



# Passive Insights

## The Income Challenge Balancing Yield and Risk in an Income-Focused Portfolio

August 2015

MARKETING MATERIAL – FOR  
PROFESSIONAL INVESTORS ONLY (as  
defined in MiFID Directive 2004/39/EC  
Annex II)

Deutsche Bank AG  
Deutsche Asset  
& Wealth Management  
db X-trackers ETF Team  
Winchester House  
1 Great Winchester Street  
London EC2N 2DB  
United Kingdom

Hotline: +44 (20) 7547 1747  
[info.dbx-trackers@db.com](mailto:info.dbx-trackers@db.com)  
[etf.deutscheawm.com](http://etf.deutscheawm.com)

### Authors

**Vincent Denoiseux**  
Passive Asset Management  
[vincent.denoiseux@db.com](mailto:vincent.denoiseux@db.com)

**Pierre Debru**  
Passive Asset Management  
[pierre.debru@db.com](mailto:pierre.debru@db.com)

### Content

Part 1: A More Complex World for Income Investors	2
Part 2: Accessing Income	6
Part 3: Combining income-oriented asset classes	20

*“Compound interest is the most powerful force in the universe.”*

*Commonly attributed to Albert Einstein*

This marketing document has been produced for information purposes only by a Structuring function of Deutsche AWM and contains opinions developed by the Passive Asset Management team. This does not constitute investment advice or independent research. This paper is intended for professional investors only who understand the strategies and views introduced in this paper and can form an independent view of them. Please refer to the risk factors and disclaimers at the end of this document.

### Executive Summary

Income is a vital component of long-term portfolio returns. Yet with interest rates and dividend yields at or close to historic lows around the world, generating income has become a considerable challenge, forcing investors to broaden their horizons and consider opportunities from across global markets and asset classes. In this paper we identify the major sources of income currently available from different asset classes and present income-oriented portfolios using exchange-traded funds (ETFs).

In Part 1, we review the recent evolution of the levels of income in the global bond market and other asset classes. We also consider the likely outcome of the current environment of ultra-low interest rates, taking into account historical experience. In Part 2 we quantify the contribution of income to long-term equity returns, before looking at the primary sources of income still available to portfolio investors, focusing not only on absolute levels of income but also on the risk/return characteristics of higher-yielding assets. In Part 3 we focus on the relationships between different categories of higher-yielding asset and how to build diversified ETF portfolios for different categories of income-oriented investors. Some of our key findings and conclusions are:

- Based on US market data, government bond yields and equity market dividend yields were over 50% below long-term averages<sup>1</sup> at end-2014.

<sup>1</sup> Average being calculated between 1871 and 2014



## Balancing Yield and Risk in an Income-Focused Portfolio

- The annual income from a representative index of European government bonds has fallen by 72% between 1999 and 2015. The decline in annual income from corporate and high-yield bonds over the same period has been 78% and 55%, respectively.
- However, there are still income-yielding opportunities for investors willing to take some additional risks: indices of corporate and high-yield bonds still yield above 4% as at end-June 2015, for example, while an index of infrastructure securities also yields 4%.
- Dividend income is an important component of long-term equity market returns, contributing 27% to the average annual total return of the MSCI World index between 1969 and 2015.
- Real interest rates have recently turned negative, but previous episodes of financial repression, involving negative real interest rates, have lasted for up to 35 years.
- We define the yield to volatility ratio as a risk-adjusted measure of income. The ratio helps investors compare yields both across and within asset classes.
- Investors should take a holistic, cross-asset class perspective to generating yield. Our results show that cross-asset diversification can help investors to target higher yield to volatility ratios at the portfolio level.
- Based upon an optimisation to maximise risk-adjusted returns, we analyse two portfolios targeting respectively 3% and 4% annual income, respectively, based on market yield levels in June 2015.

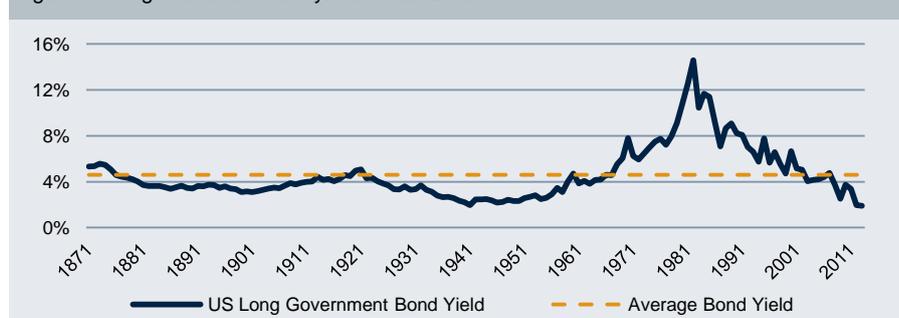
The wide range of income-generating ETFs available on the db-x trackers platform enables investors to construct yield-focused portfolios, customised according to their risk and return targets.

### 1. A More Complex World for Income Investors

#### Bond income falls...

Income-focused investors face a more complex world in 2015 than during recent decades. Bonds are traditionally the asset class of choice for investors seeking a reliable income stream. But recently yields on short maturity bonds in many major government debt markets have moved into negative territory, meaning that investors were paying to own these bonds, rather than receiving income for holding them. During the first quarter of 2015 negative yields were recorded on short-maturity government bonds in Belgium, France, Germany, the Netherlands, Sweden, Switzerland and Japan.

Figure 1: US government bond yields near historic lows



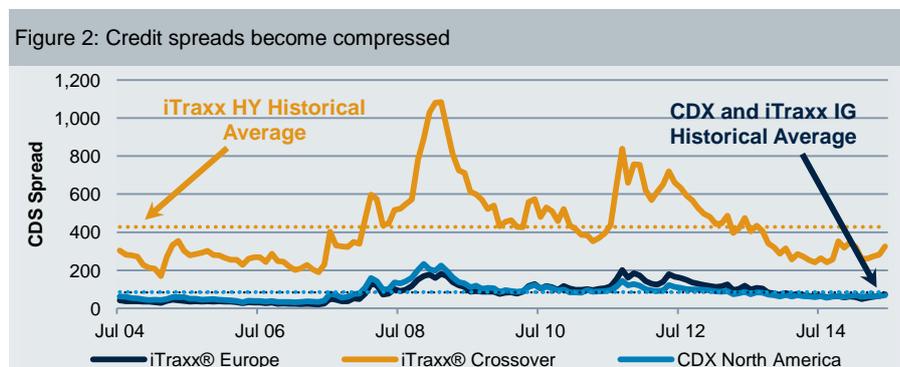
Source: Robert Shiller Online Database, Deutsche AWM, US Treasury, 1871-2014. Past performance is not a reliable indicator of future returns.



## Balancing Yield and Risk in an Income-Focused Portfolio

Most fixed income yields are at or near historic lows in many markets. For example, in the US, the yield on ten-year government bonds at the end of 2014 (2.17%) was close to its all-time lows (see Figure 1) and **53% below the average US long bond yield between 1871-2014 (4.6%)**.

During the last decade, credit spreads have also become significantly compressed (see Figure 2). The Markit iTraxx 5Y IG and HY indices show five-year credit default swap (CDS) spreads for European investment grade and high yield bond issuers, respectively. The Markit CDX 5Y IG index shows five-year credit default swap (CDS) spreads for US investment grade bond issuers. As at June 2015, investment grade and high yield credit spreads were below historical averages in both the US and Europe.



Source Bloomberg, Deutsche AWM. June 2004- June 2015. Past performance is not a reliable indicator of future returns.

In Figure 3 we illustrate the effect of falling rates and falling credit spreads by showing the expected annual income generated by a notional investment of €100,000 in three categories of euro-denominated bonds, offering progressively higher yields: government, corporate and high-yield. The yields from these three bond market segments are measured using representative indices and shown at four points in time: end-1999, end-2004, end-2009 and June 2015.

Figure 3: Expected annual income delivered by a €100,000 portfolio in €-denominated government, corporate and high yield bonds invested at different dates

	31/12/1999	31/12/2004	31/12/2009	30/06/2015
Markit iBoxx Sovereigns Eurozone	€ 5,357	€ 3,654	€ 3,724	€ 1,519
Markit iBoxx Euro Liquid Corporates	€ 5,954	€ 3,977	€ 3,709	€ 1,326
Barclays Pan European High Yield	€ 10,587	€ 6,700	€ 10,736	€ 4,788

Source: Markit, Barclays, Deutsche AWM, December 1999-December 2014. The costs of investing in the index via financial products are not taken into consideration. Past performance is not a reliable indicator of future returns.

Figure 3 illustrates the striking decline over the last 15 years in the yield produced by bond portfolios, the asset class traditionally used by investors to produce a stable income. For example, between December 1999 and June 2015:

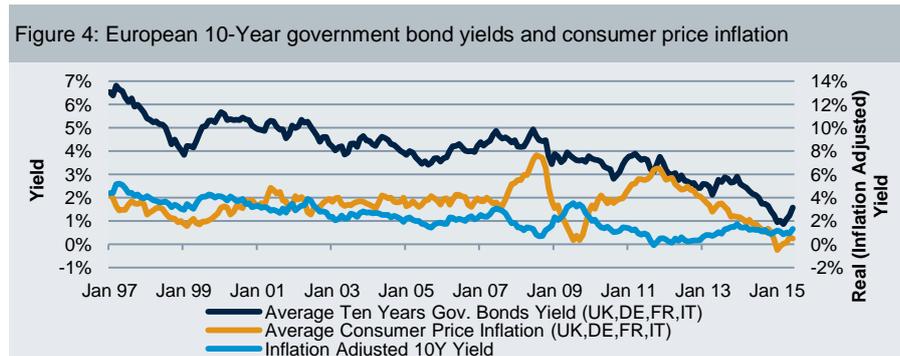
- The annual income generated by indices of **Eurozone sovereign bonds** and **Euro-denominated liquid corporate bonds** fell by **72% and 78% between 1999 and 2015, respectively**.
- During the same timeframe, the decline in annual income from **European high-yield bonds** over the same period was **55%**.
- High-yielding European corporate bonds generated in average less income in the first half of 2015 than Eurozone sovereigns did in 1999.



## Balancing Yield and Risk in an Income-Focused Portfolio

### ...at a faster rate than inflation

Recent declines in government bond market yields reflect falling inflation expectations. However, government bond yields have decreased at a faster rate than inflation, resulting in lower levels of real (inflation-adjusted) income (see Figure 4). As many investors have historically relied on their bond investments to produce above-inflation returns, this represents an additional challenge for income-oriented investors.

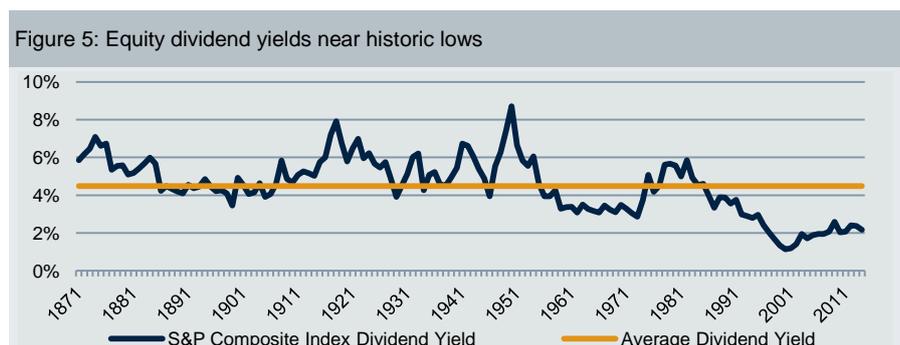


Source Bloomberg, Deutsche AWM. Observation period: January 1997-June 2015. Past performance is not a reliable indicator of future returns.

Even though average year-on-year consumer price inflation in the UK, Germany, France and Italy has fallen steadily since 2011, reaching negative territory in early 2015, the relatively faster decline in ten-year government bond yields has meant that real bond yields remain near 18-year lows.

### Shrinking yields and convergence across asset classes

Equity dividend yields are also at or near historic lows in many markets. As illustrated in Figure 5, the end-2014 yield on the S&P Composite index, a broad index of US equities (2.16%), was **52% below the average US equity market yield between 1871 and 2014** (4.49%) and just above the record lows witnessed during the 1999-2000 internet bubble.



Source: Robert Shiller Online Database, Deutsche AWM, 1871-2014. Past performance is not a reliable indicator of future returns.

The recent fall in yields can be observed across all asset classes (traditional or alternative) and geographies. In Figure 6, we highlight the extent of the decline and the convergence in yield levels across selected asset classes and global markets (global equities, aggregate bonds, high-yield bonds, investment grade CDS, high-yield CDS, global real estate securities) since the millennium. The fall has occurred despite interim spikes in yields in 2008/2009 (in lower-credit bond indices) and in 2011 (in high-yield bond and higher-yielding Eurozone sovereign bond indices).

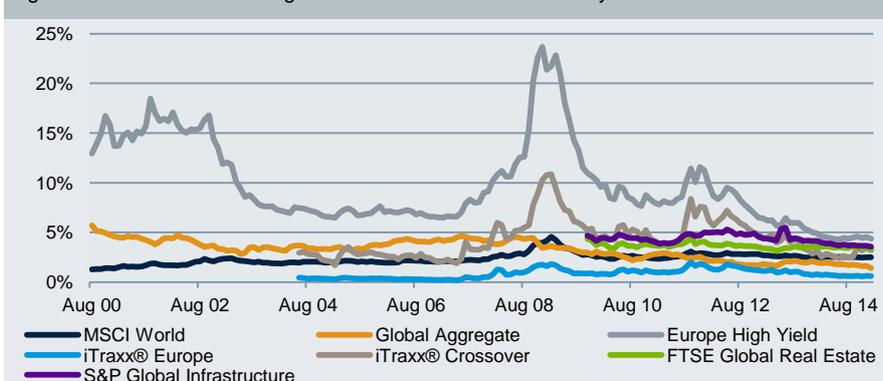


## Balancing Yield and Risk in an Income-Focused Portfolio

### Index Nomenclature

MSCI World	MSCI World Index Net USD Index™ (NDDUWI)
MSCI EM	MSCI Emerging Market Net USD Index™ (NDUEEGF)
DAX	DAX Index™ (DAX)
Europe Corporates	iBoxx € Liquid Corporates TR Index™
Europe High Yield	Barclays Pan-European High Yield TR unhedged USD Index™ (LP01TRUU)
US Corporates	iBoxx \$ Corporates TR Index™
US High Yield	Barclays US Corporate High Yield TR unhedged USD Index™ (LF98TRUU)
Global Aggregate	Barclays Global Aggregate TR unhedged USD Index™ (LEGATRUU)
iTraxx® Europe	iTraxx Europe 5 Year Long Total Return Index™ (ITRXTE5I)
iTraxx® Crossover	iTraxx Europe Crossover 5 Year Long Total Return Index™ (ITRXTX5I)
CDX North America	Markit CDX North America Investment Grade Index™
FTSE Europe Real Estate	EPRA Europe Net Return Index™ (NEPRA)
FTSE Global Real Estate	FTSE EPRA/NAREIT Global TR Net Index™ (TENHGU)
S&P Global Infrastructure	S&P Global Infrastructure Net TR Index™ (SPGTINNT)

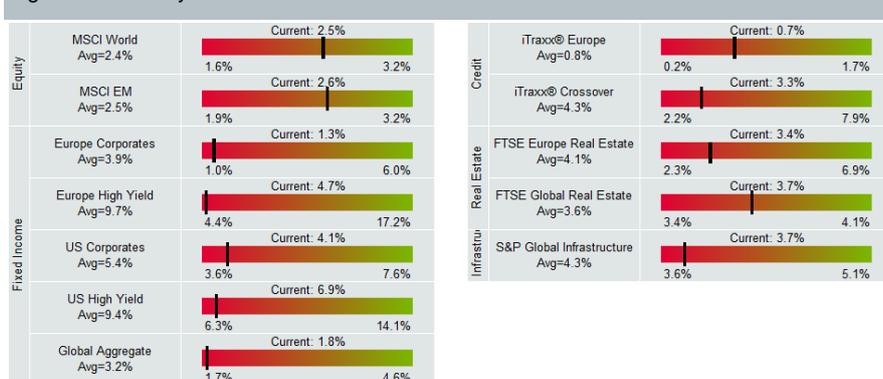
Figure 6: Decline and convergence in cross-asset class index yields



Source: Deutsche AWM, Index Providers, August 2000-June 2015. Data series for both iTraxx indices start in June 2004. Data series for FTSE Global Real Estate and S&P Global Infrastructure indices start in October 2009. Past performance is not a reliable indicator of future returns.

In Figure 7, we show the mid-2015 yield levels of representative regional and global equity, fixed income, credit, real estate and infrastructure indices in the context of historical ranges for these indices (defined as the 5% and 95% percentile of 12M yield historically over the relevant period. See footnote of Figure 7). Across regions and asset classes, current income levels are close to recent historical lows, except for the equity dividend yields which are rather evolving at their long term averages. This result is quite interesting and we will see below if such appealing dividend yield in a relative term is translated in risk-adjusted terms.

Figure 7: Current yields in historical context



Source: Deutsche AWM, Index Providers, August 2000-June 2015. Data series for both iTraxx indices start in June 2004. Data series for FTSE Global Real Estate and S&P Global Infrastructure indices start in October 2009. Past performance is not a reliable indicator of future returns.

### Financial repression

The recent declines in bond and equity market yields are not just a result of market forces. To a large extent, they also reflect changes in public policy since the 2008/2009 financial crisis. The term “financial repression” was introduced in the 1970s by economists Ronald McKinnon and Edward Shaw and is used, according to them, to describe measures undertaken by governments to control fiscal resources and restrict competition in the financial sector.

Symptoms of a financial repression policy include suppressed (and often below-inflation) interest rates, interest rate ceilings, forced savings into government bond markets (for example via reserve or liquidity ratio requirements on banks and insurance companies), directed lending policies, exchange rate controls and financial transaction taxes.



## Balancing Yield and Risk in an Income-Focused Portfolio

The post-crisis imposition of zero or near-zero interest rates, quantitative easing policies and forced savings into government bond markets (for example, via new bank regulations or the demand for collateral resulting from the imposition of mandatory central clearing) can all be seen as symptoms of financial repression.

Unfortunately for income-seeking investors, periods of financial repression can last for decades. According to economists Carmen Reinhart and Belen Sbrancia, the post-World War II era of financial repression, characterised by negative real interest rates on deposits, lasted for 35 years (see Figure 8). According to Reinhart and Sbrancia, following a sustained period of positive real interest rates between 1981 and 2009, average real interest rates in advanced economies moved back into negative territory from 2010 onwards.

Figure 8: Real interest rates during financial repression

Average Real Interest Rate on Deposits (%)	1945-1980	1981-2009
Advanced Economies	-1.94	1.35
Emerging Markets	-4.01	2.85

Source: Reinhart, Sbrancia, "The Liquidation of Government Debt" (2011), National Bureau of Economic Research Working Paper 16893. Averages are unweighted. Past performance is not a reliable indicator of future returns.

The trends described in Part 1—record or near-record low yield levels across asset classes, falling real interest rates and the likelihood of a prolonged period of financial repression—place a significant burden on investors looking to generate portfolio income to meet future liabilities.

## 2. Accessing Income

### Income is an important component of long-term returns...

Income, whether in the form of interest coupons or dividends, has historically represented a substantial component of the long-term returns available to investors in bonds and equities, respectively.

In Figure 9 we show the average annual price return and average annual gross return of the Barclays Global Aggregate index™, a broad index of global bonds, since December 1989. The price index return measures the change in capital values of the index's constituents, while the total return index return measures the combined change in capital value and the effect of received and reinvested interest coupons paid by the index's constituent bonds<sup>2</sup>. The difference between the price and total return versions of the index therefore illustrates the effect of income over time (including the compounding of interest received).

\$1000 invested in a portfolio representing the constituents of the Barclays Global Aggregate index™ in December 1989 would have increased to \$1,139<sup>3</sup> by June 2015 as a result of bond price appreciation. Taking into account income (including reinvested income), the initial sum would have increased to \$4,425. Income therefore contributed 96% to the change in the portfolio's absolute value over the period and capital appreciation only 4%.

<sup>2</sup> The total return index is calculated by reinvesting constituents' regular cash distributions in the index on the ex-date of the distributions

<sup>3</sup> Past performance is not a reliable indicator of future returns. All performances are gross of any replication and transaction costs.



## Balancing Yield and Risk in an Income-Focused Portfolio

Expressed as a compound annual return, the price index increased by 0.51% a year over the period, while the total return index increased by 6.00% a year. In other words, income accounted for 91% of the average annual total return of the Barclays Global Aggregate index over the period.

Figure 9: Barclays Global Aggregate Index price and total returns, 1989-2015



Source: Deutsche AWM, Bloomberg, December 1989-June 2015. Past performance is not a reliable indicator of future returns.

... but capital appreciation may also be a significant performance driver

In Figure 10 we provide a similar comparison for an index of global equities, the MSCI World index™, since the index's inception in December 1969. The price index measures the change in capital values of the index's constituents, while the total return index measures both the change in capital values and the effect of received and reinvested dividends.

\$1000 invested in a portfolio representing the constituents of the MSCI World index™ in December 1969 would have increased to \$17,356 by June 2015 as a result of equity price appreciation. Taking into account income (including reinvested income), the initial sum would have increased to \$46,644. Income therefore contributed 62% to the change in the portfolio's absolute value over the period and capital appreciation 38%.

Figure 10: MSCI World Index price and total returns, 1969-2015



Source: Deutsche AWM, Bloomberg, December 1989-June 2015. Past performance is not a reliable indicator of future returns.



## Balancing Yield and Risk in an Income-Focused Portfolio

### Comparing Yield Measures

In this document we focus on standard measures of income, such as equity dividend yield and the yield to maturity on bonds. Nevertheless, the income produced by equities, bonds and other asset classes has distinct characteristics, meaning that investors should take care when making direct comparisons between yields on different asset classes.

Among other distinctions:

- Bond income is notionally safer than equity income (debt holders have priority over equity holders since companies can only pay dividends out of their earnings once expenses, including interest on debt, have been paid)
- However, bonds may be of variable credit quality/seniority level
- The interest rate on conventional bonds is fixed, whereas dividend levels vary
- Equity and bond income may be taxed at different rates, both when distributed and when received

Two complementary perspectives for an ETF investor: do not mix the underlying asset and the wrapper!

In the ETF jargon, one often refer to 'distributing' or 'income' share classes, as opposed to 'accumulating' share classes. These different terms aim to indicate that a particular ETF or share class distributes a dividend, which is often the sum of accumulated – and not already paid – coupons/dividends received by the ETF's underlying assets.

Whilst the ETF distribution is generally directly related to the income delivered by the underlying asset, and whilst the investor is ultimately only seeing the dividend paid by the ETFs, the real 'income topic' is our opinion related to the underlying asset and not the ETF. The results and developments made in this paper are therefore mostly related to the income oriented assets made available through passive ETFs.

Expressed as a compound annual return, the MSCI World price index increased by 6.47% a year over the period, while the total return index increased by 8.81% a year. In other words, income accounted for 26% of the average annual total return of the MSCI World index over the period.

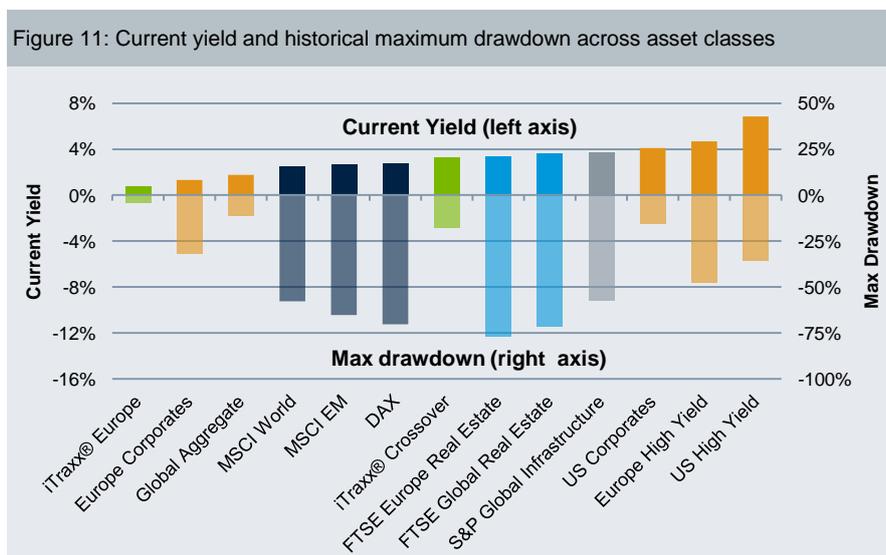
By comparison with the yield on fixed income securities, equity dividend income represents a relatively smaller, if still important component of long-term returns. However, capital appreciation has historically played a more important role in equities' total return performance.

A thorough multi-asset class approach to constructing an income portfolio should therefore focus not only on headline yield but also on potential capital appreciation and associated risk metrics, such as volatility and maximum drawdown.

### Towards a risk-aware income approach

Other things being equal, according to financial theory the greater the promised yield from an asset class (whether through equity dividends, interest rate duration or credit exposure), the higher the potential price risk. In Figure 11, where progressively higher-yielding asset classes are listed from left to right, we show that there is some correspondence between current yield and maximum past price declines. However, the relationship (based on the 15-year period shown), has not been linear: each asset class has tended to exhibit its own distinct risk/return profile.

Overall, however, individual income-seeking investors must balance their appetite for yield with their capacity to withstand price volatility. Income is only one component of an asset's total return and it is paramount to keep drawdown risk in mind, particularly when low interest rates incentivise investors to "reach for yield".



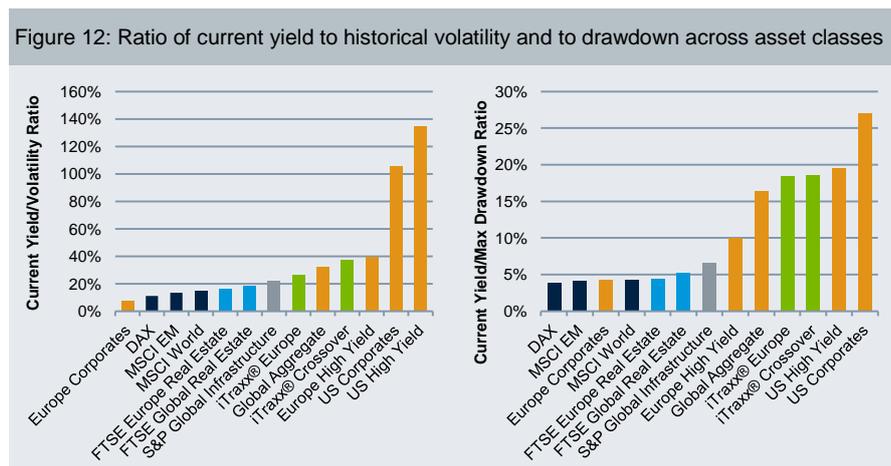
Source: Deutsche AWM, Bloomberg. Current Yield observed as of 30<sup>th</sup> June 2015, Maximum Drawdown observed between August 2000 and June 2015. Data for iTraxx indices start in September 2006 and for FTSE Global Real Estate and S&P Global Infrastructure indices in February 2005. Past performance is not a reliable indicator of future returns.



## Balancing Yield and Risk in an Income-Focused Portfolio

In Figure 12, we examine the past relationship between risk and yield across asset classes differently, by showing the ratio of current yield to historical volatility: the higher the ratio, the greater the current yield per unit of past volatility.

Based upon the fifteen-year period analysed, there has been considerable divergence in this measure, again highlighting the potential risks in using current yield as only metric when building an income portfolio.



Source: Deutsche AWM, Bloomberg, 31/08/2000-30/06/2015. Current Yield observed as of 30<sup>th</sup> June 2015. Data for ITraxx indices start in September 2006 and for FTSE Global Real Estate and S&P Global Infrastructure indices in February 2005. Volatility is defined as the annualized historical standard deviation of daily returns calculated over the whole period. Past performance is not a reliable indicator of future returns.

In the following sections, we review the major income-oriented asset class categories available to ETF investors, highlighting the source of the income generated and the potential yield enhancement offered by each category in comparison with benchmark indices. We also review the past risk characteristics of each asset class to focus on the value proposition that each asset class may represent.

### High-dividend equity indices

In Figure 12, market capitalisation-weighted equity indices (such as the MSCI World or the MSCI Emerging Markets indices) exhibited a relatively low past limited yield to volatility ratio by comparison with the other indices surveyed. However, it is possible to aim for an improvement of this ratio by constructing a portfolio of equities that is focused on higher dividend yield stocks. By design, high-dividend equity indices aim to produce a higher income stream than indices tracking broad equity indices. High-dividend indices' rules typically include some or all of the following eligibility requirements for constituents:

- A positive past record of dividend payments
- A maximum dividend pay-out ratio as a proportion of earnings
- Additional quality screens to help ensure dividend sustainability

For example, the Euro STOXX Select Dividend 30 index selects only companies with a non-negative historical five-year dividend-per-share (DPS) growth rate and a defined dividend to earnings-per-share ratio. In addition to requiring a track record of consistent dividend payments, the MSCI North America High Dividend Yield index screens for certain quality factors, such as return on equity, earnings variability, debt to equity, and recent 12-month price performance.



## Balancing Yield and Risk in an Income-Focused Portfolio

### Index Nomenclature

STOXX® 1800	STOXX Global 1800 net Return EUR Index™ (SXW1E)
STOXX® Global Select Dividend 100	STOXX Global Select Dividend 100 net Return EUR Index™ (SDGR)
Euro STOXX® 50	EURO STOXX 50 net Return Index™ (SX5T)
Euro STOXX® Select Dividend 30	EURO STOXX Select Dividend 30 net Return Index™ (SD3T)
MSCI North America	MSCI North America Net Return USD Index™ (M1NA)
MSCI North America High Div	MSCI North America High Dividend Yield net Return Index™ (M1NADY)
MSCI AC Asia ex Japan	MSCI AC Asia ex Japan net Return Index™ (NDUECAXJ)
MSCI AC Asia ex Japan High Div	MSCI AC Asia ex Japan High Dividend Yield net Return Index™ (LMAASJHDY)

Such methodologies can result in a substantial yield pick-up by comparison with representative benchmark indices. For example, as at 30/06/2015, the 4 high-dividend indices below offered an average gross dividend yield increase of 64% by comparison with their respective benchmark indices<sup>4</sup>.

Figure 13: High dividend index yields (%)



Source: Deutsche Bank, Bloomberg as of 30 June 2015. Past performance is not a reliable indicator of future returns.

The excess return accruing to owners of high-dividend stocks can be seen as characteristic of the “value” factor, one of the most widely documented risk premia in academic literature<sup>5</sup>. In the long term, researchers have found that high-dividend yield stocks tended on average to outperform their counterparts with lower dividend yields. Higher-yielding stocks tend to be cheap on a variety of valuation measures, reflecting higher cash flow risk. According to academic theory, this risk is then remunerated through a return premium, helping to generate the observed long-term outperformance of higher-yielding stocks (see Figures 14 and 15).

Figure 14 illustrates that the Euro STOXX Select Dividend 30 index has outperformed a standard, market capitalisation-weighted benchmark (the Euro STOXX 50 index) by 5.16% per annum since 1998.

Figure 14: Return comparison: Euro STOXX Select Dividend 30 Total Return index vs. Euro STOXX 50 Total Return index



Source: Deutsche Bank, Bloomberg, December 1998-June 2015. Index levels are rebased at 100 in December 1998. Past performance is not a reliable indicator of future returns.

<sup>4</sup> ETFs commonly aim to reproduce the return of a net total return index, before management fees and costs. The net total return index is calculated using dividends that are received and reinvested in the index after a deduction for withholding tax, based on the assumption that an investor is located in a particular country (e.g., Luxembourg). For further details, investors should check the index calculation methodology.

<sup>5</sup> See “Beyond Traditional Beta”, Deutsche Asset and Wealth Management, March 2015.



## Balancing Yield and Risk in an Income-Focused Portfolio

Similarly, Figure 15 illustrates that the MSCI North America High Dividend index has outperformed a representative capitalisation-weighted benchmark (the MSCI North America index) by 87 basis points per annum since 1998.

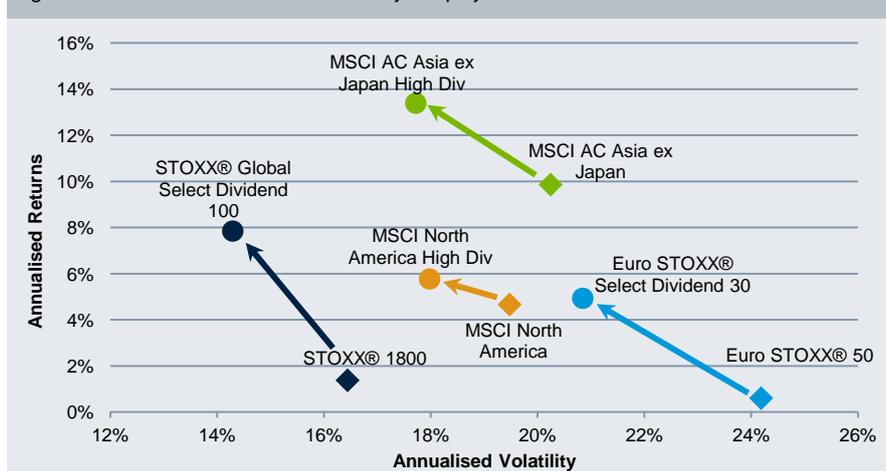
Figure 15: Return comparison: MSCI North America High Dividend Total Return index vs. MSCI North America Total Return index



Source: Deutsche Bank, Bloomberg, December 1998-June 2015. Index levels are rebased at 100 in December 1998. Past performance is not a reliable indicator of future returns.

From a risk perspective, the historical volatility of high-dividend indices has been lower or similar to that of standard market capitalisation-weighted benchmark indices (see Figure 16). However, high dividend yield indices have tended to feature larger maximum drawdowns than benchmark indices (see Figure 17). This appears to reflect the higher cash flow risk in higher-yielding stocks, which can translate into higher drawdown levels than those of standard, capitalisation-weighted indices during periods of market stress. For example, during the 2008/09 financial crisis, many financial companies in high-dividend equity indices reduced or suspended their dividends<sup>6</sup>.

Figure 16: Returns and historical volatility—equity indices



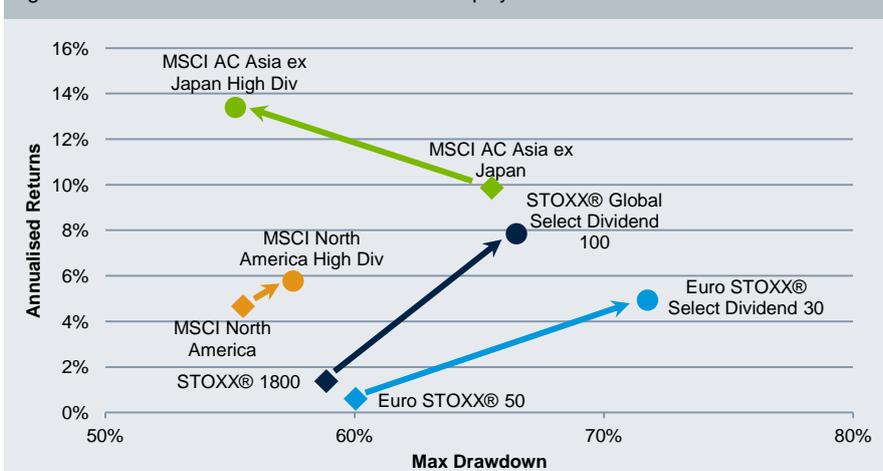
Source: Deutsche AWM, Bloomberg, Annualized Returns and Volatility observed between December 2000 and June 2015. Past performance is not a reliable indicator of future returns.

<sup>6</sup> See Achal et al., "Dividends and Bank Capital in the Financial Crisis of 2007-09", March 2011



## Balancing Yield and Risk in an Income-Focused Portfolio

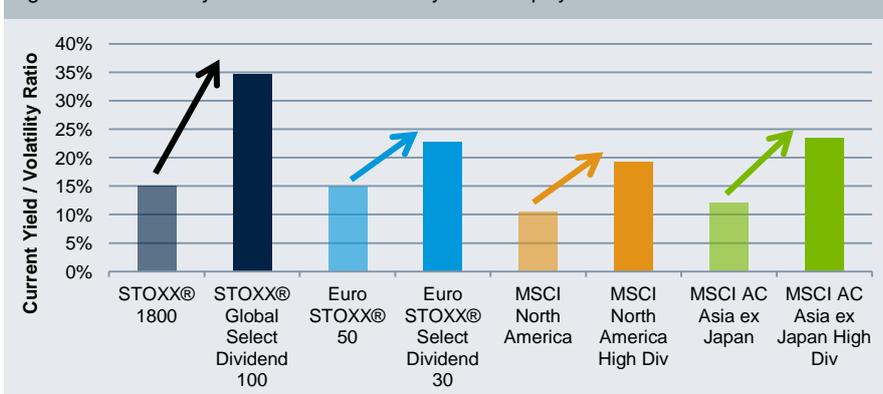
Figure 17: Returns and maximum drawdown—equity indices



Source: Deutsche AWM, Bloomberg, December 2000-June 2015. Yield observed as of 30<sup>th</sup> June 2015. Past performance is not a reliable indicator of future returns.

Overall and using the ratio of current yield to historical volatility, as defined previously, high-dividend indices exhibited an improved yield-to-risk ratio by comparison with market capitalisation-weighted benchmarks (see Figure 18a).

Figure 18a: Current yield to historical volatility ratio—equity indices



Source: Deutsche AWM, Bloomberg, December 2000-June 2015. Yield observed as of 30<sup>th</sup> June 2015. Past performance is not a reliable indicator of future returns.

### Higher-yielding bond indices

Higher-yielding bond indices aim to produce a superior income stream than indices tracking bond indices featuring the most creditworthy issuers. Traditionally there are two primary means of achieving this objective:

- Offer exposure to higher-duration bonds (in a normal, upward-sloping yield curve environment bonds with higher duration offer higher yields than bonds with lower duration)
- Offer exposure to bonds of higher credit risk

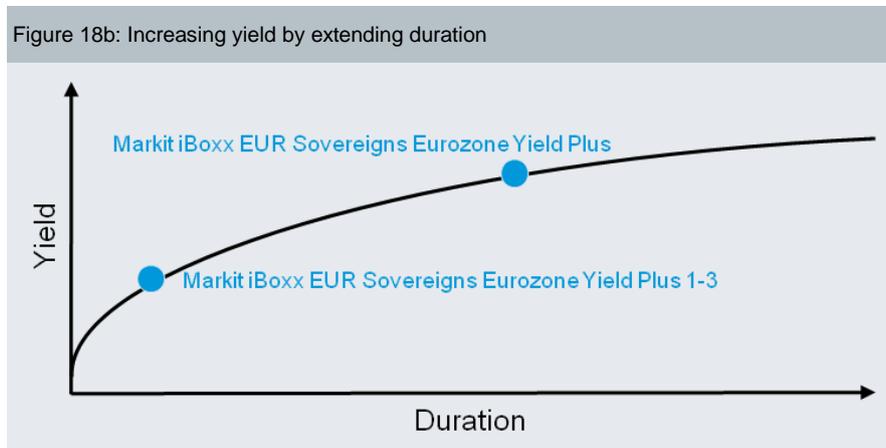


## Balancing Yield and Risk in an Income-Focused Portfolio

### Index Nomenclature

Barclays Global Aggregate	Barclays Global Aggregate TR unhedged USD Index™ (LEGATRUU)
iBxx Sovereigns Eurozone Yield Plus 1-3	iBxx Sovereigns Eurozone Yield Plus 1-3 TR Index™ (IBXXEYOT)
iBxx Sovereigns Eurozone Yield Plus	iBxx Sovereigns Eurozone Yield Plus 1-3 TR Index™ (IBXXEYPO)
DB EM Liquid Eurobond	Deutsche Bank DBIQ EM Liquid Eurobond Hedged Level (DBNELQKL)
iBxx EUR Liquid Corporate 100	iBxx € Liquid Corporates TR Index™ (IBOCLX00)
iBxx EUR Liquid Covered	iBxx EUR Liquid Covered Bon TR Index™ (IBXXECVT)
iBxx EUR Liquid Corporate 100 Financials	iBxx EUR Liquid Corporate 100 Financials TR Index™ (IBOCLX02)
iBxx EUR Liquid Corporate 100 Non Financials	iBxx EUR Liquid Corporate 100 Non Financials TR Index™ (IBOCLX04)
iBxx Germany Covered 1-3	iBxx EUR Germany Covered 1-3 TR Index™ (QX3C)
iBxx Germany Covered	iBxx EUR Germany Covered TR Index™ (QX3A)
iBxx EUR Liquid High Yield 1-3	iBxx EUR High Yield Liquid 1-3 TR Index (IBXXEHL1)
iBxx EUR Liquid High Yield	iBxx EUR High Yield Liquid TR Index (IBPXXMJA)

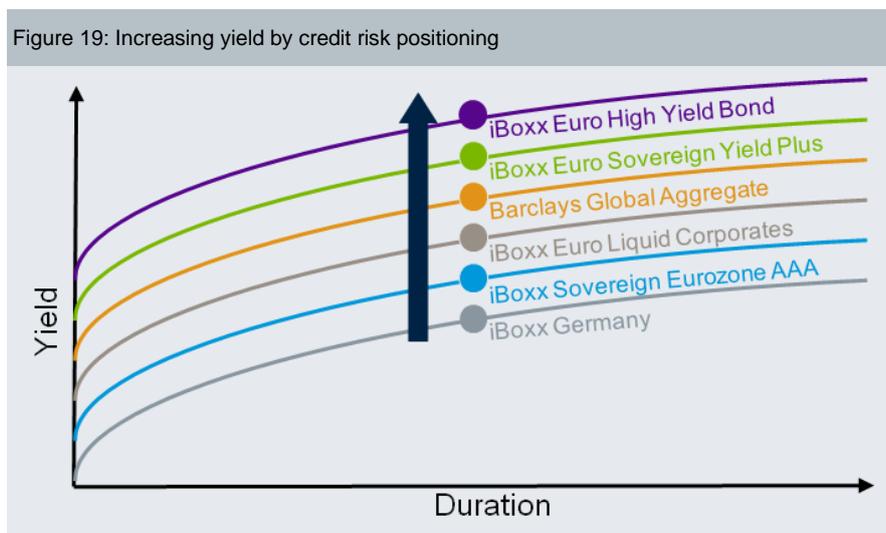
For example, within the category of bonds with a similar credit quality, an investor may increase the effective yield he/she receives by selecting an index with a higher duration (see Figure 18b).



Source: Deutsche AWM, for illustrative purposes only.

An alternative means of increasing yield is to select an index with higher credit risk for a given duration (see Figure 19). For example, the Deutsche AWM fixed income ETF range offers exposure to the following types of bond index, each with distinct credit risk (and hence yield) characteristics:

- Individual country sovereign bond indices (e.g., iBxx Germany)
- Regional or global sovereign bond indices (e.g., DB Global IG Government)
- Credit category sovereign bond indices (e.g., iBxx Sovereigns Eurozone AAA or Yield Plus)
- Emerging market sovereign bond indices (e.g., DB EM Liquid Eurobond)
- Global aggregate bond indices (e.g., Barclays Global Aggregate)
- Corporate bond indices (e.g., iBxx Euro Liquid Corporates)
- High-yield corporate bond indices (e.g., iBxx Euro High Yield)
- Covered bond indices (e.g., iBxx Euro Liquid Covered)



Source: Deutsche AWM, for illustrative purposes only. The relative credit risk levels of different index families may change.



## Balancing Yield and Risk in an Income-Focused Portfolio

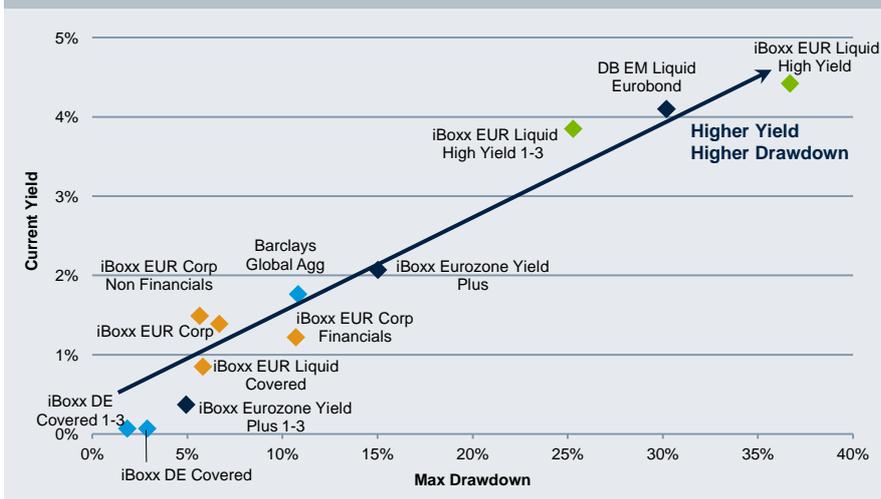
Unsurprisingly, there has been a positive historical relationship between increasing maturity/credit risk and volatility (see Figure 20): indices with exposure to longer-duration and lower credit quality constituents have had higher volatility than indices of short-duration, higher-credit bonds (such as the iBoxx Euro Germany Covered 1-3 index). Higher-yield indices have also exhibited higher past drawdown risk (see Figure 21). In fixed income, higher income comes at a clear price: higher risk, whether in the form of volatility or drawdown.

Figure 20: Yield and historical volatility—fixed income indices



Source: Deutsche AWM, Bloomberg, December 2005-June 2015. Past performance is not a reliable indicator of future returns. Current Yield observed as of 30<sup>th</sup> June 2015.

Figure 21: Yield and maximum drawdown—fixed income indices



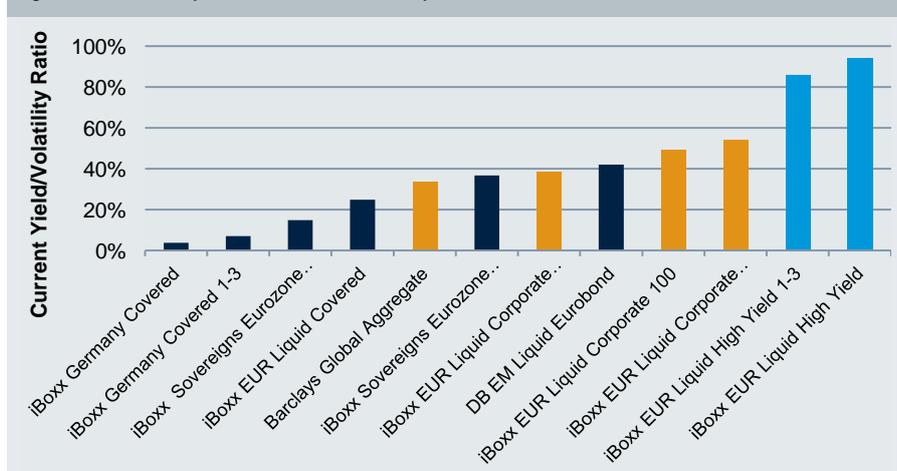
Source: Deutsche AWM, Bloomberg, December 2005-June 2015. Past performance is not a reliable indicator of future returns. Current Yield observed as of 30<sup>th</sup> June 2015.

In Figure 22 we illustrate the ratio of current yield to historical volatility across a range of fixed income indices. At the yield levels prevailing in June 2015, high yield bond indices and liquid corporate bond indices offered the highest ratio of yield to the past volatility of returns.



## Balancing Yield and Risk in an Income-Focused Portfolio

Figure 22: Current yield to historical volatility ratio—fixed income indices



Source: Deutsche AWM, Bloomberg, December 2005-June 2015. Past performance is not a reliable indicator of future returns. Current Yield observed as of 30<sup>th</sup> June 2015.

### Credit indices

Exposure to corporate credit (i.e., to corporate or high yield bonds) represents a key part of any investment in fixed income. However, an investment in bonds involves exposure to both credit and interest rate risks. It is possible to take exposure only to the credit component of a bond investment through a fully funded investment in credit default swaps. An investment in credit exhibits significantly different characteristics to an investment in fixed income.

- Using credit indices, an investor can access different categories of corporate credit exposure, for example: Geographical credit exposure (e.g., Europe or US credits)
- Credit quality exposure (e.g., investment grade or high yield)

Unlike a direct investment in equities or bonds, credit exposure is obtained through derivatives instruments called credit default swaps. Through transactions in such swaps, an investor receives a periodical fixed premium in exchange for bearing the risk associated with potential future losses on a pre-defined basket of corporate bonds (e.g., in the case of a default).

Credit ETFs usually invest the proceeds from investor subscriptions into money market instruments and simultaneously enter into credit default swaps transactions. Through this method, it is quite straightforward for these ETFs to get any level of exposure to the credit market (i.e., including leveraged exposure). As an example, a particular ETF may provide one-to-one exposure to an underlying credit index while another may have two-to-one geared exposure to the same index<sup>7</sup>. As a result, an investor can target a wide range of income levels.

As in the fixed income market, there has been a positive historical relationship between increased yield and volatility (see Figure 23). Higher credit risk indices (CDX High Yield and iTraxx Crossover and Crossover 2x) have offered both higher yields and higher volatility than investment grade credit indices (CDX IG, iTraxx Europe and iTraxx Europe 2x).

<sup>7</sup> Regulations such as Europe's UCITS rules limit the use of leverage in retail funds. Most UCITS-compliant credit ETFs deploy a maximum 200% exposure to the credit market. These leveraged products implement a periodical (usually daily) rebalancing of the positions to make sure the exposure stays within this 200% limit.

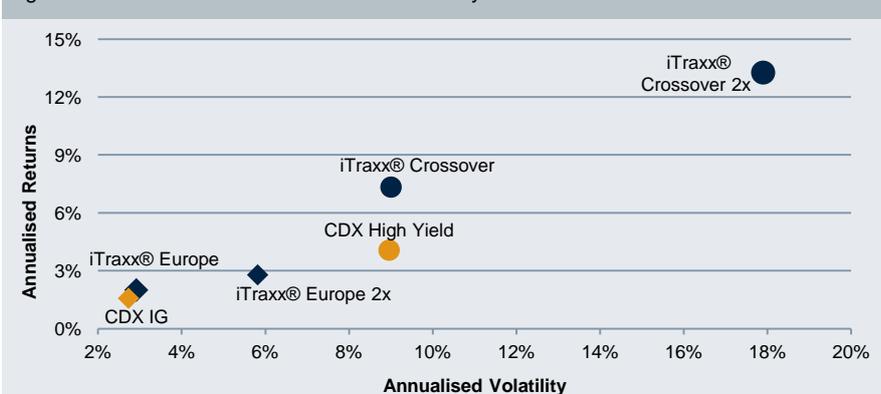


## Balancing Yield and Risk in an Income-Focused Portfolio

### Index Nomenclature

iTraxx® Crossover	iTraxx Crossover CDSI Generic 5Y Index™
iTraxx® Europe	iTraxx Europe CDSI Generic 5Y Index™
CDX High Yield	CDX High Yield CDSI Generic 5Y Index™
CDX IG	CDX Investment Grade CDSI Generic 5Y Index™

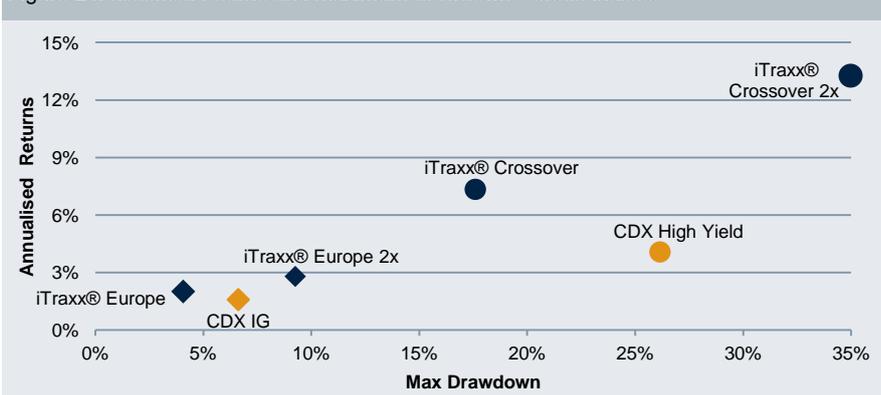
Figure 23: historical returns and historical volatility—credit indices



Source: Deutsche AWM, Bloomberg, March 2007-June 2015. Past performance is not a reliable indicator of future returns.

Higher-yield credit indices have also exhibited higher drawdown risk than investment grade credit indices (see Figure 24).

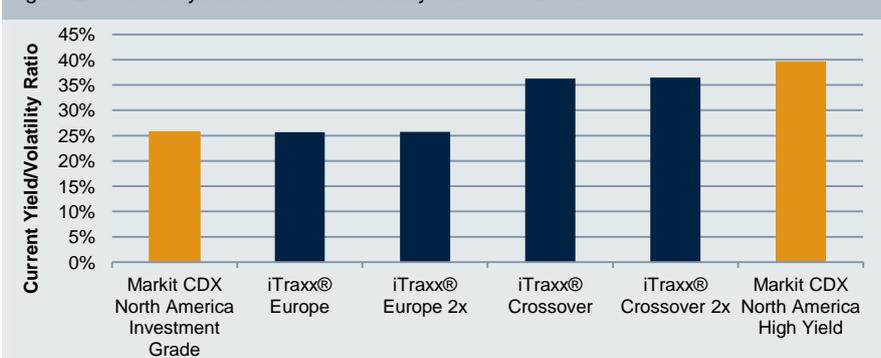
Figure 24: historical returns and maximum drawdown—credit indices



Source: Deutsche AWM, Bloomberg, March 2007-June 2015. Yield observed as of 30<sup>th</sup> June 2015. Past performance is not a reliable indicator of future returns.

In Figure 25 we illustrate the ratio of current yield to historical volatility for the featured credit indices. At the yield levels prevailing in June 2015, high yield credit indices offered a higher ratio of yield to past volatility of returns than investment grade credit indices, both in Europe and the US.

Figure 25: Current yield to historical volatility ratio—credit indices



Source: Deutsche AWM, Bloomberg, March 2007-June 2015. Yield observed as of 30<sup>th</sup> June 2015. Past performance is not a reliable indicator of future returns.



## Balancing Yield and Risk in an Income-Focused Portfolio

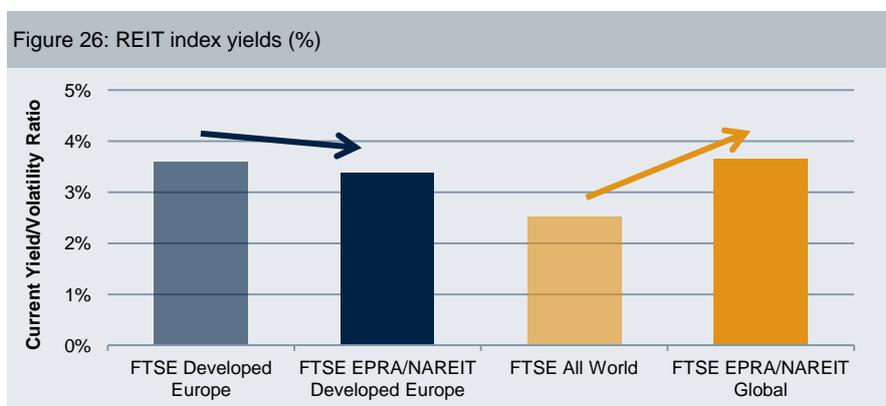
### Index Nomenclature

FTSE Developed Europe	FTSE Developed Europe net Return Index™ (TAWNT06E)
FTSE EPRA/NAREIT Developed Europe	EPRA Europe net Return Index™ (NEPRA)
FTSE All World	FTSE All World Index net Return Index™ (TAWNT01U)
FTSE EPRA/NAREIT Global	FTSE EPRA/NAREIT Global Index net Return Index™ (TENHGU)

### Real estate investment trust (REIT) indices

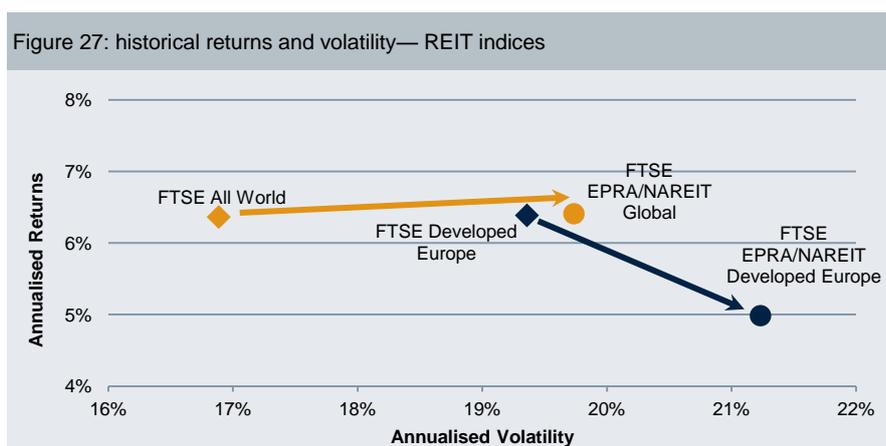
Real estate investment trusts (REITs) are listed companies that own or finance income-producing real estate. REITs operate under a legal framework that typically requires them to distribute the majority (often 90%) of their net income to shareholders. This means that dividends and reinvested dividends make up a higher proportion of the total returns from REITs than is the case with equities generally.

REITs' legal requirement to distribute the majority of their earnings makes them a natural portfolio holding for income-focused investors. As at end-June 2015, yields on indices of REITs in different geographical regions were similar to or higher than those of comparable equity benchmarks (see Figure 26).



Source: FTSE, as at 29<sup>th</sup> June 2015. Past performance is not a reliable indicator of future returns.

However, over the period from February 2005 to June 2015 REIT indices also exhibited higher volatility and higher levels of drawdown than capitalisation-weighted equity indices (see Figure 27 and 28), reflecting the poor performance of real estate securities during the 2008-2009 financial crisis.

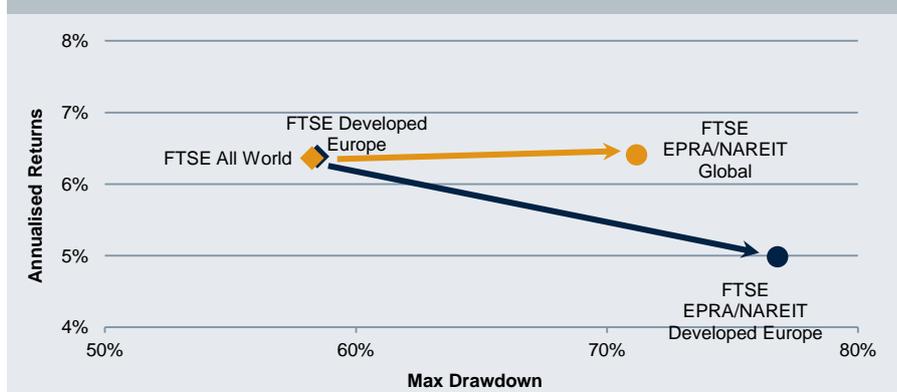


Source: Deutsche AWM, Bloomberg, February 2005-June 2015. Yield observed as of 30<sup>th</sup> June 2015. Past performance is not a reliable indicator of future returns.



## Balancing Yield and Risk in an Income-Focused Portfolio

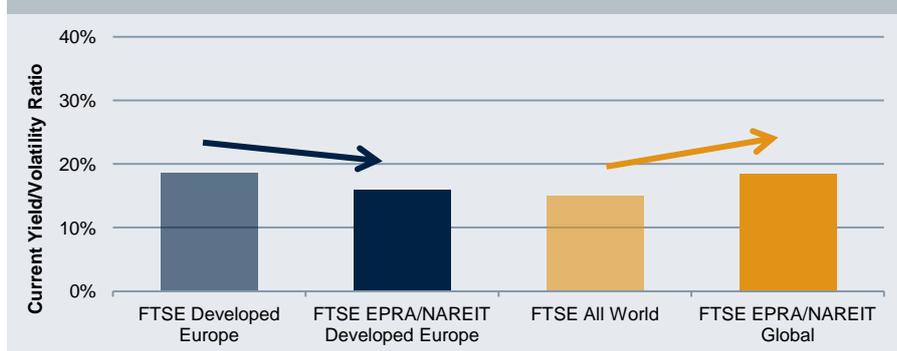
Figure 28: historical returns and maximum drawdown— REIT indices



Source: Deutsche AWM, Bloomberg, February 2005-June 2015. Yield observed as of 30<sup>th</sup> June 2015. Past performance is not a reliable indicator of future returns.

In Figure 29 we illustrate the ratio of current yield to historical volatility for the featured REIT indices. At the yield levels prevailing in June 2015, the FTSE EPRA/NAREIT Global index offered an increase in yield per unit of historical volatility by comparison with a capitalisation-weighted equity index, although this was not the case for an index of European REITs.

Figure 29: Current yield to historical volatility ratio—REIT indices



Source: Deutsche AWM, Bloomberg, February 2005-June 2015. Yield observed as of 30<sup>th</sup> June 2015. Past performance is not a reliable indicator of future returns.

### Infrastructure indices

Infrastructure assets are usually defined as those which provide for the efficient movement of people, services and products. Usually, infrastructure assets are subdivided into a number of categories, including:

- Transportation (e.g., bridges, toll roads, airports, railway networks)
- Communication (e.g., cellular telephone infrastructure, satellite networks)
- Energy (e.g., gas and electricity power supply and distribution networks, renewable energy assets)
- Social (e.g., schools, hospitals, universities, prisons)

Similarly to equities in real estate companies and REITS, the equities of infrastructure companies can offer a combination of potential capital appreciation and a bond-like income stream. Infrastructure assets' revenue streams are often inflation-linked, offering a natural inflation hedge to the owners of infrastructure equities. Because of this inherent inflation linkage, real estate and infrastructure assets are often considered alternatives to other asset classes offering long-term real returns, such as inflation-linked fixed income securities.

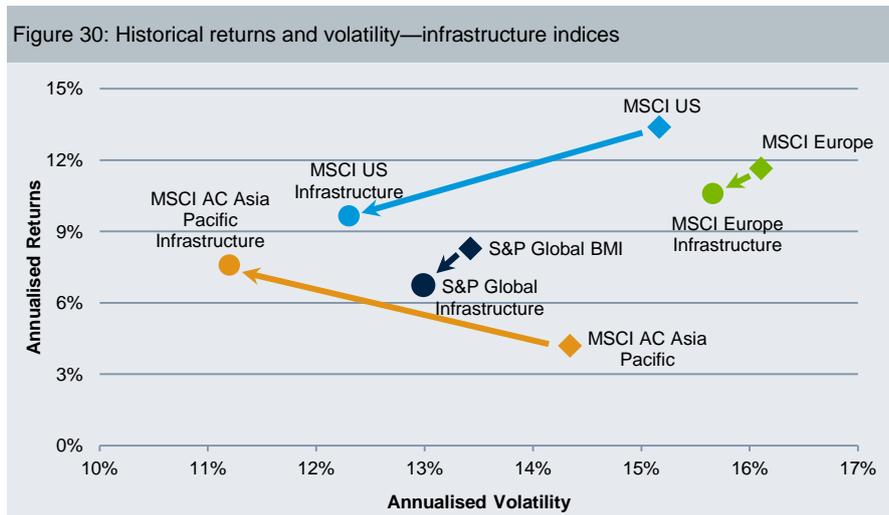


## Balancing Yield and Risk in an Income-Focused Portfolio

### Index Nomenclature

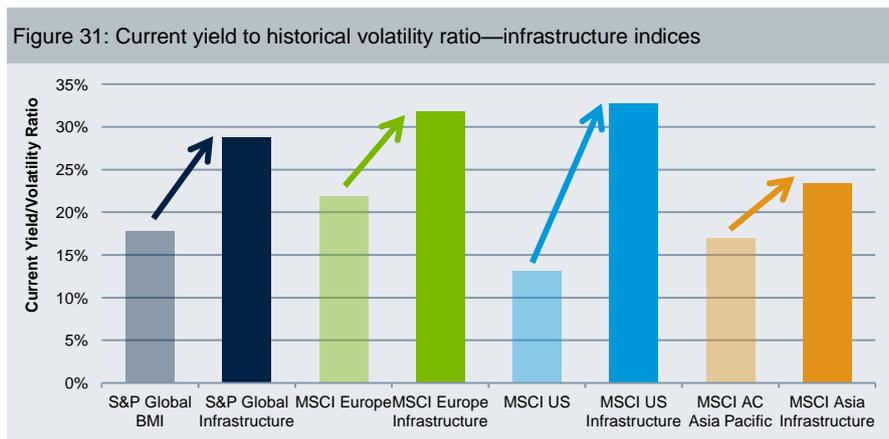
S&P Global Infrastructure	S&P Global infrastructure net Return Index™ (SPGTINNT)
MSCI Europe Infrastructure	MSCI Europe Infrastructure net Return Index™ (M1EU0INF)
MSCI AC Asia Pacific Infrastructure	MSCI All Country Asia Pacific Infrastructure net Return Index™ (M1AP0INF)
MSCI US Infrastructure	MSCI US Infrastructure net Return Index™ (M1US0INF)
S&P Global BMI	S&P Global Broad Market net Return Index™ (STBMGLU)
MSCI Europe	MSCI Europe net Return Index™ (M7EU)
MSCI US	MSCI US net Return Index™ (NDDUUS)
MSCI AC Asia Pacific	MSCI All Country Asia Pacific net Return Index™ (NDUEACAP)

By comparison with standard, market capitalisation-weighted equity indices, indices of infrastructure securities offered higher income-generating potential in June 2015. For example, the S&P Global Infrastructure Index exhibited a yield of 3.74% by comparison with 2.38% for the S&P Global BMI Index.



Source: Deutsche AWM, Bloomberg, July 2011-June 2015. Yield observed as of 30<sup>th</sup> June 2015. Past performance is not a reliable indicator of future returns.

Historically such investment has demonstrated equity like volatility and drawdown which leads to a Current Yield divided by Historical Volatility of 20% to 35% depending on regions. Due to the relative short history of such indices we do not show historical drawdown as they would look unfairly small compared to other asset classes (due to the absence of the 2008 crisis in the data available).



Source: Deutsche AWM, Bloomberg, July 2011-June 2015. Yield observed as of 30<sup>th</sup> June 2015. Past performance is not a reliable indicator of future returns.



## Balancing Yield and Risk in an Income-Focused Portfolio

### 3. Combining income-oriented asset classes

In Part 2 we showed that there is still a variety of asset class categories promising above-average levels of income to investors. However, extra yield typically comes at the expense of extra risk and investors should conduct a detailed analysis of the risk/return characteristics of each asset class when constructing their own income-oriented portfolios.

While investors cannot escape the effect of the recent declines in absolute yields across the securities markets, they can improve the risk-adjusted return of a high-income portfolio by making use of the diversification opportunities available amongst higher-income asset classes.

#### Low correlations across high-income asset classes

In Figure 32 we show the historical cross asset-class correlations between selected high-income indices over the period from March 2007 to June 2015.

During this period there were a number of potentially interesting portfolio diversification opportunities using different higher-yielding asset class categories:

- Euro corporate bond and Eurozone sovereign bond indices had negative or low positive correlations with high-dividend equity indices, creating diversification benefits
- The absolute correlations between high-yield bond indices and both high-dividend equity and liquid corporate bond indices were also relatively low
- Credit indices showed low correlation with traditional fixed income indices

Figure 32: Historical correlations across higher-yielding asset classes

	High Dividend Equities	Real Estate	Sov Eurozone Yield Plus	EUR Corporate Bond	EUR HY Bond	iTraxx® Europe	Infrastructure
High Dividend Equities	100%	78%	0%	1%	49%	54%	68%
Real Estate	78%	100%	4%	-3%	52%	65%	87%
Sov Eurozone Yield Plus	0%	4%	100%	30%	8%	27%	9%
EUR Corporate Bond	1%	-3%	30%	100%	37%	-7%	-5%
EUR HY Bond	49%	52%	8%	37%	100%	51%	50%
iTraxx® Europe	54%	65%	27%	-7%	51%	100%	66%
Infrastructure	68%	87%	9%	-5%	50%	66%	100%

Source: Deutsche AWM, Index Providers, March 2007-June 2015. Correlations were calculated using weekly returns. Past performance is not a reliable indicator of future returns.



## Balancing Yield and Risk in an Income-Focused Portfolio

In Figures 33 and 34 we provide a cross-asset-class perspective on the current levels of yield and the levels of historical risk (in terms of volatility and historical drawdown, respectively) in different categories of income-oriented asset (denoted by colour coding).

Figures 33 and 34 illustrate the high levels of diversity amongst income-oriented asset class categories, whether in terms of the nature of the source of income (e.g., equity dividends, bond interest coupons or credit spreads), the current levels of yield or the historical risk characteristics. Whatever the risk appetite of an income-focused investor, the charts suggest that a holistic, cross-market perspective to the task of generating income makes sense.

Figure 33: Current yield and historical volatility across income-oriented asset classes



Source: Deutsche AWM, Bloomberg, December 2000-June 2015. Current Yield observed as of 30<sup>th</sup> June 2015. Data for credit (iTraxx) indices start in March 2007, for real estate indices in February 2005, for fixed income indices in December 2005 and for S&P Global Infrastructure indices in July 2011. Past performance is not a reliable indicator of future returns.

Figure 34: Current yield and historical maximum drawdown across income-oriented asset classes



Source: Deutsche AWM, Bloomberg, December 2000-June 2015. Current Yield observed as of 30<sup>th</sup> June 2015. Data for credit (iTraxx) indices start in March 2007, for real estate indices in February 2005, for fixed income indices in December 2005 and for S&P Global Infrastructure indices in July 2011. Past performance is not a reliable indicator of future returns.



## Balancing Yield and Risk in an Income-Focused Portfolio

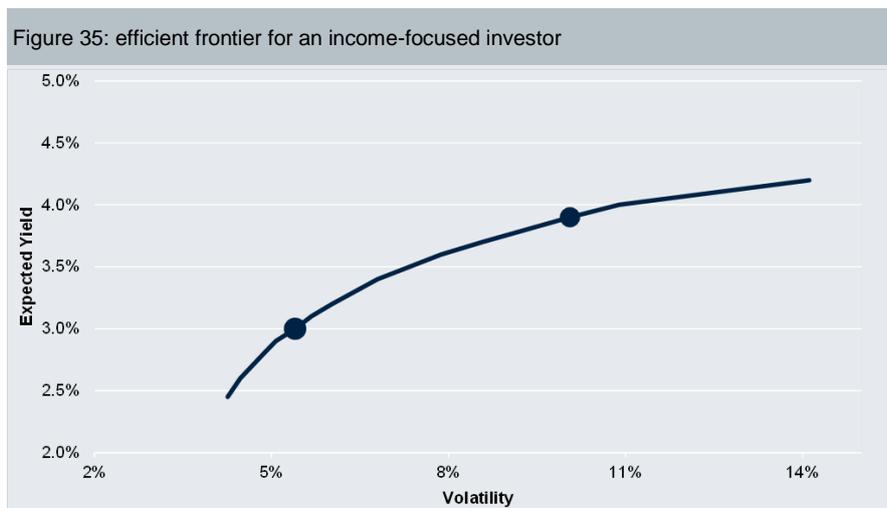
### Implementing income-oriented portfolios: two investment cases

Following the results presented above, we analyse two portfolios targeting two different risk appetites.

The weightings in these two portfolios are calculated using the classic mean-variance optimisation approach developed by Markowitz<sup>8</sup>. We can summarise this approach as follows:

- The variance-covariance matrix needed for the mean-variance optimisation is calculated with the historical volatility and correlation of the assets described in Part 2;
- The expected return is defined as the expected yield (i.e., we ignore the potential for capital appreciation and focus on the income level of each asset class)
- For each contemplated yield, the optimiser looks for the 'optimal portfolio', defined as the portfolio demonstrating the lowest risk and observing a set of constraints (in this example no asset should represent more than 15% of the portfolio).

Figure 35 represents the efficient frontier obtained through this optimisation exercise, i.e., the universe made of all optimal portfolios. Navigating across this efficient frontier enables an investor to select a particular income and then to look for the optimal portfolio demonstrating this expected yield.



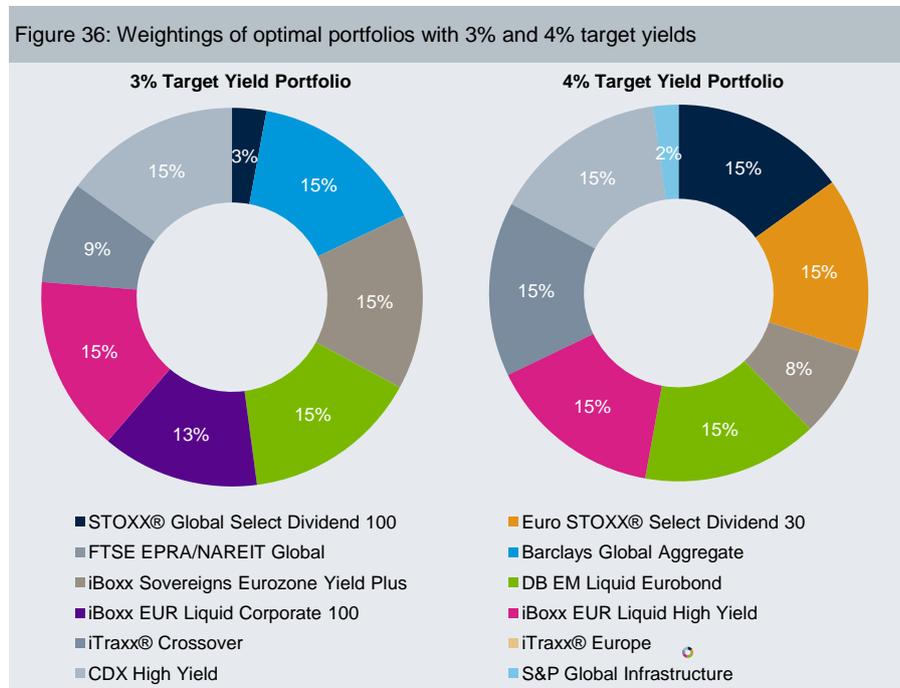
Source: Deutsche AWM, optimisation using selected income-focused indices and yield levels as at 30th June 2015. Historical volatility is calculated over the following periods: 30<sup>th</sup> March 2007 to 30<sup>th</sup> June 2015. No risk-free asset is included in the optimisation. Past performance is not a reliable indicator of future returns.

<sup>8</sup> See Markowitz, H.M. (March 1952). "Portfolio Selection". *The Journal of Finance* 7 (1): 77–91 and Markowitz, H.M. (1959). *Portfolio Selection: Efficient Diversification of Investments*. New York: John Wiley & Sons.



## Balancing Yield and Risk in an Income-Focused Portfolio

In Figure 36 we show the portfolio weightings calculated as a result of this optimisation for two risk profiles, respectively targeting 3% and 4% of annual yield.



	Portfolio with 3% Target Yield	Portfolio with 4% Target Yield
STOXX® Global Select Dividend 100	2.9%	15.0%
Euro STOXX® Select Dividend 30	0.0%	15.0%
FTSE EPRA/NAREIT Global	0.0%	0.0%
Barclays Global Aggregate	15.0%	0.0%
iBoxx Sovereigns Eurozone Yield Plus	15.0%	7.8%
DB EM Liquid Eurobond	15.0%	15.0%
iBoxx EUR Liquid Corporate 100	13.4%	0.0%
iBoxx EUR Liquid High Yield	15.0%	15.0%
iTraxx® Crossover	8.7%	15.0%
iTraxx® Europe	0.0%	0.0%
CDX High Yield	15.0%	15.0%
S&P Global Infrastructure	0.0%	2.2%

Source: Deutsche AWM, portfolio weightings calculated via an optimisation using selected income-focused indices and yield levels as at 30 June 2015. Historical volatility is calculated over the following periods: 30<sup>th</sup> March 2007 to 30<sup>th</sup> June 2015. No risk-free asset is included in the optimisation. Past performance is not a reliable indicator of future returns.

The two portfolios illustrated in Figure 36 are well diversified from both an asset class and a regional perspective. As expected, the more aggressive portfolio is invested more heavily in equities than the more defensive portfolio, which has higher weightings in fixed income.



## Balancing Yield and Risk in an Income-Focused Portfolio

Based upon the historical period used in the optimisation, the defensive portfolio demonstrates a 5.3% volatility (on a simulated basis), compared to 10.9% for the more aggressive portfolio. These risk metrics, when combined with the target yields, translate into yield to volatility ratios of 57% and 37%, respectively (see Figure 37). These yield-to-volatility ratios are higher than most of the ratios exhibited by the single income-focused investment categories described in Part 2, again making the case for a diversified approach to income generation.

Figure 37: Volatility and yield to volatility ratios for optimal portfolios with 3% and 4% target yields



Source: Deutsche AWM, yield levels as at 30 June 2015. Historical Volatility is calculated on a simulated basis over the following periods: 30<sup>th</sup> March 2007 to 30<sup>th</sup> June 2015. No risk-free asset is included in the optimisation. Past performance is not a reliable indicator of future returns.

## Conclusion

In this issue of Deutsche AWM's Passive Insights series, we focused on the challenge facing income-oriented investors in a low-yield investment environment. Although interest rates and dividend yields are at or near record low levels in many global markets, **there are still income-yielding opportunities for investors willing to take some additional risks**: indices of corporate and high-yield bonds still yield above 4% as at end-June 2015, for example, while an index of infrastructure securities also yields 4%.

Our results show that whilst opportunities to receive higher income inevitably involve higher risk, **this risk can be mitigated thanks to a cross-asset approach to portfolio construction**. Thanks to the low historical correlations between a number of higher-yielding portfolio assets, diversified, income-oriented portfolios can demonstrate interesting risk-adjusted yield opportunities.

The wide range of income generating ETFs available on the db-x trackers platform enables investors to construct income-generating portfolios customised according to their risk and return targets.



## Balancing Yield and Risk in an Income-Focused Portfolio

---

### References

McKinnon, R., (1973): Money and Capital in Economic Development, Brookings Institution

Reinhart, C., Sbrancia, B., (2011): "The Liquidation of Government Debt", National Bureau of Economic Research Working Paper 16893, updated in 2015 as IMF Working Paper 15/7

Shaw, E., (1973): Financial Deepening in Economic Development, Oxford University Press

### Passive Insights Series

- Passive Insights #1 – Smart Beta: building low vol portfolios of ETFs
- Passive Insights #2 – Fundamental Scoring for Fixed Income
- Passive Insights #3 – Equal Weighted Portfolios of ETFs
- Passive Insights #4 – Strategic Beta: GDP-Weighted All Countries Portfolio with ETFs
- Passive Insights #5 – Momentum with Sectors ETFS
- Passive Insights #6 – How institutional investors can use ETFs strategically
- Passive Insights #7 – Can ETFs be a substitute for futures? An intense debate, with changing dynamics.
- Passive Insights #8 – Over the Currency Hedge.



## Balancing Yield and Risk in an Income-Focused Portfolio

---

### Risk Factors – db X-trackers UCITS ETFs

- Investors should note that the db X-trackers UCITS ETFs are not capital protected or guaranteed and investors in each db X-trackers UCITS ETF should be prepared and able to sustain losses of the capital invested up to a total loss.
- The value of an investment in a db X-trackers UCITS ETF may go down as well as up and past performance is not a guide to the future.
- Investment in db X-trackers UCITS ETFs involve numerous risks including among others, general market risks relating to the relevant index, credit risks on the provider of index swaps utilised in the db X-trackers UCITS ETFs, exchange rate risks, interest rate risks, inflationary risks, liquidity risks and legal and regulatory risks.
- Not all db X-trackers UCITS ETFs may be suitable for all investors so please consult your financial advisor before you invest in a db X-trackers UCITS ETF
- db X-trackers UCITS ETFs following a direct replication investment policy, may engage in securities lending. In these instances the db X-trackers UCITS ETFs face the risk of the borrower not returning the securities lent by the db X-trackers UCITS ETF due to e.g. a default situation and the risk that collateral received by the db X-trackers UCITS ETFs may be liquidated at a value lower than the value of the securities lent out by the db X-trackers UCITS ETFs.
- db X-trackers UCITS ETFs employing an indirect investment policy will use OTC derivative transactions. There are appropriate arrangements in place to reduce the exposure of the db X-trackers UCITS ETF to the counterparty, in some cases up to 100%, but there is no guarantee that such arrangements will be perfect and the counterparty may lose up to 100% of its investment if the counterparty defaults.
- db X-trackers UCITS ETFs may be unable to replicate precisely the performance of an index.
- An investment in a db X-trackers UCITS ETFs is dependent on the performance of the underlying index less costs, but an investment is not expected to match that performance precisely. There may be a tracking difference between the performance of the db X-trackers UCITS ETFs and the underlying index e.g. due to the impact of fund management fees and administrative costs among other things. The returns on the db X-trackers UCITS ETFs may not be directly comparable to the returns achieved by direct investment in the underlying assets of the db X-trackers UCITS ETFs or the underlying index. Investors' income is not fixed and may fluctuate.
- db X-trackers UCITS ETFs shares may be denominated in a currency different to that of the traded currency on the stock exchange in which case exchange rate fluctuations may have a negative effect on the returns of the fund.
- The value of any investment involving exposure to foreign currencies can be affected by exchange rate movements.
- Tax treatment of the db X-trackers UCITS ETFs depends on the individual circumstances of each investor. The levels and bases of, and any applicable relief from, taxation can change.
- DB Affiliates significant holdings: Investors should be aware that Deutsche Bank or its affiliates ("DB Affiliates") may from time to time own interests in any individual db X-trackers UCITS ETF which may represent a significant amount or proportion of the overall investor holdings in the relevant db X-trackers UCITS ETF. Investors should consider what possible impact such holdings by DB Affiliates may have on them. For example, DB Affiliates may like any other Shareholder ask for the redemption of all or part of their Shares of any Class of the relevant db X-trackers UCITS ETF in accordance with the provisions of this Prospectus which could result in (a) a reduction in the Net Asset Value of the relevant db X-trackers UCITS ETF to below the Minimum Net Asset Value which might result in the Board of Directors deciding to close the db X-trackers UCITS ETF and compulsorily redeem all the Shares relating to the db X-trackers UCITS ETF or (b) an increase in the holding proportion of the other Shareholders in the db X-trackers UCITS ETF beyond those allowed by laws or internal guidelines applicable to such Shareholder.
- db X-trackers shares purchased on the secondary market cannot usually be sold directly back to the db X-trackers ETFs. Investors must buy and sell shares on a secondary market with the assistance of an intermediary (e.g. a stockbroker) and may incur fees for doing so. In addition, investors may pay more than the current net asset value when buying shares and may receive less than the current net asset value when selling them.
- Full disclosure on the composition of the db X-trackers UCITS ETF's portfolio and information on the Index constituents, as well as the indicative Net Asset Value, is available free of charge at [www.etf.deutscheawm.com](http://www.etf.deutscheawm.com). For further information regarding risk factors, please refer to the risk factors section of the prospectus, or the Key Investor Information Document.



## Balancing Yield and Risk in an Income-Focused Portfolio

---

### Disclaimer

This document is intended for discussion purposes only and does not create any legally binding obligations on the part of Deutsche Bank AG and/or its affiliates ("DB"). Without limitation, this document does not constitute an offer, or a recommendation to enter into any transaction.

Source: Deutsche Bank unless otherwise specified in the document. Opinions included herein are those of Passive Asset Management at the time of publication and may change without notice. There can be no assurance that the future performance of the strategies discussed herein will reflect their past performance.

The indices mentioned herein are registered trademarks of their respective licensors. The product(s), if any, described in this document is not sponsored, endorsed, sold or promoted in any way by the Licensors of the indices mentioned herein (with the exception of Deutsche Bank AG). The Licensors of the indices mentioned here (including Deutsche Bank AG) make no representations or warranties concerning the results obtained by using their indices and/or index levels or in any other respect, on any given day. The index sponsors are not liable for errors in their indices and are not obliged to provide information of such errors.

When making an investment decision, you should rely solely on the final documentation (including the most recent Key Investor Information Document, if applicable, which is available on [www.dbxtrackers.com](http://www.dbxtrackers.com)) relating to the transaction and not the summary contained herein. These documents are available free of charge from Deutsche Bank, London Branch. DB is not acting as your financial adviser or in any other fiduciary capacity with respect to this proposed transaction. The transaction(s) or product(s) mentioned herein may not be appropriate for all investors and before entering into any transaction you should take steps to ensure that you fully understand the transaction and have made an independent assessment of the appropriateness of the transaction in the light of your own objectives and circumstances, including the possible risks and benefits of entering into such transaction. For general information regarding the nature and risks of the proposed transaction and types of financial instruments please go <https://www.db.com/en/content/Risk-Disclosures.htm>. You should also consider seeking advice from your own advisers in making this assessment. If you decide to enter into a transaction with DB, you do so in reliance on your own judgment. The information contained in this document is based on material we believe to be reliable; however, we do not represent that it is accurate, current, complete, or error free. Assumptions, estimates and opinions contained in this document constitute our judgment as of the date of the document and are subject to change without notice. Any projections are based on a number of assumptions as to market conditions and there can be no guarantee that any projected results will be achieved. Past performance is not a guarantee of future results. This material was prepared by a Structuring function within DB, and was not produced, reviewed or edited by the Research Department. Any opinions expressed herein may differ from the opinions expressed by other DB departments including the Research Department. Sales and Trading functions are subject to additional potential conflicts of interest which the Research Department does not face. DB may engage in transactions in a manner inconsistent with the views discussed herein. DB trades or may trade as principal in the instruments (or related derivatives), and may have proprietary positions in the instruments (or related derivatives) discussed herein. DB may make a market in the instruments (or related derivatives) discussed herein. Sales and Trading personnel are compensated in part based on the volume of transactions effected by them. The distribution of this document and availability of these products and services in certain jurisdictions may be restricted by law. You may not distribute this document, in whole or in part, without our express written permission. DB SPECIFICALLY DISCLAIMS ALL LIABILITY FOR ANY DIRECT, INDIRECT, CONSEQUENTIAL OR OTHER LOSSES OR DAMAGES INCLUDING LOSS OF PROFITS INCURRED BY YOU OR ANY THIRD PARTY THAT MAY ARISE FROM ANY RELIANCE ON THIS DOCUMENT OR FOR THE RELIABILITY, ACCURACY, COMPLETENESS OR TIMELINESS THEREOF.

This document has been issued and approved by Deutsche Bank AG London Branch. Deutsche Bank AG is authorised under German Banking Law (competent authority: European Central Bank) and, in the United Kingdom, by the Prudential Regulation Authority. It is subject to supervision by the European Central Bank and by BaFin, Germany's Federal Financial Supervisory Authority, and is subject to limited regulation in the United Kingdom by the Prudential Regulation Authority and Financial Conduct Authority. Deutsche Bank AG is a joint stock corporation with limited liability incorporated in the Federal Republic of Germany, Local Court of Frankfurt am Main, HRB No. 30 000; Branch Registration in England and Wales BR000005 and Registered Address: Winchester House, 1 Great Winchester Street, London EC2N 2DB.

Investors should be aware that DB may from time to time own interests in any fund which may represent a significant amount or proportion of the overall investor holdings in the relevant fund. Investors should consider what possible impact such holdings by DB may have on them. © Deutsche Bank AG 2015. All rights reserved.

