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Efficient Portfolio Management Using Sector Index Derivatives

From the Perspective of an Independent Asset Manager

By Christian W. Jennes

Given the current market situation, selecting the appropriate investment strategy is of the utmost importance where return on investment is concerned. Many of the past's golden rules can no longer be applied to the current market environment. The scandals of the recent past have cast doubts on the meaningfulness of an analysis of individual equities, in particular those of smaller companies. Even the major investment banks with scores of analysts achieved below-average performance over the last three years. In the recent past, companies' own projections have proven hardly a reliable source, to the extent that some companies are already refusing to disclose any such forecasts. Hence, it currently does not make any sense to hope for a good return on an investment by way of "stock-picking". Looking at the strong volatility of individual shares, the chances for success when adopting a trading-oriented investment strategy are not impressive either: more often than not, stop-loss limits will be hit, forcing investors to sell near the lows.

Independent asset managers have to constantly answer to their clients. As a rule, this close contact between investor and decision-maker calls for a generally more conservative investment strategy on the one hand, and a diversification over a larger number of individual equities on the other hand. Now, more than ever, many asset managers orientate themselves to benchmarks agreed upon with clients. These often include country-specific indexes such as the DAX, FTSE 100 or the CAC 40. In this context, attention to the costs associated with asset management, and in particular transaction costs, has come to the fore. In the past asset managers were able to justify high transaction costs to their clients given the clearly positive performance they achieved. However, nowadays the performance of pure equity portfolios is normally negative: as a result, management costs have become a highly sensitive issue. The frantic and poorly thought-out tax policy in Germany currently is putting a stop to long term tax-optimized investment strategies. What is left in order to operate successfully in this challenging environment?

The Investment Approach

- Basically conservative
- Managing liquidity
- A high degree of diversification
- Sector rotation
- BWYU ("Buy What You Understand")
- Low transaction costs
- Tax optimization

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Basically Conservative

The risk profile depends on the client's personal circumstances. This is where the independent asset manager takes on a key role. A detailed analysis of the client's financial situation in connection with professional asset planning and a comprehensive explanation of the risks of each investment strategy are indispensable. In isolated cases, however, clients insist on high-risk investment strategies that contradict the results of the investment analysis – respectable asset managers will decline such a mandate.

Managing Liquidity

The current market conditions hardly allow for the application of the old principle of "buy and forget". In the third year of the downhill slide, cash holdings (or, to be precise, the equity ratio) must be adapted in times of uncertain market conditions – or after strong, sudden price movements – in order to profit from the ensuing market correction.

A High Degree of Diversification

As a reaction to the markets' unpredictability, a portfolio must be invested across a large number of individual equities. Strong diversification regarding currency, country and individual sector risks must be taken into account

Sector Rotation

As already mentioned, relying on success in "stock-picking" alone is not recommended in the current climate. Nowadays, a macroeconomic survey is more likely to produce (at best) a decent analysis of certain sectors and some rational forecasting of future trends, providing the basis for the target weighting assigned to a particular sector. A portfolio should comprise a minimum of at least ten different sectors, whereby the share of any individual sector in the overall portfolio should not exceed 20 percent. The 5–10 largest securities within each sector are analyzed. The position in each individual security should not exceed 7.5 percent of the total portfolio value.

BWYU ("Buy What You Understand")

We too, are unable to completely resist the growing use of acronyms. BWYU as an investment approach is based on the insight that it is impossible for an individual to monitor all sectors or even individual equities, let alone analyze them sensibly. Hence, one should only invest in sectors where one has a good understanding of the business models and principles. In our case, this means that we do not get involved in biotechnology, for instance, as our company does not have the expertise in this field. We also do not invest in Internet companies, whose business models are usually a complete mystery to us. The exception here, however, would be Ebay whose business model is simple and straightforward. Common, decent business sense is the most important parameter for selecting equities individually. As a number of our clients are successful businessmen, we seek their active participation in the selection process. In practical terms, this means that when we analyze the automobile sector, for instance, we interview clients, business partners or close friends as to their satisfaction with the automobiles in question. We also personally check out the manufacturer's models, test drive them or monitor which models are particularly sought-after. On top of this we form our own opinion on the quality of the management of the company. Wendelin Wiedeking, the chief executive officer of Porsche, is a positive example of management quality. And as to the Internet sector, let us just say that the author and many of his acquaintances are users of Ebay. At the end of the decision-making process, we analyze the ten largest components of a pre-selected sector in terms of traditional financial ratios.

In the remainder of the article, I would now like to illustrate the above-mentioned investment approach using a real example, in which we will also pay particular attention to the transaction costs.

Setting up the Portfolio

After analyzing the client's economic situation, we sat down together in the last quarter of 2001 to specify different investment categories. As a rule, such categories include direct participation in enterprises, real estate, life insurance or pension schemes, fixed income bonds, money market instruments, and equities. Furthermore, the equity portfolio is divided into different sectors. The equity portfolio in this case currently (status as of January 10, 2003) comprises 25 sectors: automobile, aviation, banking, beverages, chemicals, conglomerates, consumer goods, EDP hardware manufacturers, EDP software, electronics, financial services, food products, hotels and restaurants, insurance, Internet, leisure/holiday, logistics, mechanical engineering, media, oil/gas, pharmaceuticals/cosmetics, retailing, semi-conductors, telecommunications and utilities.

Using the automobile sector as an example, I will now explain how we proceed. In a first step, the so-called 'common business sense' approach would lead to a selection of the following securities: DaimlerChrysler, BMW, PSA, VW, Renault, Toyota, Porsche and Ford.

In the end, we were not able to get a clear picture of Toyota's activities outside the European market, while we had a rather skeptical attitude towards Ford's product range on the American domestic market. This is why we excluded both issues from our portfolio. Although we have a reserved attitude towards VW given its antiquated range of models, we have included the share in our portfolio due to the strong market position it holds in China (country diversification). In addition to common business sense, the fact that DaimlerChrysler, BMW and Porsche manage to sell well in the US is a point in their favor, allowing us to diversify country and, above all, currency risk. We are not able to judge the automotive components supplier market. This is why securities such as Delphi Corp., Continental or Michelin are not taken into account. Individual equities within the sector are weighted according to the subjective assessment of the portfolio manager after analyzing the financial ratios of the companies in question. This concludes the set-up of the automobile sector within the equity portfolio.

Managing the Portfolio

"To buy and forget" is no longer an adequate option. However, it would be far too costly and time-intensive to monitor the individual securities in a portfolio on a daily basis. Plus, frantic sales and purchases of individual securities cause substantial costs. What are the options here?

We revise our assessment of individual securities only every six months, or if the company concerned is subject to a dramatic change. Only in exceptional cases will a very good company turn into a very bad one overnight. In the automobile sector of our sample portfolio we only carried out a single transaction in 2002. We sold Porsche AG at the end of the first quarter. This was prompted by the favorable performance of the share price on the one hand, and the risks we saw on the other – firstly in the construction of the new Leipzig plant, and secondly in the production start of the new Cayenne series.

Managing Liquidity and Sector Rotation – Applying Derivatives

Derivatives allow for equity risks to be hedged in a sensible way. In addition to various option strategies, which are not the subject of this paper, it also makes sense to hedge with futures contracts. If, for example, the risk of an existing equity position is to be reduced, a corresponding number of futures contracts are sold against this equity position. Futures contracts have a considerable cost advantage compared to transactions on the cash market, in particular where strategies with a short term investment horizon are concerned. The following transaction costs are based on commission rates for private investors; institutional investors usually pay about half as much. The purchase and sale of shares usually costs 0.25 percent per transaction. This means that buying and selling shares worth EUR 75,000 runs up costs to the tune of EUR 375. The market value of a futures contract on the DAX Index corresponds to the futures price, e.g. 3,000, multiplied by the contract value of EUR 25 for each DAX

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index point. In the example, the current equivalent value corresponds to EUR 75,000 as well. The cost of buying and selling DAX contracts currently amounts to around EUR 25 per contract per "round turn" (i.e. purchase and sale). Costs are thus reduced by over 93 percent.

However, country-specific equity indexes are inconsistent with our investment approach, which stipulates diversification with regard to country risk. Futures contracts on the Dow Jones EURO STOXX 50 Index (only equities of euro zone countries) or the Dow Jones STOXX 50 Index (all of Europe) are better suited for this purpose. For the Dow Jones EURO STOXX 50 Future the cost advantage is slightly lower, but nonetheless still considerable. Given a futures price for the Dow Jones EURO STOXX 50 of 2,500 multiplied by 3 futures contracts and the contract value of EUR 10 for each index point, the market value equals EUR 75,000. The purchase or sale of Dow Jones EURO STOXX 50 Futures runs up costs of around EUR 20 per contract per round turn. This results in costs of around EUR 60, which, compared to the equity position, leads to a cost saving of 84 percent.

However, this strategy does not really fit to our investment approach either. The principal focus of our portfolio is closely related to our assessment of the individual sectors. Every month, we test our opinion of the sectors and, if necessary, change the weightings accordingly. On top of this, we make adjustments to the portfolio's liquidity in line with our assessment of the overall market. Ideally, changes in the equity ratio and a rotation of sectors should be carried out at the same time. Eurex Sector Index Futures are the instrument most suitable for implementing this investment approach. These futures contracts refer to the sector indexes of either the Dow Jones EURO STOXX Index or the Dow Jones STOXX 600 Index. Since January 10, 2003 Eurex offers futures contracts on ten sectors, including the automobiles, banks, energy, financial services, healthcare, insurance, media, technology, telecommunications and utilities.

Using Sector Index Futures

On the basis of the automobile sector of our sample portfolio, I am now going to illustrate the application of Eurex Sector Index Futures. On July 31, 2002 our portfolio included the following equity positions from the automobile sector:

Automobile Portfolio as of July 31, 2002

Security	Quantity	Price in EUR	Market Value in EUR
DaimlerChrysler	2,000	43.86	87,720
BMW	2,000	38.45	76,900
PSA (Peugeot/Citroën)	1,000	49.36	49,360
Volkswagen (VW)	1,000	47.15	47,150
Renault	800	46.80	37,440
Total market value			**298,570**

Originally, we had a very positive attitude towards the automobile sector and thus this sector was strongly over weighted with a share of around 20 percent of the entire equity portfolio. On July 31, 2002, we took a more critical stance towards the sector, and decided to cut its proportion in the overall portfolio by around 50 percent. The ensuing desired increase in the liquidity of the overall equity portfolio of around 10 percent was in line with our view of the overall market.

To reduce the automobile share, we can either sell shares or Eurex Sector Index Futures. To determine the actual number of futures contracts to be sold, you need the beta factor of the individual securities in the portfolio compared to the Dow Jones EURO STOXX Automobiles Index. The beta factor indicates the past sensitivity of shares in comparison to the index: a share with a beta of 0.98 is expected to fall by 9.8 percent if the index declines by 10 percent. The portfolio beta can be determined by multiplying the beta factors of the individual shares by the percentage weighting of each share in the portfolio.

Portfolio Beta for the Dow Jones EURO STOXX Automobiles Index (SXAE) on July 31, 2002

Security	Quantity	Price in EUR	Market value in EUR	Beta of the share	Weighting of each share	Weighted beta factor
DaimlerChrysler	2,000	43.86	87,720	1.221737	29.38%	0.358947
BMW	2,000	38.45	76,900	0.961749	25.76%	0.247709
PSA (Peugeot/Citroën)	1,000	49.36	49,360	0.665293	16.53%	0.109987
Volkswagen (VW)	1,000	47.15	47,150	0.996459	15.79%	0.157360
Renault	800	46.80	37,440	0.819463	12.54%	0.102759
Automobile portfolio			**298,570**		**100.00%**	**0.976762**

The level of the Dow Jones EURO STOXX Automobiles Index (SXAE) on July 31, 2002 was 202.12 and the price of the underlying Eurex Automobiles Index Future (FESA) maturing in March 2003 was 207.30. The notional "contract value" of the SXAE Index amounted to EUR 10,106. (As the beta refers to the index and not the futures contract, the index level must be multiplied with the futures contract value of EUR 50 per index point.)

The beta of the sample portfolio should equal 0.5 after hedging. This corresponds to a reduction of 0.476762 in the beta.

The number of futures contracts required for hedging is calculated from the market value of the automobile portfolio divided by the notional contract value of the SXAE Index, multiplied by the desired reduction of the beta factor, i.e. 298,570 / 10,106 x 0.476762 = 14.09.
Fourteen contracts of the Eurex Dow Jones EURO STOXX Automobiles Index Futures were sold to achieve the desired hedge. With these 14 futures contracts, the SXAE Index is hedged by a notional equivalent of EUR 141,484: 14 futures contracts x index level (202.12) x futures contract value (EUR 50/index point).

Compared to the Alternative Sale of Shares
First, we determine the number of shares that need to be sold in order to make both transactions comparable. The beta factor is again included in such calculations. The sensitivity of the automobile portfolio is lower than that of the index (as indicated by the beta factor of 0.976762). Hence, shares with a notional equivalent of the SXAE Index must be divided by the beta factor and sold in order to achieve the same result: EUR 141,484 / 0.976762 = EUR 144,850.

To determine the number of individual shares to be sold, the total value of the shares to be sold is multiplied by the weighting of each share in the portfolio and divided by the share price. The following calculation example is based on DaimlerChrysler:
total value of the shares to be sold (144,850) x weighting of share (0.2938) / 43.86 = 970.

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Number of Shares to be Sold on July 31, 2002

Security	Quantity	Price in EUR	Market Value in EUR
DaimlerChrysler	-970	43.86	42,544.20
BMW	-970	38.45	37,296.50
PSA (Peugeot/Citroën)	-485	49.36	23,939.60
Volkswagen (VW)	-485	47.15	22,867.75
Renault	-388	46.80	18,158.40
Sales proceeds			**144,806.45**

Comparing the Performance of the Futures Hedge Versus the Sale of Shares

On December 30, 2002, we decided to unwind the hedge, and to restore the original automobile portfolio, accepting the associated reduction in the overall portfolio's liquidity. The Dow Jones EURO STOXX Automobiles Index (SXAE) was trading at 150.59, while the price of the corresponding Eurex Automobiles Index Future (FESA) was 151.10 for the March 2003 contract.

The fourteen futures contracts, which were sold at a price of 207.30 on July 31, 2002, were bought back at 151.10 on December 30, 2002. This resulted in a profit of 56.20 points, multiplied by 14 contracts, multiplied by the futures contract value of EUR 50 per index point: 56.20 x 14 x EUR 50 = EUR 39,340.

To keep things simple, we did not take into account interest resulting from variation margin flows.

Portfolio with Futures Hedge on December 30, 2002

Security	Quantity	Price in EUR	Market Value in EUR
DaimlerChrysler	2,000	29.35	58,700
BMW	2,000	28.92	57,840
PSA (Peugeot/Citroën)	1,000	38.39	38,390
Volkswagen (VW)	1,000	34.74	34,740
Renault	800	43.56	34,848
Automobile portfolio			**224,518**
Dividends accrued			0
Futures hedge			39,340
Total			**263,858**

In order to be able to compare the performance of a futures hedge with the sale of shares, we assume that shares sold on July 31, 2002 would have been bought back on December 30, 2002. Any dividends paid during the reference period would have to be taken into account in both calculations (no dividends were paid during the period analysed here). In addition, interest income at 3 percent, which would have been generated from the proceeds on the sale of the shares, must be taken into account for 154 days: 3% x 154 / 365 x EUR 144,806.45 = EUR 1,832.89.

Portfolio on December 30, 2002 with Beta Adjustment via the Sale of Shares

Security	Quantity	Price in EUR	Market Value in EUR
DaimlerChrysler	970	29.35	-28,469.50
BMW	970	28.92	-28,052.40
PSA (Peugeot/Citroën)	485	38.39	-18,619.15
Volkswagen (VW)	485	34.74	-16,848.90
Renault	388	43.56	-16,901.28
Repurchase value			**-108,891.23**
Sales proceeds July 31, 2002			144,806.45
Value of (unhedged) portfolio on December 30, 2002			**224,518.00**
Dividends accrued			0
Interest on liquidity			1,832.89
Total			**262,266.11**

The performance of either strategy is nearly identical. The differences can be explained partially through rounding differences, as fractional futures contracts or shares cannot be traded. However, in addition to the absolute performance, we must also take a look at the operative and cost factors that have a decisive impact on these strategies.

Comparing the Transaction Costs of the Futures Hedge Versus the Sale of Shares

We have based the comparison of transaction costs on average commission rates for private investors (the costs to be paid by institutional investors are approximately half these rates).

Shares with a value of EUR 144,806.45 were sold on July 31, 2002, and shares with a value of EUR 108,891.23 were bought back on December 30, 2002. Given a commission rate of 0.25 percent per transaction, the transaction costs for the sale of these shares (and subsequent repurchase) amount to EUR 634.24.

A total of 28 futures contracts were traded. Assuming costs of EUR 10 per contract per side, the costs amount to EUR 280. Although the savings potential of Eurex Sector Index Futures is lower compared to DAX or Dow Jones EURO STOXX 50 Futures, the cost savings in our example are still approximately 56 percent.

Advantages and Disadvantages of Using Sector Index Futures

Handling

In addition to cost advantages, sector index futures have the advantage that dealing with a single futures contract is much easier and quicker than dealing with five different shares. With just one active position, the strategy using futures has a significantly lower error rate. A disadvantage is that Eurex margin requirements cause increased accounting efforts, which can only be offset by the use of appropriate technology.

Precision

Given the relatively small contract values, sector index futures can be used effectively for portfolios with a value beginning at EUR 100,000. A disadvantage is that hedging with futures contracts compared to a sale of shares is subject to a higher degree of rounding errors, as fractional futures contracts cannot be traded. On top of this, the beta factor is based on historical data and changes

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continually. Theoretically, a futures hedge would have to be monitored continuously, and changes to the beta factor would have to be compensated immediately by adjusting the number of futures contracts used in the hedge. However, in practice this only makes sense for extremely large positions. As is the case for a hedge using an instrument other than the underlying position, there is a risk of market imbalance. The traded price of the futures contract is not always identical with its theoretical price based on the index. In practice, larger market imbalances are, however, rare.

Liquidity

As the sector index futures were introduced not so long ago, sufficient liquidity is not (yet) always available for very large transactions. However, orders to the tune of up to ten contracts are usually executed quickly and efficiently due to the presence of Designated Market Makers. On the other hand, liquidity in foreign equities is not always guaranteed. In our example, a German investor cannot always rely upon orders in French automobile issues being executed quickly, and in line with prevailing market levels, on the German equity market. Trading equities in foreign markets is not only rather cumbersome in many countries, but also can involve much higher costs than in our example. Hence, trading with sector index futures can provide even more advantages. A sector index future that includes a selection of European equities can thus be more efficient and cost-effective.

Risk

Even if this is not consistent with our investment approach, we would like to mention that, due to the leverage effect, futures can be used to raise the portfolio's investment exposure to over 100 percent.

Compared to alternative products, sector index futures have other advantages as well. By way of an example, let us just mention that ETFs cannot be sold short without immense effort and that certificates bear the risk of default by the issuer, which is not the case for futures contracts.

Taxes

Profits and transactions on equities and derivatives are subject to different taxation rules in many countries, which may be beneficial or detrimental when hedging with futures. It is not possible to make a universal statement in this context.

For readers who would like additional information on sector index futures, I recommend the websites of Eurex **www.eurexchange.com** and of STOXX Ltd. **www.stoxx.com**. At the end of every month, STOXX Ltd. calculates the beta factors and publishes these on **www.stoxx.com > News > Monthly Statistical Report > Latest Statistical Report**.

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