Special: Dynamic risk classification of structured products – a comparison of approaches for funds and certificates

One of the by-products of the financial crisis is the marked increase in legal confrontations between investors and financial service providers/ issuers. These disputes usually relate to losses arising from risky security transactions. Investors generally make accusations about misselling, claiming in particular that they were not properly or adequately informed about the risk of the investment in question.

On 11 February 2011, the German Bundestag approved a draft law to strengthen investor protection and enhance the functioning of the capital market (Anlegerschutzverbesserungsgesetz; Investor Protection Improvement Act). The law is intended to provide investors and savers with better protection against misselling. For all financial products from 1 July 2011 onwards, investors will have to be given a product information sheet containing brief and comprehensible information on the relevant product before any contract is concluded. In the case of investment funds, the product information sheet will be replaced by the key investor information document (KIID or KID) which, as from 1 July 2011, will also have to be shown to investors before funds are sold according to the EU directive 2009/65/EC and EU regulation no. 583/2010.

The objectives of these regulatory measures are obvious. The aim is to improve product transparency and comparability using standardised information, which will make it easier for the individual investor to assess the suitability of a financial product. Risk plays a particularly important role in this process. The introduction of a risk indicator (SRRI for short – synthetic risk and reward indicator), which has to be constantly updated, is a central component of the KID, in addition to explanations of the relevant risks involved in a financial product (e.g. price, currency or credit risks). Calculation of the SRRI is specified by the supervisory authority and is essentially based on the annual volatility that is determined for each fund. A fund is then assigned to one of seven risk categories according to the annualised volatility. Studies show that the allocation of product risks to risk categories makes it easier for investors to make their decisions. Although a standardised risk ratio is therefore generally informative, it is worth having a close look at the selected methods. It is particularly important to examine the risk categories to which products are assigned and consider whether the methods used allow the risks of various products to be compared appropriately. Below, we will compare the specified calculation method for the SRRI with the established classification system of the German Derivatives Association (Deutscher Derivate Verband, DDV). The DDV assigns each structured product to one of five risk categories based on the value at risk, ranging from conservative (category 1) to speculative (category 5).

Risk classification by the DDV: value at risk (99%, 10-day holding period)

Since 2005, the DDV has been classifying structured products on the basis of the value at risk (VaR), which has also become established as a regulatory standard in banking supervision. Well-known calculation guidelines are available for this approach, with the Principle I (Grundsatz I) and derivatives regulations (Derivate-Verordnung). It is common knowledge that the VaR indicates the loss amount that is not exceeded for a specific probability and a defined holding period. The derivatives regulation and Principle I specify a 10-day holding period, a 99% confidence level and a historical observation period of at least one year. For an investment of EUR 10,000, for example, a value at risk of EUR 150 calculated on this basis means there is a 99% probability that the loss on a certificate will not exceed EUR 150 in ten days. The VaR is calculated using a full valuation approach. First of all, a simulation of the relevant risk factors (underlying price, interest etc.) is conducted in the observation period on the basis of the required market data. A probability distribution is then generated for each product and the specified holding period. In order to do so, the product is broken down into individual components and fully evaluated. The relevant VaR percentile is computed from this distribution. Each certificate is allocated to one of five risk categories on the basis of the calculated value at risk. The parameters of the risk categories were defined at one particular time and are based on the VaR measures of benchmark investments with a five-year data history.

Translation of VaR measures into risk categories (DDV method)

Risk class	Thresholds in EUR	Benchmarks	Investor type
1	0 < VaR ≤ 250	Bond indices (1 - 5 years)	risk averse
2	250 < VaR ≤ 750	Gold Spot, i.Boxx Europe, EMU Bond Index	limited willingness to take risks
3	750 < VaR ≤ 1,250	ATX, DAX, EuroStoxx 50, Dow Jones, S&P 500	willing to take risks
4	1,250 < VaR ≤ 1,750	Index-Members (average)	increased willing-ness to take risks
5	1,750 < VaR ≤ 10,000	Volatile (Small-)Caps (e.g. solar stocks)	speculative

One aspect of the DDV risk classification system that is often criticised is the assumption of a relatively short holding period of 10 days. Obviously, investment products in particular will be held for a longer period. The first thing to note is that the actual holding period may vary considerably from investor to investor. While the assumption of a standard holding period will never be appropriate for all investors, this is necessary to ensure the comparability of risks between various products. The assumption of a longer holding period (e.g. of one year) would create considerable problems, possibly leading to a distorted risk estimate and therefore potential errors in risk classification. Structured products in particular have limited maturities, which can even be shorter than one year, for example. A reinvestment assumption would be required if the risk were calculated over a longer period of time. Reinvestment at the market rate would be just as inappropriate as an extrapolation of the expected product returns to maturity. The second major problem with longer holding periods relates to the fact that the projected returns of the underlyings can only be estimated inaccurately. With a short holding period, on the other hand, the estimate of the expected return on the underlying (drift component), for example, is of subordinate importance. But as the significance

of the drift increases for longer holding periods, certain structures may have a more favourable risk classification. If the underlying drift is very positive, the risks of all long and call structures will obviously be lower than those of short and put structures. However, the risk classification method should not favour or penalise certain product structures.

Therefore, besides being in line with regulatory standards, the 99% 10-day VaR has the advantage of allowing the risks of financial products to be determined more accurately, which ensures comparability between products.

VaR measures and DDV risk categories of (structured) securities

Product	VaR	Risk class	Maturity	ISIN
(Deep) Discount EuroStoxx 50 (Cap 2000)	106	1	11/2011	DE000BN7CXY4
Deutsche Bank Bond Coupon 3.69% - 2013	129	1	04/2013	DE000DB7UQE4
Deutsche Bank Bond Coupon 5.125% - 2017	312	2	08/2017	DE000DB5S5U8
Discount EuroStoxx 50 (Cap 2100)	376	2	12/2011	DE000LB0BQL4
Bonus-Capped EuroStoxx 50 (Barrier 2300, Cap 2950)	814	3	12/2011	DE000DE4PG28
Templeton Growth Fund	910	3	---	US8801991048
DekaFonds	991	3	---	DE0008474503
EuroStoxx 50	1072	3		
BGF Latin America	1086	3	---	LU0035112274
Bonus EuroStoxx 50 (Barrier 2250, Bonuslevel 3800)	1549	4	12/2011	DE000AA15WR1
Warrant EuroStoxx 50 (Call, Strike 3000)	5039	5	12/2011	DE000VT0SV38

Risk classification according to KID: SRRI on the basis of historical volatility

The risk calculation in the KID seems simple at first glance. The SRRI is based on the annualised volatility of a fund (UCITS) derived from the historical price trend of the last 5 years. However, approaches vary, in some cases significantly, depending on the type of fund. For example, the SRRI for structured funds, whose profile is very similar to structured products and certificates, is calculated differently. Logically, the VaR is also used as a basis in order to reflect the asymmetrical distribution of structured products. However, the VaR is subsequently reverse engineered to produce an annualised volatility, despite the evident distribution problems, to allow comparability between different types of funds. The fund is then assigned to one of seven risk categories according to the following system:

Translation of volatilities into risk categories (KID method)

Risk class	Volatility Intervals	
	equal or greater	smaller
1	0%	0.5%
2	0.5%	2%
3	2%	5%
4	5%	10%
5	10%	15%
6	15%	25%
7	25%	

What is noticeable is that the volatility parameters are very conservative, especially where there have been extreme market fluctuations during the underlying 5-year history. Broadly diversified equity funds and ETFs on broad European equity indices are currently in the highest risk categories of

6 and 7 even though investors usually associate DAX investments with a medium risk. The following table provides an overview of the current risk classifications for various examples of investment:

Risk categories of (structured) securities according to KID

Security	Risk class acc. KID
DWS Euro Reserve (money market)	2
DWS Invest Euro-Gov Bonds	3
Corporate Bond DBK Maturity 2011 – Coupon 5 ½	3
Corporate Bond DBK Maturity 2013 – Coupon 5 ¼	4
UniGlobal	6
DWS Vermögensbildungsfonds I	6
Fidelity European Growth A	6
Templeton Growth Fund	6
BGF Latin America	7
db x-trackersDAX ETF	6
db x-trackers SMI ETF	6
ComStageETF STOXX 600 TR	6
iShares EuroStoxx 50 (DE)	7
LyxorETF MSCI Emerging Markets	7
STOXX Europe Small 200 Source ETF	7
db x-trackers DJ STOXX 600 B. Resources ETF	7

as of March 2011

The VaR is also used for structured products (funds) in the KID as described above, but the methodology differs from the method that is established on the German derivatives market. In contrast to the DDV method, which is based on a 10-day holding period, the 99% VaR in the KID is calculated up to the product's maturity. However, calculating the VaR to maturity makes it impossible to compare the risks of various products. A structured product – e.g. a guarantee product – with a maturity of two years has a low two-year risk, likewise the five-year risk of a product with a maturity of five years is low. These products are designed to protect capital and therefore have a low risk when they mature. By contrast, the two-year risk for a product with a maturity of five years is relatively high as it has a further term of three years after the two years have expired. On the other hand, the two-year product has a higher five-year risk. Following the two-year period, the return has to be invested for another three years, which means there is a significant reinvestment risk. This example shows that the selected method involving calculation up to the product maturity does not enable risks to be compared, but is akin to a comparison between apples and pears. A standard holding period – similar to Basle II and III regulation – has to be defined in order to compare risks. Given the aforementioned problems with inaccurate estimates of the drift component, a short holding period is an advantage.

The information in the following table provides further clarification of the above statements. The table shows examples of risk calculations for capital protection certificates (bond plus long call structure) on the EuroStoxx 50 with a strike price of 3600 points (as of 03/01/11, the EuroStoxx 50 was listed at 2839.43 points on 03/01/11) and various maturities (1 - 5 years). To enhance comparability, the VaR measures according to the DDV method have been converted into volatilities in line with the method for structured funds in the KID.

Comparison of risk calculations for a capital protected product (bond plus long call) according to KID and DDV

	Residual maturity				
	1 year	2 years	3 years	4 years	5 years
Volatility according to KID (SRRI)	0.7%	0.5%	0.4%	– 0.1%	– 0.5%
Risk category according to KID	2	2	1	1	1
Volatility according to DDV	1.8%	2.8%	4.0%	4.6%	5.7%
Risk category according to DDV	1	1	1	1	2

The figures in the table highlight the differences between the two approaches. The SRRI decreases as the residual maturity increases and even shows negative risk values for maturities of four and five years. However, risks on the capital market typically rise with longer product maturities. The negative risk values stem from the specified SRRI calculation methodology, which involves calculating the VaR with a historical drift, but the conversion to an annualised standard deviation is made via a risk-neutral drift. The 99% percentile can then be in positive section of the probability distribution, with the result that the risks of long-dated certificates are lower than those of short-dated products.

According to the DDV method, on the other hand, the risk values increase with the length of the maturity. This is due to a combination of the product maturity – a longer maturity is associated with higher risks – and the consideration of all risk factors (e.g. interest or volatility risk) with a standard holding period. If structured products are not held to maturity, the investment is not only subject to the price risk of the underlying, but also to other risks such as volatility risks. The KID method is limited to the price risk of the underlying because it is assumed that the product will be held to maturity. The SRRI is not comprehensive enough, especially for investors who will monitor the risk of a structured product during its maturity and may wish to sell it before it matures.

Conclusion

The focus of the current regulations at national and European levels is on adequately explaining the risks of a financial investment. The dynamic calculation of a risk ratio and the assignment of products to risk categories make it easier for investors to understand the products and compare risks. However, it is important that the calculated ratios adequately depict the risks of the respective financial products. Due to the rather conservative classification system, long-term time horizon and calculation up to the product maturity, the dynamic risk ratio required for funds in the KID may cause problems in practice. A methodology that reflects all risk factors is more suitable, especially for structured products and funds. The DDV established this type of classification on the German certificates market back in 2005. The extension of the KID risk calculation to PRIPs (packaged retail investment products), which include structured products, is currently being debated. The risk calculation methodology should be carefully assessed and extensively tested using practical examples to ensure that the generally useful approach of classifying risks is widely accepted in practice. This report has shown that a suitable approach should involve a standard holding period, which is preferably short to achieve accurate risk estimates.

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