

# THE AD EFFECT FORMULA

Rolf Speetzen, Axel Springer Verlag AG, Hamburg, Germany

## Introduction

Two years ago in Berlin, I presented an econometric model, which aimed at predicting the market share developments of fast moving consumer goods through marketing parameters such as distribution, promotion, and last but not least, advertising by media categories. This year we were able to carry the analysis a little further.

The data input is now based on five years bi-monthly periods, stating the turnover in Deutschmarks per brand and product category, the value weighted distribution per brand and sales outlet and the advertising expenditures by media categories, again by brand and product field. Altogether we have data from 147 brands and from 69 product categories.

This enlarged data base allows us to analyse radio and outdoor advertising in addition to print and television.

So far the 1990s have seen only moderate growth of the economy in Germany with increasing saturation of the fast moving consumer goods markets. This caused extreme competition between the brands.

Against this background it is not surprising that advertising expenditures more than doubled within two years. According to Nielsen S&P statistics the 1996 ad spends came to 25.2 billion Deutschmarks, whereas 1987 all spends together accounted for 11.9 billion Deutschmarks.

Out of this total, the fast moving consumer goods alone came to 7.6 billion Deutschmarks in advertising expenditure in 1996. This enormous amount of money is a very good reason for aiming at solutions for optimum spending.

But what is optimum spending? What effect does advertising have on market shares?

There is a number of tools to answer the questions, for example psychological approaches establishing the influence of advertising on purchasing behaviour or the so-called single-source panels, where the test households state their exposure to advertising as well as the purchase of the brands in question.

## The Model

The Ad Effect Formula follows a different route. It is based on data which are collected and compiled for different purposes, such as the monitored advertising expenditure data, retail panel data for market shares and the weighted distribution.

The art is, to weld all these data together into a model to predict the market share developments as the dependent variable against the variation of the other marketing means as the independent variables.

At the last symposium in Berlin we discussed the model in detail. Therefore it can be cut to the essentials within this paper.

The dependent variable, the market share, is taken from the retail panel and stated as the share of the total turnover of all competitive brands within a product field. The advertising per brand again enters the formula as share of the total advertising expenditure within a product category. And distribution comes as a weighted value. It shows per product field the percentage of turnover of all outlets selling the brand in question against the total turnover of all relevant outlets.

The idea behind the model implies: the market share in the current period is dependent on the market share in the previous period, potential changes in the distribution as well as advertising effects. As explained in Berlin: Best and realistic results could be achieved through a non-linear multiple regression analysis.

Here is the result:

$$\begin{aligned} \text{Market Share}_t &= 0.98 * \text{Market Share}_{t-1}^{0.99} * \text{distribution}_t / \text{distribution}_{t-1} \\ &\quad + 0.19 * \text{Print}^{0.69} \\ &\quad + 0.15 * \text{TV}^{0.68} \\ &\quad + 0.15 * \text{Radio}^{0.68} \\ &\quad + 0.16 * \text{Outdoor}^{0.68} \end{aligned}$$

This equation means: The resulting current market share is mainly influenced by the previously achieved market share. The coefficient 0.98 is a good insurance. With no advertising or distribution changes a brand can maintain 98 percent of the previous

market share. However, unfortunately that is not the full story. There is also an exponent of 0.99 which means that the higher the market share the larger the decline.

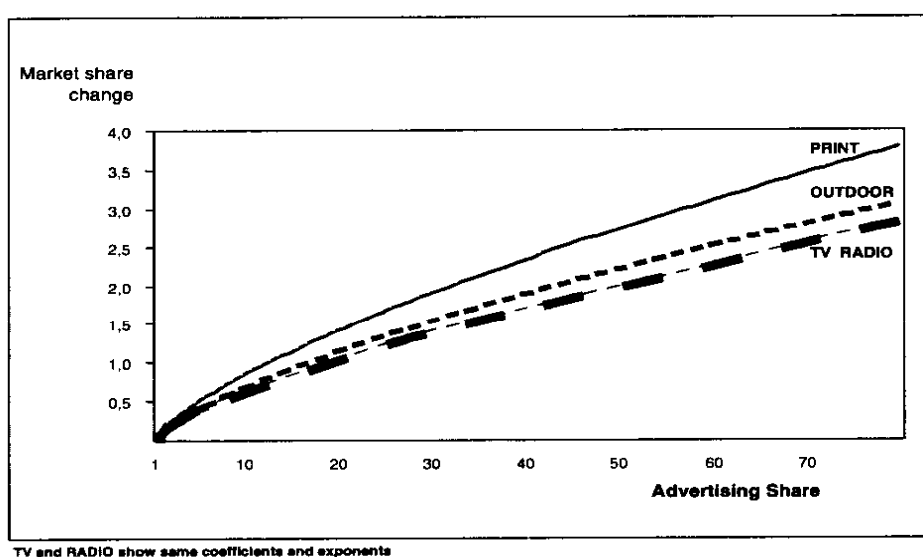
Distribution can influence the market share only in cases of changes. No change in distribution results in the score 1 for the multiplier in the first row of the formula.

Advertising is an important marketing parameter. It works. The coefficients from 0.15 to 0.19 show that all four media categories have similar effects. The higher the coefficient of a media category the higher the relative contribution of this media category towards the market share development. However, no rose without a thorn. Again we have to take the exponents into account. And they demonstrate considerable saturation effects. The smaller the exponent the higher the saturation. In other words, small exponents indicate that advertising spends into this media category reach a level with considerable diminishing returns much sooner.

The following graph can demonstrate the effects of advertising.

**Graph 1**

### Effect of Advertising



Near the origin all curves are similar and close together. Print has a moderate advantage through the larger coefficient and exponent, indicating a steeper increase and a little less saturation at the end, with the higher scores.

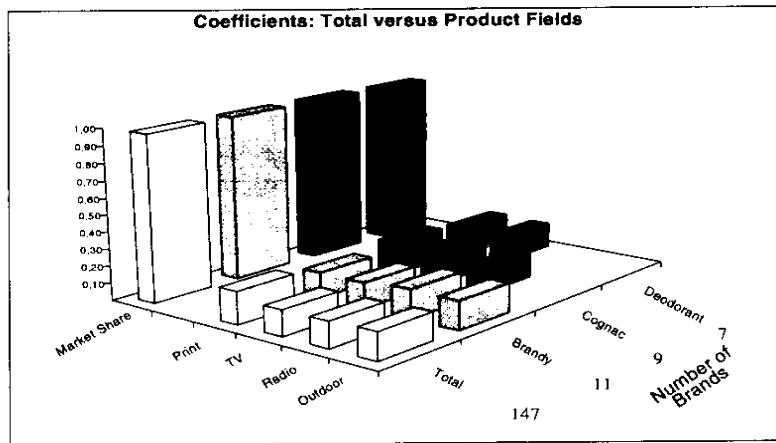
The main message is: All media show diminishing returns. With large budgets it does not pay anymore to invest more money into a limited selection of advertising vehicles. The better solution is a mix of the media, avoiding the high investments into one medium by splitting the budget and getting the benefit through the more efficient contribution.

### Validity

One word about the validity of the Ad Effect Formula. The regression equation explains 98.6 percent of the variance between the observation periods. 93.3 percent refer to the market share of the previous period, 5.3 percent refer to the advertising expenditures within the period. The remaining 1.4 percent cannot be explained through the Ad Effect Formula.

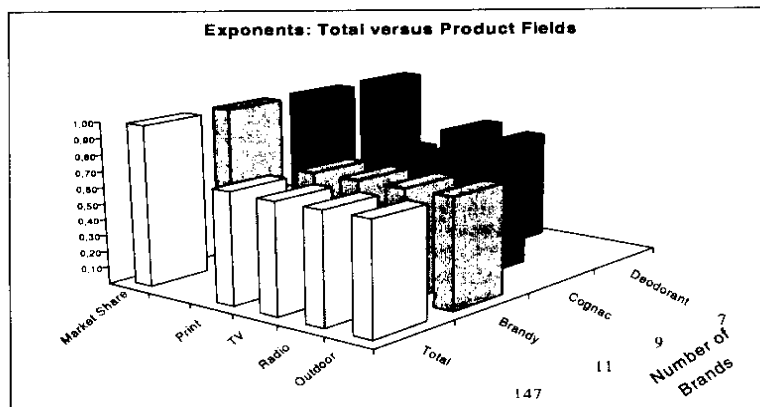
It seems very little, however, it is still a fifth of the variance not explained through the previous market share.

To test the model, we have compared actual with estimated market shares. There is a very close match and a correlation of 0.99 with a mean deviation of less than 0.2 percent between pairs of values. These are good results again.

**Graph 2****No Differences Between Product Fields**

And the general validity finds entrance into individual markets. A special calculation for the separate markets did not result in varying coefficients or exponents. The above graph shows the coefficients for the four media and the market share based on the total of 147 brands as well as the same coefficients based on 11 brandy, 9 cognac and 7 roll-on deodorant brands.

What is true for the coefficients can be shown for the exponents, too. Again there is no relevant variation between the total and the separate brands.

**Graph 3****No Differences Between Product Fields****Results**

The Ad Effect Formula is able to answer some important questions in marketing such as:

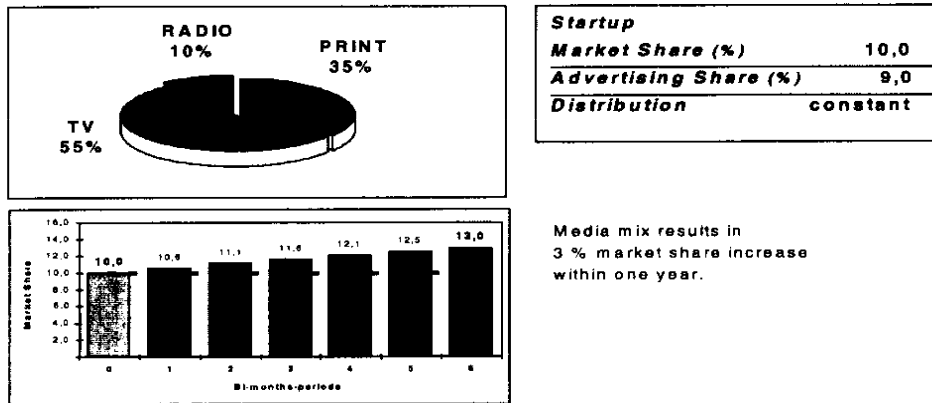
- Can advertising push market shares?
- Is a mix of media better than a single medium campaign?
- What share of advertising is necessary to stabilise the market share?
- How does advertising support large market shares?
- How does the distribution in combination with advertising influence the market share?
- What is the effect of a hiatus?

First question: Can advertising push the market shares? Let us assume a scenario where a brand has a start-up market share of 10 percent, a continuous advertising share of 9 percent of which 55 percent are being spent in TV, 35 percent in print and the

remaining 10 percent in radio. This advertising share and mix of media increases the market share within a year by 3 percent. The distribution level remained constant.

Graph 4

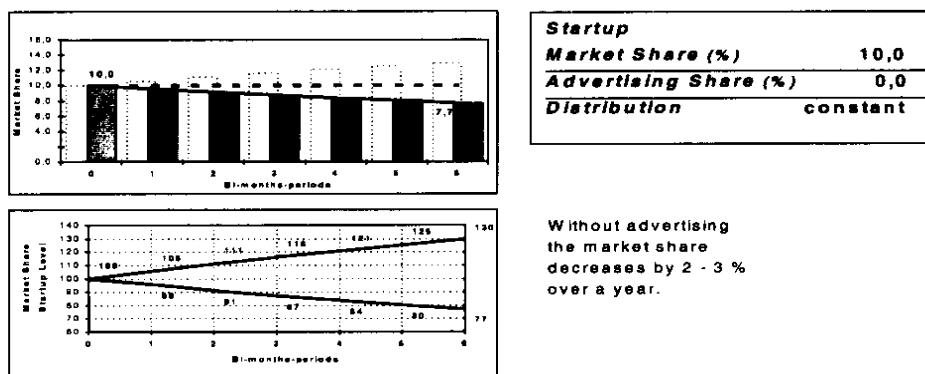
#### Continuous Advertising Increases Market Share



However, a hiatus in advertising, stopping it for a period or more, would lead to a loss of market shares, altogether 2.3 percent within the same period.

Graph 5

#### No Advertising - Less Sales

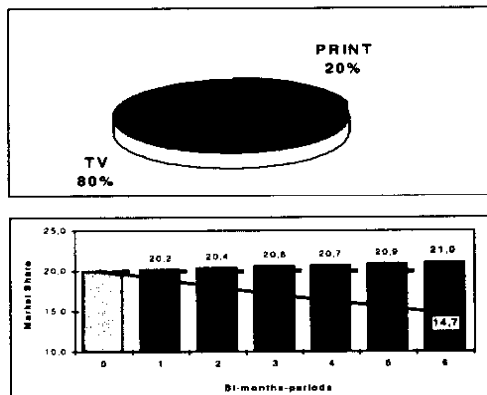


All parameters were kept at the same level as in the scenario before. Except the advertising was set as 0. The result is clearly visible. And the conclusion is clear: Advertising works!

The next question: Is a mix of media better than a single medium campaign?

Again we can compare two scenarios. The first shows a start-up market share of 20 percent, a 15 percent share of advertising, 80 percent of it TV, 20 percent print. This proportion with such a heavy weight on one medium can still be regarded as a mono campaign.

Graph 6

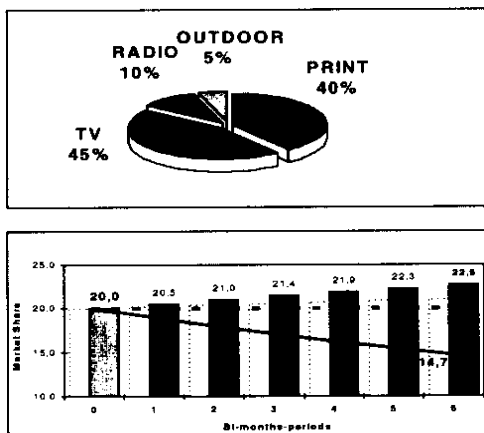
**Mono Campaigns Are Less Effective**

<b>Startup</b>	
<b>Market Share (%)</b>	20,0
<b>Advertising Share (%)</b>	15,0
<b>Distribution</b>	constant

The overproportional TV-share leads to a marginal market share increase of 1 % after one year.

This brand can expect a market share increase of 1 percent over one year. An advertising pause would lead to a considerable loss. The brand would end up at 14.7 percent after one year with zero advertising.

Graph 7

**Mix-Campaigns Have Optimum Effect**

<b>Startup</b>	
<b>Market Share (%)</b>	20,0
<b>Advertising Share (%)</b>	15,0
<b>Distribution</b>	constant

A balanced mix can increase the market share considerably.

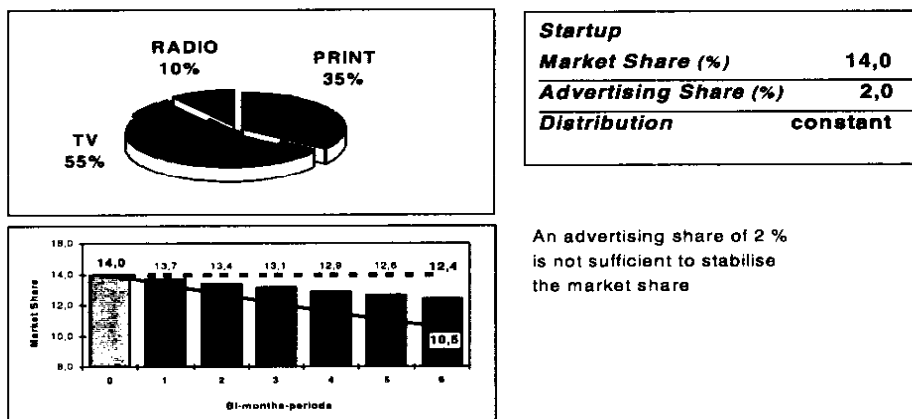
However, would that same brand had spent the same advertising money into a cake of 45 percent TV, 40 percent print, 10 percent radio and 5 percent outdoor, this well balanced mix would have pushed the market share to a level of 22.6 percent within a year, according to the Ad Effect Formula. And that is clearly better than the meagre 1 percent from the TV stressed campaign.

Question: What share of advertising is necessary to stabilise the market share?

Of course, the budget size necessary to stabilise the market share is dependent on the market share level and the advertising situation within the product field. A market with a large number of competitors with relatively small budgets each needs more advertising share, than a market with just a few competitors spending large sums into usually few media. For demonstration let us assume a 14 percent start-up market share level, 2 percent advertising share and again, as usual a constant distribution level.

Graph 8

### Small Advertising Shares Destabilise The Brand

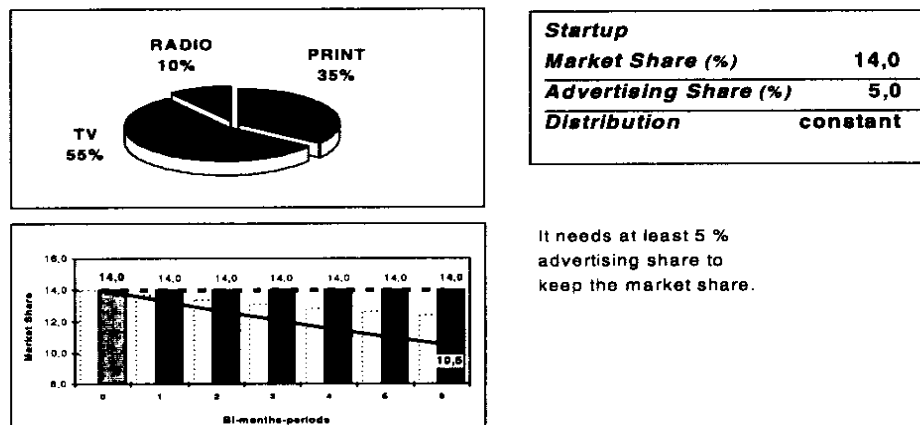


As can be seen, the advertising went into a well balanced mix of TV (55 %), print (35 %), and radio (10 %). Yet the 2 percent does not seem enough to keep the market share level. The market share drops to 12.4 within a year.

If this brand would have invested 5 percent of advertising instead, the picture would have changed.

Graph 9

### Stabilising Market Share Needs Minimum Advertising Share



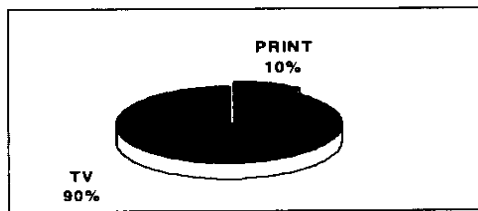
The 5 percent advertising share would have stabilised the market share very well. Again a cessation of all advertising would have led to a considerable loss of market share. The brand would end up at 10.5 percent after one year with no advertising.

Question: How does advertising support large market shares? Large market shares are nice to have, yet hard to keep. Brands with large market shares are vulnerable. The large market shares can only be maintained by investing large shares of advertising.

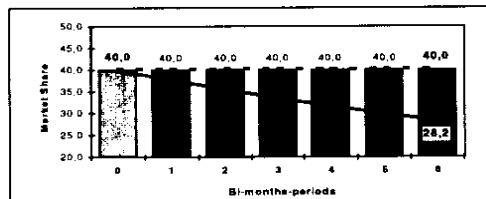
The following graph illustrates a start-up market share of 40 percent and an advertising share as high as 43 percent of which 90 percent are invested into television, 10 percent into print.

Graph 10

### Large Market Shares Require Large Advertising Shares



<b>Startup</b>	
<b>Market Share (%)</b>	<b>40,0</b>
<b>Advertising Share (%)</b>	<b>43,0</b>
<b>Distribution</b>	<b>constant</b>



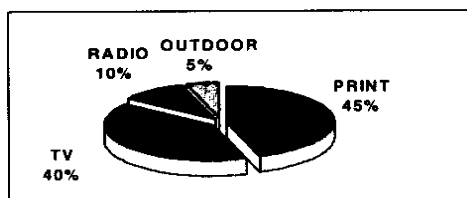
The large market share requires an overproportional advertising share. Usually we find mono-strategies in these cases.

The overproportionally high share of advertising could just stabilise the market share. An advertising pause would have resulted in a disaster. The brand would have lost almost 12.2 percent of market share. That is a clear sign for the fact that advertising works, even or especially with large market shares, and that these large market shares have to be defended very well.

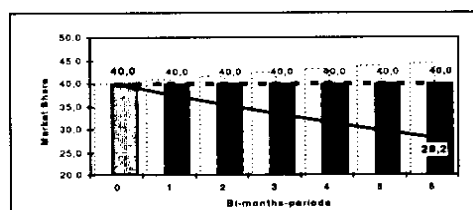
However, there are better and more economical ways of defending the market shares. The magic is called media mix.

Graph 11

### Stabilising Market Share With Less Money



<b>Startup</b>	
<b>Market Share (%)</b>	<b>40,0</b>
<b>Advertising Share (%)</b>	<b>27,0</b>
<b>Distribution</b>	<b>constant</b>

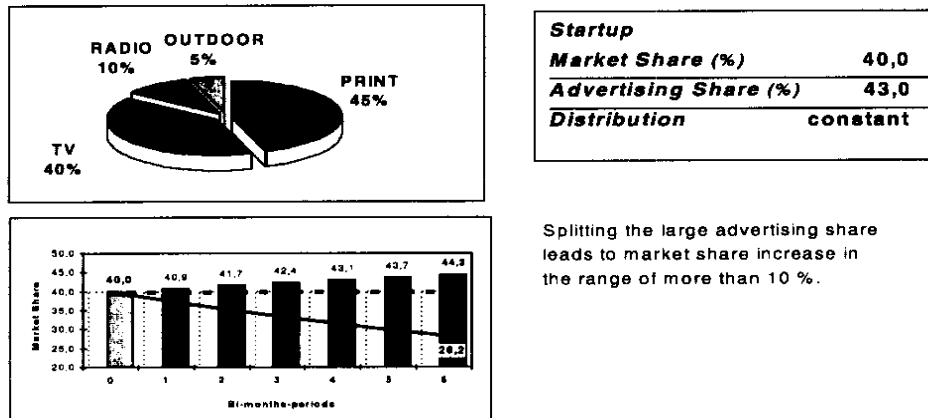


To stabilise the large market share only 27 % advertising share are needed based on a balanced mix.

If that brand would have chosen a mix of media, TV 40 percent, print 45 percent, radio 10 percent, and outdoor 5 percent, then a share of just 27 percent of all advertising within that product field would have kept the market share at the level of 40 percent. Media mix proves again more effective than single medium campaigns.

Graph 12

## Media Mix Pays



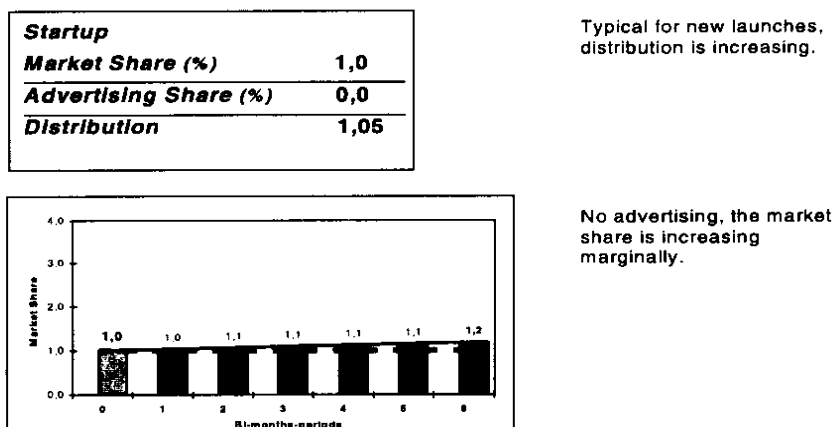
If that brand would again invest 43 percent of all advertising in that product category, however, this time into a balanced mix, as in the graph above, that brand would profit and could even increase the large share to 44.3 over a year. The lesson is, splitting the budget into more media pays!

Question: How does distribution in combination with advertising influence the market shares? So far, the scenarios were based on constant distribution levels. But distribution is an important marketing parameter. The changes in distribution can influence the development of market shares. Within the Ad Effect Equation the distribution works as a multiplier.

The next graph should demonstrate the effect of distribution changes. It is based on the assumption of a new launch. The market share is set as 1 percent. No advertising is presumed.

Graph 13

## Distribution Changes Without Advertising Have Little Effect

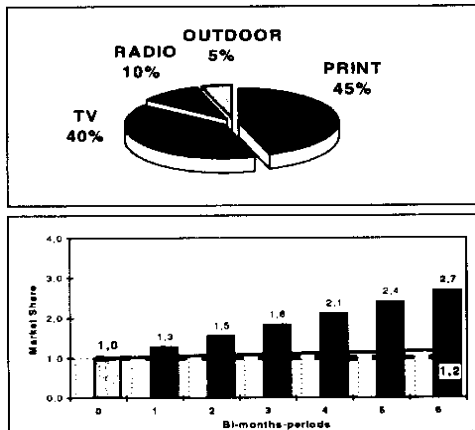


Typical for new product launches, the distribution level increases by 5 percent within two months. The result is an extremely moderate increase in market share. Through the increasing distribution the brand would profit a meagre 0.2 percent market share increase over the year.

If that brand would have invested a budget to pay for 1 percent of advertising in that product field and used a balanced mix, the brand could have expected a considerable 1 percent increase in market share through the combination of the two marketing tools.



Graph 14

**Advertising Reinforces Distribution****Startup**

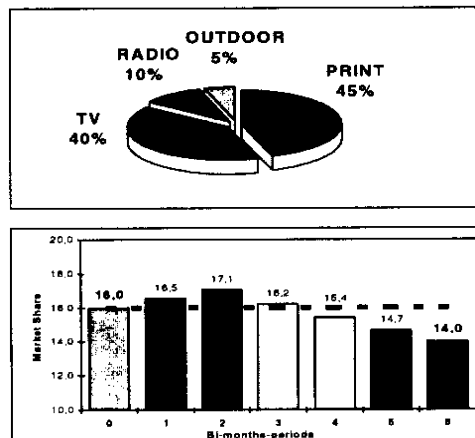
<b>Market Share (%)</b>	<b>1,0</b>
<b>Advertising Share (%)</b>	<b>1,0</b>
<b>Distribution</b>	<b>1,05</b>

Advertising is backing the distribution increase. The market share is increasing.

Question 6: What is the effect of an advertising hiatus? The previous examples have already shown that a cessation of advertising will result in market share losses. The scenario is based on constant distribution levels, 16 percent start-up market share, well balanced between the media for just the first two observation periods.

The result is obvious. There is a carry-over effect of the previous advertising into the third period. But after that period the market share drops below the starting level.

Graph 15

**No Advertising - Less Market Share****Startup**

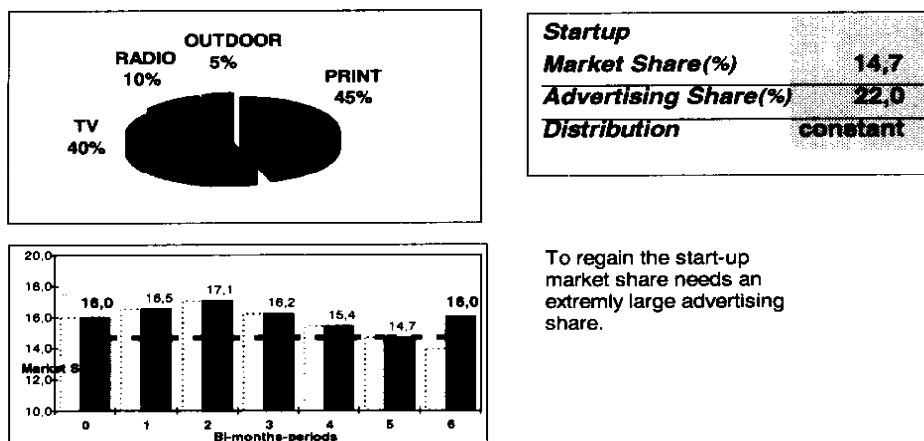
<b>Market Share (%)</b>	<b>16,0</b>
<b>Advertising Share (%)</b>	<b>12,0</b>
<b>Distribution</b>	<b>constant</b>

Advertising backed the sales only in the first two periods. In period 3 we see some carry-over effects, which decline in later periods.

To achieve again the old market share needs an overproportionally and expensive share of advertising.

Graph 16

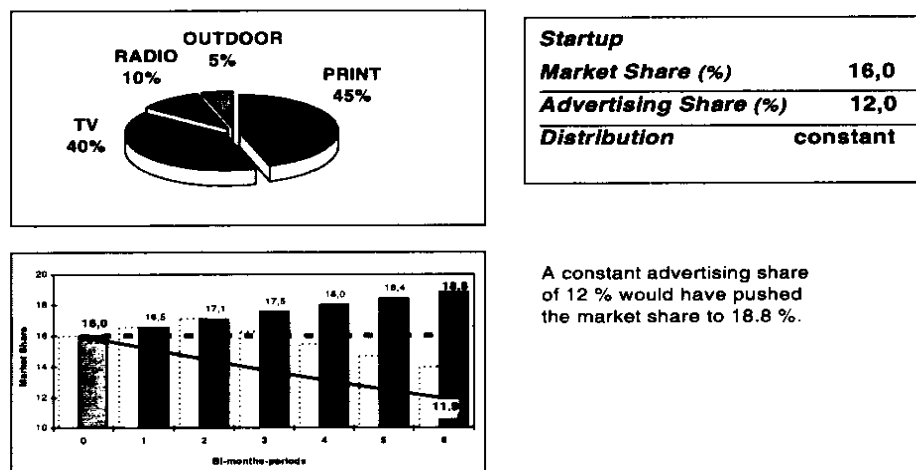
### Regaining Market Share Is Expensive



The enormous budget to buy 22 percent of advertising in that product category would have pushed the market share level in the that period to the start-up level.

Graph 17

### Continuous Advertising Is More Economic



Continuous advertising over the year would have increased the market share to 18.8 percent. For this increase a moderate 12 percent of advertising would have been adequate.

### Conclusion

Above the line advertising is a major tool for market success. A cessation of advertising results in a declining market share. The larger the market share, the larger the loss.

The influence of competing advertising has to be considered while determining the budget.

Too small advertising investments and advertising pauses lead to declining market shares, which can only be recovered by overproportional expenditures. Continuous advertising pays out.

Large market shares need large advertising shares. Increases can only be achieved through overproportional advertising shares. Media mix can diminish the saturation effects and the decreasing marginal utilities.

All media included in the analysis show similar effect curves, with slight advantages for print.

Mix works better than mono campaigns. The larger the market and the advertising shares, the larger the advantage of mix.

Altogether: Advertising works, and splitting the budget into a mix, avoiding the concentration and saturation through the single medium approaches is the most economic way to market success!

