

**Comparative Changes in Average Price and a Price Index:  
Two case studies  
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In the national accounts and the French consumer price index, the measurement of change in prices is based on a firm principle: *"If none of the basic prices moves, the index does not move."*

The "basic price" is the price of a product as defined by its physical and economic characteristics. Physical characteristics depend on the product brand and the reference (or model) in the brand. Economic characteristics include the conditions under which the product is made available to the consumer, particularly the distribution channel used.

The average price of a homogeneous family of products varies, as does the corresponding price index, because the prices of the models offered for sale vary.

It also varies (while the price index does not) because, over time, there are changes in the choices consumers make:

- among the various points of purchase (this is the "point of purchase" effect);
- among the various packages available (this is the "line" effect);
- among the various packages available (this is the "packaging" effect).

Average price can also vary because the quality of certain products changes or because new products are positioned alongside old ones ("quality" effect).

Lastly, it varies because the product family considered by the statisticians is never completely homogeneous and consumers alter the pattern of their purchases among the various products in the family ("basket" effect).

Original version in French. detailed tables are not included

**COMPARATIVE CHANGES IN AVERAGE PRICE  
AND A PRICE INDEX:  
TWO CASE STUDIES**

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**Case Study #1: Comparative changes in average price and a price index for milk chocolate bars (Nielsen material).**

Only rarely can statisticians completely quantify the 5 effects mentioned above, because to do so requires sufficiently detailed information on prices charged and quantities sold so that points of purchase, brands and packaging can be identified.

The Retail Price Division had the chance to use such material from the NIELSEN marketing corporation, a major supplier to producers of consumer goods and their distributors (particularly mass merchandisers).

The material pertains to milk chocolate bars and covers the two-year period from 1988 to 1990.

It does not reveal any quality effect (period too short for a substantial change in products available) or basket effect (extremely homogeneous product family).

However, it does give the following results:

- "point of purchase" : - 0.8% per year,  
effect
- "line" effect : - 0.6% per year,
- "packaging" effect : negligible over the  
period

These 3 effects account for nearly all the change of -1.6% per year in average price over a period when a Laspeyres' price index would have shown a decrease of only 0.2% annually.

They clearly illustrate the frequent lack of understanding between professionals (who argue "average price") and price statisticians (who argue "Laspeyres' price index").

**Case Study #2: Measurement of the "point of purchase" effect over 12 years on changes in average food prices (INSEE food consumption surveys material).**

The second case study is much broader than the first, as it covers 29 product families and 12 years. However:

- the study is limited to the measurement of the "point of purchase" effect only, as INSEE's food consumption surveys provide data on quantities and average prices by point of purchase but not by brand or packaging;
- the study focuses on product families that are much less homogeneous than in the previous case study, because the food consumption surveys describe household food purchases from some 200 product families, rather than the tens of thousands listed by NIELSEN.

The study results are as follows:

Over 12 years and for 29 product families sampled fairly broadly from among the foods households consume (meats, dairy products, fruits, vegetables, solid and liquid foods...), the impact of shifts in household purchases from "traditional" points of sale to mass merchandisers on the change in average price (impact not included in a price index: "point of purchase" effect) is generally between -0.7% and -0.1% annually, the median being approximately -0.4% annually.

The "point of purchase" effect does not have uniform values for all foods. The extent of the effect depends both on the shifts over 12 years in the choices consumers made among points of purchase (these shifts in turn depend on the market share of mass merchandisers in 1979) and on the size of the average price differentials among points of purchase.

Case Study #1

**Comparative changes in average price and a price index:  
A case study using NIELSEN material**

Outline

The NIELSEN material

An average price/price index disparity of approximately -1.4% per year.

"Point of purchase" effect: approximately -0.8% per year.

"Line" effect: approximately -0.6% per year.

"Packaging" effect: hardly noticeable.

Summary and conclusions.

**The NIELSEN material**

NIELSEN is a private marketing corporation and a subsidiary of a US group known the world over. It provides manufacturers and distributors of consumer goods with information on their market share and price positions, which it obtains through direct observations of distributors.

The main features of NIELSEN's approach are as follows:

- NIELSEN uses a national panel of some 1,000 points of sale representing all forms of distribution.
- The prices of all products sold by each point of sale in the panel are exhaustively recorded every two months. The NIELSEN "inspectors" are provided with bar code readers which enable them to record some one million prices every two months.
- The quantities sold of each product by each point of sale during the two-month period are recorded, following the formula devised by NIELSEN's founder:

$$\text{Sales} = \text{Purchases} + \text{Opening inventory} - \text{Closing inventory.}$$

This method presupposes the use of accounting records from each point of sale and consequently its voluntary participation in the panel.

- From this exhaustive information on prices and quantities sold, NIELSEN calculates the market shares and retail prices of each product family, in a detailed stratification defined at least by brand (e.g. Suchard), packaging (e.g. three 100-g bars) and type of point of sale (e.g. hypermarkets).
- From these various average prices and quantities sold, NIELSEN derives summary indicators (for example, average price of a bar of dark chocolate, all brands, packages and points of sale combined). *These average price indicators are used as references by the profession to monitor the changes in retail prices of chocolate products.*

In August 1990 NIELSEN provided the Retail Price Division with computer diskettes containing complete information (prices, quantities sold, value of sales) on *milk chocolate bars*, for the period from early 1988 to early 1990 (NIELSEN's archiving system made it complicated for the firm to supply data for a longer period).

This market segment represents some 16% of all chocolate products (Table 1).

It is a sufficiently homogeneous market segment for there to be very little "basket" effect within it, at least over 2 years.

The prices of milk chocolate bars are recorded in one of NIELSEN's national panels, which includes 915 points of sale (Table 2).

The chocolate bar market is divided between manufacturers' and distributors' brands.

NIELSEN identifies the following manufacturers' brands, in descending order of market share: Suchard, Poulain, Côte d'Or, Lanvin, Menier, Nestlé, Cantalou... The other manufacturers' brands are not widely distributed and are grouped together in the NIELSEN statistics under the catch-all heading "other manufacturers' brands".

Of the distributors' brands, only Carrefour is identified. Brands such as Ivoria (Intermarché), Casino, Produit U, Beaumont (Monoprix),

Félix Potin and Forza (Prisunic) are grouped together under "other distributors' brands".

For each of the previous brands or groups of brands, NIELSEN distinguishes packages of 100 grams, 2 X 100 grams (or 1 X 200 grams) and 3 X 100 grams. The prices per 100 grams of the various packages differ widely.

The raw material provided by NIELSEN is as follows:

- quantities sold during the two-month period (number of bars or 100-gram bar equivalents);
- average prices recorded during the quarter (in francs per 100-gram bar);
- value of sales (in francs), calculated as quantities X average prices.

These statistics were consolidated by INSEE in a fixed format with rows representing brands (and within each brand, packages) and columns representing types of points of sale. The resulting tables each include approximately 180 strata (30 brands X packaging, 6 distribution channels).

The quantities and sales values are additive. The average prices are always calculated by dividing "value of sales" by "quantities sold".

The main features of the chocolate bar market in early 1988 are shown in Tables 3 and 4.

a) Manufacturers' brands cover 75% of the market, compared to 25% for distributors' brands. The manufacturers' brands with the highest sales are:

- Suchard	(38%)
- Poulain	(17%)
- Côte d'Or	(14%)

b) Large packages sell the most by far. The market shares (in value) are as follows:

- 3 X 100 g bars: 70%
- 2 X 100 g bars (or 1 X 200 g): 19%
- 100 g bars: 11%

c) Hypermarkets (23%) and supermarkets with an area of more than 800 m<sup>2</sup> (36%) have the largest market share. Traditional points of sale (grocers, bakeries, smoke shops) account for only 15% of milk chocolate bar sales.

A comparison of Tables 1 and 4 reveals only a slight change in market shares between early 1988 and early 1990. For example, hypermarkets gain 2% and large supermarkets 3%, primarily at the expense of traditional points of sale (-3%).

Lastly, *Table 5* clearly shows the differences in average price by type of point of sale: 3.85 francs per 100-gram bar in the hypermarkets as opposed to 5.24 francs per bar in the traditional points of sale.

Similarly, it is clear that, within each brand, large packages have a significantly lower price per 100 grams than small packages.



**An average price/price index disparity of approximately -1.4% per year**

The change in average price is calculated from *Tables 5 and 8*. In February/March 1988, the average price (all brands, all packages, all points of sale) of chocolate bars purchased by consumers was 4.210 F (an additional decimal place was used for precision of the calculations, even though the "thousandth" is not a unit of counting).

In February/March 1990, the same average price was 4.074 F (*Table 8*).

The change in the average price over 2 years (which is the only significant indicator for manufacturers and distributors) was:

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or a decrease of approximately **-1.6% per year**.

\* To calculate the "pure" Laspeyres' price index (if none of the prices moves, the index does not move), we apply the table of unit prices by stratum for 1990 (point of purchase X brand X package) to the table of quantities purchased by consumers in 1988 (by point of purchase X brand X package). This produces an average price of 4.192 francs per 100-gram bar.

The Laspeyres' price index is then the ratio of this price of 4.192 F to the (real) average price for 1988, which is 4.210 F. The ratio is 99.57 or approximately **-0.2% annually**.

*This (pure) price index is quite significantly different from the average price index, which was -1.6% annually.*

It could be calculated in an equivalent manner as the mean of the 1990/1988 price indices by stratum, weighted by the relative share in value of each stratum in 1988. This is the method used most frequently by price statisticians to calculate "micro indices".

What is the significance of the concepts of "average price" and "Laspeyres' price index" ?

To use an average price is to consider that all milk chocolate bars are absolutely identical in the eyes of consumers, whether the brand is inexpensive or expensive and the package is large or small, and that the service to the purchaser is absolutely identical, whether the bar is purchased in a hypermarket or a traditional grocery store.

To use a price index is to consider that a Lanvin milk chocolate bar is different from a Carrefour bar (difference in quality) and that the service purchasers receive in a local business is better than the service in a mass merchandiser.

The Laspeyres' price index reacts clearly to a change in the price of any brand in any point of sale, but not to shifts in consumer purchases from one brand to another or one point of purchase to another ("If none of the prices moves, the index does not move.").

**The "point of purchase" effect: approximately -0.8% per year**

\* The "point of purchase" effect is the effect which a shift in consumer purchases from one form of sale to another has on average price, where all other parameters, particularly prices, remain unchanged.

\* To measure the "point of purchase" effect, we have to compare the situation used to calculate the Laspeyres' price index (1988 quantities and 1990 prices by stratum) with a situation where the 1990 prices by stratum would still be used, along with the 1990 quantities by point of purchase, but within each point of purchase, the 1988 pattern of the quantities would remain.

The "point of purchase" effect over 2 years is (Table 10):



or approximately -0.8% per year.

It can be seen that this effect alone accounts for more than half of the disparity between the average price index and the pure price index.

\* To analyse the causes of a "point of purchase" effect of this size, it is enlightening to proceed as follows (Table 11 and Chart 1).

We look first at the changes in market share (in quantities) of each point of purchase between 1988 and 1990. We see that in 2 years, hypermarkets gained 1.36 penetration points, large supermarkets 3.50 points and small supermarkets 2.91 points, whereas superettes lost 4.32 market share points, traditional points of sale 2.90 points and variety stores 0.55.

We then examine the average price differentials among all the points of purchase. To obtain an exact measurement of the desired "point of purchase" effect, we compare each average price by point of purchase (using 1990 prices by stratum and 1988 quantities) to an average price for all points of purchase, which will be the aggregation of the previous prices using the 1988 quantities by point of purchase.

With this measurement, the prices for milk chocolate bars appeared 7.6% below average at hypermarkets in 1990, 3.4% below at large supermarkets, 4.8% below at small supermarkets and 9.4% below at variety stores, whereas prices appeared 10.3% above average at superettes and 27.5% above at traditional stores.

Using these variables, the "point of purchase" effect can be explained as follows.

The strongest contribution to the total effect of -1.57% in 2 years is made by traditional stores (-0.86%). Their market share decreased by nearly 3 points while their prices are approximately 30% above average. It is not surprising, then, that this had a downward impact on average price, all other things being equal. The same is true for superettes, with a slightly smaller impact. The mass merchandisers (hypermarkets, large supermarkets) have similar although even smaller impacts.

On the whole, Chart 1 provides a convenient way of predicting the size of the "point of purchase" effect: *the price differential by point of purchase gives an indication of the potential downturn of the average price of the product, while the changes in market share (in principle, losses for the least expensive points of purchase) indicate to what extent these potential movements may have materialized as a result of consumer choices.*

\* Tables 10 and 11 also present an approximate method which is often used to measure the "point of purchase" effect.

The 1990 average prices by point of purchase using 1988 quantities by brand and packaging are generally not known, although we do have the real average prices by point of purchase for 1990.

The approximate method consists simply in comparing the 1990 real average price for "all points of purchase" with an average price (4.145 F/bar) obtained by weighting the 1990 real prices by point of purchase with the 1988 quantities by point of purchase. The resulting "point of purchase" effect (4.074/4.145) is 98.29, which is not very different from the figure of 98.43 calculated exactly.

Chart 1 shows why the approximate method is fairly robust: the changes in market share (in quantities) are correct and the 1990 price differentials by point of purchase are not very different when we take the average prices by point of purchase calculated using the 1990 prices by stratum and the 1988 quantities by brand and packaging.

**"Line" effect: approximately -0.6% per year**

\* The "line" effect is the impact which a shift in consumer purchases from certain brands to other brands has on the average price of milk chocolate bars, where all other parameters, and particularly prices, remain unchanged.

\* To measure the "line" effect, we must begin with the average price per bar of 4.126 F resulting from the calculation of the "point of purchase" effect (1990 prices by stratum, 1990 quantities by point of purchase, but 1988 pattern of quantities within each point of purchase) and look at what happens when, within each point of purchase, we go from the 1988 to the 1990 pattern of quantities by brand, while retaining the 1988 pattern of quantities by packaging within each brand X points of purchase.

\* Combined with the quantities by point of purchase bought in 1990, the previous average prices give an average price for "all points of purchase, all brands, all packages" of 4.079 F/bar (Table 12).

When compared to the average price of 4.126 F/bar resulting from the calculation of the "point of purchase" effect, this gives the measurement of the "line" effect:



or approximately -0.6% per year.

Thus, the "line" effect is smaller than the "point of purchase" effect, but in itself accounts for a substantial portion of the disparity between the average price index and the pure price index (approximately -1.4% per year).

\* The cause of this "line" effect is quite clear: between early 1988 and early 1990, consumers divided their purchases differently within each point of purchase between the relatively expensive brands (manufacturers' brands and, within them, Côte d'Or or Nestle) and the relatively inexpensive brands (distributors' brands or, within the manufacturers' brands, Poulain or Cantalou).

A negative overall "line" effect means that market shares have shifted from relatively expensive brands to relatively economical brands.

\* We can give an approximate illustration of the "line" effect (Table 13) by taking the real average prices by brand for 1990 and

comparing them with the shifts in market share (in quantities) of each brand from 1988 to 1990. Of course, the resulting "line" effect is not completely accurate (98.72 instead of 98.86), because the 1990 real average prices are only approximate and the changes in market share by brand partly overlap changes in market share by point of purchase (some brands are no longer sold by certain points of purchase).

However, Table 13 shows that the market share of distributors' brands, which are less expensive, increased by 1.6 points, while the shares of Côte d'Or and "other manufacturers' brands", which are more expensive, decreased by 2.7 points and 1.1 point respectively.

**"Packaging" effect: hardly noticeable**

\* The "packaging" effect is the impact which a shift in consumer purchases from certain packages to other packages has on the average price of milk chocolate bars, where all other parameters, and particularly prices, remain unchanged.

\* To measure the "packaging" effect, we simply compare the real average price for February/March 1990, which is 4.074 F/bar, with the average price resulting from the calculation of the "line" effect, which is 4.079 F/bar.

\* According to Table 14, the "packaging" effect is:



The effect is less than -0.1% per year and therefore much weaker over the 2-year period than the "point of purchase" and "line" effects described previously.

\* The reason for this is easy to see if we again use an approximate analysis (Table 15).

The market share of 100-gram packages, which are priced well above average, decreased by 1.4 points, while the market share of 300-gram packages, which are priced slightly below average, rose symmetrically by 0.7 points.

The "packaging" effect did not come into play to a great extent between early 1988 and early 1990. On the one hand, 200-gram packages, which cost above average, nevertheless gained a larger market share. On the other hand and more importantly, households' preferences for the least expensive 300-gram packages appear to have stabilized and did not change much in two years. No doubt the effect was different when these large packages first came on the market.

**Summary and conclusions**

\* This ends our case study of milk chocolate bars using the NIELSEN material.

Given an extremely homogeneous product line (no "basket" effect) and a relatively short time period during which we can assume there was no "quality" effect, we succeeded, thanks to comprehensive price and quantity information, in separating exactly (Chart 2) the factors that account for the change in average price:

Average price index	=	(Pure) price index	x	"Point of purchase" effect	x	"Line" effect	x	"Packaging" effect
96.76	=	99.57	x	98.43	x	98.86	x	99.88

\* This is a particularly telling exercise, because on the one hand we have an average price which decreased by approximately 1.6% per year, and on the other we have a (pure) price index which virtually did not move (-0.2% per year). This is a textbook illustration of the lack of understanding between professionals and government statisticians!

What can account for the size of the difference between the two concepts? Quite clearly, consumer behaviour during the period under study:

- consumer purchases shifted from the most expensive to the most economical points of sale: effect of approximately -0.8% per year on average price;
- they opted for the least expensive brands over the most expensive: effect of approximately -0.6% per year on average price;
- lastly, consumer purchases shifted slightly from small packages to large packages, but the impact on average price was fairly weak.

\* It is difficult to give an opinion on whether or not the preceding orders of magnitude can be applied generally. Although there are constants of some significance, the relative market shares of the points of purchase probably vary considerably from one product family to another. Similarly, the price differentials among brands or points of purchase must vary widely from one product family to another.

In addition, the rate at which household purchases shift is certainly not constant over time. Movements between points of purchase do correspond to major trends, but they also depend on the initial situation: there are doubtless more shifts between points of purchase when traditional stores represent 80% of the total than when they have fallen to 20%. Moreover, whether consumers choose the least expensive or high-end items probably depends on the economic environment. We can assume, for example, that consumer choices in 1993 are quite different than in 1988-90.

\* In any event, let us take -1.6% per year as the order of magnitude of the disparity between the change in average price and the change in the corresponding (pure) price index. Let us also take -0.8% per year as the order of magnitude of the "point of purchase" effect, which seems to account for most of the disparity.

Case Study #2

**Measurement of the "point of purchase" effect on changes in  
average food prices:  
A study using INSEE food consumption survey material**

Outline

The food consumption survey material.

Pasta : a "point of purchase" effect of -0.5% per year.

Baby food in jars : a "point of purchase" effect of -1.6% per year.

Potatoes : a negligible "point of purchase" effect.

The "point of purchase" effect for 29 foods.

Summary and conclusions.

*The food consumption survey material*

INSEE's surveys of household food consumption are among the oldest of the surveys of living conditions. They took place annually from 1965 to 1982 (except in 1968 and 1975) and have been conducted every two years since 1983. The results of the 1991 survey were published in the summer of 1993.

In the survey, the households themselves fill in expenditure notebooks in which they record their daily food purchases broken down by product and point of purchase. For each purchase, the households indicate what they spent in francs and the quantities that were purchased, and this information can then be used to calculate average price by product and point of purchase.

The distribution classification system used in the food consumption surveys comprises eight types of point of sale.

The system is reasonably consistent with the NIELSEN grid, but it is less detailed with respect to mass merchandisers (no distinction between large and small supermarkets, superettes combined with variety stores such as Prisunic and Monoprix). However, it includes traditional channels that are not analysed extensively by NIELSEN: markets, mobile shop trade, purchases directly from producers or wholesalers.

According to the 1987 food consumption survey, the distribution of all household food expenditures among the eight types of point of sale was as follows:

TRADITIONAL STORES	SPECIALTY STORES
	MARKETS
	PURCHASES FROM FARM OR PRODUCER
	WHOLESALE/INDUSTRIAL STORES
	MOBILE SHOP TRADE
	OTHER SELF-SERVICE STORES
GENERAL FOOD STORES	
SUPERMARKETS	HYPERMARKETS

The study that follows focuses on 29 foods or groups of foods listed in Table 19.

These 29 product families are taken from the classification of expenditure items in the food survey, which at its most detailed level includes some 200 items.

The selection of these 29 families for the study is the result of a compromise between representativeness and homogeneity.

With regard to representativeness, we hope that we selected not only a sample of foods that more or less covers the range of consumer items, but a variety of situations in terms of market share (of each distribution channel) and average price differential (for each channel compared to the others) that will more or less reflect the range of situations likely to occur in the sale of foods.

With regard to homogeneity, the survey classification, even at its



most detailed level, does not provide definitions as precise as the milk chocolate bars studied using the NIELSEN material. To take that example again, the detailed family that comes closest in the food survey is "chocolate bars" (dark or milk chocolate, with or without confections).

To choose the 29 families, we selected from among the most detailed items in the food survey classification. In some cases, we opted for larger families (cheese, poultry, mutton...).

The study proposes to measure the "point of purchase" effect over a 12-year period from 1979 to 1991.

Why a long time frame? First of all, because in the absence of any order of magnitude, we are more interested initially in an average rate over a long period rather than data over a short period, which can be affected by households' circumstantial behaviour. Secondly, because the measure of the "point of purchase" effect is very sensitive to data on extreme years and consequently is more accurate if movements of a certain size have been able to produce effects between the beginning and end of the period.

**Pasta: a "point of purchase" effect of -0.5% per year**

\* Using the food consumption survey material, we will conduct the same analysis as in the first case study on milk chocolate bars (Table 16).

However, owing to the limitations of the material, we must use the approximate method, based on the real quantities sold by type of point of sale in 1979 and 1991 and the real average prices by type of point of sale in 1991.

The market share (in quantities) of each of the 8 types of point of sale are shown for 1979 and 1991 (columns 1 and 2). What changes in market share (column 5) appear over 12 years?

Hypermarkets move up 14 points from 22% to 36%; supermarkets gain 17 points from 34% to 51%. Mass merchandisers as a whole (hypermarkets plus supermarkets) saw their market share rise by 31 points from 56% (already a sizeable figure) to 87%.

Who lost market shares? The big losers were grocers (traditional general food stores), who saw their share decrease by 14 points from 19% to 5%, followed by superettes, whose market share declined by 11 points from 15% to 4%. Mobile shops and markets together lost 5 points and held on to limited market shares.

All in all, even though modern forms of selling already dominated the market in 1979, very large shifts in market shares took place between 1979 and 1991 and caused the share of mass merchandisers to rise to 87% of the total (these changes in market share are illustrated on the left-hand side of Chart 3).

\* Table 16 continues the analysis by showing the average price per kilo of pasta for the points of purchase frequented by households in 1979 and 1991 (columns 3 and 4). An average price (1991 average prices by point of purchase, 1979 quantities by point of purchase) is calculated in column 6, and column 7 shows the 1991 average price differentials by point of purchase that are required to calculate the "point of purchase" effect.

These price differentials range from +38% for specialty independents to -44% for direct purchases from wholesalers. The range of price differentials is illustrated on the right-hand side of Chart 3\*, where the points of purchase are placed in order from most expensive (specialty independents) to least expensive (wholesalers). Within this range, grocery stores come in at +16%, supermarkets at -10% and superettes at slightly above average.

\* The last column in Table 16 gives the anticipated result, in the form of a cumulative "point of purchase" effect of -5.91% over 12 years (or -0.51% per year) as well as a breakdown of the effect: the contribution of supermarkets to the overall "point of purchase" effect is -1.65%, which is obtained by dividing the 17-point increase in market share (in quantities) by the price differential of -9.6%.

A striking observation emerges from Table 16: the 8 contributions by point of sale are negative, which means that households purchased less from the most expensive points of sale and more from the least expensive ones. The fact that there are no exceptions illustrates a certain rationality on the part of consumers!

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\* Translator's note: French reads "graphique 1".

If we place the types of points of sale in descending order of contribution to the "point of purchase" effect, we obtain the following analytical grid:

	Change in market share	Price differential	Contribution to "point of purchase" effect (over 12 yrs)
Grocers	- - -	+++	-2.2
Supermarkets	+++	- - -	-1.6
Hypermarkets	+++	- -	-1.0
Markets	-	+++	-0.4
S p e c i a l t y independents	-	+++	-0.3
Superettes	- - -	+	-0.2
Mobile shop trade	- -	+++	-0.2
Wholesalers	0	- - -	0
			-5.9

The price differential gives an indication of the potential downturn of average price, whereas the changes in market share indicate the extent to which these decreases materialized between 1979 and 1991 as a result of consumer choices.

For pasta, all of these phenomena result in a mean "point of purchase" effect of -0.5% annually over 12 years (compared to -0.8% per year from 1988 to 1990 for milk chocolate bars).

**Baby food in jars: a substantial "point of purchase" effect (-1.6% per year)**

Table 17 uses the same format as the previous table to show the change in market share of each type of point of sale and the price differentials among points of sale in 1991 (see also Chart 4).

First of all, we observe that the average price differentials by point of sale do not follow the same orderly progression as in Chart 3. Baby food in jars is missing completely from markets and short distribution channels. More importantly, the most expensive points of sale are particularly expensive (specialty independents = pharmacies: +49%; grocers: +23%; superettes: +36%), whereas mass merchandisers offer distinctly more attractive average prices than for pasta: hypermarkets -19% (-7% for pasta); supermarkets -23% (-10% for pasta). Trade practices therefore seem to be very clear: unit prices between 5 and 6 F at pharmacies, grocers and superettes; unit prices between 3 and 3.50 F at mass merchandisers.

It is not surprising that, faced with such marked price differentials, consumers "overreacted" in terms of market shares.

Starting from a dominant position of approximately 66% of the market in 1979 (compared to 56% for pasta), mass merchandisers (hypermarkets and supermarkets) had a 94% market share in 1991. Pharmacies, superettes and grocers were marginalized in 12 years and saw their combined market share drop from 21% to a residual 5%.

As a result of these various movements, the "point of purchase" effect is -17.3% over 12 years, or approximately -1.6% per year, which is much larger than the same type of effect for pasta. In descending order of size, the contributions (all negative) of the various points of sale to the overall effect are as follows.

	Change in market share	Price differential	Contribution to "point of purchase" effect (over 12 years)
Pharmacies	- - - -	++++	-7.0
Superettes	- - - -	+++	-3.5
Hypermarkets	+++	- - -	-3.3
Supermarkets	+++	- - -	-2.5
Grocers	- -	++	-1.0
			<hr/> -17.3

This second example suggests that, like changes in market share, price differentials among points of purchase can differ widely from one product family to another.

As well, it suggests that the redistribution of market shares between mass merchandisers and small points of sale reached certain limits in 1991, and that it will be difficult to observe a "point of purchase" effect of the same magnitude during the 1990s.

**Potatoes: a negligible "point of purchase" effect**

The market shares and price differentials of the various points of purchase show unique characteristics in the case of potatoes (Table 18 and Chart 5).

With regard to price differentials, we observe the following distinctions in comparison to the orderly progression for pasta: mobile shops offer average prices well below the mean, no doubt because the potatoes are obtained from farms or family gardens; superettes charge well above average for potatoes, whereas supermarkets cannot offer their usual competitive advantage.

The pattern of market shares is quite different than for pasta. First of all, markets and greengrocers not only had a significant market share of approximately 22% in 1979, but they managed to keep almost all of it in 1991, which demonstrates that consumers remain attached to these traditional forms of selling.

Mass merchandisers did see their market share increase by 20 points from 23%\* to 51%, but it was at the expense of traditional grocers (-9%), producer-wholesalers (-7%) and, to a lesser extent, superettes (-4%). The large decrease in the flow of purchases from short distribution channels is remarkable (usually the change is marginal) and can only be accounted for by the fact that this distribution channel had a strong market share in 1979 (21%) which remained large in 1991 (14%).

These features provide the key to understanding the reason for the lack of "point of purchase" effect on potatoes (table follows).

\* Translator's note: Judging from Table 18, I believe this should be 31%.

	Change in market share	Price differential	Contribution to "point of purchase" effect (over 12 yrs)
Grocers	- -	++	-1.0
Superettes	-	+++	-1.0
Hypermarkets	++	-	-0.7
Supermarkets	++	0	0
Markets } Greengrocers }	0	+++	0
Mobile shop trade	-	- -	+0.2
Short channels	-	- - - -	+2.5
			0

Grocers and superettes have a negative impact on the "point of purchase" effect, more or less as for pasta (less for grocers, more for superettes).

Hypermarkets and supermarkets have a negative impact on the overall "point of purchase" effect, but it is much smaller than in the case of pasta (no price differential for supermarkets!).

Markets and greengrocers have no impact on the "point of purchase" effect as consumers remain attached to these forms of selling and there was no decrease in their market share.

Finally, the strong price advantage associated as usual with short distribution channels is associated here with a substantial decrease in their market share, resulting in a strong positive impact on the overall "point of purchase" effect. The presence of positive impacts of some points of purchase on the overall "point of purchase" effect apparently indicates less economic rationality on the part of consumers.

This reflects reality: many consumers shop at mass merchandisers because they project the image of offering attractive prices, which is true on the whole, but sometimes false for certain product lines. Potatoes do not seem particularly inexpensive in supermarkets, but once consumers have made the switch, they buy their potatoes there as well.

Markets and greengrocers no doubt project an image of quality and freshness which causes consumers to overlook their higher prices.

Finally and most importantly, the abandonment of short channels (purchases from the producer or a wholesaler) is much more a reflection of a lifestyle change (such purchases take time and effort) than economic reasoning. Because such channels offer far more attractive prices, pure economic rationality would dictate that their market share increase rather than decrease. This is true of potatoes and all other foods, but the market share of these short channels (still 15% in 1991) makes their impact on the overall "point of purchase" effect particularly visible.

To compare, in a clearer manner, the "point of purchase" effect on potatoes with the effects associated with the sale of other foods (where the market share of short channels is generally very small), perhaps we should measure the "point of purchase" effect associated solely with shifts in purchasing among the usual points of sale. Excluding purchases from producers and wholesalers, the "point of purchase" effect for potatoes would be -3.3% over 12 years (-0.3% per year), which is closer to what we observed for pasta, for example.

*The "point of purchase" effect for 29 foods*

As for the three examples analysed above, the study was conducted on the 29 product families selected from the classification for the food consumption surveys.

The "point of purchase" effects measured from 1979 to 1991 for these 29 families are presented in descending order of size in Table 19.

The average annual "point of purchase" effect ranges fairly widely from -1.57% (baby food in jars) to +0.19% (apples). However, if we exclude extreme values (2 product families with strong "point of purchase" effects, 3 families with positive "point of purchase" effects), we see that 24 out of 29 families have a "point of purchase" effect between -0.7% and -0.1% per year. The mean effect for the 29 families studied is -0.43% per year. The mean and dispersion are also illustrated in Chart 6.\*

The dispersion can appear slightly narrower if we examine separately those product families where a significant percentage of purchases are made through short distribution channels. Aside from potatoes, these families include apples, poultry, mutton and, to a lesser extent, other fruits and vegetables (tomatoes), other meats (veal and pork) and dairy products (milk and butter).

Excluding short channels, the "point of purchase" effect appears to be between -0.1% and -0.7% per year for 27 out of 29 families, and the mean is relatively unchanged at -0.39% per year.

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\* French reads "graphique 4."

*Summary and conclusions*

\* Measured from a fairly broad sample of foods, the "point of purchase" effect -- the difference between a price index and an average price index resulting solely from changes in consumer preferences for points of purchase -- was approximately -0.4% per year between 1979 and 1991. Except for 2 or 3 product families, the effect had values between -0.7% and -0.1% per year, based on the price differentials for each product among the various distribution channels and the shifts of consumer preferences regarding points of purchase.

\* After examining the 29 different food markets, it seems difficult to imagine that, except in very specific cases (baby food in jars), the annual "point of purchase" effect can have values outside the range < -0.7%, -0.1% >.

The analysis of the average price differentials among the distribution channels reveals *differences of approximately 30-35% between the most expensive and least expensive channels*; these differences seem to be ceilings, except for a few cross-tabulations of foods and points of purchase with a small market share.

In comparison, *the market share of each distribution channel changed considerably between 1979 and 1991*, a time of strong growth of hypermarkets and supermarkets. In 1991, mass merchandisers frequently had market shares of 80% to 90%, and market shares (and consequently "point of purchase" effects) will probably change more moderately in future than they did in the past. This prediction is supported by the example of product families such as whisky, where mass merchandisers already had market shares in the order of 80% in 1979; the "point of purchase" effect over the following decade is small.

\* The range < -0.7%, -0.1% > is still fairly wide. The simple arithmetic mean of -0.4% per year that we drew from it is fairly crude. A follow-up to the study should focus on calculating a weighted mean using the budgetary weight of each food consumed by the households, if necessary by making reasoned estimates of price differentials and changes in market shares for foods where the information is missing.

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