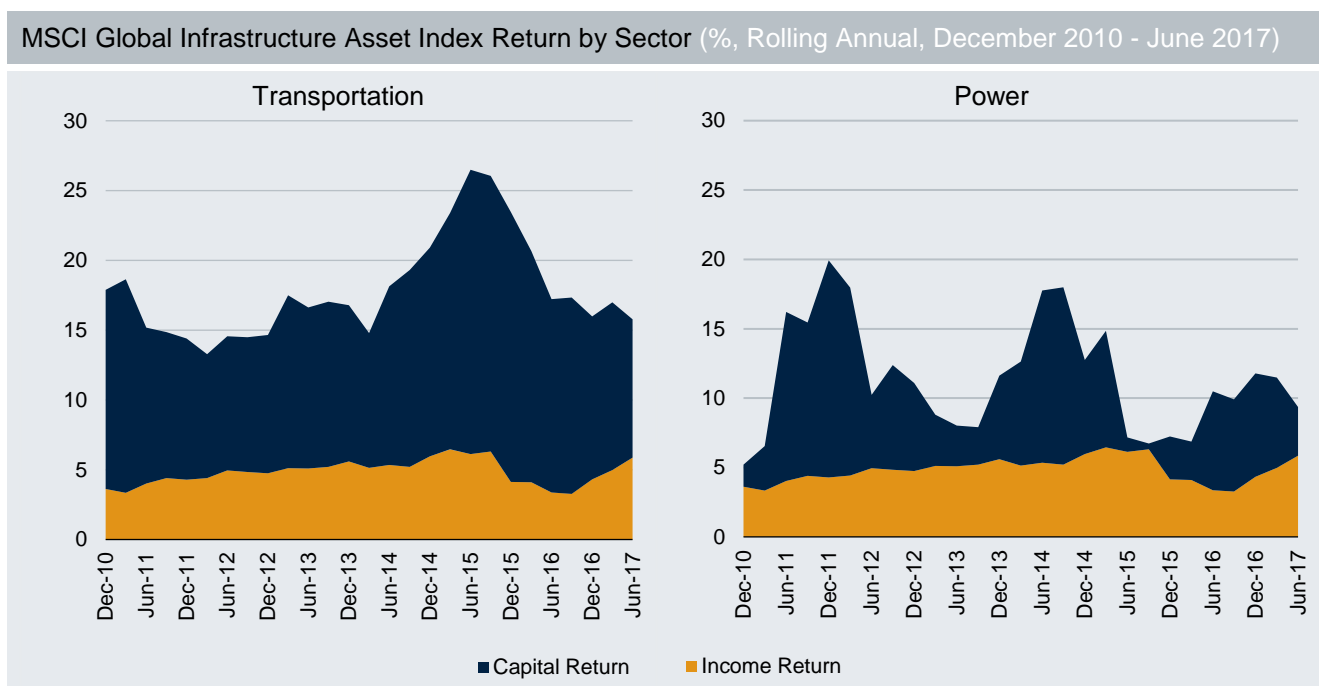
Returns: Data for unlisted infrastructure performance and volatility have historically been relatively limited. In November 2014, MSCI published the MSCI Global Infrastructure Asset Index,⁷⁸ which is starting to provide investors with some initial indications of the historical performance of the asset class. The Index demonstrates that unlisted infrastructure has historically exposed investors to comparatively lower total return volatility, and hence has achieved high Sharpe ratios.⁷⁹

Over recent years, global unlisted infrastructure has recorded persistent double digit total returns. This has been supported by a steady and predictable income return profile, where a reasonable premium over government bond yields can be achieved, although capital returns can be exposed to potential volatility.⁸⁰

- **By Sector:** Looking at sector specific performance, recent capital returns have mirrored the dynamic described for valuations, with the transportation sector benefiting from expectations of improving operational fundamentals.⁸¹ For 2018, we believe that transportation is set to remain an outperformer, due to the favourable economic outlook and supported by improving traffic volumes, particularly across European airports and toll roads. Moreover in the medium term, we acknowledge that transportation assets can have capital appreciation potential supported by organic business and economic growth.⁸²

Except for assets that are regulated or supported by long-term power purchase agreements (PPAs), which tend to offer more stable propositions, capital returns in the power sector have historically proved to be more volatile, particularly for merchant power, reflecting the structural changes that the sector is undergoing and the width of the investable risk/return spectrum.⁸³

Sector-by-sector fundamentals, current market situations and outlook underpin our view that investing in unlisted infrastructure requires strategic asset allocation, asset management skills, and a detailed understanding of jurisdictions and regulation in order to support capital growth, mitigate risks and support investment returns.



Source: MSCI Global Infrastructure Asset Index, local currency, September 2017. Past performance is not a guide for future results.

⁷⁸ MSCI releases industry's first global asset infrastructure index, Sydney, 19 November 2014. Past performance is not indicative of future returns.

⁷⁹ MSCI Global Quarterly Infrastructure Asset Index, "Summary - Period ending June 2017", December 2017

⁸⁰ MSCI Global Quarterly Infrastructure Asset Index, "Summary - Period ending June 2017", December 2017

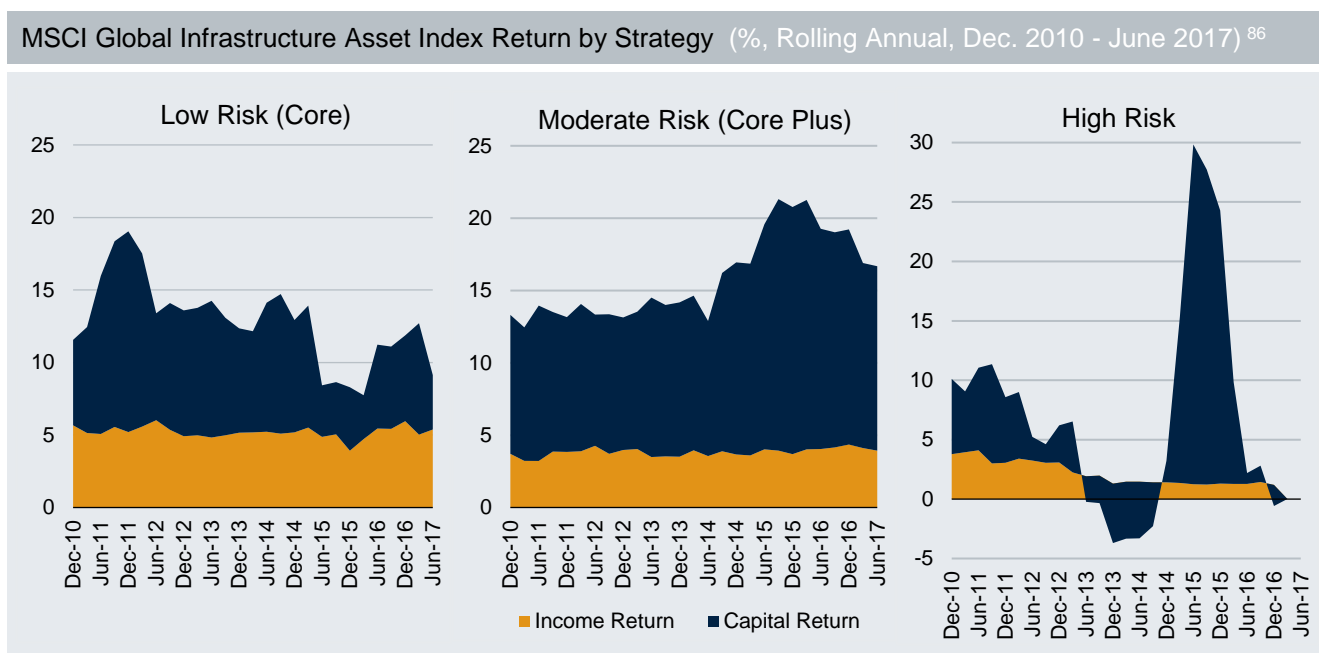
⁸¹ MSCI Global Quarterly Infrastructure Asset Index, "Summary - Period ending June 2017", December 2017

⁸² Based on Deutsche Asset Management proprietary methodology for ranking unlisted infrastructure sectors, as at 31.12.2017. Valuations for 2018 are based on a ten year dividend discount model and a terminal value calculated as a ten year annuity. Dividend yields, leverage, growth, exit assumptions and discount rate vary by country and sector, 10 January 2018

⁸³ Based on Deutsche Asset Management proprietary methodology for ranking unlisted infrastructure sectors as at 31.12.2017. Valuations for 2018 are based on a ten year dividend discount model and a terminal value calculated as a ten year annuity. Dividend yields, leverage, growth, exit assumptions and discount rate vary by country and sector, 10 January 2018

- **By Strategy:** Looking at historical performance by strategy, the MSCI Global Infrastructure Asset Index indicates that core and core plus investment strategies have showed lower volatility, while high-risk strategies, including predominantly merchant power deals, have proved to be materially more volatile.⁸⁴

We also note that while income return across core and core plus strategies has been fairly comparable, core plus infrastructure has historically demonstrated more consistent potential for capital appreciation, supported by the possibility that core plus assets can be actively managed to improve operations and grow the business over time.⁸⁵



Source: MSCI Global Infrastructure Asset Index, local currency, September 2017. Past performance is not a guide for future results

- **Return Forecasts:**⁸⁷ In the current infrastructure market, there is a large volume of dry powder and a high degree of competition for large-scale, core infrastructure businesses. Often, large institutional investors and sovereign wealth funds have been vying to make direct investments, and this has led to a compression of return forecasts.

Although returns vary by country, sector and asset, for 2018 we estimate that on average, levered unlisted equity infrastructure entry returns assumptions in mature European markets will be on average in the range of 7% to 8% (IRR) for core assets,⁸⁸ with some limited upside provided by an expected increase in sovereign bond yields compared to 2017. We continue to see a sound premium over government bond yields, but we expect returns to remain compressed, particularly for regulated networks, while transportation deals should yield a premium over regulated networks.

⁸⁴ MSCI Global Quarterly Infrastructure Asset Index, "Summary - Period ending June 2017", December 2017

⁸⁵ MSCI Global Quarterly Infrastructure Asset Index, "Summary - Period ending June 2017", December 2017.

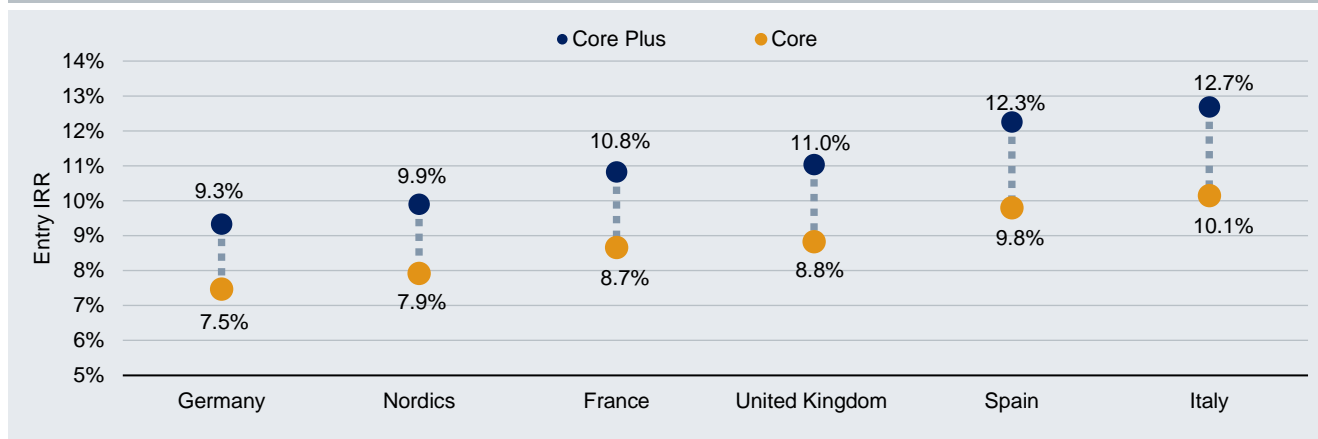
⁸⁶ Deutsche AM, MSCI Global, December 2017. Total Returns based on MSCI Global Quarterly Infrastructure Asset Index, as at June 2017, Local. Core Infra = 'Low Risk' in MSCI Infrastructure Investment Style Matrix, includes brownfield assets in geographically mature markets, with significant component of income yield, predictable and regulated revenues, long-term investment horizon, and an investment grade rating profile. Core/Core+ = 'Moderate Risk', includes brownfield assets with some development risk, in mature markets, with relatively predictable revenues and income and capital, generally contributing equally to total return. 'Opportunistic' = High Risk includes high risk brownfield or greenfield assets, located in mature and maturing markets, with a sub-investment grade profile, with potentially volatile income streams and with the capital return component representing the primary driver of total return. Past performance is not guide for future results.

⁸⁷ All opinions and estimates herein, including any forecast returns, reflect Deutsche Alternative Asset Management (Global) Ltd's judgment on the date of this report and are subject to change without notice.

⁸⁸ Based on Deutsche Asset Management proprietary methodology for ranking unlisted infrastructure sectors as at 31.12.2017. Valuations for 2018 are based on a ten year dividend discount model and a terminal value calculated as a ten year annuity. Dividend yields, leverage, growth, exit assumptions and discount rate vary by country and sector, 10 January 2018. The information herein reflects our current views only, are subject to change, and are not intended to be promissory or relied upon by the reader. There can be no certainty that events will turn out as we have opined herein. Forecasts are based on assumptions, estimates, opinions and analysis which may prove to be incorrect. Past Performance and forecasts are not reliable indicators of future returns. No assurance can be given that any forecast or target will be achieved.

In the core plus space, particularly across the middle market, we see the opportunity for investors to acquire assets at a risk-adjusted premium over core strategies, with average, levered entry return assumptions estimated in the range of 9%-11% (IRR).⁸⁹ This is partially due to the slightly higher risk profile, but is predominantly supported by core plus assets offering the possibility to actively manage and expand operations over time, supporting capital appreciation potential.

Unlisted Infrastructure Average Levered Entry IRR Assumptions by Strategy (% , 2018, Estimate)⁹⁰



Source: Deutsche Asset Management proprietary database, Based on Deutsche Asset Management proprietary methodology for ranking unlisted infrastructure sectors as at 31.12.2017. Valuations for 2018 are based on a ten year dividend discount model and a terminal value calculated as a ten year annuity. Dividend yields, leverage, growth, exit assumptions and discount rate vary by country and sector, 10 January 2018. There is no guarantee the forecast shown will materialise.

4.3 Debt Market Update⁹¹

A Growing Market: In recent years the infrastructure debt market has developed rapidly, offering a growing set of opportunities to long-term investors at a time of historically low interest rates. In 2018, high demand for infrastructure debt is set to continue. Over time, as banks retrench from lending for regulatory reasons, private infrastructure debt should increasingly establish itself as a capital efficient building block to long-term investors' portfolios, both for infrastructure corporate lending and project finance.⁹² Institutional investors increasingly see infrastructure debt as a way to match long-term duration liabilities without diverging significantly from the risk profile of investment grade sovereign bonds.⁹³ At the same time, private infrastructure debt may offer the opportunity to diversify a portfolio, investing in real assets with comparatively strong credit quality and a default-adjusted yield premium over fixed income.⁹⁴

Supportive Regulation: The comparatively strong credit profile of infrastructure debt⁹⁵ has recently been acknowledged by the European insurance regulator under the new Solvency II framework, leading to a reduction in capital charges for insurance companies investing in qualifying infrastructure debt. This may have a major impact on the way in which European life insurance companies consider infrastructure debt as an asset class, increasing demand further.⁹⁶

On June 8, 2017, the European Commission proposed that the reduction in the amount of capital that insurance companies need to hold when they invest should be extended to infrastructure corporates, with the aim of further supporting investment in infrastructure. According to Solvency II regulation, qualifying infrastructure will now include infrastructure corporates and special purpose vehicles (SPV).⁹⁷ Qualifying infrastructure debt now benefits from a risk calibration lower than that of generic corporate debt, resulting in a lower capital charge for

⁸⁹ Based on Deutsche Asset Management proprietary methodology for ranking unlisted infrastructure sectors as at 31.12.2017. 2018 Valuations for 2018 are based on a ten year dividend discount model and a terminal value calculated as a ten year annuity. Dividend yields, leverage, growth, exit assumptions and discount rate vary by country and sector, 10 January 2018. The information herein reflects our current views only, are subject to change, and are not intended to be promissory or relied upon by the reader. There can be no certainty that events will turn out as we have opined herein. Forecasts are based on assumptions, estimates, opinions and analysis which may prove to be incorrect. Past Performance and forecasts are not reliable indicators of future returns. No assurance can be given that any forecast or target will be achieved.

⁹⁰ Nordics includes Denmark, Norway, Sweden, Finland, figures provided represent arithmetic averages calculated for these four countries

⁹¹ Any forecasts provided herein are based on Deutsche Asset Management's opinion at the time of publication and are subject to change.

⁹² S&P Global, "Infrastructure Finance Outlook, Q1 2017 Issue", April 2017

⁹³ Preqin, June 2017

⁹⁴ Moody's Investors Service, "Infrastructure Default and Recovery Rates 1983-2016", 27 July 2017

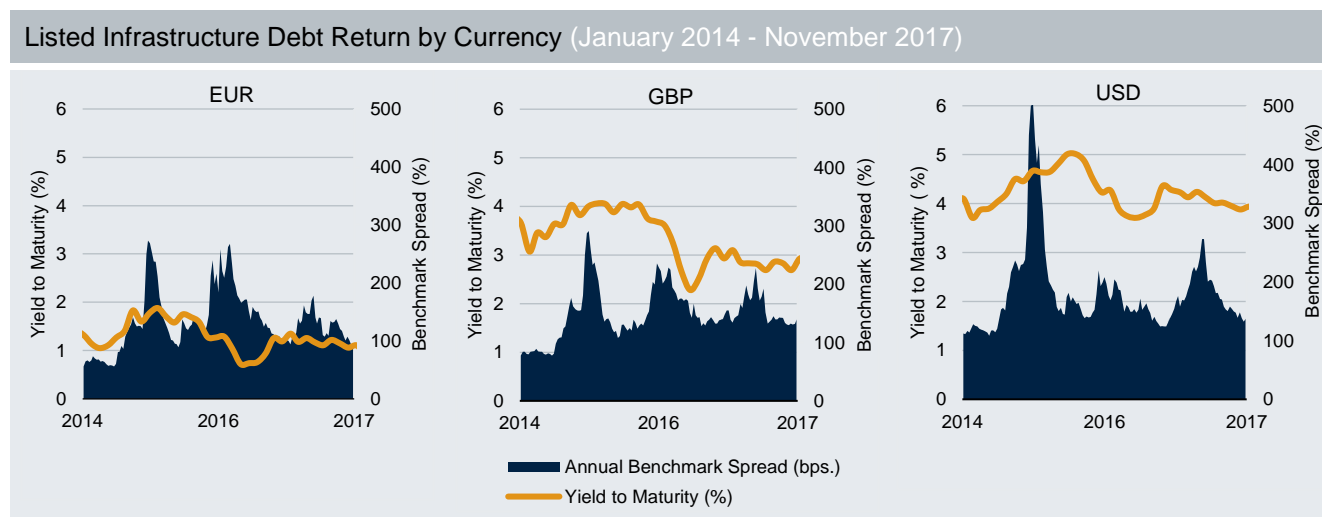
⁹⁵ Moody's Investors Service, "Infrastructure Default and Recovery Rates 1983-2016", 27 July 2017

⁹⁶ European Commission, "New EU rules to promote investments in infrastructure projects", 30 September 2015

⁹⁷ Investment and Pension Europe, "Commission calls for Solvency II rule change to boost infra spending", 8 June 2017

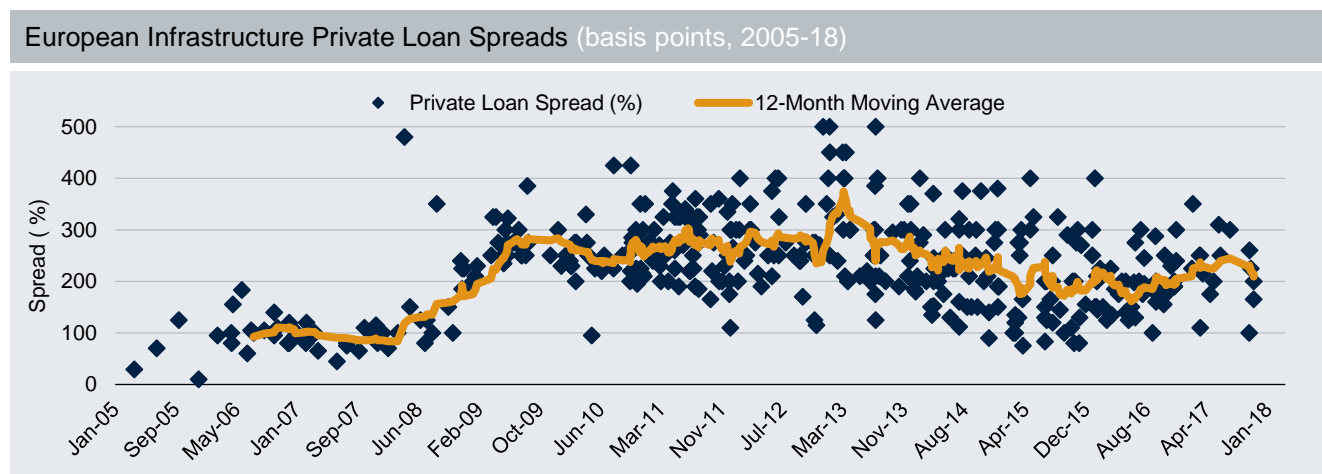
insurance companies investing in infrastructure debt. For example, the spread risk capital requirement for 'BBB' rated corporate bonds with a duration of 10 years is 20%. In comparison, a qualifying infrastructure instrument of the same rating and duration would attract a 15% spread risk capital requirement.⁹⁸

Solid Transaction Volume and Pipeline: In Europe, a total of 164 refinancing transactions took place in 2017, raising EUR 44.2 billion in debt.⁹⁹ Low interest rates also continued to support the volume of infrastructure debt transactions in the greenfield space and in the non-investment grade space. In our view, the pipeline of financing opportunities in Europe is expected to remain solid, supported by a return to investment in the transportation sector and continued refinancing activity. We believe that businesses will continue to lock in the historically low cost of debt and extend debt maturities, although we project yields to increase over the course of 2018. The pipeline for infrastructure debt will also be supported by PPP deals, as well as by a growing share of greenfield projects – particularly across renewables – being financed by long-term investors.



Source: Markit iBoxx infrastructure debt indices in EUR, GBP, USD, period ending November 2017, 15 December 2017. Past performance is not a guide for future results

Spread Premium: Private debt investment strategies are complex and require bespoke origination experience from an asset manager to negotiate transaction structure, duration and covenants. In 2018, we estimate that private debt may continue to offer an illiquidity premium over listed infrastructure debt, particularly at origination, in the range of 60-90 basis points¹⁰⁰ for investment grade rated debt with a duration of 7 to 10 years.¹⁰¹



Source: Deutsche Asset Management proprietary transactions database, 17 December 2017. Past performance is not indicative of future returns

⁹⁸ Solvency II regulation and amendment of the 8.6.2017 of the Solvency II regulation

⁹⁹ Based on Infrastructure Journal database as at 31.12.2017, 12 January 2018. Figures include all European projects in the database that have been listed with the status "Financial Close". This figure reflects both infrastructure project financing and non-project financing deals

¹⁰⁰ Estimate, based on Deutsche Asset Management proprietary database of private debt infrastructure transactions benchmarked against Markit iBoxx infrastructure corporate debt indices, as at December 2017. There is no guarantee that the forecast highlighted will materialise

¹⁰¹ Based on Deutsche Asset Management proprietary database of private debt infrastructure transactions benchmarked against Markit iBoxx infrastructure corporate debt indices, as at December 2017

5 Key Sectors & Markets Operating Performance Outlook

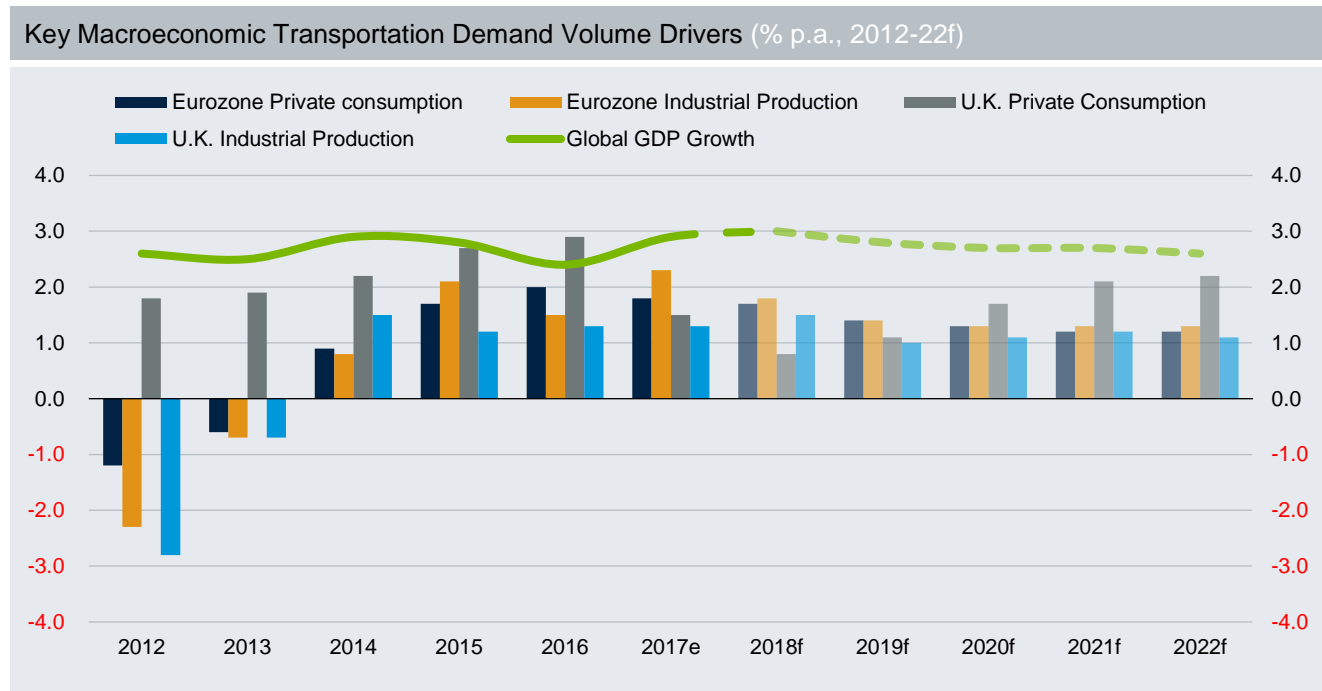
5.1 Transportation

Operating Performance: In 2017, the European transportation industry continued to expand on the back of supportive macroeconomic fundamentals, and we expect this trend to continue in 2018. Transportation is a complex industry and includes, among others, air, marine, road and rail services for both passengers and freight. Although there are differences across industry sub-sectors and regions, traffic volumes have a strong correlation with GDP growth, and in particular to private consumption. This impacts passenger volumes as well as industrial production, which in turn drive freight transportation volumes.

- **Airports:** In 2018, the European airport sector is expected to benefit from strong traffic growth. We expect growth to average 6% in continental Europe for both passengers and cargo traffic, while we anticipate that U.K. airports will experience traffic growth of below 5% on average as the economic environment continues to slow due to Brexit-related uncertainty.¹⁰²

For the same reason, it cannot be excluded that some airlines may move capacity away from the United Kingdom to other European countries. On the supply side, increased airline capacity and historically low oil prices are expected to be supportive factors for the industry in 2018.¹⁰³ Oil prices are forecast to average around USD 65 per barrel in 2018,¹⁰⁴ a level still materially below the price of USD 110 per barrel in 2013. However, oil prices have already increased by 15% over the last year, and unexpected price increases could facilitate airline consolidation, potentially restraining air traffic growth in the medium term.

- **Toll Roads:** European toll roads are positioned for traffic growth in 2018. We expect average growth of 4%, supported by low oil prices and by industrial production driving heavy vehicle traffic. Traffic levels in France are already above pre-crisis level, while Southern European toll roads progress in their recovery. We forecast Italian toll roads to reach pre-crisis traffic volumes in 2018, while Spanish toll roads are only forecast to recover in the medium term due to wider availability of toll-free alternatives, notwithstanding the supportive macroeconomic outlook.¹⁰⁵



Source: Oxford Economics, 12 January 2018. Notes: f = forecast. Past performance is not indicative of future returns. There is no guarantee the forecast shown will materialise

¹⁰² Deutsche Asset Management Forecast based on number of sources, including Oxford Economics, Bloomberg, Eurostat and Moody's Investors Service data, as at December 2017

¹⁰³ Based on a number of sources, including Oxford Economics, Bloomberg, Eurostat and Moody's Investors Service data, as at December 2017

¹⁰⁴ Oxford Economics, 17 January 2017

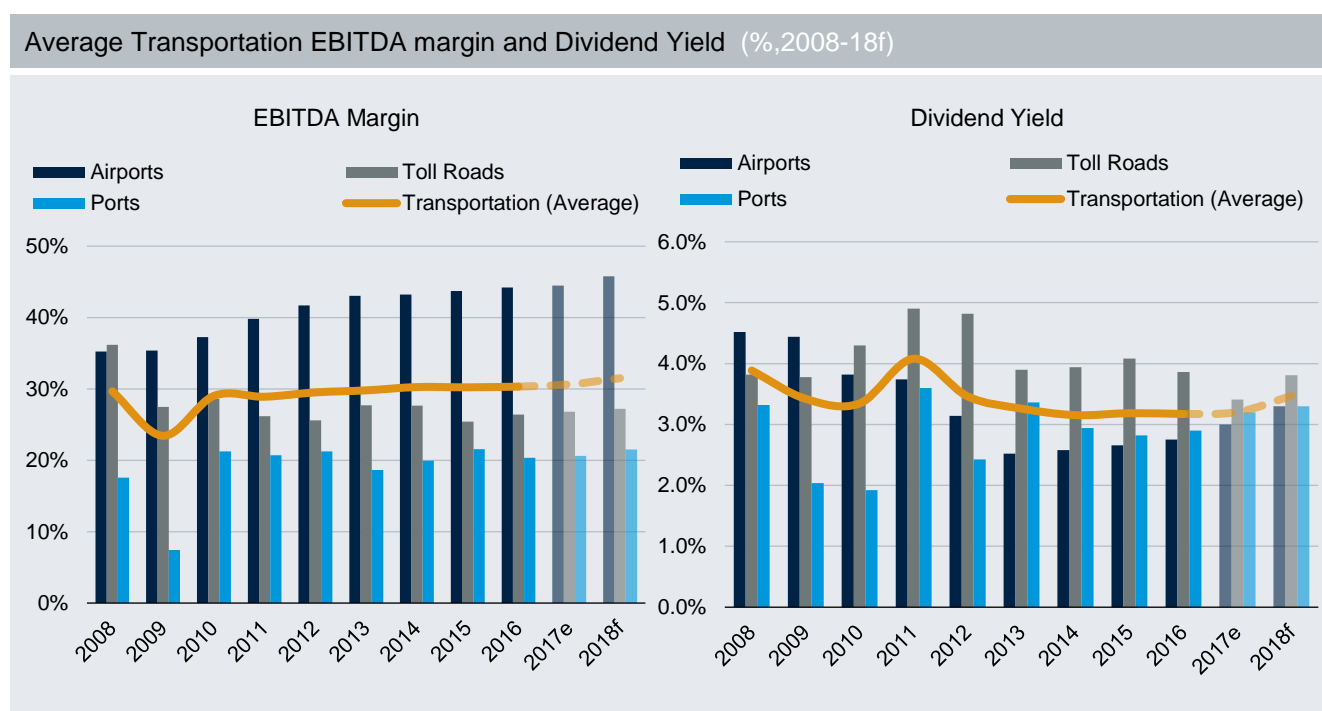
¹⁰⁵ Based on a number of sources, including Bloomberg, Eurostat and Moody's Investors Service data, as at December 2017

- **Rail:** The 2018 outlook remains stable for both European passenger and freight rail, underpinning our favourable view for rolling stock investment fundamentals. Traffic volumes are forecast to continue on their trend of long-term growth, as capacity expands gradually. In the medium term, we continue to see a shift of freight traffic from roads to rail, driven by tighter regulation around diesel trucking capacity and a growing importance of intermodal freight transportation.¹⁰⁶
- **Ports:** In our view, the outlook for European ports is stabilising but remains exposed to potential volatility, particularly for less diversified ports.¹⁰⁷ A supportive economic outlook for China continues to sustain the recovery in world trade.

In the shipping sector, accelerating trade will support dry bulk demand growth, while current oil prices and supportive oil demand are expected to drive a further rebound for tanker rates. Some oversupply in the container liner industry, driven by overcapacity, might put downward pressure on freight rates and lead to some consolidation in the sector over time.

Competition is stronger in ports than in other infrastructure sectors. In particular, we believe that the shift from bulk to containerisation, which has supported growth in the past, is maturing in developed markets, while it still has potential to support growth in emerging markets. Therefore, we expect European ports to grow in line with global long-term GDP growth, rather than outperforming GDP growth as it has in the past.¹⁰⁸

Financial Performance: Growing traffic volumes and tariff growth should translate into a moderate improvement in financial performance across the transportation industry. Key European industry players are forecasting an improvement in EBITDA margins, as well as a consolidation of dividend payments,¹⁰⁹ with average dividend yields stabilising above 3%.¹¹⁰



Source: Bloomberg, 17 December 2017. Notes: e = expected, f = forecast. Past performance is not indicative of future returns. There is no guarantee the forecast shown will materialise.

¹⁰⁶ Based on a number of sources, including Oxford Economics, Bloomberg, Eurostat and Moody's Investors Service data, as at December 2017

¹⁰⁷ Oxford Economics, Eurostat, 15 January 2017

¹⁰⁸ Based on a number of sources, including Oxford Economics, Bloomberg, Eurostat and Moody's Investors Service data, as at December 2017

¹⁰⁹ Bloomberg; Deutsche Asset Management internal database of European listed peer companies, 17 January 2017

¹¹⁰ Bloomberg; Deutsche Asset Management internal database of European listed infrastructure peer companies, 17 January 2018

Strategic Themes: We believe that investors looking to allocate to transportation in 2018 may consider the following strategic themes when looking at infrastructure investment:¹¹¹

Transportation Strategic Themes	1	Focus on long-term value creation: In our view, investment fundamentals in the European transportation industry remain favourable, particularly for airports and toll roads. We believe that a focus on assets that can benefit from projected structural demand growth could maximise value creation in the long term.
	2	Airports: Airports may offer a mix of regulated and unregulated cash flow, and could potentially provide investors with exposure to capital appreciation, bolstered by structural long-term growth prospects. While valuations for large airport hubs may limit returns, smaller airports could offer potential for value creation and medium-term capital appreciation, in spite of a smaller size and less diversified catchment areas.
	3	Caution on ports: Although our outlook for European ports has stabilised compared with last year, the sector remains exposed to potential global trade volatility and a maturing competitive landscape. A focus on well diversified cargo streams and strategic locations, including major logistics hubs, may mitigate the potential for shipping freight volume volatility. We would also favour assets that offer the potential to implement strategic asset management initiatives to improve business volumes in the medium term.
	4	Urbanisation: Urbanisation is an ongoing long-term trend in Europe. Large cities generate the vast majority of GDP, supported by continued population growth, proving supportive for long-term investment in urban transportation. At the same time, urban expansion, increased population density, changing demographics and the need for sustainable, smart mobility models will increasingly represent long-term policy challenges and will require increased commitment from private investors, particularly for urban transportation.
	5	Watch technological change: In 2017 we have continued to observe a material acceleration in the disruptive effect that technological change is having on electric mobility and related infrastructure. Although still not mature enough for long-term investors, electric vehicle charging networks are a quickly maturing technology, potentially requiring material investment in the future. At the same time, digitalisation, car-sharing and ride-hailing represent potential threats to traffic volumes. ¹¹²

5.2 Energy, Utilities & Networks

Operating Performance: The energy sector continues to experience an unprecedented shift amid sluggish energy demand, a move towards renewables, stricter climate regulation and low power prices.¹¹³ Energy demand has historically been correlated with population and economic growth, but with energy decoupling from carbon, accelerating energy efficiency and rising renewables capacity, this relationship is increasingly fading, driving structural changes in the market.¹¹⁴

- **Electricity Generation:** The 2018 outlook for energy demand remains subdued with energy efficiency reducing consumption levels, particularly in the United Kingdom. The climate for EU generators should improve, as some coal and nuclear generation capacity is mothballed and the commodity market recovery puts some upward pressure on power prices and dark and spark spreads. In turn, this should prove supportive for base-load power generation, including gas-fired power plants. Nevertheless, these assets will increasingly be pushed out of the merit order due to growing renewables and rising CO₂ prices from 2021 onwards.¹¹⁵
- **Renewables:** In 2018, we are expecting installation of renewables to continue, but to moderate compared with the levels observed in previous years due to fading subsidy regimes, with offshore wind capacity increases remaining strong. In the medium term, renewable energy will progress closer towards grid parity across European countries as the cost of technology reduces further, boosting capacity.¹¹⁶ Increases in oil and gas prices accelerate this trend.

¹¹¹ Any forecasts provided herein are based on Deutsche Asset Management's opinion at time of publication and are subject to change.

¹¹² The Boston Consulting Group, "Self-driving vehicles, robo taxis, and the urban mobility revolution", July 2016

¹¹³ Based on a number of sources, including Bloomberg, Fitch Ratings, Moody's Investors Service data, as at December 2017

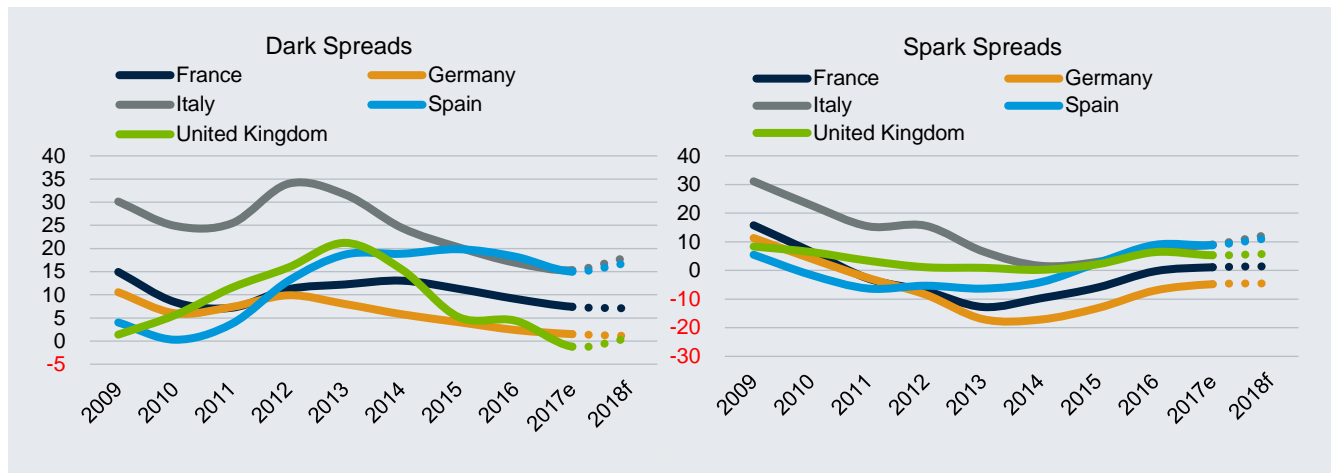
¹¹⁴ DNV GL, "Energy transition outlook 2017", 2017

¹¹⁵ Based on Bloomberg and DNV GL data, as at November 2017

¹¹⁶ Bloomberg, "Clean energy is approaching a tipping point", 19 September 2017

- **Utilities:** Overcapacity will continue to affect European utilities, resulting in mothballing of thermal base-load generators, further deleveraging through disposals in Europe, and investment refocusing on faster growing, emerging geographies and energy services. In renewables, as EU growth opportunities remain moderate, utilities will continue to focus on capacity installation in other regions, including the U.S. and Latin America.¹¹⁷

Average Baseload Dark and Spark Spreads¹¹⁸ by Country (EUR/MWh, 2009-18f)



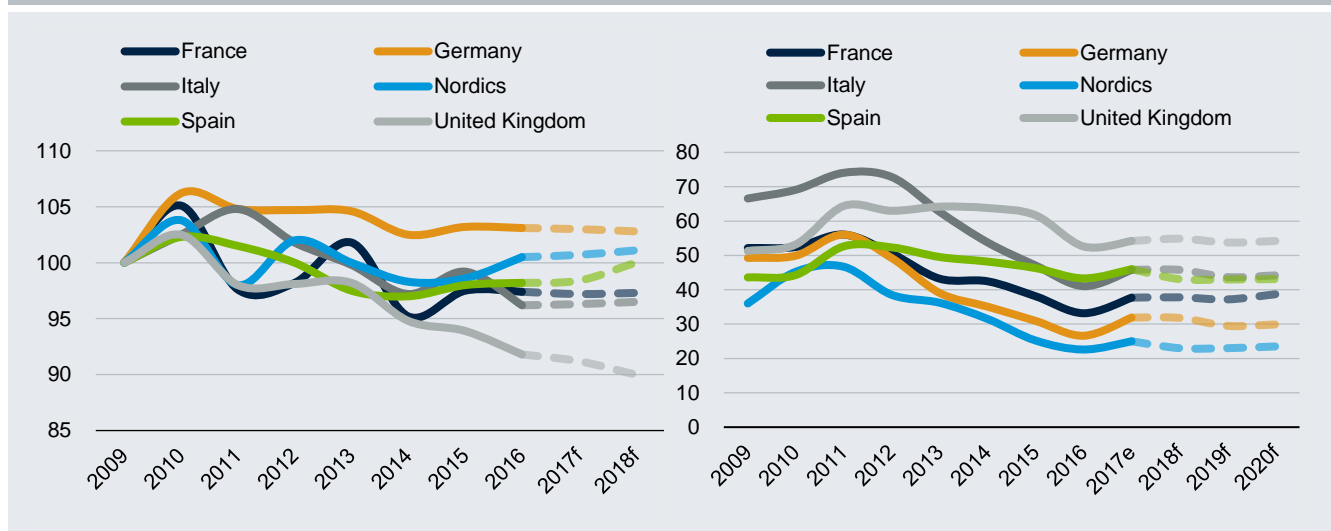
Source: Bloomberg, 17 December 2017. Notes: e = expected, f = forecast. Past performance is not indicative of future returns. There is no guarantee the forecast shown will materialise.

- **Networks:** Network utilities have seen a gradual reduction in regulated returns since 2010, due to a steady decrease in allowed cost of debt, and we see this trend continuing in 2018. In 2017, Italy's regulator has, for example, reduced allowed return for electricity and gas transmission networks, while the German regulator has announced a reduction for 2018-2019.¹¹⁹ The regulated return of U.K. energy grids and water companies is also expected to reduce in the next regulatory cycle.¹²⁰

With inflation forecast to pick up gradually, networks will enjoy some earnings growth potential, while the negative impact of lower allowed return will be partially mitigated by the possibility to refinance maturing debt at historically low rates.

Power Demand (2009 = 100, 2009-18f)

Baseload Power Price (EUR/MWh, 2009-20f)



Source: Bloomberg, 17 December 2017. Notes: e = expected, f = forecast. Past performance is not indicative of future returns. There is no guarantee the forecast shown will materialise.

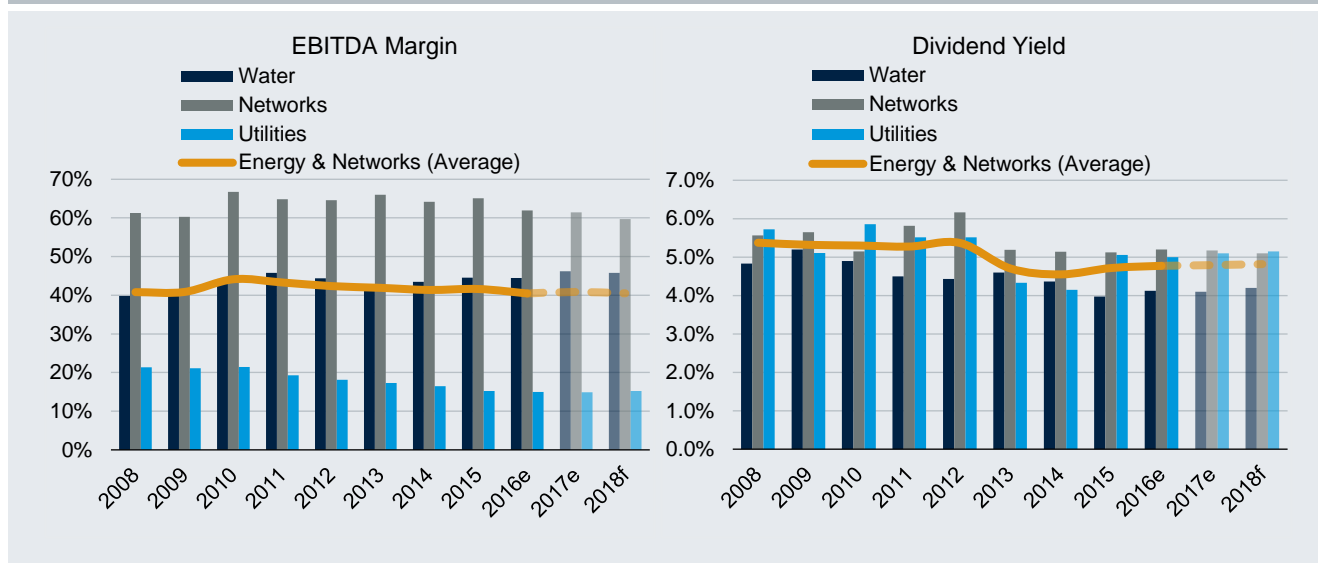
¹¹⁷ Based on a number of sources, including Bloomberg, Fitch Ratings, Moody's Investors Service data, as at December 2017

¹¹⁸ The dark spread is the theoretical gross margin of a coal-fired power plant from selling a unit of electricity, having bought the fuel required to produce this unit of electricity. The spark spread is the theoretical gross margin of a gas-fired power plant from selling a unit of electricity, having bought the fuel required to produce this unit of electricity.

¹¹⁹ Fitch Ratings, December 2017

¹²⁰ Moody's Investors Service, November 2017

Average Energy, Utilities & Networks EBITDA Margin and Dividend Yield (% , 2008-18f)



Source: Bloomberg, 17 December 2017. Notes: e = expected, f = forecast. Past performance is not indicative of future returns. There is no guarantee the forecast shown will materialise.

- **Energy Transition:** The shift towards renewables and battery storage is catalysing a structural change across the energy sector, with capacity markets¹²¹ and frequency response services forecast to expand gradually across Europe and to stabilise the grid. Battery prices (Li-ion) declined to USD 200 per kWh in 2017 from over USD 600 per kWh in 2010.¹²²

With a further drop in battery prices of over 10% forecast for 2018, we see the electric vehicles industry accelerating, requiring increased investment in energy distribution grids.¹²³ An unexpected, material increase in oil and gas prices would accelerate this trend. Alongside smart grids and renewables, the energy transition is changing the business profiles of European utilities.¹²⁴

In our view, utilities will gradually focus on new, digital technologies and act as virtual aggregators for increasingly distributed energy generation. We would expect to see expansion into demand response services and engagement with active customers through the provision of smart metering and other services, potentially including telecommunications.

As these technologies mature, we continue to follow their evolution closely. We believe that utilities will increasingly require industrial and financial partnerships to restructure their operations, particularly at municipal level, where contractual power tends to be lower due to more limited business size.

Today, we see several utilities adopting diverging strategies to restructure their business models. We observed the consequences of a similar dynamic about a decade ago when renewables emerged. Therefore, we believe that over time winners and losers will emerge, triggering a wave of consolidation in the industry.¹²⁵

Financial performance: We expect the financial performance of the European energy sector to remain fairly stable throughout 2018. Utilities are experiencing a trend of narrowing EBITDA margins that is forecast to continue in the medium term, particularly as they expand into lower margins services.

As a result of lower margins, reduced financial flexibility and an increase in business risk, the sector is forecast to maintain its trend of gradual deleveraging in the long term, while dividend yields should remain relatively stable in the medium term.¹²⁶

¹²¹ Capacity markets ensure adequate balancing of an electrical system by remunerating baseload generators for the capacity they make available, rather than for the electricity generated.

¹²² Bloomberg New Energy Finance, October 2017

¹²³ BMI, "The road to unlocking EV potential", December 2016

¹²⁴ World Economic Forum, "The future of electricity", March 2017

¹²⁵ IEEFA, "Global Electricity Utilities in Transition", October 2017

¹²⁶ Bloomberg, Deutsche Asset Management internal database of European listed infrastructure peer companies, 17 January 2018

Strategic Themes: The energy sector remains exposed to material structural changes, offering potential investment opportunities, but at the same time requiring a detailed understanding of power market dynamics and regulatory frameworks. Sector investment and asset management experience is also important in order to mitigate risks through operational and financial asset management initiatives. We believe that investors looking to allocate to the sector may consider the following strategic themes:¹²⁷

Energy, Utilities & Networks Strategic Themes	1	Climate change supported investments: In our view, climate change policies will support renewables and energy efficiency in the long term. The Paris agreement is set to enter into force in 2020. Countries have agreed “to reach global peaking of greenhouse gas emissions as soon as possible” and the agreement aims to achieve carbon neutrality in the second half of this century. ¹²⁸
	2	Caution on regulated networks: Regulated energy and water networks continue to represent a defensive infrastructure sector, and this is reflected in high valuations for these assets. However, we have recently observed a compression in regulated allowed returns in several European countries, which is forecast to continue. Moreover, we believe that in this sector, capital appreciation potential tends to be more limited than in the unregulated space. For this reason we suggest to focus on networks where there are opportunities for consolidation or material investment needs, supporting asset capital appreciation potential in the long term.
	3	Municipal utilities: We forecast increasing consolidation activity for municipal regulated utilities in Europe, as municipalities may continue to dispose of non-core asset. Increasingly, they may also look at partnerships with private investors to unlock investment needs as they refocus business models and expand into other services. In the long term, considerable privatisation potential exists at municipal level in some European countries. This is especially true for regulated networks, including water networks, but also for waste management concessions. ¹²⁹
	4	Allocate to U.S. energy: U.S. opportunities exist for investors seeking to complement and diversify their portfolios of European investments into renewable energy opportunities supported by PPAs, providing long-term return visibility. In the long term, the U.S. infrastructure market will continue to expand to transportation and social infrastructure.
	5	Exit thermal generation: We believe that the sector remains vulnerable to the ongoing structural changes in the European energy markets. The sector is particularly exposed to climate change policies, while changes to the European emissions trading scheme may lead to a rise in CO ₂ prices and impact the profitability of thermal generators further in the medium term.
	6	Watch technological change closely: In 2017 we observed a material acceleration in the development of battery storage technologies and demand response energy services. Although we believe that these assets are not yet suitable for long-term investors, they should watch technological changes closely, as some of these technologies might mature quickly and have a material impact on power markets.

¹²⁷ Any forecasts provided herein are based on Deutsche Asset Management's opinion at time of publication and are subject to change.

¹²⁸ European Commission, “Historic climate deal in Paris: EU leads global efforts”, 12 December 2015

¹²⁹ Deutsche Bank, Privatisation in the euro area, 31 July 2015

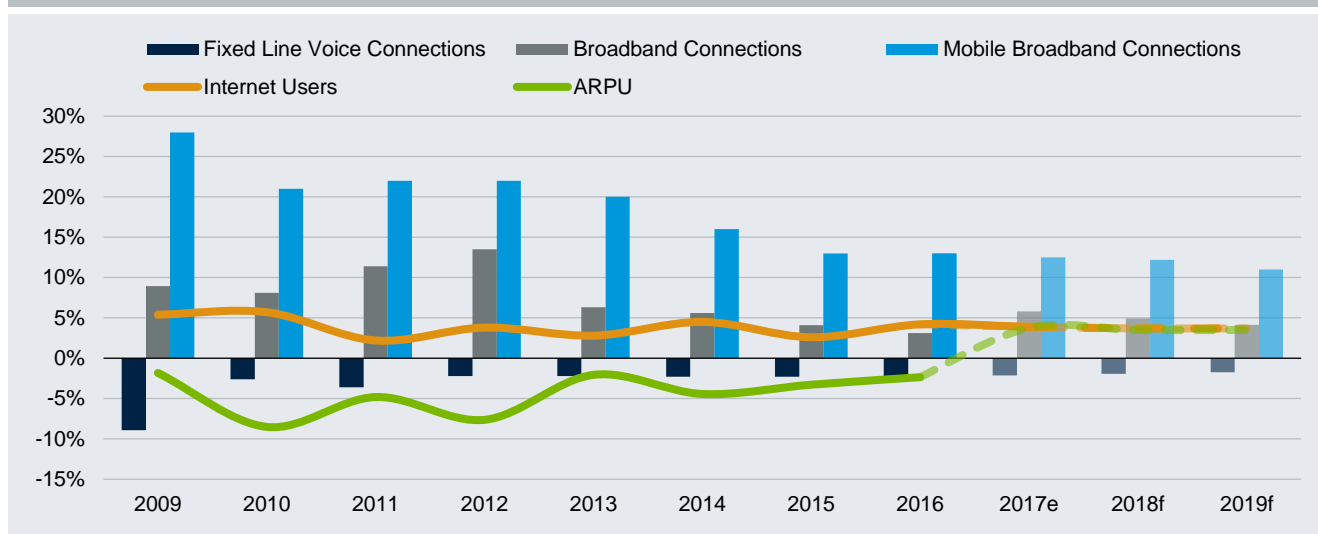
5.3 Telecommunications

Market Dynamics: The 2018 outlook for European telecommunications remains positive as the sector continues to benefit from stronger consumer spending a long-term trend of digitalisation.¹³⁰

- **Supportive Demand Fundamentals:** In 2017, we observed several brownfield transactions across the mid-stream telecommunications sector, as telecom operators continued to dispose of non-core assets, including towers and masts, as well as wireless and fibre optics networks.

Robust demand for data and connectivity supports the case for future telecom infrastructure transaction opportunities across fibre optics, telecom towers and data centres. Investment in the sector is likely to be strong, as companies will carry on upgrading networks to higher-capacity and higher-speed systems to support growing service and data demand.¹³¹

Key Telecommunications Industry Demand Metrics (% p.a., 2009-19f)



Sources: Bloomberg, 12 December 2017. Notes: e = expected. f = forecast. Past performance is not indicative of future returns. There is no guarantee the forecast shown will materialise.

- **Industry Convergence:** Telecommunications is a rapidly changing industry and the boundaries between telecom service and cable television are being eroded across Europe.

The dynamics of convergence and competition differ by country, but the services provided by cable and telecom companies continue to converge to include television, broadband and mobile, and fixed telephony. Moreover, the sector is undergoing structural changes as it moves from vertical integration towards a more decentralised model.

An increase in the number of broadband users continues to help support revenue growth for cable companies and telecom providers. There remains scope for material investment in fibre optics due to growth in broadband penetration, particularly high-speed broadband, as many European countries still lag behind EU's objectives.

The elimination of mobile-roaming charges in the EU in 2017 is a negative short-term factor for industry profitability, but may lead to greater roaming usage and support mobile-data consumption patterns in the medium term. Moreover, penetration of 4G still has growth potential in Europe.¹³²

In the medium term, the proliferation of smartphones may partially cap broadband penetration, as smartphones may increasingly be used as the primary internet connection, especially in peripheral markets due to high investment costs and high costs for lower-income households. The adoption of 5G technology from 2020 onwards will support increased data demand.

¹³⁰ Based on a number of sources, including Oxford Economics, Bloomberg, Fitch Ratings, Moody's Investors Service data, as at December 2017

¹³¹ Based on a number of sources, including Bloomberg, Fitch Ratings, Moody's Investor Service data, as at December 2017

¹³² Based on a number of sources, including Oxford Economics, Bloomberg, Fitch Ratings, Moody's Investors Service data, as at December 2017

However, the 5G technology may also create the need to replace wires in the last mile, increasing competition among cable and telecommunications companies.¹³³

The revenue profile of players in the industry will continue to grow, supported by the favourable economic outlook. Consolidation and M&A activity should continue in the sector, particularly as mobile operators seek to integrate with fixed-line operators or cable companies.

Capital spending is expected to remain high in the industry, as regulators are increasingly encouraging investment through transparent regulatory frameworks and predictable investment returns.¹³⁴

- **Favourable Long-Term Outlook:** Consumer trends suggest that demand for high speed data will continue to grow materially in the medium term,¹³⁵ driven by digitalisation, an expansion of data centres and cloud computing, particularly at corporate level.

In the long term, the internet of things will emerge as a network of physical devices, vehicles and home appliances embedded with sensors and connectivity capabilities, which will encompass technologies across the infrastructure sector, including smart grids, virtual power plants, smart homes, intelligent transportation and smart cities.¹³⁶ These devices will collect and share an unprecedented amount of data, while also opening up new sectors and opportunities for infrastructure investment.

Strategic Themes: Investors looking to allocate to the sector may consider the following strategic themes:¹³⁷

Telecommunications Strategic Themes	1	Barriers to entry: Investors focusing on core and core plus investment strategies should favour assets with high barriers to entry, such as telecommunications towers, as the telecommunications sector will be exposed to increased competition in the future, in spite of strong demand fundamentals.
	2	Focus on cash-flow predictability: Some telecommunications assets do not have long-term contracted revenues. In our view, investors should focus on assets with contracted revenue profiles, offering potential for stable and predictable cash flows in the medium term. Also, not all telecommunications assets have a comparable risk/return profile. Telecommunications towers may be supported by long-term contracts and long-term land lease arrangement, and fibre-optic networks are also generally supported by long-term contracts. Data centres are typically more exposed to the volatility of demand, and although we recognise that it is a market that will grow and mature in the medium term, ¹³⁸ we would not consider it suited for core and core plus investment strategies yet.
	3	Technological risk: Telecommunications assets like data centres can be exposed to material risk of technological obsolescence. As the long-term technology durability of these assets is more difficult to assess, we believe they are mainly suitable as part of a core plus investment strategy, complementing a diversified infrastructure portfolio that includes core assets. Alternatively, we see them as suitable for shorter holding periods of five to seven years if adequately backed by contracted cash flows.

¹³³ Moody's Investors Service, November 2017

¹³⁴ Based on number of sources, including Oxford Economics, Bloomberg, Fitch Ratings, Moody's Investors Service data, as at December 2017

¹³⁵ Based on Oxford Economics, Bloomberg, as at December 2017

¹³⁶ Bloomberg, "The internet of things", October 2016

¹³⁷ Any forecasts provided herein are based on Deutsche Asset Management's opinion at time of publication and are subject to change.

¹³⁸ Bloomberg, "Five trends for cloud computing and the data centre in 2017", 16 December 2016

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