Multilateral Pricing

A challenge for international product management

The German original of this article was first published in planung & analyse, issue no. 2/2014.

Abstract: In today's globally networked world, products are not only subject to competition among each other; a product also competes with itself in case it is offered at different prices in different countries or market segments. If markets with distinct price structures cannot be separated completely from each other, parallel imports may occur that endanger the company's global objectives.

In this context, finding the right price for each of the countries becomes a complex management exercise. In order to respect the company's global objectives as well as the countries' interests adequately, the optimisation approach has to take the price-demand function for each market and information about product flows among markets into account.

Ever since the introduction of the Euro and the increasing integration of national markets via the internet, isolated markets are virtually a thing of the past. As a result, enterprises are forced to consider their sales markets altogether, in order to come up with a common pricing strategy for all markets collectively.

Especially when market-specific prices are optimised through isolated pricing per country, prices may differ significantly from market to market. These differences in price may cause a great amount of parallel imports, where products from low-price countries flow over to those countries with higher prices. Dealers specialised in this kind of arbitrage, customers close to the border, but also transnational shopping opportunities as offered online may boost this phenomenon. For manufacturers this usually means severe profit setbacks.

Hence, the products are not simply competing with their traditional rivals; the products themselves become their very own competition if offered at a better price in a different country or segment. So when pricing a product, price management needs to consider the economic and competitive conditions in several countries at the same time. Since all the different countries' interests must be taken into consideration, the task at hand becomes far more complex than simply pricing a product for a single country.

The Limits of Heuristic Approaches

For pricing within an international context, managers have the choice between the following two opposing approaches:

Isolated pricing for individual countries:

This means setting the (locally) optimal price for each segment and leaving it simply to the effects of the forces of the free market. Market overlaps between countries are omitted, and every country is able to set its own price, decentralised and isolated from the others.

Standard price strategy:

This means ignoring the willingness to pay for each country and centrally setting one price for all markets.

Isolated pricing ignores possible differences in prices between markets, accepting possibly resulting parallel imports. This causes the risk of products from low-price countries going on sale in high-price markets. The consequences are profit setbacks in high-price markets. In order to counter this threat, a transnational monitoring of all sales channels must identify parallel imports right when they emerge. Furthermore, instruments must be available to contain such an inadvertent flow of goods (for example curtailing the quantity of goods for individual countries).

In comparison to that, the standard price strategy seems rather simple. Nevertheless, it leads to turnovers taking a tumble in markets with low willingness to pay, while not achieving possible maximum profits in markets with a high willingness to pay. At the same time, this approach would be difficult to place with the organisations of the respective local markets. In order to do so, this would require a considerably strong corporate head office in relation to the local organisations. However, both pricing strategies keep us a long way from profit maximisation, and they may additionally cause discontent in local markets. Therefore, there is a need for another optimisation approach that takes the different situations of the individual countries as well as the business goals of the whole enterprise into account.

Simultaneous optimisation of prices in several countries

In order to optimise prices for maximum profits, local prices need to be determined in a way that optimises the overall business goal while also considering the different situations in the respective countries as well as possible parallel imports. Such an optimisation process, as offered by AlasCaCEO, takes place in several steps:

- Determining the optimal local price for each market

- Determining the local willingness to pay

- Estimating the local market share

- Market adjustment by considering exchange rates and trader margins as well as the market sizes of the respective countries

- The actual optimisation process: If there are less than five products to be optimised, it is possible to simply run through all price-product-combinations from A to Z and to determine the respective optimum

If there are more than five products needing price optimisation, the situation becomes more complex: Even if the search for the optimal prices of five products takes only a few seconds, the time needed to search increases exponentially with the number of products; therefore one must follow a different strategy. At the heart of the optimisation process there is a combination of the simplex algorithm and the Newton Raphson method, which is used to determine the optimal prices. When provided with starting values, the optimisation process quickly finds a good solution. By varying the starting values, local maxima are recognised and thus excluded.

Fig.1: Calculation of optimal prices (assumption: no parallel imports)
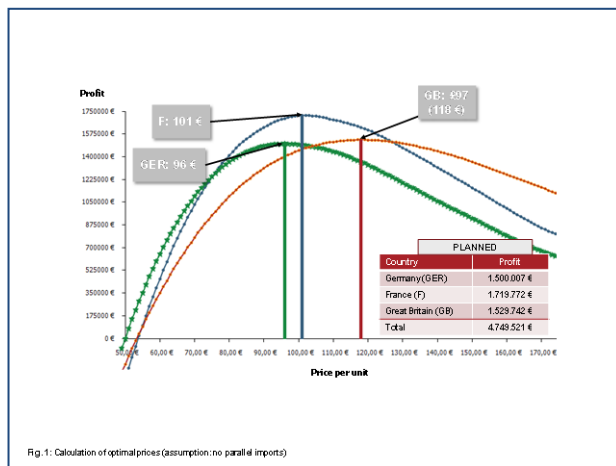
The optimisation process can be influenced by providing additional parameters. For example, providing a price corridor determines the maximum price difference allowed between the products of two countries. Furthermore, it is also possible to set caps and bottom lines for the local market share, for example in order to reach a certain minimum market share for a local market, which would secure a certain level of market presence in it. Additionally, different objectives for individual countries (for example maximising profits or turnover) may be considered during optimisation as well.

Required data basis for an optimisation approach

In order to find a balance between the possibly differing interests among local organisations and corporate head office, and to achieve a wide acceptance of the prices, several objectives should simultaneously be pursued while fixing the prices for the local markets:

- Adjusting the local prices based on the willingness to pay

- Decreasing arbitrage

- Optimising profits for the whole enterprise

This type of optimisation basically requires knowledge of the following characteristic values for each market:

- The willingness to pay in terms of the products

- The competing products and their actual market prices

- The trader margins

- The size of the national markets (as country weights)

- Exchange rates (if relevant)

- The arbitrage functions between the different markets

Fig. 2: Arbitrage based on price differences between the countries
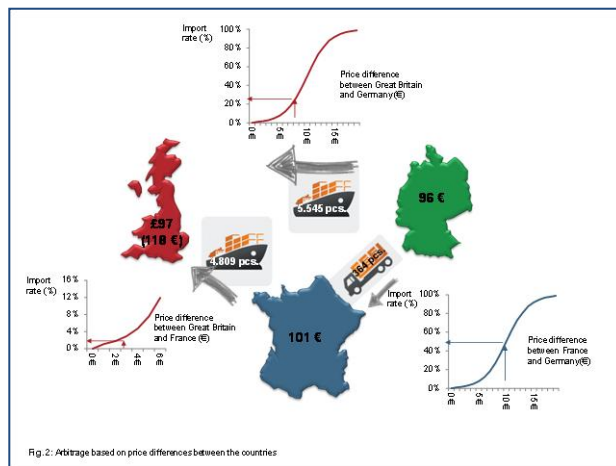
The first two points in particular can be determined rather easily, for example by surveying the final customers by means of approaches like conjoint analysis – in this case especially discrete choice analysis – or Van Westendorp's Price Sensitivity Meter (PSM). The market prices of rival products, the trader margins, and exchange rates should generally also be well known. The size of the respective local markets needs to be estimated (for example based on previously achieved turnover figures in those markets). The arbitrage functions between the markets may either be calculated based on current data on the markets, or at least roughly determined via expert interviews.

Optimisation in practice

For clarification, let us take a look at a practical case where a product is on sale in three countries: Germany, France, and Great Britain. For this product, all three countries show different levels of willingness to pay. If we ignore any possible parallel imports and therefore imagine that all three markets could be fully separated from each other, then we could set isolated prices for each country, as depicted in fig.1 by maximising the respective profit function of a country. There the profit function is determined using the

demand function of a country and the related cost of the product. With 118 euros for Great Britain and 96 euros for Germany, the optimal prices differ significantly according to this calculation.

If the price difference is big enough, parallel imports will occur between the countries. An optimisation tool like AlasCaCEO always considers these kind of bilateral arbitrage functions, which capture the percentage of a country's demand that is supplied through imports from the other country, respectively, dependent on the differences in prices between the countries (see fig. 2).

In our example, Great Britain imports a considerable number of products from Germany and France due to the differences in local prices, while parallel imports are merely marginal in Germany and France.

The parallel imports significantly affect the profit of the whole enterprise. With isolated pricing, the profits are 2.5 percent lower than it was initially expected without any kind of parallel imports. As an import nation, Great Britain is especially hard hit as profits drop by almost 33 percent.

In such a case, the optimisation algorithm looks for price constellations that improve overall business profits in comparison to isolated pricing (see fig. 3).
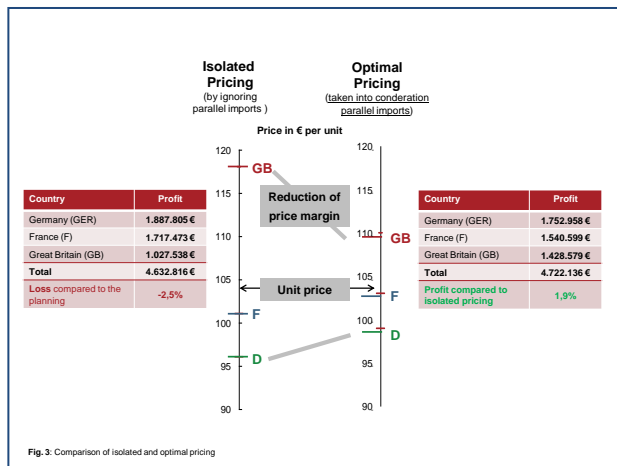

Fig. 3: Comparison of isolated and optimal pricing

For this purpose, the price range between the respective local prices is only lowered as far as it benefits overall business profits. In this case this leads to a price of 110 euros in Great Britain and 99 euros in Germany; therefore the original price range has been reduced from 22 euros to 11 euros. In comparison to isolated pricing, profits increase by almost 2 percent. This approximates the level that would have been the result if there had not been any parallel imports. In order to prevent parallel imports entirely, the uniform standard price would have to be fixed at 104 euros. In that case a profit of 4,662,567 euros would be made, which would not quite reach the level of optimal pricing. Furthermore, the price in Germany would have to be increased by 8 euros, exceeding the 100 euro price threshold.

Fig. 4: Reduction of parallel imports to a manageable level
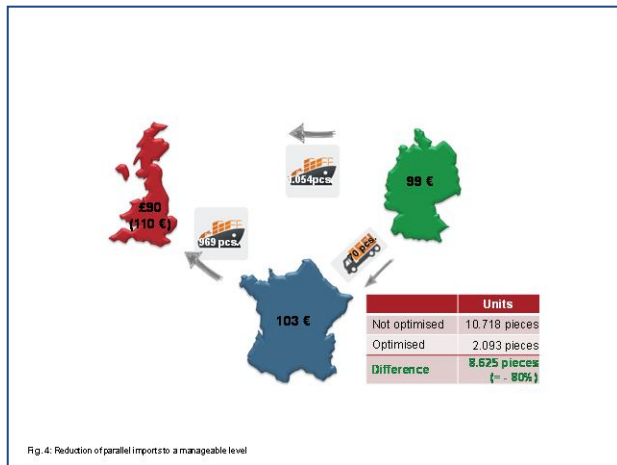
A significant side effect is a considerable reduction of parallel imports (see fig. 4), which should reassure dealers' organisations especially in high-price Great Britain. In contrast, the effort – with regard to the necessary price adjustments – is relatively manageable: Great Britain needs to drop the price by 7 percent, while Germany only needs to increase it by 3 percent.

Price optimisation and simulation as a management tool

Even though the actual objective is optimising profits for the entire company, experience shows that – compared to isolated pricing and the standard price strategy – other characteristic values are positively affected as well.

The prices in the different markets are approximated without having to be unified, unlike with the standard price strategy. Parallel imports decrease and so does the resulting dissatisfaction among the merchants affected. As a result, acceptance of the whole transnational pricing system increases, since not only the merchants respond positively, but also the organisations in the respective countries. Because compared to the standard price strategy, there still remains some leeway – even though limited – for individual pricing decisions in the different markets.

Even if the optimal price vector is the best one in terms of profits, solutions close to optimal prices actually may be significantly more favourable for the company. By means of if-then scenarios, the consequences of price changes are directly determined. Especially the possibility of immediate simulation has proven to be a very helpful tool in international pricing studies (and as a consequence thereof also for varying objectives of local organisations and corporate head offices). In pricing workshops, discussions on alternative pricing scenarios arise automatically. Based on the simulation results, every group sees the consequences of certain price changes immediately. Thus all participants are able to immediately assess the consequences, which significantly expedites decision making.

AlasCaCEO is a tool developed by Produkt + Markt.

Bibliography

Ahmadi, R.; Yang, B. (2000): Parallel Imports: Challenges from Unauthorized Distribution Channels, in: Marketing Science, Vol. 19, No. 3, S. 279-294.

Dias, Gaby; Wenig, Jens (2011): Händlern auf Augenhöhe begegnen, in: Markenartikel, 5/2011, S. 88-90.

Diller, Hermann (2008): Preispolitik, Abschnitt 9.3, Stuttgart.

Monroe, Kent B. (2003): Pricing – Making Profitable Decisions, Chapter 20, McGraw-Hill.

Pechtl, Hans (2005): Preispolitik, Kapitel 8, Stuttgart.

Siems, Florian (2009): Preismanagement, Abschnitt 8.4, München.

Simon, Hermann; Fassnacht, Martin (2009): Preismanagement, 3. Auflage, Abschnitt 13.4, Springer Science+Business Media.

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