

Vysoká škola ekonomická v Praze
Recenzované studie

**Working Papers
Fakulty mezinárodních vztahů**

4/2009

**Prices Borne by Households
with Different Incomes
and Perceived Inflation**

Gabriela Smrčková

**Faculty of International Relations
Working Papers**

4/2009

**Prices Borne by Households
with Different Incomes
and Perceived Inflation**

Gabriela Smrčková

Volume III



Vysoká škola ekonomická v Praze
Working Papers Fakulty mezinárodních vztahů
Výzkumný záměr MSM6138439909

Název: Working Papers Fakulty mezinárodních vztahů
Četnost vydávání: Vychází minimálně desetkrát ročně
Vydavatel: Vysoká škola ekonomická v Praze
Nakladatelství Oeconomica
Náměstí Winstona Churchilla 4, 130 67 Praha 3, IČO: 61 38 43 99
E 17794
Evidenční číslo MK ČR: 1802-6591
ISSN tištěné verze: 1802-6583
ISSN on-line verze: 978-80-245-1550-2
ISBN tištěné verze: Prof. Ing. Eva Cihelková, CSc.
Vedoucí projektu: Vysoká škola ekonomická v Praze, Fakulta mezinárodních vztahů
Náměstí Winstona Churchilla 4, 130 67 Praha 3
+420 224 095 270, +420 224 095 248, +420 224 095 230
<http://vz.fmv.vse.cz/>



VÝKONNÁ RADA

Eva Cihelková (předsedkyně)

Vysoká škola ekonomická v Praze

Vladimíra Dvořáková

Vysoká škola ekonomická v Praze

Olga Hasprová

Technická univerzita v Liberci

Zuzana Lehmannová

Vysoká škola ekonomická v Praze

Marcela Palíšková

Nakladatelství C. H. Beck

Judita Štouračová

Vysoká škola mezinárodních

a veřejných vztahů, Praha

Dana Zdražilová

Vysoká škola ekonomická v Praze

REDAKČNÍ RADA

Regina Axelrod

Adelphi university, New York, USA

Peter Bugge

Aarhus University, Aarhus, Dánsko

Petr Cimler

Vysoká škola ekonomická v Praze

Peter Čajka

Univerzita Mateja Bela, Banská

Bystrica, Slovensko

Zbyněk Dubský

Vysoká škola ekonomická v Praze

Ladislav Kabát

Bratislavská vysoká škola práva

Emílie Kalínská

Vysoká škola finanční a správní

Eva Karpová

Vysoká škola ekonomická v Praze

Václav Kašpar

Vysoká škola ekonomická v Praze

Jaroslav Kundera

Uniwersytet Wrocławski, Wrocław,

Polsko

Larissa Kuzmitcheva

Státní univerzita Jaroslav, Rusko

Lubor Lacina

Mendelova zemědělská a lesnická
univerzita, Brno

Cristian Morosan

Cameron School of Business

Václava Pánková

Vysoká škola ekonomická v Praze

Lenka Pražská

emeritní profesor

Lenka Rovná

Univerzita Karlova v Praze

Mikuláš Sabo

Ekonomická Univerzita

v Bratislave, Slovensko

Naděžda Šišková

Univerzita Palackého v Olomouci

Peter Terem

Univerzita Mateja Bela, Banská

Bystrica, Slovensko

Milan Vošta

Vysoká škola ekonomická v Praze

ŠÉFREDAKTOR

Marie Popovová

Vysoká škola ekonomická v Praze

Prices Borne by Households with Different Incomes and Perceived Inflation

Gabriela Smrčková (smrckovag@seznam.cz)

Summary:

After the introduction of the new currency in 2002, the majority of the population of the Eurozone started to blame the Euro for causing sharp price increases. Up to now, a number of papers have been produced trying to explain the possible gap between the price perception indicator and the measured inflation rate. Some of the analyses looked at the personal consumer basket in detail, stressing that consumers are more likely to notice inflation when they the decreasing number of goods and services they can purchase with a fixed sum of money on an ongoing basis. This paper tries to continue to search in the individual consumer basket examining the differences in consumption found in different income groups of households, and the possible impact of this factor on price perception.

Key words: inflation, price perception, consumption patterns, households' expenditures

Ceny pro různě příjmové domácnosti a vnímaná inflace

Gabriela Smrčková (smrckovag@seznam.cz)

Abstrakt:

Po zavedení eura ve fyzické podobě v roce 2002 začala většina obyvatel eurozóny vinit novou měnu z vysokého růstu cen. Řada studií byla dodnes vypracována za účelem odhalení příčin, které by dokázaly vysvětlit zhoršení ukazatele vnímané inflace, který nemohl být vysvětlen makroekonomickými fundamenty, a to především vývojem skutečné inflace. Některé analýzy nahlížely detailně na spotřební koš a upozorňovaly, že spotřebitelé jsou schopni vnímat pohyb cen u omezeného množství výrobků a služeb jimi poptávaných. Tato studie pokračuje v analýze individuálního spotřebního koše a snaží se odhalit dopady rozdílů ve spotřebě u různě příjmových skupin obyvatel na vnímanou inflaci.

Klíčová slova: inflace, vnímaná inflace, spotřebitelské zvyklosti, výdaje domácností na spotřebu

JEL: E21, E31, H31

Content:

Introduction7

1. Measuring Price Development for Households with Different Incomes...9

2. Atypical Price Movements after the Changeover 16

3. Does Households' Inflation Matter for Price Perception? 23

Conclusion..... 28

References 29

ANNEXES 30

Introduction

January 2002 seems to represent a structural break in the evolution of the Price Perception Indicator (PPI) which is the result of the regular EC survey amongst European consumers. Its purpose is to identify the consumers' views on price developments over the past twelve months. The PPI is a balance indicator which puts together different consumers' responses to price development ascribing different weights to different possible answers. Being a qualitative indicator, it cannot be numerically compared with the HICP (the Harmonised Index of Consumer Prices, which measures inflation in the Eurozone) without previous recalculation.¹ However, graphical comparison can be done to synchronize these two indicators.

Graph 1 indicates that the PPI started to deviate in 2002 from its previous path, signalling the increase in the number of consumers who perceived the price acceleration. 2002 being the year of the introduction of the common currency, which could lead to some problems in the manipulation and memorizing of prices, it is not illogical to expect some relationship between the Euro and the phenomenon of price perception aggravation. Unfortunately, the perception of price increases could not be explained by the deterioration of price stability, as the HICP remained low, and the annual rate of inflation reached 2.1% in 2002 in the whole Eurozone area.

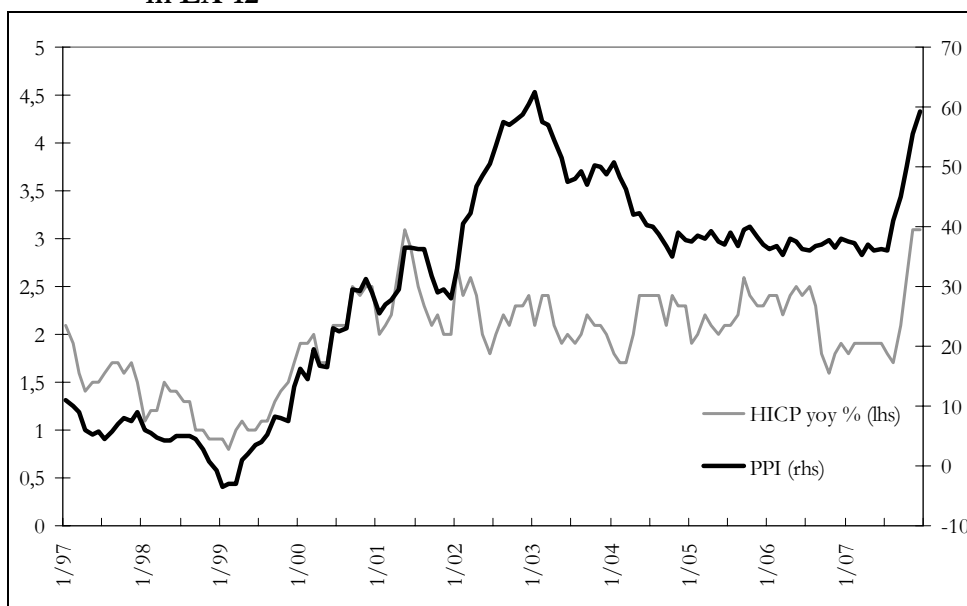
However, some unusual price movements were observed in 2002 which can be mainly ascribed to domestic shocks (tax changes in some EA-12 countries), unfavourable weather conditions in Europe (sharp increase in fruit and vegetable prices at the beginning of the year), as well as external factors (energy prices).² All the above mentioned factors were evident at the beginning of the year, and were slowly disappearing during the first half of 2002.

In contrast, the perception of intense price increases remained high for a long period after the Euro's introduction indicating a strong persistence in the majority of countries (see graph 1). The gap between these two indicators only closed after several years and not before 2005 in many countries.

¹ See for example Aucremanne – Collin – Stragier (2007) or Del Giovane – Sabbatini (2004).

² Del Giovane – Sabbatini (2004).

Graph 1: Inflation rate (HICP) and indicator of perceived inflation (PPI) in EA-12



Source: Eurostat, European Commission.

Ignoring a possible strong psychological impact of the currency changeover on consumers' perception due to the fact that people needed to memorize a large amount of new prices, and to learn how to deal with the Euro banknotes and coins; one reasonable explanation for the abnormal development of PPI vis-à-vis the HICP, after 2002, seems to lie in the individual consumer basket, which can notably differ from the average basket used for the calculation of the HICP. The differences arise from the variety of goods and services purchased by a single consumer, and the prices at which some specific products are bought, largely as a consequence of being purchased in different shops.

The main limitation on households' purchasing power is the amount of disposable income they have; this narrows down consumption possibilities, making life easier for those whose income is higher. In consequence of these budget limitations, low income households tend to spend more of their income on basic goods, and buy lower quality products at lower prices. In contrast, high income households have access to a wider range of goods, and they spend more on luxury goods and additional services. Due to individual expenditure patterns, the different income household groups may face a large variety of price developments which, in turn, may cause differing inflation perceptions amongst consumers.

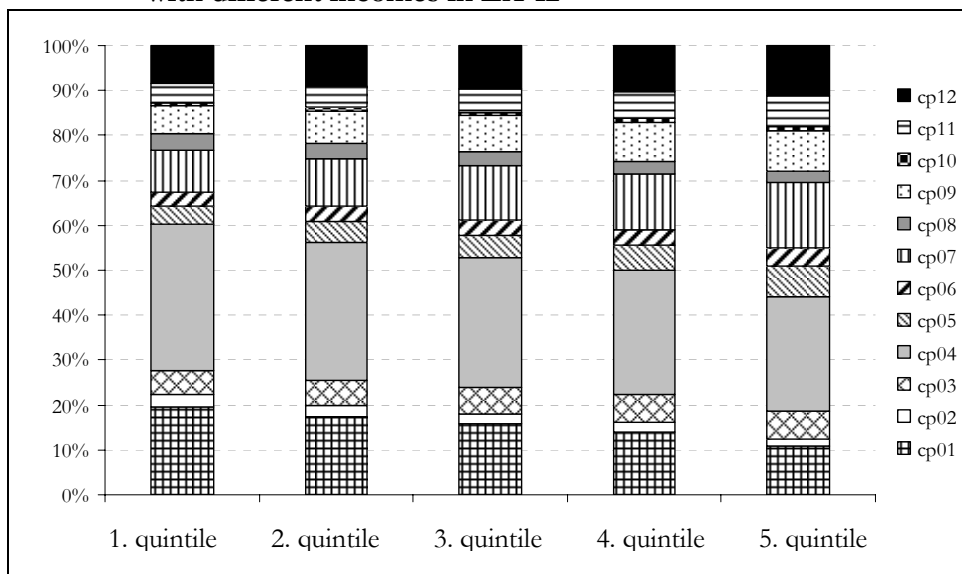
1. Measuring Price Development for Households with Different Incomes

Consumer expenditure patterns can be seen from the Household Expenditure Survey, which is carried out every five years in the EU. The survey's results, which show the spending habits of different consumers in given time period, are used for the construction of weighting in the CPI/HICP (Consumer Price Index, Harmonized Index of Consumer Prices) which are then adjusted in line with the national accounts estimates. The aim of the CPI/HICP is to reflect the price development in the total consumer expenditure of the section of the population surveyed, which is represented by the average household. The weightings are then constructed for this purpose, and do not contain any information about price development in different income households. Moreover, they are somehow different from the expenditure weights obtained by the household survey for the middle income group in the Eurozone due to the adjustments made in line with national accounts.

The major difference between the weightings used in the HICP and the expenditure patterns obtained from the household survey at the level of COICOP2, can be observed in the fourth COICOP classification (housing, water, electricity, gas and other fuels), where the difference amounts to nearly 15 pps; stressing the almost double impact of housing costs on the average family budget, to the expenditure share contained in the HICP (see graph 3). This disproportion is mainly due to the fact that the owner occupier's addition of rent; which has a strong impact on the family budget; is not included in the HICP. In other group classifications the difference does not exceed 4 pps, and its impact is mainly reversed, proving itself to be a major expenditure share in the HICP in comparison to the expenditure patterns surveyed.

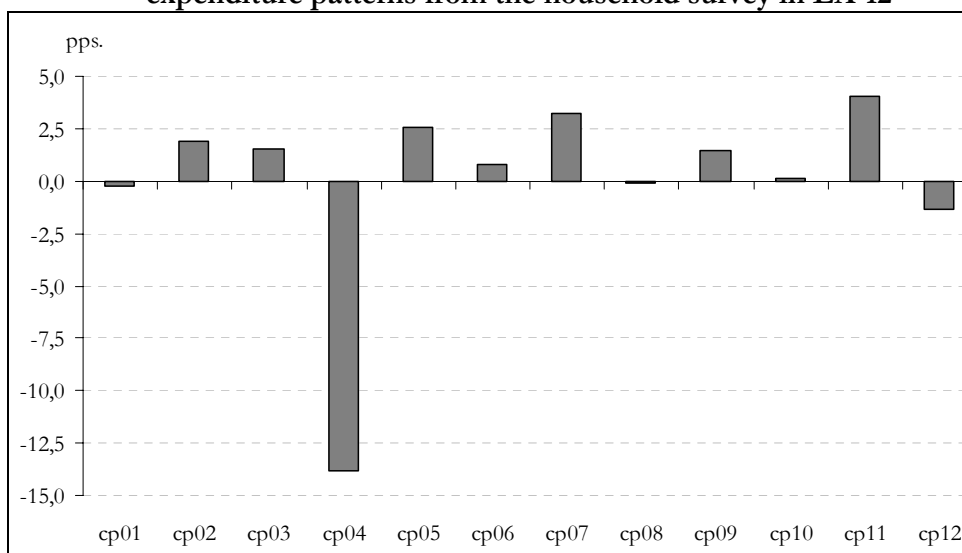
It is evident that the structure of consumer expenditure in the Eurozone differs among different income households (see graph 2). Whereas the low income households spend more than 50% of their budget on food and housing costs (cp01 and cp04), these two categories slightly exceed 30% of high income households' expenditure. For these reasons, we can expect some different inflation rates among different income households, which can be calculated by using expenditure patterns obtained by the household survey. The scope of this analysis is to observe whether inflation differs across unequal income households due to their specific consumption patterns.

Graph 2: Structure of consumer expenditures in groups of households with different incomes in EA-12



Source: Eurostat, own calculations.

Graph 3: Weightings of differences in the HICP in comparison with the expenditure patterns from the household survey in EA-12



Source: Eurostat, own calculations.

In this context, it is necessary to point out that in some Eurozone countries, the differences between low and high income households are not as pronounced as in other countries due to the strong redistribution effect, whose purpose is to equalize the amount of disposable income amongst consumers (see Table 1). The greatest differences in the structure of consumer expenditure between

different income households are traditionally observed in Italy, Spain and Greece. On the other hand, a more equal distribution of disposable income is typical for France, Austria, Finland and Netherlands. In consequence, the recalculated rate of inflation for the different income households will probably vary most in countries where the variation of structure of consumer patterns is higher across social classes.

Tab. 1: Differences in expenditure patterns between the first and the fifth household income quintile in 12 expenditure COICOP groups in 2005 (in pps)

EA-12 countries	cp01	cp02	cp03	cp04	cp05	cp06	cp07	cp08	cp09	cp10	cp11	cp12
EA-12	8.7 ³	1.1	-0.8	7.4	-2.8	-1.1	-5.5	1.4	-2.6	-0.3	-2.5	-2.9
BE	5.3	0.8	-1.8	12.3	-2.6	2.2	-7.0	0.6	-3.2	-0.1	-3.7	-2.7
DE	7.6	1.0	0.1	10.1	-1.8	-3.0	-7.0	2.2	-1.3	0.2	-1.5	-6.3
IE	8.8	2.7	-0.8	9.6	-3.9	-1.5	-5.2	1.0	-2.1	-0.1	-3.3	-5.2
GR	10.2	2.0	-0.3	2.3	-1.8	1.1	-3.9	0.7	-1.5	-0.5	-1.9	-6.1
ES	12.8	1.9	0.2	-6.5	-1.7	-0.1	-0.2	0.3	-3.0	-1.0	-1.3	-1.4
FR	3.4	1.1	-0.6	9.8	-3.1	-1.2	-4.3	1.4	-2.4	0.0	-2.3	-1.8
IT	14.9	0.9	-2.9	12.2	-5.8	-1.8	-8.5	1.5	-4.2	-0.7	-5.0	-0.8
NL	2.9	0.6	-1.1	5.7	-2.2	-0.6	-3.8	0.8	-1.8	0.7	-2.6	1.2
AT	5.7	0.9	0.1	2.3	-0.5	-0.8	-2.9	0.8	-3.0	0.2	-1.4	-1.5
PT	10.7	1.2	-1.9	7.9	-2.0	5.1	-8.1	0.6	-5.2	-2.6	-3.2	-2.5
FI	5.3	0.8	-1.3	7.7	-1.5	1.1	-6.5	1.9	-3.4	0.1	-1.3	-3.1

Source: Eurostat, own calculations.

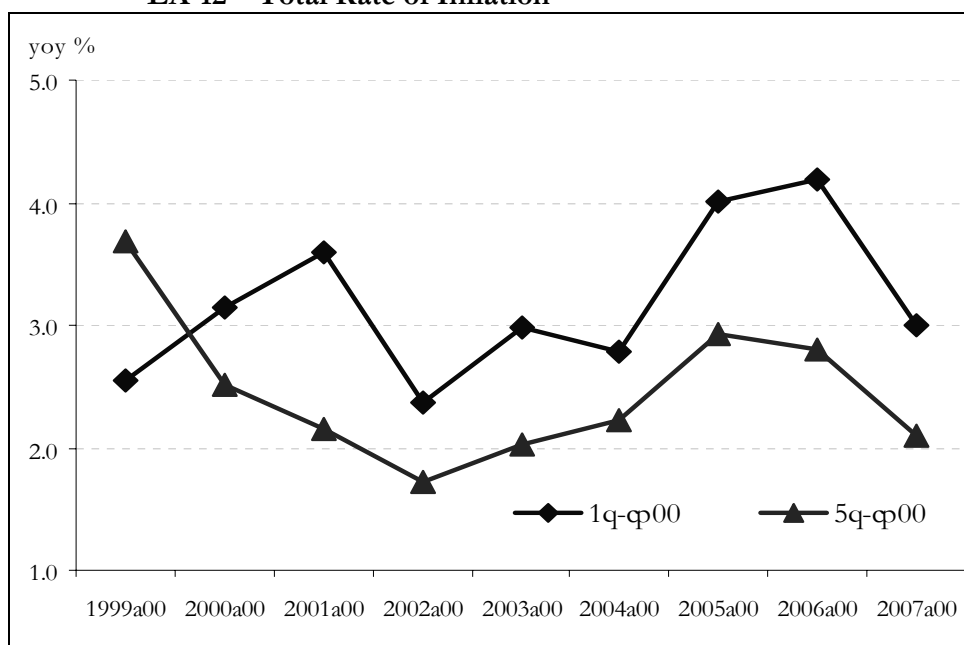
Any calculation of the index of consumer prices based on the Laspeyres-type index must deal, firstly, with the consumption patterns of the subcategory of households, and, secondly, with the prices which this subcategory faces during its daily shopping (Mostacci – Natale – Pugliese, 2004). The consumption patterns of different income households can be extracted from the households' expenditure survey.

On the other hand, no information is available regarding the prices which the different subcategories must face in their daily life. For obtaining this kind of information, an additional survey amongst consumers should be carried out. However – Giraldo – Trivellato (2004) state that they do not feel uncomfortable about using the general prices obtained for the calculation of the HICP as the impact of lower prices on lower income households is probably outweighed by the lower geographical mobility of this group, which leads to their having to deal with higher prices. From their point of view, omitting the different prices for household subcategories does not necessarily lead to misinformation.

³ The positive number indicates that the low income households spend a major proportion of their income on the specific item group, in comparison with the high income households and viceversa.

As the household survey is only carried out every five years, and the 1999 survey does not contain information from all the Eurozone countries; the only possible way to estimate inflation rates for the different income households in the Eurozone is to use the 2005 survey results. Bearing in mind that household expenditure patterns change from one year to another; a fact which is reflected in the changing weightings in the HICP; this solution might lead to some inaccuracy in the estimates, especially in the years farthest from 2005. Looking at the HICP weightings, it can be seen that all types of households face a decline in spending on food, even though there is a more rapid decline in the high income households than in the low income ones. This effect led to a slight underestimation of the inflation rate at the beginning of the period observed, which is more pronounced in low income households. However, for the purposes of the comparisons between the different households' income we must not pay too much attention to this factor, as we can expect that it will have a more or less similar impact on all income groups and will not affect the comparisons at all.

Graph 4: The recalculated rate of inflation for households with different incomes using the weightings from the household survey in EA-12 – Total Rate of Inflation

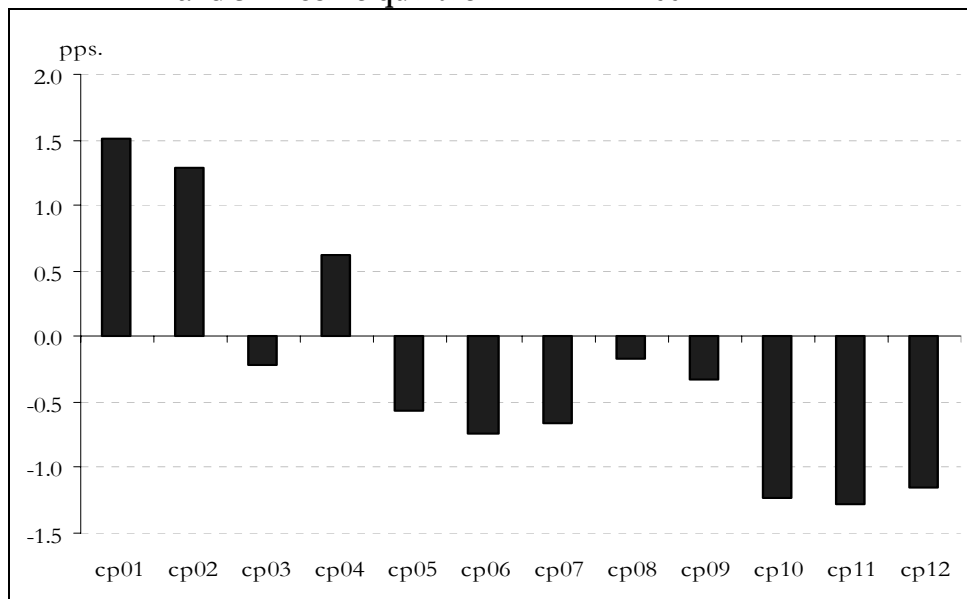


Source: Eurostat, own calculations.

From the total rate of inflation recalculated for different income households we can see (graph 4), that in majority of the years under observation, the low income households suffered more from the jump in prices as a result of the greater increase in average prices than did the high income households. The only exception was 1999, when the high income households felt a greater price

increase due to the anomalous inflation in the subgroups of health and miscellaneous goods and services. The average gap between the first and fifth quintile amounted to a 1 pp disadvantage for the low income households.

Graph 5: The recalculated rate of inflation for households with different incomes using the weightings from the household survey in the EA-12 – differences in recalculated rate of inflation for the 1st and 5th income quintile in EA-12 in 2002



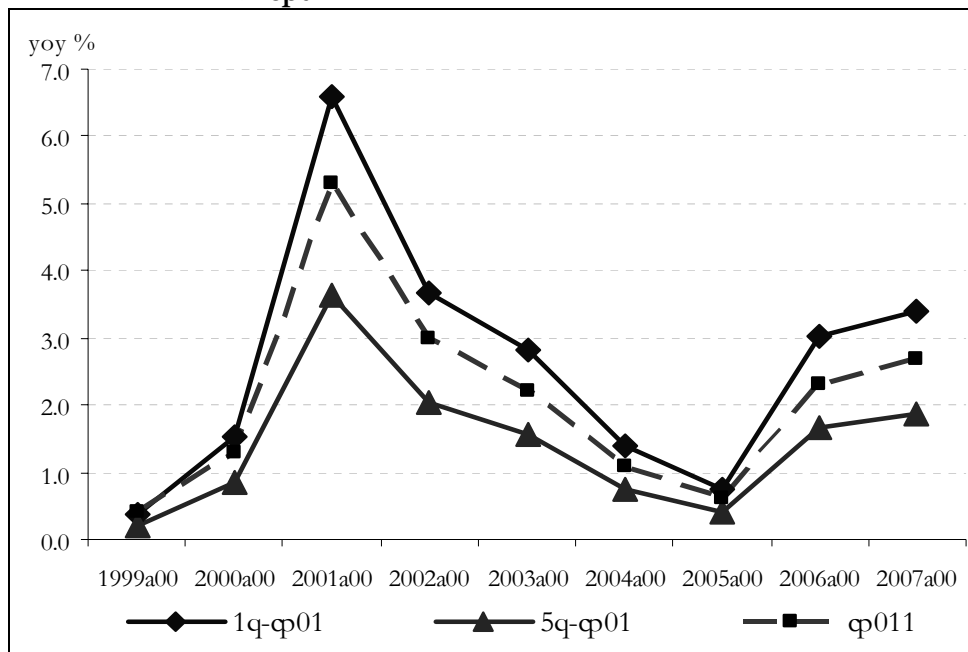
Source: Eurostat, own calculations.

Note: the graph is computed by using the differences between the results of the recalculated rate of inflation for the 1st and the 5th income quintile. The results are expressed in pps. Positive numbers show that the inflation rate was higher for the 1st income group in comparison to the last one.

Due to the fact that the HICP does not contain information about many items which, on the other hand, burden the average family budget (like owner-occupier's imposed rents, repair/reconstruction of dwellings, life insurance etc.); the rate of inflation published by Eurostat evolves differently in time, and cannot be directly compared to our recalculated index. However, in many cases, where the weightings in the HICP get closer to the expenditure weightings from the household survey, the comparison between the different rates of inflation calculated, and the official one, can be done, bearing in mind that the original item weightings differ. In these cases, the official inflation rate remains between the rate of inflation of the first and the fifth household income quintile, as can

be, for example, seen in the group; ‘food’ (see graph 6). The rate of inflation for ‘food’⁴ which occupies a large proportion of consumption expenditure in low income households; reached a peak in 2001, and came to nearly 7% of the yearly growth, reaching a gap of 3 pps; between the first and fifth income household quintile. Also, in 2002, the gap remained relatively wide, becoming then smaller in the following years, closing only in 2005.

Graph 6: The recalculated rate of inflation for households with different incomes using the weightings from the household survey in EA-12 in cp011



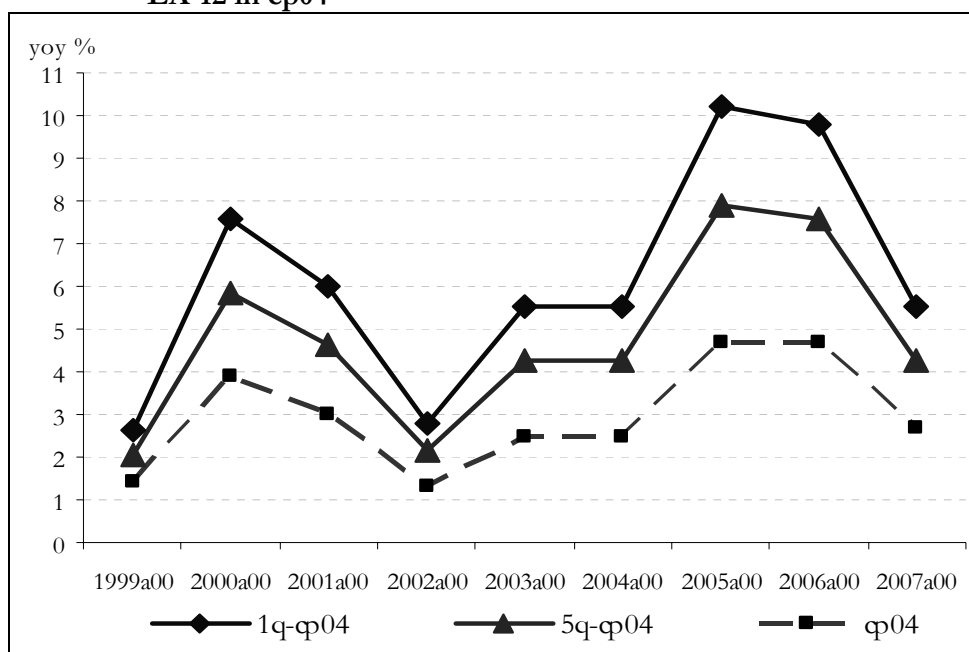
Source: Eurostat, own calculations.

Looking at housing costs (see graph 7); which represent the second most important item group as regards household expenditure; we see that both income groups suffered, throughout the whole period under observation, from the greater price increases in comparison to the official inflation rate. This was caused by the fact that the owner occupier’s imposed rent; which is important from the expenditure point of view for those who are actually affected by it; is not considered by the HICP. Its impact almost doubles the total housing costs expenditure, according to the household survey. The problem of owner occupier’s imposed rents has long been discussed, and it is not yet clear whether

⁴ The recalculated rate of inflation for food (cp11) and housing costs (cp04) in different income groups of households was computed in the same way as the recalculated overall inflation. The weightings from the Household Expenditure Survey were used instead of weightings for the computation of the price index.

it should be considered an investment, or, a consumption expenditure, and then to be included in the HICP. The problem also raises the question of how to best evaluate this item. However, in the period of changeover we do not see any particularly huge gap in the inflation rate between the low and high income households in cp04. The gap actually narrowed from 2 pps in 2000 to 0.6 pp in 2002, and the inflation rate was calculated at about 2 pps of the official estimated price increase affecting the low income households. The gap started to widen only from 2003 with the acceleration of price increases in this item group.

Graph 7: The recalculated rate of inflation for households with different incomes using the weightings from the household survey in EA-12 in cp04



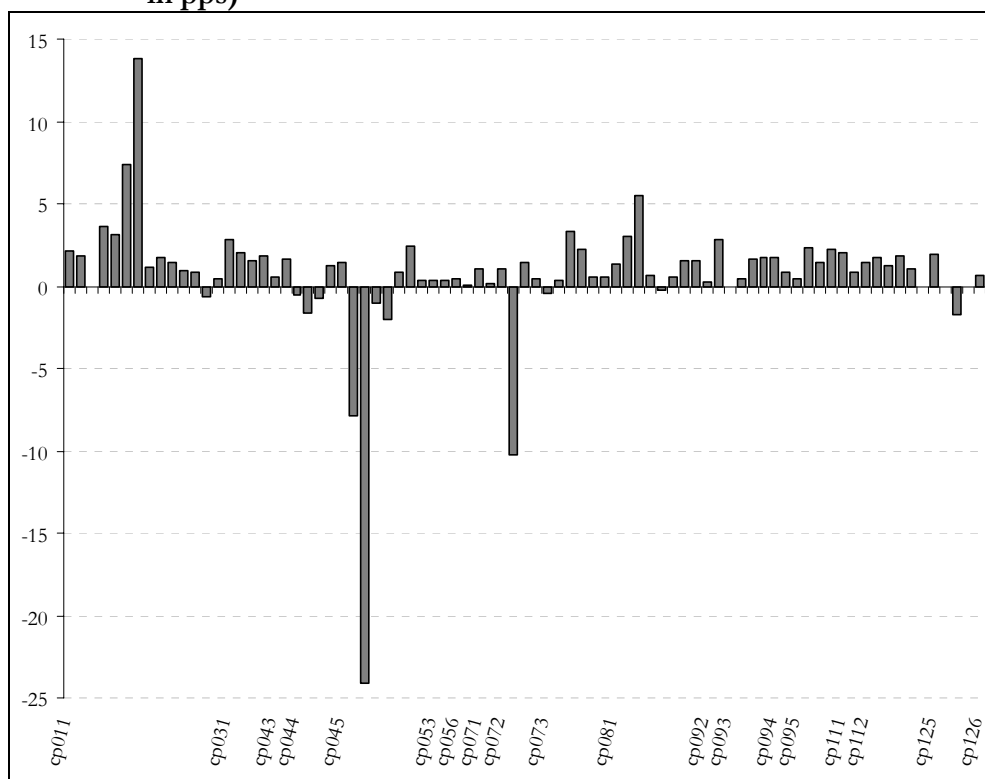
Source: Eurostat, own calculations.

From the composition of the recalculated inflation rate, we can see that in the year of the currency changeover, only in three item groups (cp01, cp02 and cp04) did the low income households have to deal with higher price increases compared to households from the last quintile. On the other hand, the price development in the remaining COICOP groups affected more high income households. Moreover, those items with major rise in prices in 2002, such as: miscellaneous services (cp12), transport (cp07), restaurants and food have also made a major contribution to the overall inflation in high income households. Considering that both income groups experienced a similar budgetary impact in 2002; with the price increase in the 55% of total consumer expenditure in the first quintile, and 62% in the fifth quintile, we can expect similar developments in the PPI in both income groups in 2002.

2. Atypical Price Movements after the Changeover

Analyzing in detail the price development in the first quarter of 2002 against average price movements three years before the changeover, we can discern a more pronounced price increase in nearly all COICOP 4 item groups except energy (see graph 8)⁵. The major rise in prices was visible in fruit and vegetables due to the bad weather in the previous season; in all processed food; in some types of services like restaurants, accommodation; personal care, postal services, and electricity; tobacco and public transport. On the other hand, mild inflation was typical for items like: gas, liquid fuels and thermal energy. These price movements characterized all Eurozone economies in the period after the changeover. Some trans-national heterogeneity can be mainly attributed to different spending patterns, as well as the implementation of tax reforms in some of the countries.

Graph 8: Atypical price movements in the EA-12 in Q1 2002 (COICOP 4 in pps)



Source: Eurostat, own calculations.

⁵ The calculations were calculated by comparing the simple average of the evolution of prices in the period between 1999 and 2001, with the inflation for the same period, in 2002. The methodology of this calculation is partly inspired by Del Giovani – Sabbatini (2004).

Amongst Eurozone countries, major price shocks were seen in Greece (fruit, vegetables, public transport, automobiles and postal services); in Ireland (energy, public transport, information processing equipment, cultural services); in France (a jump in prices in nearly all items except fuel and postal services); in Finland (fruit, vegetables, energy, information processing equipment); and in Belgium (similar situation to that observed in France). During the following quarter, or to the end of the year at the latest, price developments in the majority of the COICOP item groups were observed to have returned to normal, already, in the period from 1999 to 2001. A much faster than average jump in prices, in 2002, was seen only in restaurants, cafes, etc.; as well as in hairdressing salons, the insurance industry and periodical publications.

The whole impact on the inflation rate in the Eurozone in 2002, due to the atypical price movements, was estimated at 0.16%, with the descending force throughout the year (0.88% in January and 0.73% in the first quarter). This, above average, impact was observed in France, Greece, Ireland, Finland and Belgium. The opposite applies to other Eurozone countries (see the table 2). Luxemburg seems rather an exception in this story, with its huge price decrease in liquid fuel in 2002, was atypical for previous years, and which led to the abnormal price movements having a negative impact on the overall inflation. The overall impact was calculated as the sum of atypical price movements in 2002, positive as well as negative, in the detailed COICOP4 item groups. This compared to the average price development during the three years before the physical introduction of the Euro. In this context, it is necessary to bear in mind that the author's estimates represent a maximum ceiling for the possible changeover effect on price increases, as they contain information about all atypical price movements in the period surveyed, such as the impact of the bad weather conditions and tax changes. The item group "Health" was not considered in the calculations.

The above indicated estimates are fully in line with the Eurostat (2003) calculations for the changeover impact on overall inflation in 2002; which should lie between 0.12 and 0.29%. They estimated the changeover effect as being abnormal price movements in different item groups, which could not have been explained by the exogenous shocks typical for that period. Eurostat also mentions that the inflationary impact was concentrated mainly in the service sector, especially COICOP groups, such as restaurants, cafes and the like; hairdressing salons, the repair and cleaning of clothing, as well as recreational and sporting services.

Tab. 2: Impact of atypical price movements on overall inflation in 2002 (in %)⁶

EA-12 countries	January 2002	Q1 2002	2002
Greece	1.70	1.05	0.53
Ireland	1.40	1.06	0.70
France	1.29	1.10	0.30
Finland	1.27	0.82	0.10
Belgium	1.13	0.55	-0.67
EA-12	0.88	0.73	0.16
Germany	0.77	0.55	-0.30
Portugal	0.60	0.43	0.60
Spain	0.54	0.46	0.57
Netherlands	0.37	0.06	-0.02
Italy	0.35	0.55	0.33
Austria	0.16	-0.02	-0.33
Luxembourg	-0.09	-0.31	-0.51

Source: Eurostat, own calculations.

Naturally, the estimates must be interpreted cautiously, as it is nearly impossible to distinguish a purely changeover effect from the other factors. However, calculations made by other national institutes indicate some similar results; with regard to passing through the changeover; on inflation. Folkerstma (2002) came to the conclusion that conversion to the Euro has raised the Dutch CPI by 0.2–0.4%. Del Giovane – Sabattini (2004) estimated the overall effect [of the changeover] on annual inflation in Italy to be about 0.5%.

The recalculation of the indicator of Perceived Inflation, suggested by Aucremanne (2007)⁷, shows that Greece, which suffered most from the atypical price development at the time of the changeover, also witnessed the strongest gap between the perceived and measured rate of inflation (6.7 pps against the average of 1.8 pps in the Eurozone).

Moreover, nearly all countries with an above average abnormal price increase after the changeover, displayed a greater deviation in their PPI from the official rate of inflation, this in 2002, in comparison with the other countries (see graph 9 and 10). The most visible exception is the Netherlands, which had the biggest

⁶ Estimates were calculated by comparing the average price movement of the detailed COICOP 4 item groups in the period 1999–2001, with the inflation rate in 2002 in the same groups. The overall impact was calculated as a sum of individual effects using the respective expenditure weightings.

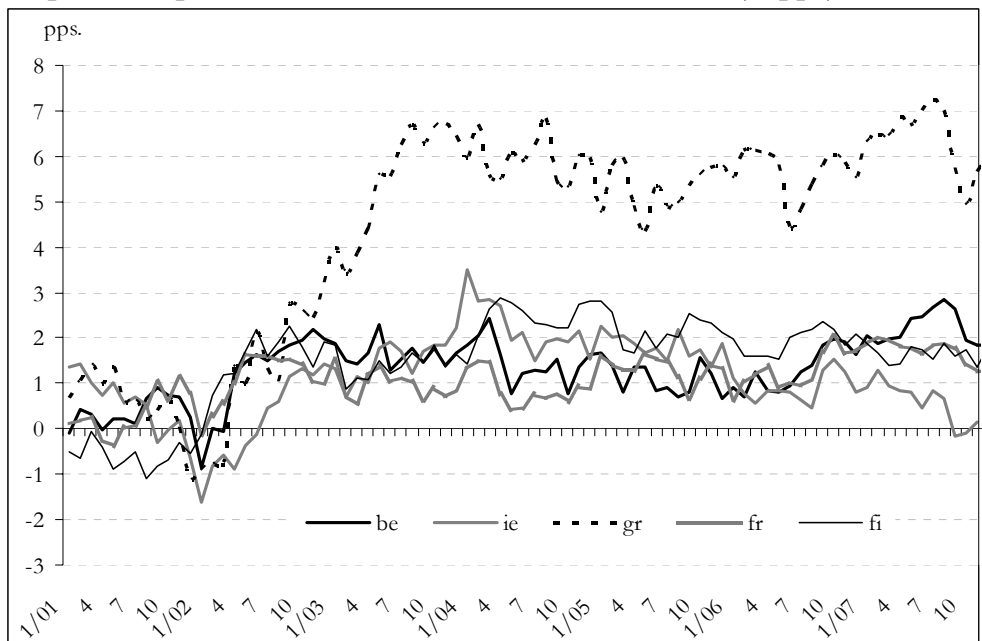
⁷ The recalculation permits a direct comparison between the two indicators. It is based on the assumption of a strong correlation of the PPI with the inflation rate before the changeover. For further details it is recommended to consult Aucremanne's paper.

gap between the two abovementioned indicators, already in 2002; and whose decomposition of price development in detailed consumer baskets does not show any particular strong jump in prices. This is a result of the high inflation observed in 2001 caused by the VAT changes, and the introduction of the ecological taxes. This price shock, which affected mainly food prices, the gastronomy sector, and housing costs, is comparable to that faced by other Eurozone countries at the beginning of 2002, even though Dutch inflation in 2001 was much higher. Nevertheless, no particular deviation of the PPI from the official rate of inflation was observed prior to the period of the Euro's introduction.

On the other hand, it was observed that the gap between the PPI and the inflation rate started to increase earlier in comparison to other Eurozone countries. This might have been driven by a prior price shock which also extended to the period after the changeover. However, the unbiased results in this camp support the opinion that not only the individual consumer basket matters in individual price perception.

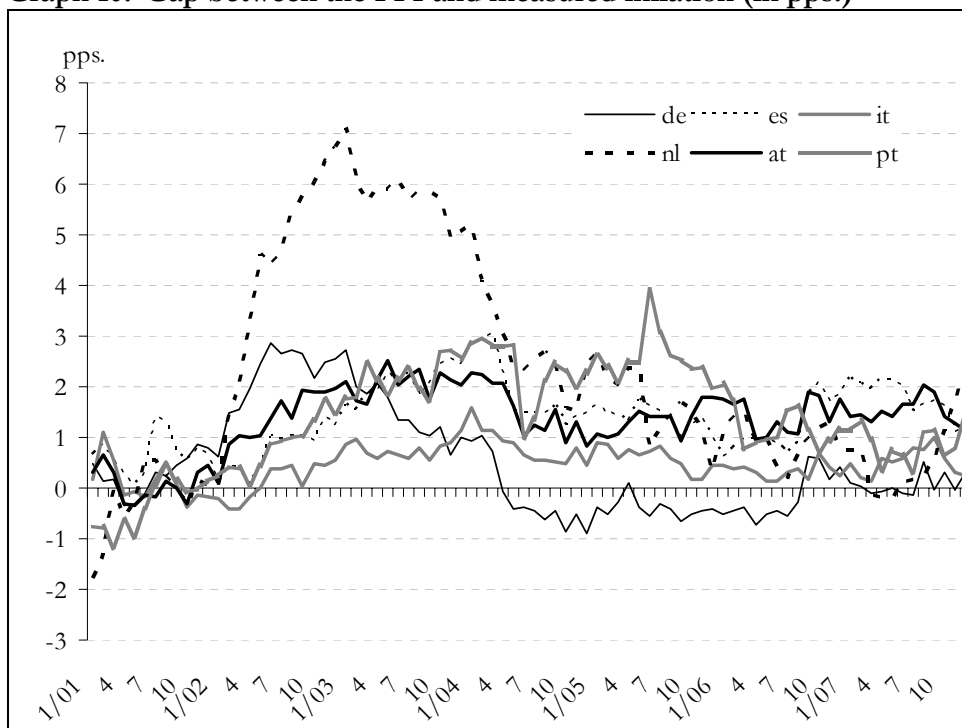
Looking at the estimated impact of atypical price movements on different income households' inflation by using the weightings from the household survey, we can observe that there is no huge difference in the effects on inflation within the two groups of consumers. While the low income households suffered more by the rise in prices in the first quarter of 2002 (0.77 pp of overall inflation as against 0.57 pp in the high income households), due mainly to an abnormal increase in the price of fresh food; the overall effect of atypical price development over the course of the whole year was somehow more pronounced in the high income group of consumers. Although the differences faced by both extreme income quintiles are not as strong as to possibly cause different developments in price perception across dissimilar households' income groups.

Graph 9: Gap between the PPI and measured inflation (in pps)



Source: Eurostat, European Commission, own calculation using methods proposed by Aucremanne (2007).

Graph 10: Gap between the PPI and measured inflation (in pps.)



Source: Eurostat, European Commission, own calculation, using methods proposed by Aucremanne (2007).

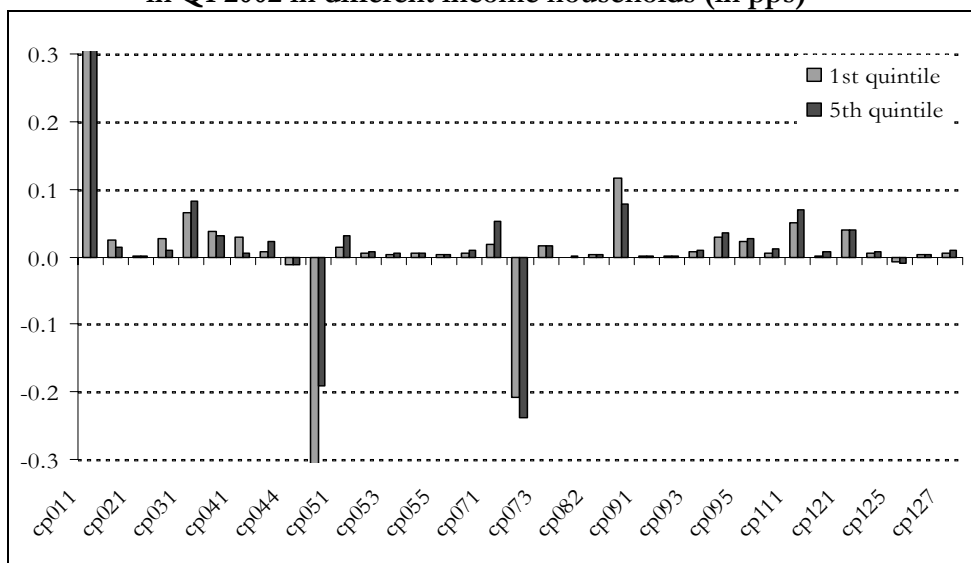
The overall impact on inflation in the year of the changeover stayed at 0.16 pp in case of the 1st income quintile, as opposed to 0.18 pp in the 5th income quintile. Slower increases in food prices, observed throughout 2002, accompanied by a lower jump in the price of energy at the end of the year, in comparison to a previous three-year average, had a weak impact on the inflation of low income households, which spend a large proportion of their income on these two items (see graph 11 and 12). On the other hand, the persistent increase in the price of services throughout the year led to the atypical price movements having a greater impact on high income households' inflation.

It must be borne in mind that the results obtained for individual types of households cannot be compared with previous estimates of atypical price movements, as the weightings used in this exercise are not the same. They reflect the proportion of consumers' expenditure on singular COICOP item groups as obtained from the direct survey amongst consumers. The calculation is, however, similar to that used for working out the different rates of inflation amongst various income groups of households. In any case, the results obtained from the two exercises are very similar.

The results shown above confirm the hypothesis that both extreme income groups faced a similar price shock in 2002. The abnormal price movements,

which were confirmed by the data, could have originated, not only in exceptional price developments due to the exogenous shocks, but also in the gradual rounding off of prices. Accompanied by a monetary shock, this effect could probably have been one of the main driving forces behind the deviation of the PPI after the introduction of the Euro.

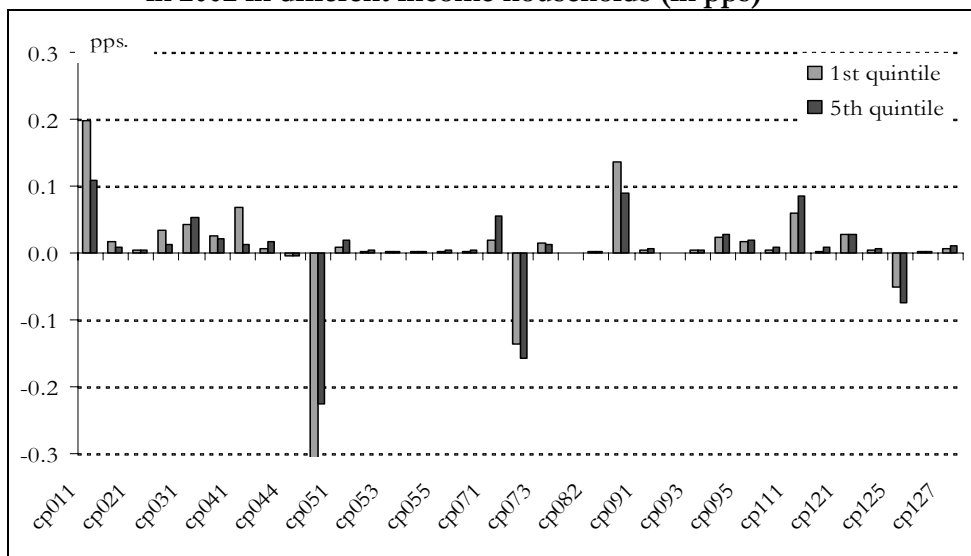
Graph 11: Contributions of atypical price movements to overall inflation in Q1 2002 in different income households (in pps)⁸



Source: Eurostat, own calculations.

⁸ The contribution of food to overall inflation amounted to 0.8 pp. in the case of low income households, and 0.4 pp. in the case of high income households in Q1 2002

Graph 12: Contributions of atypical price movements to overall inflation in 2002 in different income households (in pps)



Source: Eurostat, own calculations.

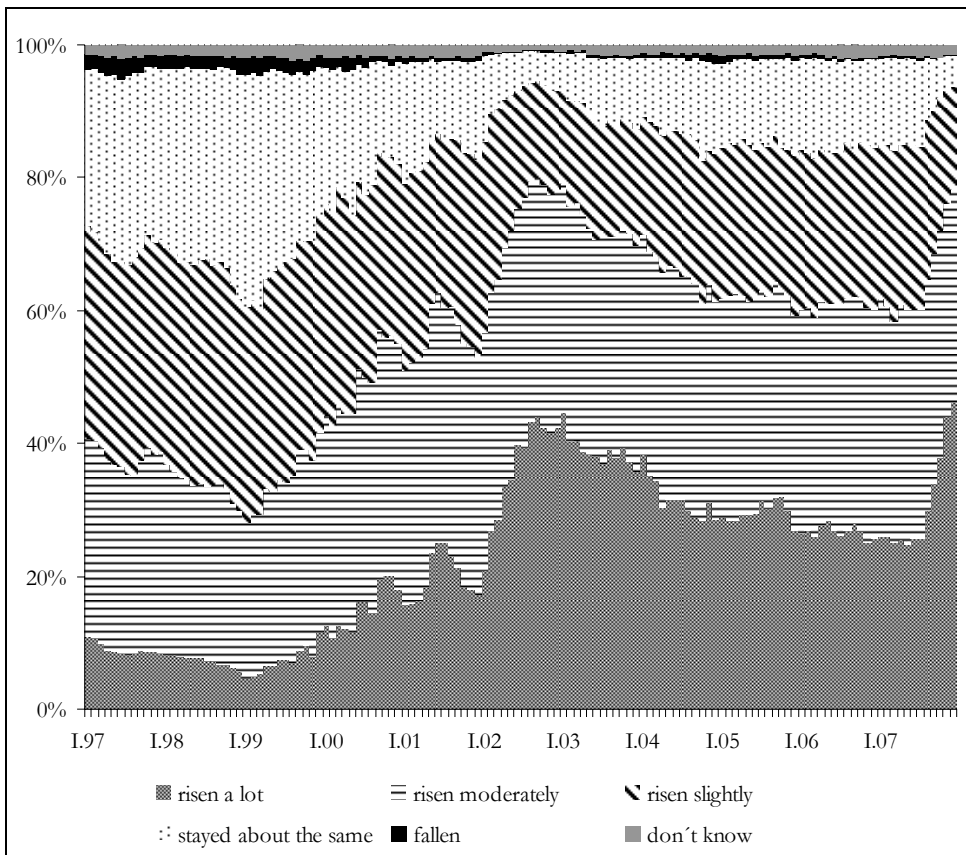
3. Does Households' Inflation Matter for Price Perception?

From the previously discussed problem, we might expect that the impact of higher inflation rate suffered by low income households could, in some way, lead to higher price perception amongst this group of consumers. This hypothesis is in some way confirmed by the data which demonstrate that a considerably higher proportion of consumers from low income households hold the opinion that prices had increased substantially.

Examining in detail the composition of the PPI, it can be seen that the number of respondents who stated that the prices had risen a lot increased markedly from 2002. Almost 40% of all Eurozone consumers were of this opinion (see graph 13). This growth took place at the expense of the response stating that the prices had increased slightly; as the proportion of those feeling the moderate price increase stayed about the same. In total, nearly 80% of Eurozone inhabitants had, at the end of 2002, the feeling that some pronounced price increase had taken place. Due to the fact that it is impossible to fix a straight line between these two possible responses, we can expect that one's own sensitivity towards the price movements plays a role in the final answer chosen, which cannot be logically explained, and will depend more on individual psychological factors.

The difference between low and high income households' groups⁹ that felt a pronounced price increase remained at 8 pps. During the changeover, the level was already observed before January 2002 (see graph 14). In contrast, the number of consumers who felt the moderate price increase in the high income group showed a sharper increase as compared to consumers from the low income group, in such a way that the gap between the two extremes almost closed in 2003. After that period it oscillated at the level of 0 to 2 pps. This effect was caused by the decrease in the proportion of consumers stating that they felt a moderate price increase in low income households, and the simultaneous slight increase in the number of consumers having the same opinion regarding price development in the high income group.

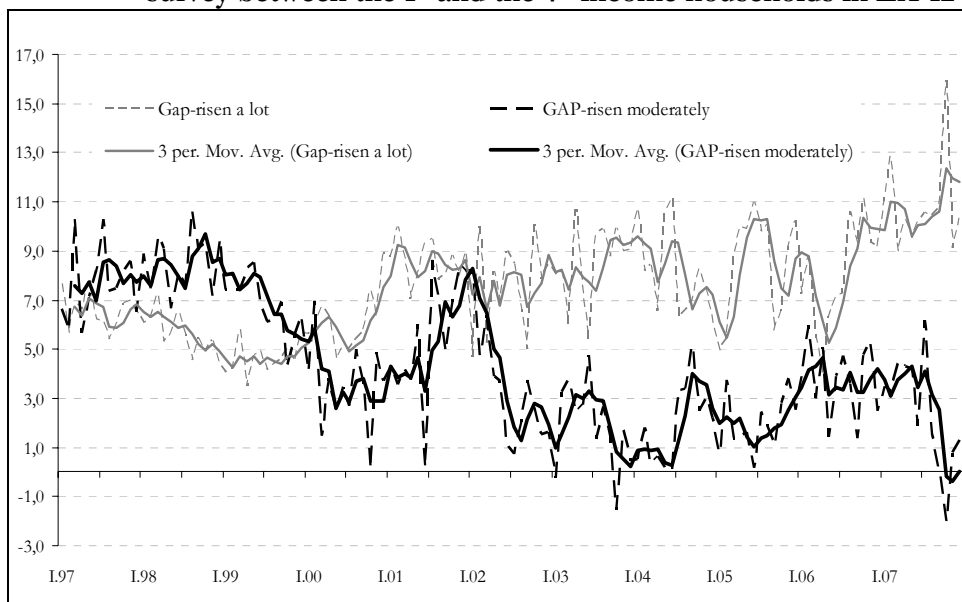
Graph 13: Break down of responses to the Price Perception Indicator in EA-12



Source: European Commission.

⁹ It must be considered that the household survey works with income quintiles while the PPI can be only broken down into income quartiles. The high and low income groups of consumers are not equal in these two statistical surveys.

Graph 14: Gap in price perception responses from the business consumer survey between the 1st and the 4th income households in EA-12



Source: European Commission.

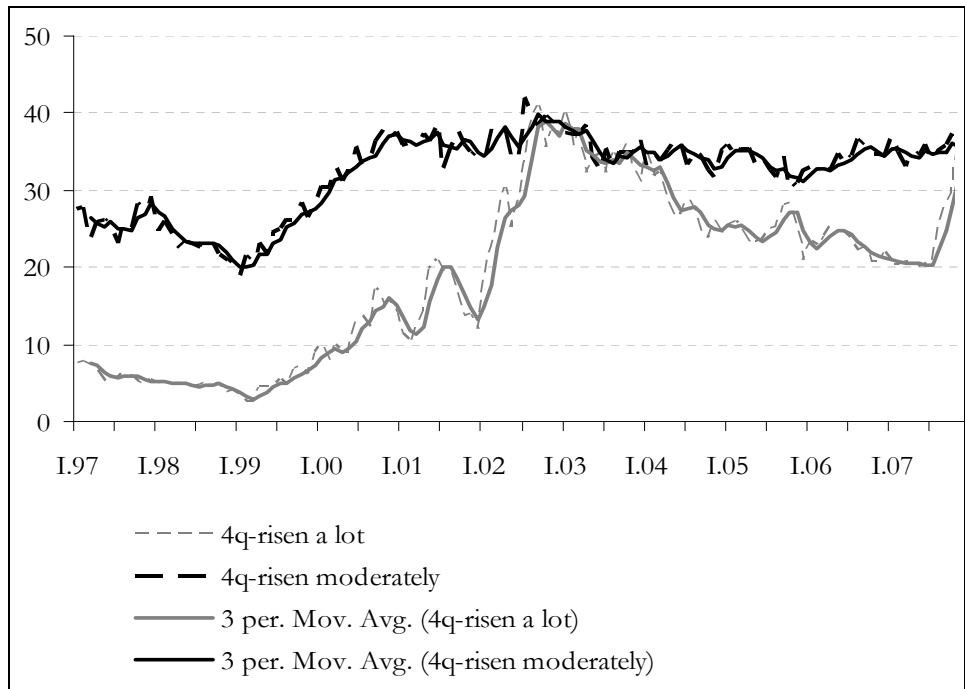
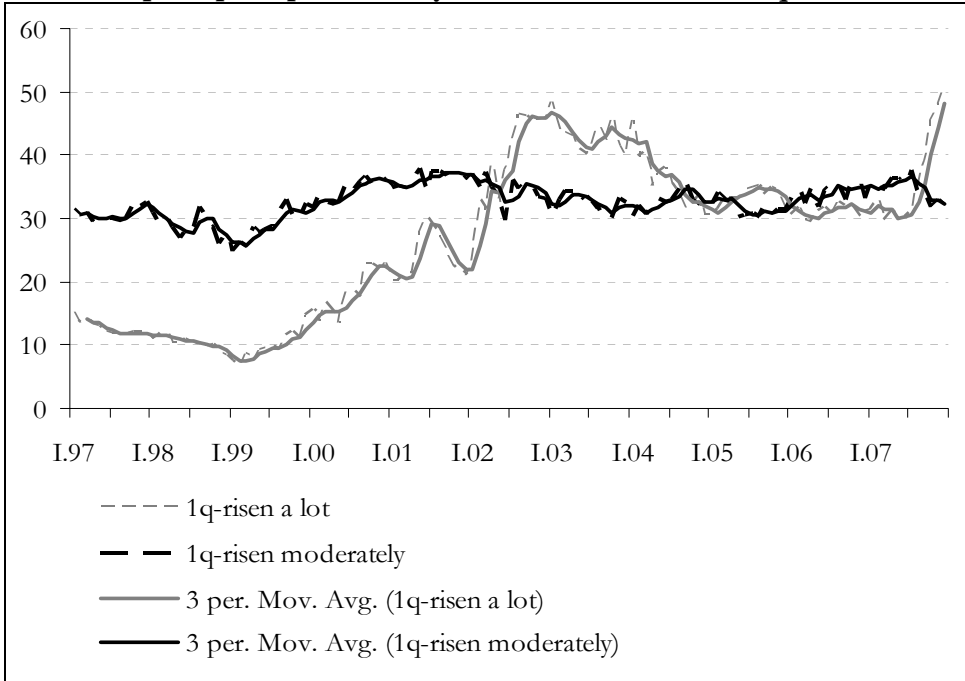
The deterioration of price perception amongst the high income consumers should have been explained by the greater impact of the atypical price movements in items consumed mainly by this group of households. The overall impact of abnormal price movements was slightly higher for this group of consumers; however, the contrary holds true for the recalculated total inflation.

The graphical representation confirms that in both extreme income groups the price perception of a sharp price increase rose markedly after 2002 (see graph 15), but no particular change in differences of level between the low and the high income households was observed, as the gap in perceived inflation for the different income groups remained about the same during the changeover. Even though the final proportion of consumers who felt an intense price increase was higher in low income individuals throughout the whole period surveyed; the change in levels in this response was about the same in both extreme quartiles, and amounted to nearly 20 pps between 2002 and 2003.

Being aware of abnormal price increases in many items, such as food, and services, such as, restaurants, hairdressers and transport, we can believe that this factor had a positive effect on the deterioration of price perception in both income groups. A marked aggravation of price perception after 2002 can be partly explained by the quite large number of items in which atypical price movements was observed after the changeover. Consequently, specific price movements, which affected a large variety of items, might have led to a synchronized jump in the number of respondents from different types of

households who had perceived strong price increase after the changeover. However, looking at the PPI in 2002, low income consumers continued to notice higher inflation in comparison to high income consumers, due to the fact that the overall recalculated inflation rate was higher for this specific household group.

Graph 15: Percentage representation of consumers who stated “prices have risen a lot” and “prices have risen moderately” in the price perception survey in the 1st and 4th income quartile



Source: European Commission.

Conclusion

After the recalculation of the official rate of inflation for different income households, by using the weightings from the household survey, the major price increase suffered by the low income households was confirmed in most of the periods observed. This is the consequence of the greater impact of specific items, especially food and housing; overall expenditure on them, and the price volatility of these items. Major price increases of specific items, together with their major share in the total basket, must necessarily lead to a higher price impact on those who actually face it, in this case the low income households.

The permanent higher price increases experienced by low income households might, in time, explain why this group of consumers demonstrates higher perceived inflation. The detailed analysis of price developments in different COICOP groups in 2002 indicates that the price increase felt by both income groups was rather similar; a sharper price increase in the basic necessities; suffered mostly by low income households; were accompanied by an unusual rise in prices in services, gastronomy and transport; affecting mainly the budget of high income households. This balancing effect in 2002 may explain the very same development in perceived inflation experienced by two extreme income household groups.

Even though this analysis in some way confirms that the individual consumer basket matters in price perception, the results do not give us any satisfactory explanation regarding a so pronounced, and unusual, deterioration of perceived inflation after 2002. One possible explanation lies in the relatively large number of items which confirms unusual price movements at the period of the changeover. However, it is unlikely that only this effect, in itself, could illustrate such a pronounced structural break in perceived inflation after 2002. Though other factors like the evolution of real wages, difficulties in handling the new currency, price memorizing, the dual display of prices, and the conversion rate and rounding off effect have probably made their own contribution to price perception during the changeover. Being, therefore, most probably the psychological effect of the perception, the candidate countries should concentrate on a campaign of communication aimed at spreading correct information among the people. Another important thing is to avoid any shocks to prices during the changeover, such as changes in taxes; which could have a real impact on inflation.

References

AUCREMANNE, L. – COLLIN, M. – STRAGIER, T. (2007): *Assessing the Gap between Observed and Perceived Inflation in the Euro Area: Is the Credibility of the HICP at Stake?* Working Paper Research Series, National Bank of Belgium.

CSU (2008): *Indexy spotřebitelských cen (metodická příručka pro uživatele)*. Český statistický úřad [cited 2008-10-20]. Available from:
<<http://www.czso.cz/csu/redakce.nsf/i/inflace>>.

DEL GIOVANE, P. – SABBATINI, R. (2004): *L'introduzione dell'euro e la inflazione rilevata e percepita*. Temi di discussione N. 532, Banca d'Italia.

EUROPEAN COMMISSION: *Business and Consumer Surveys* [cited 2008-10-20]. Available from:
<http://ec.europa.eu/economy_finance/db_indicators/db_indicators8650_en.htm>.

EUROSTAT (2003): *Euro-indicators*. Eurostat News Release 69/2003 of 18/06/2003 [cited 02-11-2008]. Available from:
<http://epp.eurostat.ec.europa.eu/pls/portal/docs/PAGE/PGP_PRD_CAT_PREREL/PGE_CAT_PREREL_YEAR_2003/PGE_CAT_PREREL_YEAR_2003_MONTH_06/2-18062003-EN-AP.PDF>.

EUROSTAT (2004): *Harmonized Index of Consumer Prices (HICPs). Short Guide for Users*. Luxembourg: European Communities.

FOLKERSTMA, C. K. – VAN RENSELAAR, C. – STOKMAN, A. C. J. (2002): *Smooth euro changeover, higher prices? Results of a survey among Dutch retailers*. Research Memorandum WO No. 682.E. Amsterdam: De Nederlandsche Bank NV.

GIRALDO, A. – TRIVELLATO, U. (2004): *The Effects of Inflation on Households with Different Consumption Structure*. Dipartimento di Scienze statistiche, Università di Padova [cited 2008-11-04]. Available from:
<<http://www.sis-statistica.it/files/pdf/atti/RSBa2004p121-124.pdf>>.

MOSTACCI, F. – NATALE, G. – PUGLIESE, E. (2004): *Gli Indici dei Prezzi al Consumo per Sub Popolazioni*. Contributi Istat n. 3/2004. Roma: Istituto Nazionale di Statistica [cited 2008-11-04]. Available from:
<www.istat.it/dati/pubbsci/contributi/Contributi/contr_2004/2004_3.doc>.

NUCCITELLI, A. (2006): *Experimental Indicators of the Impact of the Price Dynamics on Specific Sub-Populations: Some Quality Issues and Results*. Proceedings of Q2006, European Conference on Quality in Survey Statistics [cited 04-11-2008]. Available from: <[www.statistics.gov.uk/events/q2006/downloads/I07_Nuccitelli\(a\).doc](http://www.statistics.gov.uk/events/q2006/downloads/I07_Nuccitelli(a).doc)>.

ANNEXES

List of abbreviations

CPI	Consumer Price Index
COICOP	the Classification of Individual Consumption by Purpose
EA-12	Eurozone (12 countries)
pp/pps	percentage point/percentage points
PPI	Price Perception Indicator

12 – COICOP classes

01	Food and non alcoholic beverages
02	Alcoholic beverages, tobacco and narcotics
03	Clothing and footwear
04	Housing, water, electricity, gas and other fuels
05	Furnishings, household equipment and routine household maintenance
06	Health
07	Transport
08	Communication
09	Recreation and culture
10	Education
11	Restaurants and hotels (Gastronomy & Hospitality sector)
12	Miscellaneous goods and services



University of Economics, Prague
Faculty of International Relations
Náměstí Winstona Churchilla 4
130 67 Prague 3
<http://vz.fmv.vse.cz/>



Vydavatel: Vysoká škola ekonomická v Praze
Nakladatelství Oeconomica

Tisk: Vysoká škola ekonomická v Praze
Nakladatelství Oeconomica

Tato publikace neprošla redakční ani jazykovou úpravou

ISSN 1802-6591