Consumers' Opinion of Inflation Bias Due to Quality Improvements

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Abstract

Measurement of quality changes has proven to be an especially difficult aspect of calculating unbiased rates of inflation. We propose a new methodology of capturing quality improvements based on consumer focus groups and apply this methodology in an environment where quality changes might be expected to be especially rapid and extensive, a post-communist transition economy. We find that the methodology is practical and that it indicates a substantial understatement of quality improvements during transition, and, therefore, a substantial overstatement of inflation resulting in a serious downward bias in growth rate estimates for post-communist economies. The move to free markets has apparently improved consumers' welfare more by improving what they can purchase than by increasing how much they can purchase. Overall, mismeasurement of quality changes may have understated Czech growth rates during the first decade after communism by as much as 5 percentage points per year.

I.   Introduction and Motivation

It has long been recognized that quality improvements pose special problems in

calculating measures of inflation including Consumer Price Indices (CPI). As Nordhaus (1998,

p. 61) put it:

> "Quality change poses severe problems for a statistical agency. It is non-
> mechanical in the sense that there is no way to determine quality change on a
> routine basis. It is heterogeneous in the sense that each quality change is *sui
> generis* and, like a child, requires individual attention. It is informationally
> demanding because it may require vast quantities of data that are expensive to
> obtain and often do not pass the test of a market transition. Even though routine
> procedures are established to handle quality change, in the end quality decisions
> require the subjective judgement about the extent of quality change, and agencies
> are reluctant to make subjective judgements."

Greenlees (2000, p. 60) is even less optimistic, saying "quality adjustment is also important

because it is so difficult.... Moreover, there are few common solutions to the problems that

arise."

Despite its difficulty, a great deal of effort is expended by statistical agencies throughout

the world in attempting to adjust reported measures of increases in consumer prices for quality

changes. Greenlees (2000) and Reinsdorf et. al. (1996) discuss the adjustments made in the U.S.

while Lowe (1998) summarizes Canadian practice and Armknecht and Mitland-Smith (1999)

look at techniques used in a number of countries.

Not withstanding these efforts to capture quality changes, there is a widespread consensus

that a substantial fraction of such changes remains unobserved, leading to an upward bias in CPI

measures. In the U.S. the Boskin commission from the mid 1990s estimated that the annual bias

from unmeasured quality change amounted to 0.6 percentage points or over half of the total bias identified and one fifth of average U.S. inflation rates at that time (Boskin, et. al., 1998).[1]

The difficulties involved in adjusting for quality changes in measuring inflation can be seen from an examination of the techniques that are currently widely used and their limitations. Moulton and Moses (1997) report that in a typical month in the U.S. approximately 4 percent of sample price points involve item replacement because the previously sampled item is not available. Overall, some 30 percent of items scheduled to remain in the sample for a full year must be replaced at some point in that year. Of the items that must be replaced, approximately 65 percent of the time BLS experts decide that the new item is comparable to the version no longer available and do not make any quality adjustment. In the remaining 35 percent of the cases, some form of quality adjustment is applied.

1) The least common technique, *the overlap method*, is applied to slightly over 1 percent of items replaced. It based on simultaneous observation of prices for both the old and new versions of the product. The price change associated with quality change is estimated as the difference in the market prices in this overlapping period. At the moment when the new product substitutes for the old one in the consumer basket the price difference between the new product's price in period t and the old product's price in period t-1 is divided between a pure price increase and the quality change estimated from the overlapping period:

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[1] Although see Hulten (1997) and Moulton and Moses (1997) for critiques arguing that in theory quality biases could be smaller than found by the Boskin commission.

$$p_{t-1}^{new} - p_{t-1}^{old} = \Delta$$
$$p_t^{new} - p_{t-1}^{old} = \delta p_t + \Delta$$

This method may produce distorted results if a producer initially offers the new version at the same price as the previous one but later adjusts prices to reflect true quality differences. In addition, it requires that both the old and new version of a product be traded in the same outlet at the same time, something that rarely happens.

2) Quality changes can also be inferred using related products using either a *link* or *class mean imputation*, a technique that is used for about 23 percent of item replacements in the U.S. First a price index δp_t^{n-1} is calculated based on other, similar goods for the month when a new version of a product is introduced. The percentage change in price between the new and old versions of the product is then decomposed into a price increase effect, assumed to be the same as that for other products of a similar nature, and a residual that is defined as quality change. This method suffers from the required assumption that the price behavior for the item being replaced will be the same as for other, continuing items. If, for example, producers use new model introductions as an opportunity to make unusually large price increases or if old models are heavily discounted prior to being discontinued, this method will overstate quality changes. On the other hand, if producers discount new models as part of an introduction strategy (for example, by providing discount coupons to encourage consumer sampling of new products), the method will overstate quality changes.

3)   For approximately 10 percent of item replacements, quality improvements are calculated

by a *direct quality adjustment*, based on either the market value of measurable differences

in physical characteristics when such differences have been priced independently or the

change in production cost associated with added product features. Such adjustments can

be made only when the quality improvement involves previously optional characteristics

becoming bundled into the standard version of the product or where reliable incremental

cost data can be isolated by manufacturers. Examples might include air bags and anti-

lock brakes for cars, or modems and CD-ROM drives for computers.

For specific products, mostly durables such as cars, computers, VCRs, or microwaves, the

direct cost adjustment relies on *hedonic regressions*. In this procedure price is regressed

on characteristics of the specific good and the coefficients given by this price-quality

relationship used to deduce the "true" value of the new products by applying estimated

coefficients to measured differences in characteristics between the old and new goods

(see, for example, Feenstra, 1995 and Triplett, 1990). The U.S. Bureau of Labor

Statistics has used such adjustments for a number of years and has recently announced a

major expansion of quality adjustments derived from hedonic models (see Fixler et. al.

1999; the series of studies for various products reported at

http://stats.bls.gov/cpihome.htm; Schwartz and Scafidi 2001). Such a methodology

requires that a wide array of product varieties with differing identifiable characteristics be

available in the market at the same time.

Recently Bils and Klenow (2001) have proposed an innovative method of inferring

quality improvements over time based on instruments derived from cross section Engle curves

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relating expenditure for consumer durables to consumer incomes. The assumption is that the higher prices paid by higher income consumers for specific durables such as a washing machine represent the purchase of higher quality items. This enables an adjustment for predicted quality increases as overall levels of consumer incomes rise over time. They find that for a sample of 66 items, BLS quality adjustments capture approximately 40 percent of the predicted quality growth across goods, leaving the remaining 60 percent of true quality growth to show up as an overstatement of inflation rates.

Clearly, there are problems with all of these techniques. As with hedonic regressions, the methodology proposed by Bils and Klenow requires there to be a wide variety of versions of specific products on the market at one time to estimate the cross-section Engle curves. No method will capture subtle quality changes within a product if these are embedded in the product without an identifiable model change. For example, no technique would observe that fresh milk had a longer shelf life or that new treatment methods made an otherwise identical shirt more wrinkle free.

Given the data and methodological problems with current techniques for adjusting for quality changes over time, innovation is required. Diewert (1996) challenged readers as follows: "in order to appreciate how choice sets have changed over time, I invite each (older) reader to think about the bundle [of] goods and services that he or she consumed as a youth." Below we take up this challenge in a specific context, that of the post-communist Czech Republic. We start with the rather obvious assumption that the best way to ascertain the extent to which consumers believe the quality of the products they purchase has changed is to ask the consumers themselves.

While we believe that the methodology we have used has general applicability, we have chosen to apply it to the transition Czech Republic for several reasons. First of all, the very nature of the transition means that the sort of small, embedded quality changes that the method is particularly well suited to capturing will be especially common and occur in an especially rapid time frame. In 1990, for example, "fresh" milk sold in the Czech Republic came in a plastic container that gave the milk a chemical smell and resulted in spoilage in less than two days. By 1996 fresh milk from the same dairy came in a paper-pack that assured a natural smell and had durability that was guaranteed for four days. At the start of transition jam from local producers came in a jar with a pry-off cap that could not be resealed and often contained fruit pits and stems. Within a few years the fruit was pitted and the caps could be screwed on and off at will. Similarly, film colors became true and batteries lasted several times as long.

Secondly, mismeasurement of inflation due to factors such as quality improvements poses fundamental problems for understanding the transition from planned to market economies. As Filer and Hanousek (2000) have pointed out, eliminating even a relatively minor overstatement of the inflation rate by 20 per cent "would show that every country in the region grew during the 1990s, turning a story of decline and disruption into one of growth and hope." (p. 293, see also Duchene and Gros, 1994). Quality improvements are likely to be an especially important source of bias in transition economies, largely because initial quality levels were so low. As Stiglitz (1994) and others have pointed out, specification of quality is much more difficult than specification of quantity. Thus, command economies, where personal rewards of management depend on plan fulfillment, have a natural tendency to economize on effort and other resources

by continually reducing quality while meeting numerical quantity goals for imprecisely specified goods.

In this paper we use consumers' expressions of what they would be willing to pay for older versions of products conditional on the current versions' price to derive an indication of their perception of quality differences between current and pre-transition products. Examining 63 products from a wide variety of sectors, consumers in the Czech Republic reported that if they were to purchase the 1990 quality product today they would be willing to pay an average of only 54 per cent of what they pay for the current quality product for the earlier version. This implies that the actual price increase for these products during the decade was 66 per cent instead of the official 139 per cent.

II.   Methodology

We derive our results from a series of focus groups conducted in the Czech Republic between March and May, 2001. Focus groups have previously been used by economists to determine the price consumers might be willing to pay for hypothetical products and services such as environmental amenities.[3] Among enterprises focus groups are widely used to investigate consumer acceptance of potential new products prior to their launch, including issues

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[3]See Soderholm (2001); Hanley et. al. (2001); Kaplowitz and Hoehn (2001); Kontogianni et. al. (2001); Ortuzar, Iacobelli and Velez (2000); Chilton and Hutcheson (1999); Freeman and Rogers (1999); Beattie et. al (1998); Knoppers and Mathios (1998); Kramer and Mercer (1997), Lunt (1996), Johnston et. al (1995), Desvousges and Smith (1988), and Mitchell and Carson (1986).

of appropriate pricing for such products.[4] Thus, it would seem appropriate to extend the

methodology to investigate how consumers would value older, presumably lower quality,

products that are no longer on the market relative to how they value today's version of these

products. In effect, we asked consumers: "Given the price and quality of a product in the CPI

basket today, what would be a reasonable price for the quality characteristics of the same product

as it existed at the start of the transition were you able to purchase this older product today?"[5]

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[4]See Bernacchi (2001); Samel and Henthorne (1993) for examples and Feick et. al. (1995) for a
use of focus groups in evaluating consumer experiences in the transition.

[5]While it might at first appear that our methodology has much in common with contingent

valuation studies, there is a fundamental difference. Contingent valuation involves asking

consumers what they would be willing to pay for a hypothetical product or service with which

they have no actual experience. We, on the other hand, are asking consumers about appropriate

relative prices for two products with which they have actual experience. In general differences

between willingness to pay and willingness to accept have been shown to be smaller when close

substitutes exist for the product in question (Shogren (1994); Adamowicz, Bhardwaj and Macnab

(1993)). Surely there can be no closer substitutes than old and new versions of the same product.

Secondly, the difference is generally assumed to arise from informational discrepancies between

products with which consumers have experience and those that are unknown to them (Kolstad

and Guzman 1999). In our case, consumers have full information on both the old and new

versions of the products, having actually consumed both.

The difference in these prices represents the difference in the quality of the item, expressed in today's currency. Only price increases in excess of this difference can be said to represent true inflation.

We engaged a firm with extensive experience in market research in the Czech Republic to conduct these focus groups. Each group was composed of men and women aged 33 to 55 who were the head or spouse of the head of a household in 1990 and who had secondary or higher education.[6] Each group consisted of six individuals and evaluated approximately ten independent products from a variety of the major categories in the consumer basket.

Each focus group followed a similar script.

1)   The moderator presented a product as it existed in 1990 (using a photo or the actual product if available). Group members were asked to recall this particular product and discuss its typical features and what they liked and/or disliked about it. The members of the group worked together to reach a consensus view of the characteristics of the earlier product.

2)   The current version of the product was presented and the group discussed its characteristics and how they differ from the product as it existed in 1990.

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[6]We excluded those less than 33 years of age since they were not likely to be main shoppers and have well-developed product knowledge ten years earlier when they were 23 or younger. In the Czech Republic fewer than 10 percent of workers in this age group have less than a secondary school education. These are likely to be recent immigrants or members of minority groups from whom it would be difficult to elicit reliable data in the current research framework.

3) The moderator distributed a record sheet for the product under discussion and asked group members to carefully consider all the differences between the current version of the product and the product as it existed in 1990. The moderator then revealed the current price of the product[7] and asked, "if both versions of the product were sold on the market today alongside each other what would you consider to be a fair and appropriate price for the 1990 version, provided that the current version costs _____ crowns?[8]"

4) After the price was assigned individually by the respondents, the individual choices were discussed among the group. The moderator would probe to elicit discussion of why the participants assigned the relative prices they did.

5) At the end of the session, after discussing about ten different products, respondents were asked again to record their relative evaluations for each product. This gave respondents a chance to revise their evaluations in light of the group discussion and the patterns revealed across the several products being considered. We retained both the initial and

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[7]Defined as the official price in the December 2000 market basket as determined by the CSO.

[8]We tried a number of alternative wordings of this question in developing the study. Debriefing of participants led us to believe that the version asked elicited responses that were closest to the economist's conceptual ideal, e.g. "what price would leave the consumer indifferent between the old and new versions of the product?" It should be noted that the old and new versions are such close substitutes that it is unlikely that any particular consumer would purchase both at the same time.

revised evaluations although there were minimal differences. Results below are based on the revised figures.

III.   Results

The Czech consumer price basket consists of approximately 750 individual referent items defined at a level such "mayonnaise" or "leather walking shoes for boys." There have been almost no changes in these broadly defined items during the 1990s although the specific brand or model priced for each item may have been changed several times and may differ across different sample points (stores) at any given time. Our focus groups evaluated 63 items[9] that comprised 16.2 per

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[9]An additional three items were evaluated by the focus groups but have been excluded from the analysis because the groups concluded that the 1990 quality was so low that the proper current price would be zero or negative, implying an infinite quality improvement. These three items were hair coloring and hair permanents, where respondents indicated that the damage that the earlier versions of these products or services did to their hair meant that they would not purchase them at any price if the current version were available and women's brassieres. While this last may seem odd, women in the focus groups were adamant that problems of fit and comfort for the pre-transition product meant that there was no price at which they would wear it today given that improved versions were available at their current price. Excluding these items from our analysis biases our estimates of consumers' perceptions of average quality change towards zero.

cent of the total weight in the consumer basket as of 1990 and 15.8 per cent of the total weight in 2000.[10]

Table 1 reports the results for these 63 products. The third column shows the price of the referent good in official data in 1990 while the fourth column shows the price for the same item in December 2000. The fifth column shows the percentage increase in prices between 1990 and the end of 2000. The Czech Statistical Office, however, made conventional adjustments in months when there was an obvious change in the referent item sampled. Thus, column 6 shows the official increase in the price index for each item after incorporating any adjustments made by the CSO, Column 7, which is the difference between Columns 5 and 6, therefore, shows the part of the increase in prices excluded by the Czech Statistical Office through adjustment for quality changes.

Columns 8 though 10 contain the heart of our research. Column 8 shows the median[11] response among our focus-group members to the question "What would be a fair price today for the 1990 version of product X, given the actual price charged today for the current version of the product?" Column 9, showing the percentage difference between these hypothetical current prices for the 1990 version of the product and the actual market price for the current version of the product (column 4), represents consumers' opinion of the value of the difference in quality between these two product today. Finally, column 10 indicates the percentage difference between the actual 1990 price of the product (column 3) and what consumers' would be willing

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[10]This compares with the 12.4 percent of the U.S. consumer basket represented by the items studied by Bils and Klenow (2001).

[11]Results are virtually identical if we use the mean response instead.

to pay for the constant-quality version of the product today (column 8). As such, it represents the true cumulative inflation rate for this product purged of the effect of quality changes.

Looking at the first row of data in Table 1 makes the importance of adjusting for hidden quality improvements clear. In 1990 a liter of milk sold for 2.8 crowns while in December 2000 it sold for 12 crowns according to official price data. This was a 328.6 per cent increase as shown in column 5. There were no significant adjustments made by the Czech Statistical Office, so the official price increase used for calculating the CPI over this period was 332.5 percent as shown in column 6. When consumers were asked to recall the characteristics (including packaging, flavor and shelf life) of milk as they existed in 1990 and evaluate how much they would be willing to pay for such milk today, however, they decided that 8 crowns would be a fair price given that milk with today's characteristics sold for 12 crowns. The value of the increased quality is the difference between today's price of 12 crowns and the hypothetical "fair" price for the older quality product of 8 crowns today or 50 per cent as shown in column 9. Thus, the actual price increase for milk of constant quality is not 328 per cent, but rather the 185.7 per cent shown in column 10 that results from an increase from 2.8 crowns per liter in 1990 to a hypothetical price of 8 crowns for the 1990 product version today.

We asked focus groups about a variety of products from across the consumer basket. The items evaluated cannot be claimed to be random, but they do account for a sixth of the entire basket and were not explicitly selected to be ones with large presumed quality changes. The average price increase for all products we surveyed, weighted by their share in the consumer basket, was 149.99 per cent, while the official increase in the CPI for these components after all adjustments by the Czech Statistical Office was 139.41 per cent, implying that the CSO found

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only 7.05 per cent of the price increase to be due to quality improvements.[12] Our focus group

respondents, however, found the average quality improvement across the 63 products to be 84

percent. In other words, they reported that they would be willing to purchase the 1990 quality

product today only if it were to be sold at a price averaging 54 per cent of the price for the current

quality product. This implies that the actual increase in prices for the decade for these products

was 65.95 per cent instead of the official 139.41 per cent.[13] On an annual basis, the official

inflation rate across all these items (weighted by their share in the consumer price basket) during

1990s was 9.1 per cent after official quality adjustments (and 9.6 per cent a year without such

adjustments). When consumers' perceptions of quality improvements are allow for, however, the

annual increase in prices is reduced to 5.2 per cent.

The results in Table 1 are grouped according to broad categories of goods. The patterns

are intuitively appealing, giving confidence that the focus group methodology is sound. Reported

quality improvements are smallest for food and beverages, standardized and relatively non-

complex items. Thus, the vast majority of the price increase of somewhat over 100 per cent for

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[12]While there is a positive relationship between the extent of quality improvement found by the

CSO (column 7) and that reported by our focus groups (column 9), the overall correlation

between these figures is only 0.05.

[13]While a seemingly large difference, these results are consistent with those derived from

surveys conducted in Romania in 2000, where consumers who reported their economic situation

in terms of purchasing power to be "about the same as last year" reported income increases of

less than half of the official inflation rate (Filer and Hanousek 2001).

these items was true inflation. Indeed, for some foodstuffs, our consumer groups reported no quality improvement or even a quality decline since the end of communism. Our respondents reported the greatest increase in quality for personal care products and recreational products, followed by clothing and home care products.

If we assume that other items within each broad product group behaved in the same way as those we sampled, then scaling up the sampled items to reflect weights for the full consumer basket implies a slightly greater official index increase of 152.4 per cent, a quality improvement of 71.1 per cent, and a true price increase of 77.2 percent, results very close to those for our sample reported above.

Overall, it appears that the Czech Statistical Office has captured less than 20 percent of the quality change that our respondents believe has occurred over the first decade of the transition. This compares with the 40 percent that Bils and Klenow (2001) suggest the BLS captured in the U.S. Intuitively the somewhat greater uncaptured component of quality change (80 percent versus 60 percent) makes perfect sense given the more extensive and rapid changes in basic products that occurred as a part of transition and the relative lack of sophistication of the Czech Statistical Office. These results suggest that average quality-adjusted consumption growth rates in the Czech Republic during the 1990s may have been between 4 and 5 per cent per year greater than the official figures suggest.

The reader is cautioned, however, to view the findings as preliminary. We have not sampled the full consumer price basket.[14] More importantly, consumers were evaluating the

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[14]Although even if there were no quality improvement in the remaining items in the consumer price basket, the biases we have identified in the 16 per cent of the basket we have studied would
(continued...)

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quality of goods assuming that they were actually available and not assigning any reduction in quality for scarcity. As one group member said during the discussion, "You had to line up for them and couldn't always find baked goods, but when you did you knew they were fresh!" In effect, the true price increase should be substantially smaller than the apparent price increase in our data once search and scarcity (waiting) costs are factored into prices at the start of the transition. Obviously, this would make quality improvement an even more significant fraction of the real price change.

Extension of this research to other transition economies[15] as well as to more items in the Czech consumer price basket are obvious next steps, as is an attempt to apply the focus group methodology in a developed economy such as the U.S. where results can be compared with those derived from other methods. There is no reason to believe, however, that such extensions would change the bottom line -- that a substantial understatement of the degree of quality improvement (and, therefore, a substantial overstatement of inflation rates) has resulted in a serious downward bias in estimates of growth rates of post-communist economies. The move to free markets has apparently improved consumers' welfare more by improving what they can purchase than by increasing how much they can purchase.

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[14](...continued)
be sufficient to increase measured growth rates by 1.3 per cent a year over the full decade. Of course, the assumption that no other goods exhibited a quality increase is totally unjustified.

[15]The methodology should also be useful in studying more developed economies. While the uncaptured quality improvements would not be expected to be as great, they may still be significant.

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Table 1
Summary of focus group quality adjustment estimates

Product Description (1)	Weight 1990 (2)	Price 1990 (3)	Price 2000 (4)	% Price Increase (5)	Index Increase (6)	Captured Change (7)	Today's Price for 1990 Product (8)	% Quality Change (9)	% Actual Price Increase (10)
Food									
milk	3.5	2.8	12	328.57	332.54	-3.97	8	50.00	185.71
bread	5.7	3.6	14.48	302.22	314.23	-12.01	14.5	-0.14	302.78
roll	7.4	0.5	1.6	220.00	224.8	-4.80	1.2	33.33	140.00
pie	1.1	0.8	2.5	212.50	192.53	19.97	2.9	-13.79	262.50
chicken	6.4	30.5	46.2	51.48	52.16	-0.68	40	15.50	31.15
sausages	2.5	39.6	71.45	80.43	77.44	2.99	65	9.92	64.14
yoghurt	2.3	3.3	11.6	251.52	261.99	-10.47	8	45.00	142.42
cheese	3.2	32.5	110	238.46	187.17	51.29	110	0.00	238.46
mayonnaise	1.4	3	8.5	183.33	177.37	5.96	6	41.67	100.00
butter	10.9	53	95.97	81.08	79.77	1.31	95	1.02	79.25
rape-seed oil	1.8	15.2	36.27	138.62	159.02	-20.40	30.5	18.92	100.66
bananas	4.3	17	27	58.82	58.09	0.73	27	0.00	58.82
coffee	16.1	17.6	12.7	-27.84	-15.03	-12.81	12.7	0.00	-27.84
tea	0.7	3.7	37.19	905.14	747.11	158.03	20	85.95	440.54
milk chocolate	1.9	10.1	17.72	75.45	71.42	4.03	13.5	31.26	33.66
chewing gum	1.4	5	8.75	75.00	75.49	-0.49	2.8	212.50	-44.00
ice cream	0.7	32.3	97	200.31	141.82	58.49	97.5	-0.51	201.86
ketchup	0.5	6.6	45.21	585.00	609.33	-24.33	40	13.03	506.06
Total	**68.3**			110.94	111.08	-0.14		13.72	86.29

Table 1
(continued)

Product Description (1)	Weight 1990 (sum = 1000) (2)	Price 1990 (3)	Price 2000 (4)	% Price Increase (5)	Index Increase (6)	Captured Change (7)	Today's Price for 1990 Product (8)	% Quality Change (9)	% Actual Price Increase (10)
Drinks									
carbonated water	0.7	0.7	5.6	700.00	635.59	64.41	5.6	0.00	700
bottle of wine	4.2	30	80	166.67	160.17	6.50	70	14.29	133.33
Total	**4.9**			242.86	228.09	14.77		12.24	214.29
Clothes									
cotton dress	2.5	318.1	1521	378.15	323.6	54.55	500	204.20	57.18
bra	1	91.1	384.81	322.40	250.56	71.84	82.5	366.44	-9.44
night gown	0.2	127.4	420.03	229.69	212.65	17.04	200	110.02	56.99
t-shirt	0.8	124.5	236.43	89.90	57.44	32.46	236	0.18	89.56
jeans	0.8	350	589	68.29	60.77	7.52	589	0.00	68.29
women's handbag	0.3	402.3	603	49.89	285.81	-235.92	325	85.54	-19.21
Total	**5.6**			259.86	229	30.86		165.13	47.4
Shoes									
men's walking shoes	1.1	347.2	1322	280.76	266.20	14.56	650	103.38	87.21
ladies´shoes	0.3	276.3	1179.6	326.93	294.57	32.36	650	81.48	135.25
Total	**1.4**			290.65	272.28	18.37		98.69	97.51

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Table 1
(continued)

Product Description (1)	Weight 1990 (sum = 1000) (2)	Price 1990 (3)	Price 2000 (4)	% Price Increase (5)	Index Increase (6)	Captured Change (7)	Today's Price for 1990 Product (8)	% Quality Change (9)	% Actual Price Increase (10)
Accommodation									
hotel class B/***	0.1	128.2	1082	743.99	638.34	105.65	700	54.57	446.02
latex painting	0.8	14.2	43.2	204.23	214.04	-9.81	17.5	146.86	23.24
Total	**0.9**			264.20	261.18	3.02		136.60	70.22
Household									
kitchen unit	4	4294.9	17705	312.23	286.51	25.72	7000	152.93	62.98
bed for kids	0.2	390	2865	634.62	613.91	20.71	2000	43.25	412.82
electric bulb	4.1	4.8	11.1	131.25	132.58	-1.33	11.1	0.00	131.25
table lamp	1.4	258	530.38	105.57	111.17	-5.60	400	32.60	55.04
Total	**9.7**			212.56	202.89	9.66		68.66	97.91
Dry Goods									
cotton sheet, pillow case	0.2	253	452	78.66	75.39	3.27	490	-7.76	93.68
towel	1.4	32	111.5	248.44	237.13	11.31	111.5	0.00	248.44
Total	**1.6**			227.21	216.91	10.3		-0.97	229.09

Table 1
(continued)

Product Description (1)	Weight 1990 (sum = 1000) (2)	Price 1990 (3)	Price 2000 (4)	% Price Increase (5)	Index Increase (6)	Captured Change (7)	Today's Price for 1990 Product (8)	% Quality Change (9)	% Actual Price Increase (10)
Home Appliances									
washing machine	2.8	6067.7	14480	138.64	132.55	6.09	9500	52.42	56.57
refridgerator	2.6	5720.4	10000	74.81	61.44	13.37	4970	101.21	-13.12
vacuumcleaner	0.9	1606.3	3842	139.18	100.02	39.16	2000	92.10	24.51
electric hair dryer	0.2	332.4	690.8	107.82	66.98	40.84	350	97.37	5.29
safety razor	0.2	411.4	2150.5	422.73	373.03	49.70	650	230.85	58.00
electric iron	0.6	160.4	1982	1135.66	1230.82	-95.16	900	120.22	461.10
Total	**7.3**			204.86	198.27	6.59		86.38	59.68
Electrical Supplies									
battery	1.1	1.7	6.97	310.00	329.67	-19.67	1.9	266.84	11.76
	1.1			310.00	329.67	-19.67		266.84	11.76
Home Care Products									
washing powder	2.1	13.2	86.4	554.55	537.61	16.94	40	116.00	203.03
detergent for dishes	1.2	10	64.46	544.60	520.38	24.22	20	222.30	100
drycleaning	0.2	22.4	63.3	182.59	177.26	5.33	47.5	33.26	112.05
Total	**3.5**			529.88	511.11	18.77		147.72	162.51

Table 1
(continued)

Product Description (1)	Weight 1990 (sum = 1000) (2)	Price 1990 (3)	Price 2000 (4)	% Price Increase (5)	Index Increase (6)	Captured Change (7)	Today's Price for 1990 Product (8)	% Quality Change (9)	% Actual Price Increase (10)
Transport									
personal car Skoda	25.3	86708.1	260000	199.86	155.09	44.77	135000	92.59	55.69
bike for kids	0.5	816.8	3535	332.79	246.28	86.51	2650	33.40	224.44
motor oil	0.2	28.3	80.44	184.24	159.52	24.72	45	78.76	59.01
repair of car brakes	1.6	296	1115	276.69	264.00	12.69	1000	11.50	237.84
Total	**27.6**			206.61	163.09	43.52		86.72	69.33
Recreational Products									
color TV	9.3	12276.8	11485	-6.45	-5.53	-0.92	2750	317.64	-77.60
videorecorder	1.6	8371.7	10420	24.47	21.57	2.90	2350	343.40	-71.93
portable radio & tape recorder	1	3419.9	2335	-31.72	-29.43	-2.29	650	259.23	-80.99
cinefilm	2.1	46.3	114.43	147.15	145.82	1.33	50	128.86	7.99
cross country ski	1.2	579.2	1570	171.06	138.49	32.57	800	96.25	38.12
rose	0.4	10.6	39.75	275.00	266.95	8.05	30	32.50	183.02
Total	**15.6**			36.65	34.16	2.49		266.78	-50.13
Amusement Services									
cinema ticket	0.1	16	55.21	245.06	240.31	4.75	32.5	69.88	103.13
MF daily	1.8	2.5	7.5	200.00	200.00	0.00	3.8	97.37	52.00
Total	**1.9**			202.37	202.12	0.25		95.92	54.69

Table 1
(continued)

Product Description (1)	Weight 1990 (sum = 1000) (2)	Price 1990 (3)	Price 2000 (4)	% Price Increase (5)	Index Increase (6)	Captured Change (7)	Today's Price for 1990 Product (8)	% Quality Change (9)	% Actual Price Increase (10)
Personal Care Products									
toothpaste	1.1	3.4	14.3	320.59	291.30	29.29	8	78.75	135.29
soap	0.3	66	24.8	-62.42	224.54	-286.96	18	37.78	-72.73
hair shampoo	0.6	17.1	31	81.29	47.31	33.98	27	14.81	57.89
toilet paper	6.7	3.8	4.67	22.89	16.44	6.45	1	367.00	-73.68
paper tissues	0.3	3.9	17.57	350.51	365.05	-14.54	8	119.63	105.13
Total	**9**			71.25	70.65	0.60		289.07	-33.38
Total weight	**161.9**			149.99	139.41	10.58		84.17	65.95