SOCIAL COSTS AND BENEFITS OF STRUCTURED PRODUCTS: HOW SHOULD THE GERMAN REGULATORS REACT TO TRANSPARENCY, WEALTH APPROPRIATION, PRICING AND RISK IN THE LOCAL STRUCTURED PRODUCTS MARKET?

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Introduction
Structured products are securities that are issued by banks as debt obligations and allow private investors to realize a variety of investment strategies. Since their introduction in Europe in the 1990’s, the market has grown to a multibillion-dollar value. This market is also a large and active financial market in Germany.

Similar to classic warrants, structured products are issued on a specific underlying security such as an index future. Legally, structured products are defined by the promised pay-off upon their expiry which depends on the price of the structured product’s underlying security at that point in time. For some structured products underlier prices prior to expiry also affect that payoff, e.g. the payoff of so-called bonus certificates changes when their underlying security hits a predefined price barrier (“knock out event”).

Technically, in Germany structured products are generally treated as unsecured debt obligation of the issuing financial institution. In addition to issuing structured products and settling pay-offs upon expiry, the issuers also serve as market makers during the lifetime of these products. They set prices at their own discretion. Issuers also charge a bid-ask spread to cover parts of their overhead costs associated with market making.

Structured products have been both praised and criticized. On the one hand it could be argued that structured products have democratized parts of the retail investment landscape. Prior to the inception of structured products, investors could simply buy a stock or a simple stock option or investment in funds. The latter decision had effectively transferred investment decision to the fund manager. The first two options only allowed for very simple investment strategies.

Now this has completely changed. Structured products allow investors to express complex market views, for example bonus certificate allow investors to monetize a neutral market view and discount certificates can express a volatility bearish view. Further, entire asset classes such as commodities, most prominently crude oil futures, were outside the reach of small scale investors, but are now available through tracking certificates. The benefit that arises from this increase in investment choice and diversity can be termed the “social benefit” (or social utility) of structured products.

On the other hand some have criticized structured products. Generally this criticism can be split into three arguments: First, since structured products are unsecured debt obligations they can expire worthless when the issuing financial institution collapses. Such catastrophic failures are rare, however not impossible as the collapse of Lehman Brothers showed. Second, structured products are easy to misunderstand and thus potentially dangerous for small-scale private investors. Third, it has been alleged that structured products would first and foremost benefit the issuers,
not the clients, especially if they were overpriced: While the pay-off at maturity is defined in a legally binding and specific way secondary market prices are not. In fact issuers are not required to make a secondary market but if they do they are free to set prices as they like. In addition, money that is bound in the structured products market can not be allocated to other market sectors, especially if private investment would strongly move towards the structured products market there could arise a shortage situation (with respect to private consumer investment) in other market segments. These issues are termed the “social cost” of structured products.

Both potential social benefits and costs of structured products benefit from providing a baseline for our argument by analyzing the fair pricing issue.

The Results
Figure 1 shows the results of the statistical analysis of mispricing (DIFF) for our two samples. This Figure shows that products with embedded vanilla options (sample 1) were on average overpriced by 0.52% with a significance level of 99.9999% (p = 0.000000). Products with embedded exotic options (in sample 2) were on average overpriced by 1.27% (p = 0.011784). This is considerably smaller than the overpricing reported by Stoimenov and Wilkens (2005), which was in the range of 2% – 5%.

![Figure 1. Statistics Analysis of Mispricing in Sample 1 and 2](image)

One potential explanation for the reduction in overpricing (difference in the two studies) may be that the growth in the equity-linked structured products markets from 2003 to 2007 and subsequent increase in competition among issuers may have caused a reduction in overpricing.

Conclusion
In this paper we looked at the social costs and benefits of structured products in the German market.

A typical alleged social cost of structured products is overpricing. In a nutshell, banks are accused of profiting by charging high prices. The gains from overpricing may be viewed as a second source of income in addition to the bid-ask spread for the banks that offer these structured products.

An analysis of potential mispricing shows that one cannot rule out strategic mispricing of the products that are more likely to be sold back to the dealer. Neither
one can rule out that a normally distributed mispricing which both contains underpricing and overpricing, but is slightly shifted to the right (has a positive mean) to the benefit of the dealer (harming the customer). At the same time one may only identify small amounts of overpricing. Mispricing may be simply because the structured products are difficult to price. Analyzing about 500 structured products shows that on average, equity-linked, structured products with embedded vanilla options were overpriced by 0.52% and equity-linked structured products with embedded exotic barrier options were overpriced by 1.27%.

In particular, since mispricing increases with complexity of the products, the bank may be charging more for the potential errors and difficult task of valuing these complex products. In a strategic mispricing game, one may overprice a complex product in order to escape detection. In the final analysis, more transparency should be demanded by the regulator. One can conclude that there is overpricing to the disadvantage of the client and the distribution of this overpricing is so that it is hard to detect.

In conclusion, while mispricing is significant, it could be viewed as a secondary source of income for the banks. It is small enough that the individual retail customers may view it as a justifiable transaction cost. In addition, while the majority of products are overpriced, some products are underpriced. The best advice to the retail customers is to view this overpricing as an acceptable and small implicit premium to gain access to this market. For the private customers with limited funds, after transaction costs, it is practically impossible to exploit the mispricing. In addition, the structured products at their current prices are economically useful. Finding products that are underpriced is complicated and costly and therefore retail customers should not count on taking advantage of the mispricing of these products.

To increase transparency it is best that the market makers increase bid-ask rather than over-price in these markets. At the same time we are aware of the fact that more fairly priced products with a slightly larger bid-ask spread could potentially appeal less attractive than overpriced products with a more tight bid ask spread. The reason for this is that the absolute size of the bid ask spread can be immediately understood by everybody while the correctness and fairness of pricing is comparably more difficult to understand. Also extreme fair pricing would attract the informed portion of the consumer who might also be the most demanding consumers. Still, in an ideal world structured products should be priced exactly correct by all market participants. Of course, a higher retail price, than wholesale price is justified. However, it should be transparent.

This empirical analysis provided a baseline for this paper’s discussion of social benefits and costs. With respect to social benefits or utility one may conclude that structured products would de-facto contribute to completing the security market space in an Arrow-Debreu model, simply for the fact that they could not be practically replicated by private investors at a reasonable cost.

More specifically there are three social benefits for structured products: First, they place investment strategies that are more complicated than simple options strategies or direct investments into the consumer realm, e.g. small scale investors can express more complex market views (e.g. volatility bearish, market neutral) with respect to a variety of asset classes. Second, they open up entire asset classes to private investors, e.g. energy commodities. Third, they can function as de-facto insurance, e.g.
when exchange currency neutral features are built in.

For example, when a German investor invests in gold this can be problematic as gold is traded in dollars, while the German investors’ funds are normally in Euros. Therefore, when the gold price moves up, but the Eurodollar moves down the German investor does not gain. If however a structured product is bought that exclusively tracks the gold prices without being affected by currency prices, then the potential for wrong decisions decreases and it becomes easier for the investor to invest.

References

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Abstract
This paper analyzes the structured products in the German secondary market from a regulatory and social interest point of view. It investigates the wealth appropriation and price transparency problems in this markets over-time and with the technical precision needed for a regulatory analysis. In its empirical part, this paper, in particular, increase the precision of past pioneering studies in this area. It also incorporates an algorithm for calculating the values under the normal distribution with additional precision; improves upon escrowed dividend model; incorporates the dividend-yield estimates published by commercial financial data providers; and uses volatility surfaces, to improve the calculation precision of volatility input into the valuation formula. It shows that after removing the above sources of imprecision, the mispricing hypothesis cannot be rejected. This study also distinguishes between random mispricing and systematic overpricing and shows that there is a shift in the underlying estimation distribution indicating systematic overpricing to the disadvantage of the retail customer. In a final step author derived specific recommendations for German regulatory reaction to transparency and wealth appropriation problems in local structured products markets.

Keywords: structured products, price transparency, mispricing, Germany