Infrastructure research paper

Investment opportunities in European infrastructure

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Executive summary

- Europe's relatively young infrastructure investment market is a fraction of its potential size. However, its growth is assured as more governments choose to privatise assets.
- These privatisations are typically driven by the desire to raise funds to help alleviate fiscal stress. In Europe, fiscal stress is exacerbated by the costs of an ageing population such as pension obligations and health care.
- Fiscal stress is also a factor contributing to the infrastructure funding gap in both advanced and developing economies – a situation that is motivating governments to involve the private sector in their infrastructure funding plans.
- CFS Research estimates the current value of existing European infrastructure assets to be €4.6 trillion, representing 33% of the global total. This market is estimated to require 10% growth per year to meet construction, upgrade and maintenance requirements.
- While investor demand is expected to remain strong, annual forecast spending requirements and anticipated infrastructure deal flow exceed expected financial investment allocations to European infrastructure.
- Much of this investor activity is likely to focus on the UK, Germany, Sweden, the Netherlands and France. These countries were identified to be among the most attractive in terms of investment markets in Europe according to a filter and ranking model based on key economic prospects, infrastructure market factors, capital market conditions and risk issues.

Colonial First State

1. Introduction

Infrastructure investment involves taking equity ownership of a business that owns or leases and operates an infrastructure asset. These types of investments include toll roads, airports, electricity distribution grids and gas pipelines.

Traditionally, governments have been responsible for providing these essential service assets. This is still the case today however governments do not need to fund, construct nor operate these assets in order to meet this obligation.

This paper aims to provide a top-down analysis of the European infrastructure investment landscape. The paper is structured as follows: Section 2 gives an overview of the supply of European infrastructure investments, Section 3 discusses investor demand for infrastructure, Section 4 summarises the infrastructure investment supply and demand outlook, Section 5 outlines the methodology and results for ranking Europe's most attractive infrastructure investment markets and concluding remarks are made in Section 6.

2. Supply of infrastructure assets

The size of the current unlisted infrastructure investment market can be argued to be a small fraction of its potential size as so many assets are still in public sector ownership. We are yet to see Europe privatise much of its road, rail, ports and parts of its energy sectors.

CFS Research has identified 118 European infrastructure privatisations announced between January 2006 and December 2007 but not yet transacted. These are likely to come to market within the next five years. Eighty-seven of these announced privatisations have reported expected values totalling €175 billion (bn). This suggests that the supply of investment–grade assets will continue to increase over the medium term.

The main reasons why Europe's governments choose to transfer ownership of infrastructure assets to the private sector are to either raise funds to allay fiscal stress or to meet a specific industry policy of privatisation.

Fiscal stress

Infrastructure assets in OECD countries need maintenance, upgrading or replacing at significant cost. Europe's governments are facing growing liabilities and health costs as their populations age. In addition, compliance with stricter environmental standards is increasing the cost of infrastructure upgrades. This has led to a gap (referred to as the infrastructure funding gap) between the required and actual amount of spending on infrastructure.

Governments facing increasing fiscal stress are therefore considering privatising infrastructure assets to help raise funds to meet other commitments. They are also drawing on the private sector to help build new infrastructure using public-private partnerships (PPPs)[1].

Infrastructure funding gap

A critical dimension of the infrastructure investment universe is the worldwide infrastructure funding gap. The infrastructure gap is one of the key drivers of private sector participation in the infrastructure investment market. This exists because government finances struggle to keep pace with infrastructure spending needs. This is illustrated in Figure 1 which shows the enormous shortfall in infrastructure spending in global developing economies in 2005. The World Bank estimates the size of the funding gap in these countries was €200 bn (the difference between infrastructure needs estimated at €330 bn and actual 2005 spending of €130bn).

A similar story presents itself for advanced economies. The public sector, which has traditionally been the source of infrastructure financing, is facing additional pressures from ageing populations, and associated spending on health, welfare and retirement. At the same time, political pressures limit the scope for tax increases.

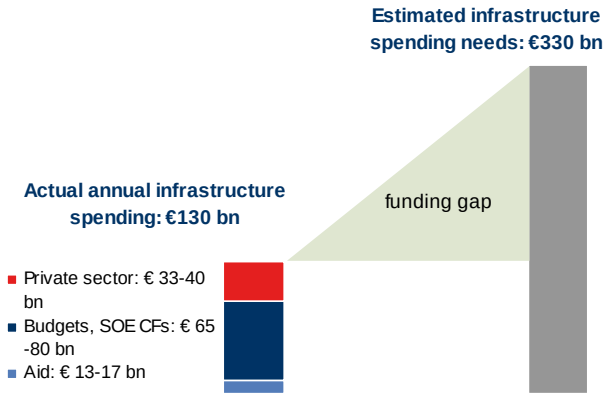
In gauging this trend, consider OECD government spending on gross fixed capital formation (GFCF) since 1990 as shown in

[1] A PPP is characterised by project risk sharing between the government and private sectors with the private sector providing funding.

Figure 2. GFCF is considered only as a proxy for spending on infrastructure as it also includes some non infrastructure-related expenditure such as publicly provided housing. Notably, the share of government spending on GFCF to total spending has fallen from 9.5% in 1990 to approximately 7.0% in 2005.

Figure: 1

Estimated infrastructure shortfall in 2005 global developing economies



Note: SOE CFs refers to State Owned Enterprise cash flows. Figures converted from USD using 29 February 2008 exchange rate of USD/EUR 0.6611.

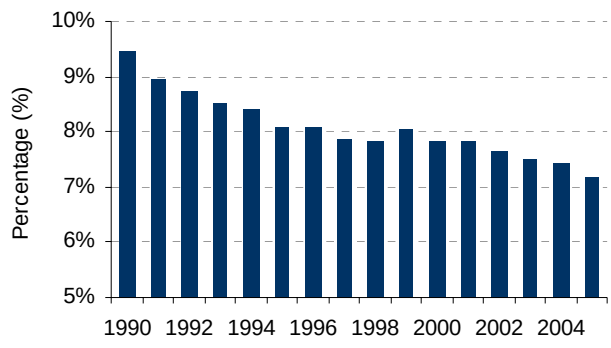
Source: World Bank & CFS Research

It should also be noted that as countries privatise assets, the required government spending on maintenance of these assets reduces.

This downward trend in government spending on GFCF is occurring across all global regions including Europe, and is expected to continue. Where this is a reflection of fiscal pressure there is a heightened potential for private financing and ownership of infrastructure.

Figure: 2

OECD share of public investment to total spending average 1990-2005



Source: OECD, CFS Research.

Government policy

Some governments have made policy decisions to privatise certain infrastructure assets. For instance, the privatisation of the UK's water sector was largely motivated by the desire to improve competition and the efficiency of services for the benefit of consumers. At an aggregate level, the EU has issued directives for the unbundling of European energy assets that has led to privatisations in some cases.

Such decisions are typically made when governments see the private sector as being more qualified and best able to manage the risks of operating an infrastructure business than a government agency.

Market size

The key implication of the continuing privatisation of infrastructure assets is the potential scale of the infrastructure investment opportunity.

CFS Research estimates the current value of European infrastructure assets - transport, energy, water and telecommunications facilities - to be €4.6 trillion (tn). This figure was derived using the World Bank's 2005 estimate of the total global infrastructure stock of US$17 tn. In estimating the value for 2007 we assumed the 2005 ratio of infrastructure stock to world GDP was unchanged in 2007. The value for 2007 was further adjusted upwards to include ports and airports which are excluded from the 2005 figure. Estimates for these sectors are based on 2006 estimates of global sector revenue from the global analytic and forecast data provider, Datamonitor. These estimates are intended to be illustrative rather than prescriptive. *[Note: the estimates of infrastructure value by sector are constructed using a bottom-up approach with estimates reported in Appendix A]*.

Based on these adjustments, and converting the US dollar amount at the USD/EUR exchange rate of 0.6611 (as at 29 February 2008) we arrived at a figure of €13.8 tn for the value of global infrastructure stock with Europe accounting for €4.6 tn. This figure is broken down by region in Table 1.

Table 1 shows that approximately 98% of the value of existing infrastructure assets in

Europe lie in Europe's OECD or developed economies. This is not surprising because the infrastructure in an advanced economy is likely to be of greater amount, higher quality and broader range than for developing economies. For example, gas pipelines and toll expressways are more prevalent in advanced economies.

Table: 1

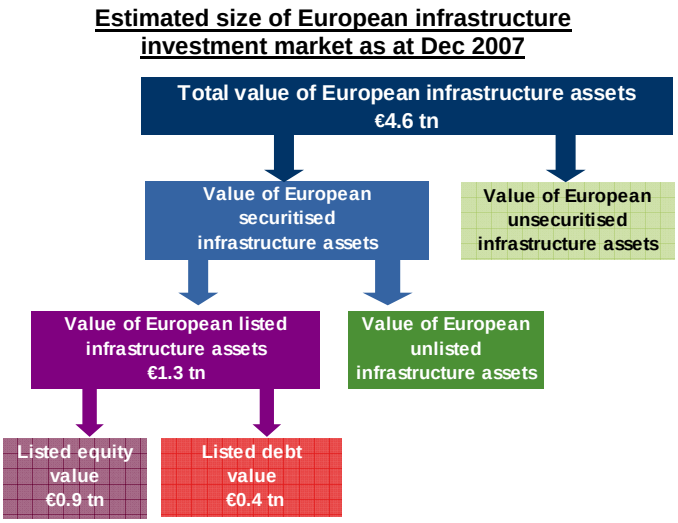
Estimated value of existing global infrastructure stock (€ bn)			
Region	**OECD**	**Developing**	**Total**
Europe	4,507	86	4,593
North America	3,914	0	3,914
Asia	1,526	1,566	3,092
Middle East	0	379	379
Latin America	228	643	871
Africa	0	286	286
CIS & other EM*	0	443	443
Oceania	261	3	264
World	**10,436**	**3,404**	**13,840**
mix (%)	*75%*	*25%*	

* Commonwealth of Independent States and other emerging markets. All amounts are converted from USD using 29 February 2008 exchange rate of USD/EUR 0.6611.

Source: World Bank, IMF, CFS Research.

Furthermore, Figure 3 illustrates that of the estimated €4.6 tn in European infrastructure stock, listed infrastructure accounts for approximately €1.3 tn based on the Macquarie Global Infrastructure Index. This implies the value of securitised unlisted and unsecuritised European infrastructure is approximately €3.3 tn.

Figure: 3



Note: All amounts are converted from USD using 29 February 2008 exchange rate of USD/EUR 0.6611.

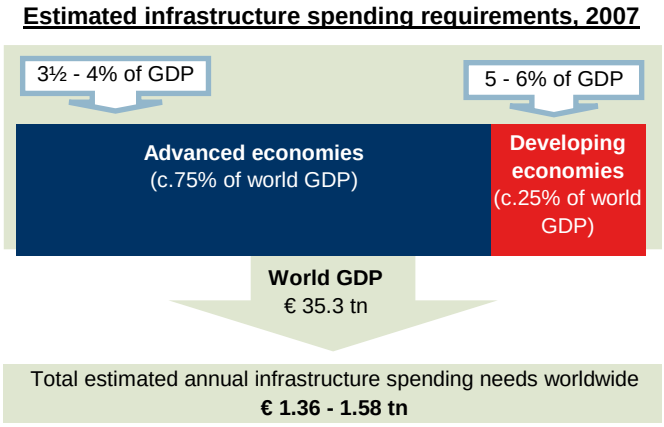
Source: World Bank, Macquarie & CFS Research

Annual spending requirements

CFS Research estimates current European annual infrastructure spending requirements for the construction of new infrastructure, maintenance and upgrades are approximately €443 bn. This is the greatest annual requirement of any global region and gives an estimate of the annual required supply of infrastructure investment opportunities.

Figure 4 outlines the process applied to arrive at this annual spending figure. According to the World Bank, the required annual spend on infrastructure by advanced economies is approximately 3.5% to 4.0% of nominal GDP while it is 5% to 6% of GDP for developing economies. Given the share of advanced economies to developing economies, the resulting estimated annual infrastructure spending requirement ranges between €1.36 trillion and €1.58 trillion. The average is approximately €1.47 trillion.

Figure: 4



Source: World Bank, IMF, CFS Research.

Using the average of the World Bank's GDP range for advanced and developing economies, the estimated effective annual infrastructure spending requirement equates to 4.2% of forecast 2007 world GDP. The estimated average annual spending requirements by region are presented in Table 2.

The vast majority of the annual global spending requirement is in the OECD economies compared with developing economies. Opportunities in these countries would therefore benefit from relatively stable political and regulatory regimes.

Table: 2

Estimated annual infrastructure spend versus value of new build projects

	Estimated annual required spend		Announced new build projects (since Jan-2006)	
By region:	**€ bn**	**share (%)**	**€ bn**	**share (%)**
Europe	443	30%	300	30%
North America	374	25%	137	14%
Australia	22	1%	57	6%
Asia	365	25%	269	27%
Other	271	18%	248	25%
Global total	**1,475**	100%	**1,010**	100%
By economic development:				
OECD	997	68%	524	52%
Developing	477	32%	486	48%
Global total	**1,475**	100%	**1,010**	100%

Source: World Bank, Thomson PFI & CFS Research

Note that this method yields a forecast annual spending requirement of €477 bn for *developing* countries in 2007. This compares with the €330 bn estimated by the World Bank in 2005 (Refer to Figure 1). The increase in estimated annual spending requirements is a reflection of the pace at which nominal GDP levels have grown in developing economies in the last two years.

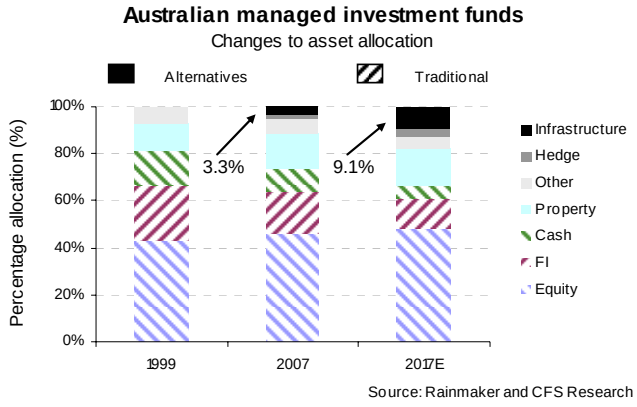
It is illustrative to compare the estimated annual spending requirement on infrastructure with the value of announced greenfield projects. Since 2006, €300 bn in *European* projects have been announced but not yet completed according to Thomson Project Finance International's database. While the Thomson data does not include maintenance spending, the size of the disparity suggests that Europe may not be planning for the amount of greenfield infrastructure the World Bank forecasts it will need.

3. Investor demand for infrastructure assets

Over the last two years in particular there has been a structural shift in the demand for direct infrastructure investments. This has occurred as infrastructure investing has expanded from Australian and Canadian investors to European, Middle Eastern and US investors. Their choice to allocate to infrastructure is a strategic decision based on the investment characteristics that infrastructure can provide i.e., stable cash flows, long-term investment horizon and natural inflationary hedges. This strategic choice explains why the shift is structural – it is not expected to unwind. Consequently, the number of infrastructure investment vehicles being offered has increased.

In order to estimate the amount of equity likely to flow to wholesale infrastructure each year, CFS Research examined the Australian investment market because it is one of the most mature for infrastructure investing in the world. Figure 5 shows that infrastructure allocations of Australian investors are forecast to increase from 3.3% in 2007 to 9.1% in 2017 according to investment research company, Rainmaker. The split between direct and listed specialist infrastructure funds is not specified however, we have conservatively assumed the majority of this allocation is to direct infrastructure. Note that the increased allocation to infrastructure is in line with increased allocations to alternative investments over the next decade at the expense of fixed interest.

Figure: 5



Source: Rainmaker and CFS Research

While the projected increased allocation is significant for Australian investors, the impact on the global market is negligible. Australia's assets under management are estimated by Cerulli Associates to have accounted for just below 2% of the global total in 2006. The material impact to the infrastructure investment market will therefore come with the allocation decisions of US and European investors which accounted for a combined 85% of the total global investment management market in 2006 as shown in Table 3.

Table: 3

Share of global funds under management as at 2006	
Region	% share
US	53.8%
Europe	31.4%
Australia	1.9%
Japan	5.8%
Asia ex-Japan	2.2%
Other	4.9%
Total	**100.0%**

Source: Cerulli Associates

Allocations to global unlisted infrastructure

Unfortunately, there is currently no publicly available data for the global allocation to unlisted infrastructure. Therefore, in order to better understand the likely impact of increasing global allocations to this asset class, CFS Research created three allocation scenarios to 2011 in conjunction with Cerulli Associates' forecast growth in global asset management industry assets under management[2].

The initial asset allocation levels by region were estimated based on our industry knowledge of the maturity of each region's infrastructure investment market. Global investment allocations to infrastructure as a share of total funds under management were checked for reasonableness by examining their resulting estimated absolute capital value. For instance, we know that Standard & Poor's estimates that as at November 2006 approximately €66 bn to €99 bn of fund equity money had been raised globally for investment into infrastructure assets. We conservatively estimate that €41 bn in equity was raised globally by 45 infrastructure funds during the year to 30 June 2007.

The key qualitative assumptions made were that global regional allocations to wholesale infrastructure are below those of Australia. This is based on US and European investors being relatively new to the concept of direct infrastructure investing.

Case 1 (low case): This is a hypothetical case presented to illustrate the value of allocations to unlisted equity infrastructure if allocations remained unchanged from 2007 to 2011. North America is assumed to maintain a 0.4% equity allocation from 2007 to 2011 (or €75 bn to €102 bn). Europe maintains a 1% (€112 bn to €159 bn) allocation while Australia stays at 3.3% (€34 bn to €49 bn) over the period.

This case is not likely to eventuate as the sector is relatively immature but growing quickly. Anecdotal evidence suggests that allocations to unlisted infrastructure will increase. For example, reports of institutional investors targeting wholesale infrastructure allocations of 5% or more are becoming more common. In addition, sovereign wealth funds (SWFs)[3] are set to quickly grow their estimated €1.9 tn in assets at a rate three to four times faster than pension funds. This is important because SWF's have relatively less conservative asset allocations than pension funds and favour alternative asset classes including infrastructure.

Case 2 (medium case): North America moves from 0.4% (€75 bn) to 0.8% (€203 bn), Europe from 1% (€112 bn) to 2% (€318 bn) and Australia from 3.3% (€34 bn) to 4.1% (€60 bn) while the rest of the world allocates 0.1% in 2010 and 2011 (€7 bn). This case results in the growth in total global allocations to wholesale infrastructure from an estimated €206 bn in 2007 to €563 bn in 2011 as depicted in Table 4.

We consider this to be a feasible result given recent fund raising and allocation trends. New net annual fund inflows to wholesale infrastructure of between €40 bn and €130 bn as shown in Table 4 are considered plausible.

Case 3 (high case): This is a hypothetical case to illustrate the value of infrastructure allocations if global allocations grew at the same rate as those forecast for the Australian market by Rainmaker. If this were the case, they would start at 3.3% in 2007 and move to 5.6% by 2011 (€1.2 tn to €2.7 tn). This is clearly not achievable as the current equity allocation to unlisted infrastructure is nowhere near €1.2 tn.

[2] Cerulli's forecast does not include unlisted infrastructure.

[3] SWFs are government investment vehicles with typically large amounts of capital to invest.

Table: 4

Growth in global allocation to unlisted infrastructure

	Case 1 - low case			Case 2 - medium case			Case 3 - high case		
Year	% of global equity allocation	Value of global equity allocation (€ bn)	Annual equity flow to direct infrastruc-ture (€ bn)	% of global equity allocation	Value of global equity allocation (€ bn)	Annual equity flow to direct infrastruc-ture (€ bn)	% of global equity allocation	Value of global equity allocation (€ bn)	Annual equity flow to direct infrastruc-ture (€ bn)
2006E	0.4%	132	19	0.4%	132	19	2.5%	796	682
2007E	0.5%	210	77	0.6%	206	73	3.3%	1,162	367
2008E	0.5%	231	21	0.7%	253	47	3.9%	1,497	335
2009E	0.5%	251	21	0.8%	349	96	4.5%	1,872	375
2010E	0.5%	273	22	1.0%	439	90	5.0%	2,288	416
2011E	0.5%	294	21	1.2%	563	125	5.6%	2,748	460

Source: Cerulli, Rainmaker and CFS Research

*Investment growth is assumed in Cerulli assumptions

Note: For Cases 1, 2 and 3 investment return is embedded in the total value of global assets under management. This forecast return was made by Cerulli Associates using historical regression analysis, the estimate of market appreciation and net new inflow as well as equity and fixed income trends in emerging and mature markets.

4. Product availability versus financial investor demand

The implication of our top-down analysis is a significant excess of annual infrastructure spending requirements on construction and maintenance of infrastructure in Europe compared with annual demand from financial investors for European infrastructure assets[4].

Our bottom-up assessment of announced projects also shows there is an excess of anticipated greenfield deal flow over total expected financial investor infrastructure allocations.

However, not all infrastructure investors will be interested in investing in new build, maintenance or upgrade infrastructure projects – the vast majority of current investors are interested in mature-stage assets. According to Thomson and CFS Research, there is approximately €88 bn of equity required to meet the announced and rumoured secondary market infrastructure transactions that are expected to come to market in 2008. This is enough to cater for the entire expected global unlisted infrastructure investment allocation in 2008 (Refer to Table 4).

5. Identifying attractive European infrastructure markets

Whether European countries have embraced privatisation or are in the early stage of increasing their secondary market for infrastructure assets, some countries are more attractive than others.

CFS Research employs a specific framework for identifying the most attractive investment grade markets from the global universe by region. The conceptual four step framework is illustrated in Figure 6.

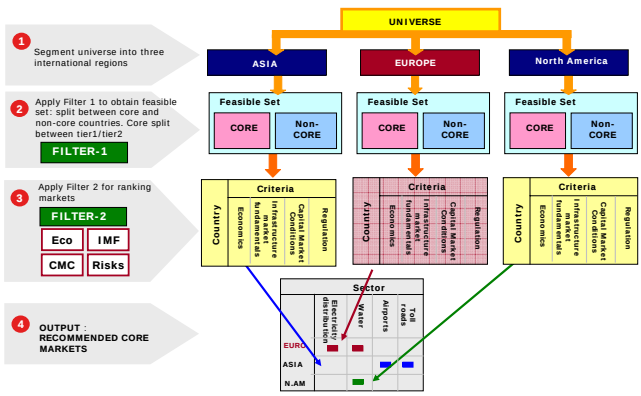
A feasible list of markets in Europe was identified from those countries comprising the European Union, and those soon to be admitted. A primary filter was applied to establish Core, Non-Core and disregarded markets. This filter uses the key indicators of market size in terms of economic output and/or population, country risk, size of equity markets and transparency.

With a core group of investment grade markets identified, the next step ranks the attractiveness of these countries for private equity infrastructure investment. This ranking process makes use of performance measures of economic prospects, infrastructure market fundamentals (IMFs) such as fiscal health, capital market conditions and risks as a means of identifying which countries have the most attractive investment environments for private sector infrastructure.

This entire method makes use of readily available macroeconomic data in all but one case (regulatory risk which will be discussed later) and is therefore transparent and repeatable.

Figure: 6

Identification process for infrastructure markets



Source: CFS Research.

[4] This analysis does not consider demand from trade investors.

Identifying investment grade European markets

A selection of filter criteria was applied to establish the feasible set of investment grade countries. These criteria are based on key indicators that include: economic growth, market size, economic freedom and transparency. Each of these indicators and the reasons for choosing the relevant filters are briefly discussed below.

Economic size: This measure relates to either economic size (based on GDP) or market size (based on population). In standardising economic size across countries, nominal GDP values are expressed in US dollars. This is an important consideration because larger countries are likely to have a far greater range of investment prospects than smaller countries.

The filter applied to this measure was as follows: countries were purged from the total set if either their economic or population size was less than 1% relative to Germany. Germany was chosen as it has the largest economy and is the most populous country in Europe. This lower bound of 1% was chosen to screen out many of the smaller countries which would offer limited investment prospects of meaningful scale.

Country risk: This indicator is used to gauge sovereign risk which measures a country's ability to repay its debt. Sovereign risk, or the financial backing of a government, is a key consideration of any investor deciding to invest offshore. The measure used for this variable was the Standard & Poor's long-term foreign currency sovereign rating. This rating reflects both the likelihood of default and any financial loss suffered in the event of default. Countries were selected if they were rated B or greater.

Investment grade markets: results

Nineteen countries were identified within the European Region as having investment grade characteristics. These countries form the set of investment grade markets and are listed in Table 5. These were then split into Core and Non-Core markets according to their level of sovereign risk, economic stability and level of transparency. In particular, core markets are those with S&P's long-term foreign currency sovereign ratings of A or greater and a Corruption Perceptions Index[5] score above the sample average of 6.7 out of 10 according to Transparency International.

Table: 5

European Investible Markets		
Core	**Non-core**	**Excluded**
Austria	Czech Republic	Bulgaria
Belgium	Greece	Cyprus
Denmark	Hungary	Estonia
Finland	Italy	Latvia
France	Portugal	Lithuania
Germany	Slovenia	Luxembourg
Ireland		Poland
Netherlands		Romania
Norway		Slovakia
Spain		
Sweden		
Switzerland		
UK		

Source: CFS Research

Countries that made investment grade, but failed the core filter are characterised as Non-Core, generally due to a higher risk profile. These countries include the Czech Republic, Greece, Hungary, Italy, Portugal and Slovenia. Non-Core markets are expected to provide opportunistic investment opportunities given:

- sovereign risks are typically effectively managed and mitigated; and
- there are sufficient economic growth opportunities.

Countries that were excluded were Bulgaria, Cyprus, Estonia, Latvia, Lithuania, Luxembourg, Poland, Romania and Slovakia.

Ranking of investment grade markets

Each identified investment grade market was subsequently ranked relative to its attractiveness as an investment destination for a private infrastructure investor.

Attractiveness measures have been grouped into four broad categories. These include:

- key economic prospects;
- infrastructure market fundamentals;

[5] http://www.transparency.org/policy_research/surveys_indices/cpi/2007/regional_highlights_factsheets.

- capital market conditions; and
- risk issues.

These measures were selected as they help indicate how attractive each market is for private sector infrastructure investment. The following sections discuss these market ranking criteria.

Key economic prospects (Econ)

Economic prospects were considered because economic growth is a key driver of infrastructure investment opportunities and returns. Countries that do not invest in their infrastructure capacity will face constraints on economic growth whereas strong GDP growth is likely to encourage infrastructure investment to enhance productive capacity. Growth also implies existing assets will experience higher utilisation rates and therefore greater revenue generation ability. This criteria was therefore given the greatest weighting in the overall assessment.

Four criterion were used to indicate economic prospects; total economic size, forecast economic growth, unemployment and Gross Fixed Capital Formation (GFCF) as a share of GDP. Each criterion and the reason for its selection is discussed below.

Total economic size: The larger the economy, the greater the requirement for infrastructure and so the larger opportunity for infrastructure investment.

Forecast economic growth: As discussed above, strong GDP growth is likely to encourage infrastructure investment to enhance productive capacity. GDP growth in the investment grade markets has been forecast by CFS Research. The forecast arrives at a structurally stable economic growth rate for the period between 2008 and 2011 that ignores cyclical fluctuations. Structural growth is determined using a national balance sheet approach involving the level of prices, fixed investment, the current account and public debt to GDP.

Unemployment: Differing labour market conditions across European markets are reflected in the level of unemployment. Low unemployment is reflective of flexible labour markets. Strong structural growth prospects and strong structural growth is likely to encourage infrastructure investment.

Economic share of GFCF: GFCF is a means of measuring investment in an economy. High investment relative to GDP is likely to create a virtuous circle of stronger sustainable growth relative to strong consumption. High investment in productive capacity is also likely to enhance the need for future infrastructure. There are two caveats; strong investment in residential housing may have inflated GFCF relative to GDP in some Euro countries, particularly Spain and Ireland and in some countries low investment may be a reflection of maturity and a movement to a services dominated economy.

Infrastructure market fundamentals (Fiscal)

Countries experiencing fiscal strain are more likely to turn to private sector funding of infrastructure than those with healthier budgetary positions. This criteria was therefore given a 25% weighting in the overall assessment along with business and regulatory risks. The infrastructure market factors are measures of fiscal health including: the number of fiscal deficits since 2004, public debt as a % of GDP, and the dependency ratio.

The number of fiscal deficits since 2004: A government's fiscal commitment can be determined by its budget record, in this case since 2004. As the European economy has expanded the need for cyclical deficits should have been weak. Countries that fail in this measure are failing to improve the health of public finances at a time of relatively strong growth. This gives motivation for governments to turn to the private sector to finance their essential infrastructure services.

Public debt as a share of GDP: This is a stock measure of public finance health and is a powerful indicator of a government's ability to meet future cyclical and structural obligations. High public debt is likely to reflect a government's willingness to turn to the private sector to help fund its infrastructure commitment.

The dependency ratio: The dependency ratio measures the number of dependents (those aged less than 15 and more than 65) relative

to the labour force (i.e. those supporting the dependents). As Europe ages and birth rates fall, the dependency ratio will rise, indicating greater stress on the budgets of European countries due to higher pensions and health obligations. This should also help motivate governments to make use of greater private sector funding of infrastructure commitments.

Capital market conditions (CMC)

Pricing indicators are important in determining the likely stability of an investment once made. However, infrastructure investments typically enjoy certain inbuilt hedges against these pricing effects so this criteria was given the lowest weighting in the overall ranking assessment. Pricing indicators used include an inflation forecast and an average 10yr sovereign bond spread over German Government Bonds.

Inflation: Stable inflation, within the target area of the European Central Bank (ECB) and other national central banks, is a strong positive for Europe's economies and for investors looking for low volatility of return. While most infrastructure investments have some degree of protection from inflation due to the natural inflation hedge of income returns, inflation also flows through to interest rates and therefore discount rates, thus impacting the capital return of an investment.

Spread over German government bonds: This indicator is designed to measure the extra costs, relative to Europe's largest economy, Germany, that have been associated with borrowing in each of the investment grade markets over the last 10 years. Even within the Euro area, spreads range significantly among markets. This was chosen to indicate the implied risk premium of European countries relative to Germany. The higher the premium, the greater the investment risk.

Risk issues

This group of criteria focuses on the risk considerations from an infrastructure investment perspective. These include the ease of conducting business in a country as well as the extent to which property rights are enforced – both of which are essential for an investor to consider. Also, the stability and transparency of the infrastructure regulatory regime is of particular importance as it has the potential to make or break an infrastructure investment. This criteria was therefore assigned the same weighting as for fiscal stress in the overall assessment.

Economic freedom: The Heritage Society scores countries on the basis of key economic freedoms. These scores provide an indication of the relative ease of investing across countries. In particular the criterion includes an average of the scores for property rights and investment freedom; the higher the score the more attractive a market becomes for infrastructure investment.

Infrastructure regulation: Finally, infrastructure regulation was examined. The economic regulatory regime in each market was given a score depending on the extent of the regulatory regime for infrastructure assets and its track record in providing regulatory stability and transparency. The UK was used as the benchmark for this process due to its long and largely favourable history of infrastructure regulation which is based around controlling price rises charged to consumers. The UK was therefore assigned the highest rating of 10. All other countries were ranked subjectively based on our knowledge of European regulatory regimes relative to the UK.

The importance of this indicator in the assessment of infrastructure investment markets cannot be underestimated. It is particularly relevant to the long-term outlook of the investment as any unexpected changes to the regulatory environment can significantly impact expected investment returns. The weighting of this factor was therefore doubled resulting in a 17% weighting in the overall assessment.

Infrastructure investment grade market rankings

The results of the ranking analysis are depicted in Table 6.

Table: 6

Performance matrix for investible countries						
Market	Econ	Fiscal	CMCs	Risks	Summary	
	score	score	score	score	score	rank
Score subtotal	40.0	30.0	20.0	30.0	120.0	
Weight	33%	25%	17%	25%	100%	
UK	22.5	17.0	14.0	27.5	81.0	1
Germany	24.0	18.0	20.0	17.5	79.5	2
Sweden	17.0	16.5	20.0	21.0	74.5	3
Netherlands	19.5	14.0	17.5	22.5	73.5	4
France	22.5	18.5	17.5	14.0	72.5	5
Belgium	14.5	19.0	17.5	21.0	72.0	6
Ireland	20.0	11.5	14.0	22.5	68.0	7
Finland	19.0	15.0	17.5	16.0	67.5	8
Norway	19.5	14.0	11.0	20.0	64.5	9
Italy	19.0	23.5	17.5	4.0	64.0	10
Switzerland	18.0	11.5	12.5	21.0	63.0	11
Denmark	19.0	14.0	12.5	16.0	61.5	12
Austria	17.0	15.0	17.5	11.0	60.5	13
Portugal	15.5	21.0	12.5	10.0	59.0	14
Spain	18.0	13.0	12.5	15.0	58.5	15
Greece	22.0	21.0	11.0	2.5	56.5	16
Czech Rep	21.5	15.0	12.5	5.0	54.0	17
Hungary	14.0	21.5	4.0	10.0	49.5	18
Slovenia	17.0	9.0	5.0	4.0	35.0	19

Source: CFS Research

NB: Italicized are non-core markets

Note: The weightings were decided based on the number of sub categories in the ranking assessment. There were 11 sub categories and regulation was given a double weighting. Therefore the number of sub categories within each of the four main criteria were divided by 12. The resulting weightings were then checked for reasonableness.

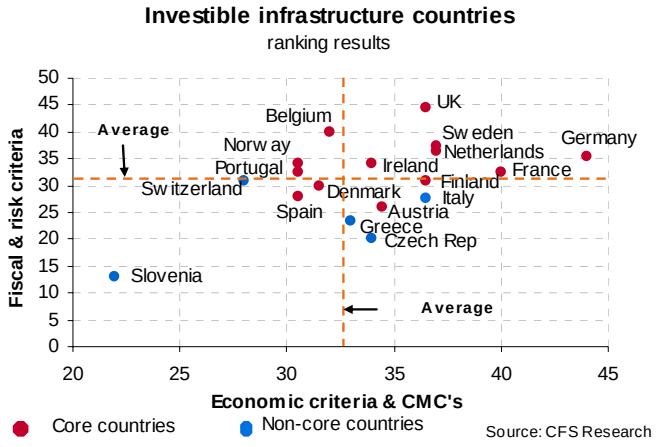
The results show the countries with the strongest economic prospects according to the chosen criteria as being the UK and Germany. Those under the greatest fiscal stress are Italy, Portugal and Greece. The countries demonstrating the most attractive capital market conditions are Germany and Sweden. Countries with the most attractive infrastructure regulatory regimes and business environments are the UK, the Netherlands and Ireland.

Overall, the most attractive countries for private sector infrastructure investment are the UK, Germany, Sweden, the Netherlands and France.

In order to graphically represent these results, criteria were grouped in order to represent scores with equal weightings on each axis. The combined economic criteria and capital market conditions account for 50% of the assessment weighting. These scores were summed and placed on the horizontal axis in Figure 2. Scores for fiscal and risk criteria also represent 50% of the assessment weighting. These were summed and placed on the vertical axis.

Figure 7 shows that the top five ranked countries all fall in the above average score range for combined economic and CMC criteria as well as for combined fiscal and risk criteria.

Figure: 7



6. Conclusion

The value of global infrastructure assets is currently estimated to be €13.8 tn. Europe is a significant infrastructure market with an estimated size of €4.6 tn, representing 33% of the global market.

We estimate that the European infrastructure market needs to grow at around 10% (or €443 bn) per year to maintain, upgrade and construct new infrastructure.

However, there is a gap between the estimated required spend and the estimated annual infrastructure project flow. This arises primarily because governments are under fiscal pressure to fund their infrastructure commitments. This pressure is being exacerbated in Europe by the costs of its ageing population. Consequently, this fiscal stress is providing the impetus for some governments to raise funds by privatising infrastructure assets. Other governments are driven by policy decisions to privatise.

Investor demand for infrastructure investment is deemed to remain solid over future years. This is in line with rising capital allocations to infrastructure in Australia. The amount of infrastructure investment product expected over the near term in new-build and mature assets appear to exceed the demand from the financial sector.

In order to understand where this investment product is likely to come from, we identified thirteen core countries within the European region with investment grade characteristics and relatively favourable risk profiles.

Countries were then ranked according to sound economic prospects, favourable infrastructure market fundamentals, stable capital market conditions, and risk. Based on these criteria, five of the most attractive European countries for infrastructure equity investment are the UK, Germany, Sweden, the Netherlands and France.

7. Appendix

Method for approximating value of global airports and ports

CFS Research estimates the current value of *European* infrastructure assets - transport, energy, water and telecommunications facilities - to be €4.6 trillion (tn).This figure was derived using the World Bank's 2005 estimate of the total global infrastructure stock of US$17 tn. In estimating the value for 2007 we assumed the 2005 ratio of infrastructure stock to world GDP was unchanged in 2007.

The value of the stock of global ports and airports was estimated using information from global analytic and forecast data provider, Datamonitor. The World Bank's 2005 estimate was then grossed up by the proportion of ports and airport revenue to total infrastructure revenue posted in these reports.

The total global revenue in 2006 for each infrastructure sector according to Datamonitor is as follows:

- Gas utilities – US$694 bn in 2006 using constant 2006 annual average exchange rates. The gas utilities market is calculated as the total value of natural gas used by industrial, (including energy generators purchasing gas from utilities), commercial, residential, and other end-users (including transport and agriculture users).The Global market consists of Brazil, Canada, Mexico, Belgium, the Czech Republic, Denmark, France, Germany, Hungary, Italy, Netherlands, Norway, Poland, Russia, Spain, Sweden, the UK, Australia, China, Japan, India, Singapore, South Korea and Taiwan.
- Water utilities – US$448 bn in 2006. The water utilities industry, which consists of all water that is collected, treated and distributed to end-users, has been valued according to average annual end-user prices. The countries and methodology are the same as for gas.
- Electricity utilities - US$1,166 bn in 2006. The electricity market consists of the sale of electricity to industrial, commercial, household and other end-users, including agricultural and transport users. The market value has been calculated according to average annual electricity prices. The countries and methodology are the same as for gas.
- Road and rail transport – US$ 538 bn in 2006. The global highways and rail tracks sector is defined as total government expenditure on the planning, building, and maintenance of road and railway infrastructure. The sector volume is defined as the combined lengths of railways and highways. The countries and methodology are the same as for gas
- Airports – US$51 bn in 2006. The market volume is stated in terms of Workload Units (WLUs), as a method of meaningfully adding together passenger and cargo volumes. One WLU is equivalent to one passenger or 100 kg of cargo. Market values are estimated from these WLU volumes, based on revenue figures per WLU for a representative sample of airport operators. The countries and methodology are the same as for gas.
- Ports – US$42 bn in 2006. The marine ports and services market is defined as the total revenue obtained by owners and operators of public and private marine ports and providers of related services. Volumes given in the report are the weight of all cargo carried by water, measured in metric tonnes, with containerized cargo treated by assuming a constant TEU-to-weight conversion factor. The countries and methodology are the same as for gas.

The sum of these revenues is US$2.94 tn. Airports and ports account for US$93.3 bn or 3.17% of the total.

8. Research team

Did you know CFS Research has a global reach and the expertise to tailor research to your needs?

For further information about this report or our research capabilities, contact our Head of Research, Dr Anthony De Francesco or his assistant Mary Bonello.

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