Aquila Group

Dear Sir/Madam,

Real assets, alternative investments, economically sustainable investments – almost 15 years have passed since Aquila Group was founded in 2001. Our objectives have remained the same over the intervening years. We have gained in experience and accompanied the development of alternative investments from a niche product to a core component in the asset allocation of institutional investors. We have evolved together, extended our track record and expanded into new markets and asset classes. In this newsletter, we focus on current market developments, the regulatory environment and the future potential.

We wish you an interesting read – Aquila Group.

In the Spotlight

EUR 57,000 billion

The figure represents the global capital requirement for infrastructure investment between 2013 and 2030, as estimated by McKinsey. This excludes the costs of climate change and the investments in renewable energies necessary to meet an internationally agreed global warming limit of 1.5°C. Under the Paris Climate Agreement, the use of all fossil fuels is to be phased out by 2050.

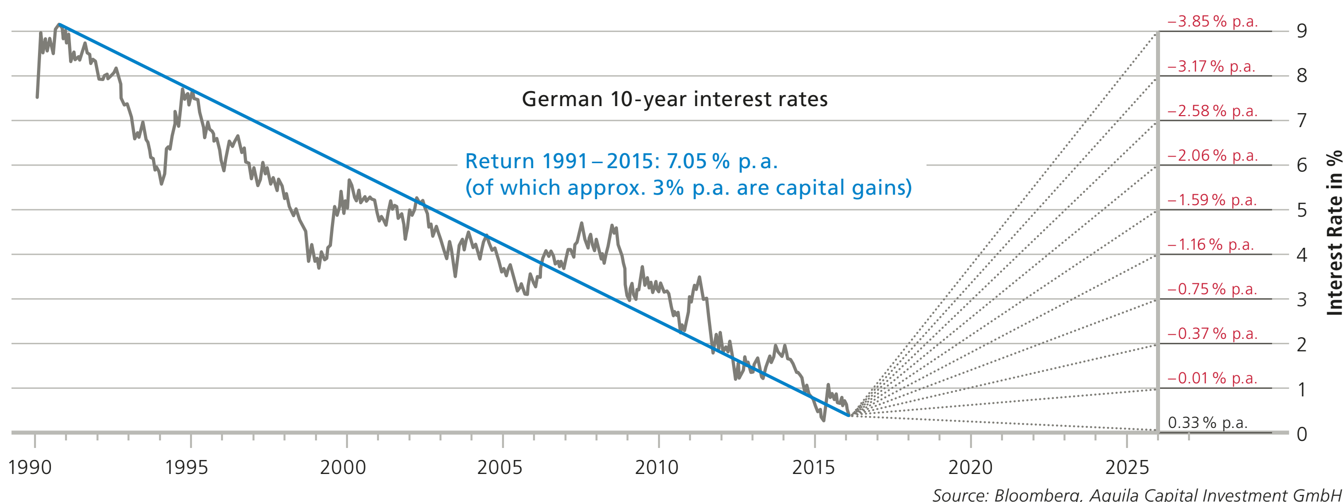
Update White Paper

The return potential of equities and bonds

One year after analysing the return potential of bonds and equities in depth[1], we would like to start 2016 by updating some of the key figures. The weakness of capital markets since the beginning of the year is consistent with the long-term return expectations outlined in our research paper. The high valuation of traditional investments has not significantly improved.

Bonds

Future Return Potential of a Buy & Hold Investment in 10-Year Government Bonds



Source: Bloomberg, Aquila Capital Investment GmbH

While the current market environment is challenging enough for unconstrained fixed income investors, the outlook for government bonds, which are the core part of institutional fixed income portfolios, looks ever more bleak, with future returns from "AAA"-rated government bonds likely to be much lower than in the past. This is illustrated by the chart below, which maps potential returns from German 10-year government bonds for the next 10 years, calculated as a function of possible future interest rate levels. If German interest rates were to stand at 4% in 2024, for example, the total return achieved from interest payments and capital for a 10-year bond held at a constant 10-year maturity would amount to –1.16% p.a. (even before inflation is taken into account). Compared with the beginning of 2015, the annual deficit has risen by 0.17 percentage points.[2]

Different assumptions for future interest rates produce other results. It is clear, however, that the return potential of German 10-year government bonds is low. The results for US government bonds are quite similar. Referring to historic data, Bank Credit Analyst[3] has calculated what future 5- to 10-year annual returns might be, using the interest rates of a 10-year government bond. This research presents a clear comparison between the current level of interest rates and the overall valuation of bonds and future returns. A current interest rate of around 0.7% implies returns over the next 5 years of less than – 0.9% p.a. and next 10 years less than 0.9 % p.a.

Bond Valuation and Returns

Real 10-Year Yields at Time of Purchase	Real Anualized Returns over Next 5 Years	Real Annualized Returns Over Next 10 Years
5 ≤	9.6	7.8
3 – 4.9	4.5	3.9
2 – 2.9	1.9	0.7
1 – 1.9	0.3	1.3
≤ 1	**–0.9**	**0.9**

[1] *White Paper "Real Assets – The new Mainstream"*
[2] *As at February 2016*
[3] *Source: www.bcaresearch.com*

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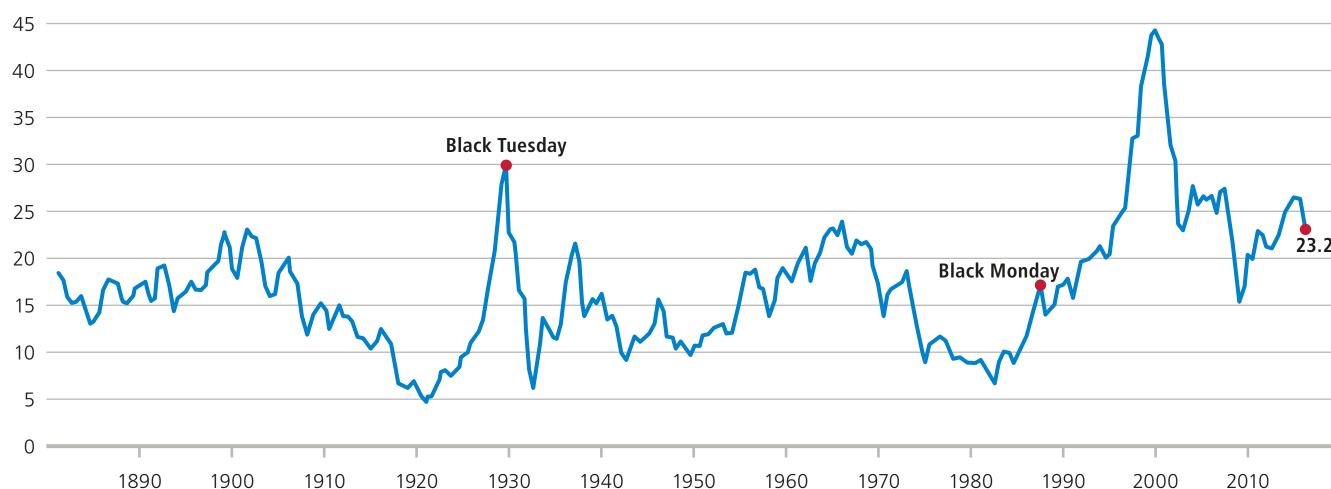
Equities

It is not only the fixed income market that is proving a challenge for investors, since equity markets have reached extended levels again as well. Equity markets follow a mean-reversion process. High and low valuations alternate, the periods in between vary in length, but occur reliably. Using the well-known Shiller price-to-earnings (PE) ratio as a yardstick, one can estimate the return potential for equities.[1] The current Shiller PE ratio of the Dow Jones index is 23 (as at 12.02.2016) and, accordingly, circa 10% below its level at the beginning of 2015. It is still significantly above its historic average of 16 however, and in the second highest decile since 1860.

Shiller PE Ratio

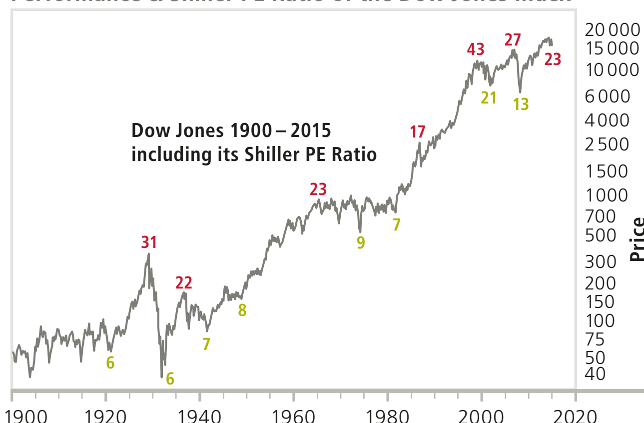


Source: Bloomberg, http://www.multpl.com/shiller-pe/, Aquila Capital Investment GmbH

Based on its current Shiller PE ratio and its 114 year history, the Dow Jones Index has a return expectation of just 1% p.a. over the next 10 years. Taking into account a current dividend yield of approximately 2.5%, the total return that can be expected using historic data is only 3.5% p.a. The Shiller PE ratio, the price-to-sales ratio, the price-to-book ratio as well as the S&P dividend yield imply similar results in terms of the valuation level of US equities.

The ratios of other regions, such as Europe, for instance (including the GIPS-countries) are not as high as in the US. However, based on the dominance of US capital markets and the experience of the last 15 years, any long-term decoupling of market developments seems unlikely.

Performance & Shiller PE Ratio of the Dow Jones Index



Source: Bloomberg, http://www.multpl.com/shiller-pe/, Aquila Capital Investment GmbH

Shiller PE Ratio versus Average Equity Returns (Without Dividends) Over the Next 10 Years (Dow Jones: 1900 – 2015).

Shiller PE Ratio	Expected Return p.a.
> 25.28	1.65 %
21.71 – 25.28	**1.02 %**
19.67 – 21.70	3.43 %
17.59 – 19.66	4.03 %
15.41 – 17.58	4.89 %
13.60 – 15.40	4.87 %
11.82 – 13.59	5.80 %
10.58 – 11.81	7.08 %
8.88 – 10.57	8.64 %
≤8.87	7.31 %

[1] *See Spremann; Scheurle: Finanzanalyse, 2010; p. 44*

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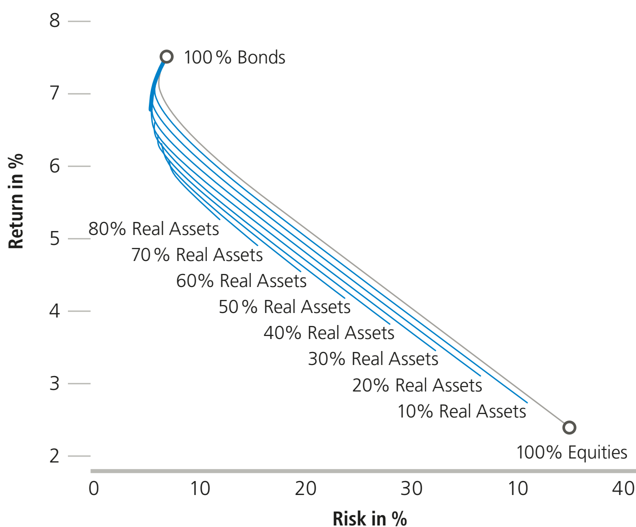
Real Assets

The mathematical consequence of these return expectations is a sustainable change in the composition of efficient portfolios. While in the past, efficient portfolios consisted of equities and bonds, we expect real assets to dominate optimal portfolios in the coming decade.[1] This might be one reason why various studies report the intention of institutional investors to increase their exposure to real assets (beyond real estate).

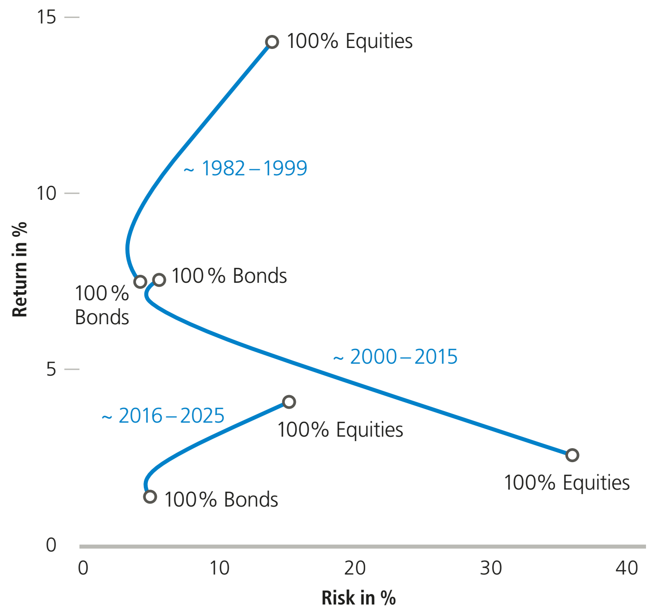
As the charts on this page illustrate, the efficient frontier of equities and bonds changed significantly in the spring of 2000, compared to the period between 1982 and 1999. Equities showed two bearish phases with high volatility and low overall returns. Fixed income securities, on the other hand, continued their positive trend, as the decline in interest rates continued and bonds became the primary driver of portfolio returns between 2000 and 2015. Between 2016 and 2025, we expect the situation to be completely different. Our analysis indicates that the risk-return profile of real assets will be significantly better in the coming decade than those of bonds and equities, resulting in marked changes in portfolio allocation along the efficient frontier: The minimum variance portfolio has a real asset allocation of 35%, with real assets being the key driver of returns. A 30% real asset allocation in portfolios with a volatility of 7% will increase the portfolios' overall return by more than 50% (from approximately 2.4% to 3.7%) giving rise to the question as to whether or not a sizeable allocation to traditional assets continues to make sense.

Efficient Frontiers of Mixed Equity and Bond Portfolios with Varying Real Asset Allocations for the Time Period 2000 to 2015



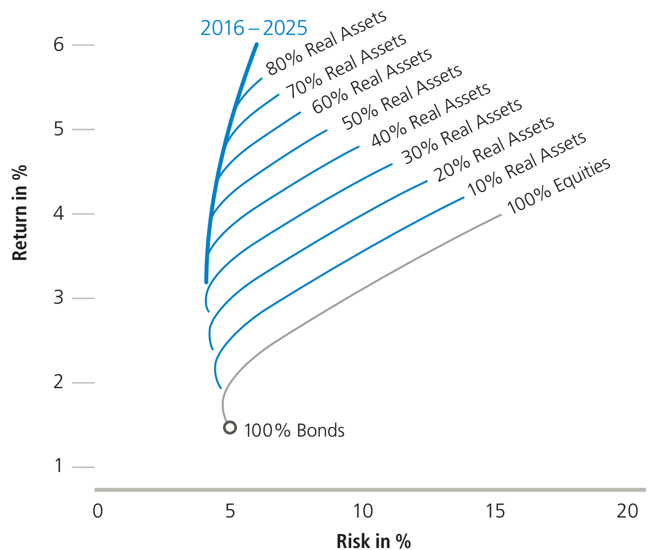
Source: Bloomberg, proprietary calculations

Historic and Expected Frontiers for Mixed Equity and Bond Portfolios for the Time Periods of 1982 – 1999, 2000 – 2015 and 2016 – 2024



Source: Bloomberg, proprietary calculations

Efficient Frontiers of Mixed Equity and Bond Portfolios with Varying Real Asset Allocations for the Time Period 2016 to 2024



Source: Bloomberg, proprietary calculations

[1] *The calculation is based on the following assumptions for 2016 – 2025: Return and annualized volatility for Equities (4% p.a., 15%), Bonds (1.5% p.a., 5.5%), Real Assets (6% p.a., 6%), Correlation Equities to Bonds: 0.5; Equities to Real Assets: 0.2, Bonds to Real Assets: 0.2)*

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Renewable Energy: Climate Summit in Paris

Outcome: The Climate Agreement reached in Paris in December 2015 is broadly viewed as a great success. For the first time, it overcomes the divergent objectives in the climate policies of emerging and industrial countries. A binding obligation has been agreed to keep global warming below 2°C and aim to limit global warming to a maximum of 1.5°C. These values are based on the pre-industrial average temperature – the goal therefore is for temperatures to rise by no more than 0.5°C to 1°C by 2030 compared with today's temperature. An ambitious target, as is the reduction of net greenhouse gas emissions to zero in the second half of the 21st century. The Paris Agreement enters into force in 2020, that is, shortly before the expiry of the not very effective Kyoto Protocol.

Interests:
USA: While the industrial nations acknowledge their responsibility for global warming, the United States was successful in pushing through an exclusion of legal liability.

Emerging economies (in particular, India): Financial measures worth USD 100 billion per year will be matched by the same amount for the adaptation and promotion of other forms of energy.

European Union: Prior to the summit, the EU proposed that targets be reassessed on a five-year basis from 2018/19 and tightened from 2021. Reporting and disclosure obligations enter into force from 2023.

China: In contrast to the EU, a member of the Chinese delegation, Gao Feng, proposed that negotiations on tightening climate targets should not be held until 2025 – and that compliance with climate targets should not be binding. This would mean no consequences for non-compliance.

Island States: An alliance of smaller island states and some emerging economies proposed that global warming be limited to a maximum of 1.5°C.

Key Players:
The president of the summit, Laurent Fabius, was described by representatives as having a strategically intelligent means of organising the negotiations. He gave critical representatives key roles and made sure he heard all delegations regularly, thereby ensuring that no party felt that their interests were being ignored.

Barack Obama: The US President had been preparing the ground for the formation of strategic alliances for months in advance, which, according to reports, increased the pressure on other participants significantly.

Implementation:
The targets will become possible only with comprehensive measures to be determined at the next global climate summit in 2025. Up to now, concrete measures have been the exclusive preserve of nation states. Environmental groups criticise that the agreed tightening of national limits is insufficient to reach the ambitious target agreed at the climate summit. According to estimates by the International Energy Agency, in order to reach the climate targets, an annual investment of USD 740 billion would be necessary in the period between 2014 and 2035.

US Secretary of State John Kerry views the agreement as a message to international markets and expects that investors will focus increasingly on renewable energies. The German Minister of the Environment, Barbara Hendricks, has made similar statements. She expects the Paris Agreement to trigger "a global dynamic, also for investors". Whether the framework conditions provide sufficient incentives for professional investors to obtain an attractive risk/return profile depends on various factors. Steering developments with state subsidies in the field of renewable energies/infrastructures is becoming increasingly unimportant, as efficiency improvements, in particular in photovoltaics and wind power, have made profitable operations possible at market prices. However, direct marketing on the electricity market is associated with a correspondingly higher volatility of earnings and, thus, a necessary risk buffer must be factored in.

One possibility, at least at EU level, of creating additional incentives that strengthen private investment in the expansion of carbon neutral energy sources would be to adjust the existing regulatory framework. Supranational provisions such as the Solvency II Directive, which entered into force on 1 January 2016, could adjust existing capital requirements for infrastructure investments on a cross-border basis. This would result in a considerable change in the cost structure and risk/return assessment for these investments made by insurance companies and increase their appeal. The current version of Solvency II is not yet resulting in comprehensive improvements in this respect. However, based on the assessment of the European Insurance and Occupational Pensions Authority (EIOPA) regarding the valuation of real assets, a revision of the current provisions under a review of Solvency II is possible.

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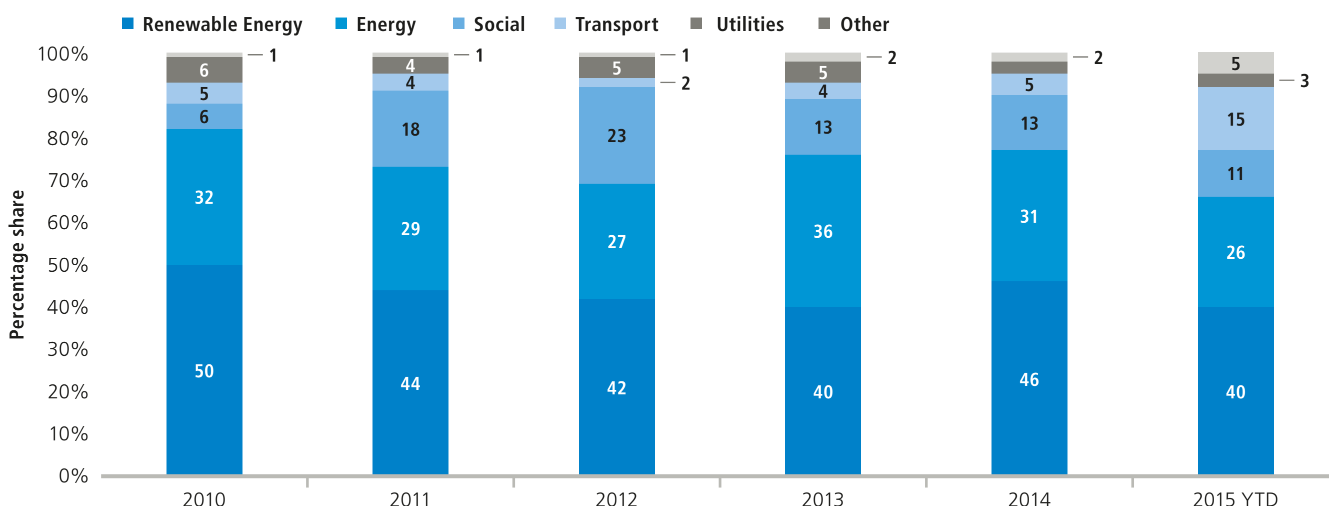
Real Assets in a Portfolio Context

The increasing importance of real assets in the portfolio allocation of institutional investors is reflected in a considerable increase in the number of comprehensive studies and analyses of the topic. Auditing companies such as PwC compile "hot topics" on real assets, EIOPA draws up discussion papers on the future regulatory environment for infrastructure investments for insurers, McKinsey produces comprehensive reports on capital requirements and the development status of real assets and Preqin publishes special reports on European infrastructure alongside semi-annual reports on alternative investments.

According to **Preqin**, the portfolio allocation of 79% of institutional investors comprises at least one alternative asset class, 58% are allocated to at least two or more asset classes. According to a survey[1] commissioned by Aquila Capital, the proportion of institutional investors invested in renewable energies increased last year from 21% to 39%. At 58%, however, more than half of European institutional investors, in particular in the infrastructure sector, are invested below their specified target allocations. Investors are aiming to expand their exposures in real estate (34%) and infrastructure (44%). Within the infrastructure sector, renewable energy is the largest sub-segment. Typically it accounts for more than 40% of the deals done each year, as the breakdown for 2010 – 2015 shows[2]:

Breakdown of Completed European Infrastructure Deals by Industry, 2010 – 2015 YTD



Source: Preqin Infrastructure Online, October 2015

Real Estate in a Portfolio Context

Real estate is represented in 59% of institutional investor portfolios and remains the most common asset held. Over 90% of investors have a positive perception of the asset class and the share of those whose yield expectations have been satisfied or exceeded has risen considerably over the last few years. This is attributable – just like the relatively high percentage share in 2012 whose expectations were not satisfied – to the impact of the international real estate and financial crisis. Reliable cash flows are now one of the three main arguments for an investment in real estate[3]. The others are diversification and the need to hedge against inflation. In particular against a backdrop of falling returns from equities and bonds investors expect adequate returns from real estate.

Core markets and locations such as major German and other European cities, however, only rarely meet these return expectations. Therefore, the focus has shifted to growth markets that not only generate the necessary yield, but also offer a stable economic and political environment and the potential for future growth.

Investment opportunity Spain

A current focus of Aquila Capital's real estate investments are the metropolitan regions of Madrid and Barcelona. While Spain's economic framework has stabilised and is well above average levels in some respects, the real estate market has not yet recovered to anywhere near its pre-crisis levels and offers significant catch-up potential.

[1] *Survey commissioned by Aquila Capital of 61 institutional investors in Europe, February 2015;*
[2] *Preqin: Special Report European Infrastructure, November 2015;*
[3] *Preqin Investor Outlook: Alternative Assets, H2 2015*

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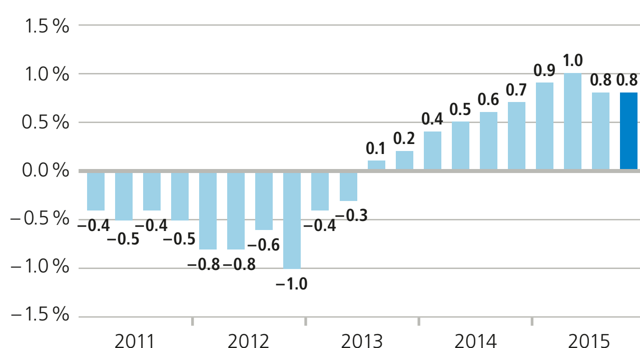
Spain: Economic Framework

Gross Domestic Product

After years of recession, GDP growth has risen considerably over recent years in Spain. In 2015, the economy expanded by 3.5% and the GDP increased by 0.8% in the fourth quarter alone.[1]

Gross Domestic Product; quarter-on-quarter growth rate



Source: Instituto Nacional de Estadística; own representation

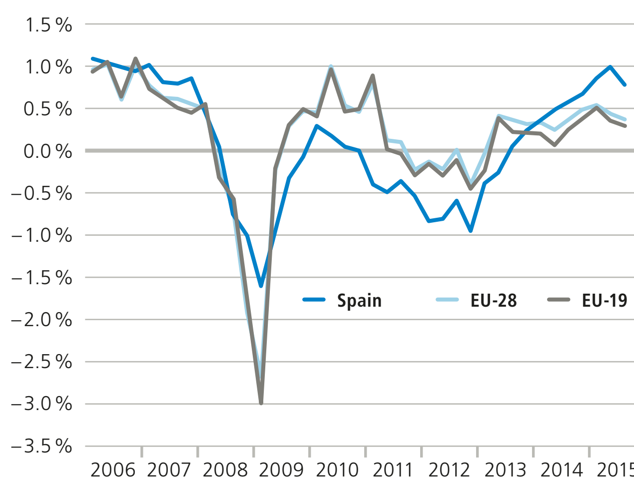
The performance of Spain's economy compares favourably with average growth rates in the European Union and the eurozone.

Analysts expect this positive performance to continue over the coming years. In its most recent assessment of world economic prospects[2], the International Monetary Fund (IMF) upgraded its forecasts for Spain and now expects GDP growth of 2.7% in 2016 and 2.3% in 2017. Accordingly, growth in Spain is expected to remain considerably above the average growth for the eurozone, which the IMF places at 1.7% for 2016 and 2017.

Domestic Demand

After a period of continuous decline in consumer demand in Spain between 2011 and 2013, demand has risen significantly since 2014, reflecting a recovery of the country's real economy. After growth of 2.4% (2014) and 4.1% (2015) the IMF expects the economy to expand by 2.8% in 2016.[3] After a considerable reduction in investment volumes in the real estate sector in the first quarter of 2014 (–6.5%), volume growth has risen steadily to over 5% in Q2/Q3 2015.[3]

Gross Domestic Product by European Standards; quarter-on-quarter growth rate



Quelle: Instituto Nacional de Estadística; own representation

Real Estate Market

In 2014, Spanish house prices rose on an annual basis for the first time since 2007 – by an average of 1.8%. This development continued in 2015 and was strengthened particularly by price increases for new-build residential properties. On an annualised basis, new-build house prices rose by 4.9% in the second quarter of 2015. The number of transactions rose by 9.7% in the first half of 2015 compared with the same period the previous year and thus came in at around 40% above 2013 levels.[4]

Spain's House Price Index (HPI) quantifies the recovery of the real estate market, where prices increased in the first three quarters of 2015 on a year-on-year basis by 1.6% (Q1), 4.0% (Q2) and 4.5% (Q3). Over the past year, the percentage increase has been roughly twice as high as the average for the eurozone and, in each quarter, considerably higher than the average for the EU.[5] This is attributable partly to the considerably lower price levels of Spanish real estate after the economic crisis and partly to a normalisation in demand.

[1] Instituto Nacional de Estadística: Estimación avance del PIB trimestral Base 2010; Cuarto trimestre de 2015; [2] IMF: World Economic Outlook, October 2015; [3] IMF: World Economic Outlook Update, February 2016; [4] European Commission: Post-Programme Surveillance Report, Autumn 2015; [5] Eurostat: House Price Index – quarterly and annual growth rates – 2015Q3.

Real Estate: Aquila Capital's Real Estate Team

A key factor for the successful implementation of real estate investments is a high availability of investment projects. At Aquila Capital, target investments are identified, on-boarded and managed by an experienced team with a permanent presence on site. Rolf Zarnekow, Head of Real Estate, and Sven Schoel, Director Real Estate, are responsible for Aquila Capital's real estate investments in Spain.

Mr Zarnekow, Mr Schoel. Why is Spanish residential property a key focus at present?

Zarnekow: We have monitored the Spanish economy and, in particular, the real estate market for a number of years. Since mid-2014, Spain has shown clear signs of a sustainable recovery. Real estate prices have reflected this development only to a limited extent.

Schoel: It's also crucial to consider the different rates of change within Spain. While the major cities benefit from rising demand for housing, the rural regions, in particular, still need considerably more time before the real estate market stabilises. Our focus clearly lies on the metropolitan regions of Madrid and Barcelona.

The activities of international investors have increased significantly over the past year. Why have the prices not yet caught up with this trend?

Schoel: In the bidding process we are now competing with the big Anglo-Saxon and, for instance, Swiss opportunity funds – especially because the price level is not yet in line with those of other major cities. Our network and successful transactions in recent years have helped to establish our very good reputation in the market, which we are benefiting from.

Zarnekow: Moreover, the price level is still a result of the real estate crisis, as well as the financial crisis. In both major cities new construction activity has come almost to a standstill. It's also due to the very limited financing activity of banks. In fact, there has been no significant housing construction for years. There's a backlog, which first must be made up and that accounts for the much faster sales of residential properties, which we are witnessing with one of our current projects in Madrid, for example.

What is special about the project?

Zarnekow: It is the biggest housing construction project in the capital. Its high quality standard is a USP, even more so as the sales price is considerably below the maximum permitted for subsidised housing.

Rolf Zarnekow
Head of Real Estate

Rolf Zarnekow heads up Aquila Group's real estate team. Mr. Zarnekow has more than 17 years of experience in the real estate industry and has held several executive positions in the international and institutional real estate space prior to joining Aquila Group. He has been in charge of real estate transactions worth more than USD 9,7 bn. Mr. Zarnekow holds a Degree in Business from the European Business School, Oestrich-Winkel.

Sven Schoel
Director | Real Estate Investments

Sven Schoel is responsible for real estate transactions. Mr. Schoel has more than 20 years' experience in the real estate busines. Prior to joining Aquila Group, he held a number of senior management positions, including head of division at Union Investment Real Estate. Mr. Schoel was also a member of the management board at a medium-sized project developer in Germany and Spain.

Schoel: The demand is correspondingly high. We are somewhat surprised that two-bedroom apartments are in particular demand. Given the population structure of the surrounding area, we planned the standard apartment with three bedrooms. But now we have a waiting list of interested parties for two-bedroom apartments in the next phase of construction.

Zarnekow: We will, of course, respond to this in the next phase of construction. One of the great advantages of a project development is that we are not only able to adjust the completion date for construction phases in accordance with demand, but we can also adjust the layout of the real estate as needed.

How high are sales levels at present?

Schoel: At the end of January, we had already sold over 50% of apartments. Even though we have just started to market the properties we are already considerably ahead of expectations. As a result of the high demand, we could already raise sale prices slightly.

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Doesn't that contradict the concept of affordable housing?

Zarnekow: No. Based on the purchase price for the land and thanks to economies of scale, we were able to work with very moderate sales prices – below the statutory maximum. We are now adjusting these to the prevailing market conditions and they are currently 8% above the original project calculation.

Schoel: With regard to the units planned as rental apartments, which we could sell as a package, we're seeing interest from various parties specialised in this type of investment. That wouldn't be the case if there was no profit to be made from this investment.

Are the conditions in Barcelona just as positive at present?

Zarnekow: Taking into account only the real estate economy, the supply of new-build properties is still too low to meet demand. That's why we also expect very good marketing opportunities for our current project in the city.

What is your view regarding the political developments? How great is the risk that Catalonia might actually separate from Spain?

Schoel: The regional coalition plans to separate from Spain by mid-2017, that is, within 18 months. We believe this to be very unlikely. Irrespective of the fact that the citizens view themselves as culturally independent of Spain, political and economic independence would go hand in hand with a considerable fall in living standards. Catalonia would on short notice no longer be part of the European Union. This issue is fuelling uncertainty in the banking sector today. At present, we do not expect an actual declaration of independence to be implemented.

Zarnekow: Undoubtedly, this clear expression of political will forms a good basis for negotiations between the Catalan and Spanish governments, in which transfer payments from the region could be reduced or greater independence achieved in certain areas.

Do you expect any negative effects for existing investments?

Schoel: No, we don't. With respect to a housing construction project we have already acquired, we expect no difficulties in its successful implementation, given the unusually good location, the lack of competition, the quick turnaround time and manageable size of the development – irrespective of a possible separation of Catalonia from Spain. Of course, we are following political developments very closely. If, in conjunction with our colleagues in risk management, we were to come to the conclusion that Catalan independence is a realistic scenario and that it could have a negative impact on future potential investments, we would suspend further investment activities in the region.

Projected view of a current Aquila Group housing construction project in the metropolitan region of Madrid.

"Successful real estate investments are dependent on more than just a favourable purchase price. But without a good price, and even with the best concept, no investment can become an opportunity." *Rolf Zarnekow*

Zarnekow: This is an argument against the independence scenario though. This risk assessment is made by all national as well as international investors, which would lead directly to a noticeable reduction in investment in the region, which is certainly not wanted by the population.

Which is currently not yet the case.

Schoel: No. We see high activity in the Spanish market, particularly by international investors. We expect a further considerable increase in 2016.

Zarnekow: From our perspective, the metropolitan regions of both Madrid and Barcelona will remain among the most attractive regions for investment in Europe in 2016 and perhaps also in 2017.

Mr Schoel, Mr Zarnekow, thank you for the interview.

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Contact | Aquila Group

Germany

Hamburg (HQ)
Valentinskamp 70
20355 Hamburg
Tel.: +49 (0)40 87 50 50-100
E-Mail: info@aquila-capital.com
www.aquila-capital.com

Frankfurt
Neue Mainzer Straße 75
60311 Frankfurt/Main

Munich
Josephspitalstraße 15
80331 Munich

Great Britain

London
17 Grosvenor Street
London W1K 4QG

Singapore

Singapore
No 8 Eu Tong Sen Street
#19-89 The Central
Singapore 059818

New Zealand

Feilding
8 Manchester Square
Feilding, 4702

Luxembourg

Senningerberg
Airport Center Luxembourg
5, Heienhaff
1736 Senningerberg

Spain

Madrid
Av. de Burgos 12, pl 13
Madrid 28036

Switzerland

Zurich
AQ Investment AG
Poststrasse 3
8001 Zurich

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