



15th CEIES seminar

Inflation in Europe — Different measures and their users

Berlin, 4 and 5 October 2001



EUROPEAN
COMMISSION



THEME 1
General
statistics

A great deal of additional information on the European Union is available on the Internet.
It can be accessed through the Europa server (<http://europa.eu.int>).

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1st day - 4 October 2001

(starting at 2 p.m)

13:30 REGISTRATION

14:00 OPENING SESSION

Welcome to the participants:

Mr J. Lamel, Vice-chairman of CEIES

Opening address:

Mrs K. Siune, chairperson of the subcommittee

Keynote speech:

Mr B. Meganck, Director, European Commission, Eurostat

14:30 (1) STATE OF THE ART

CHAIR: MR U. HEILEMANN, Rheinisch-Westfälisches Institut für Wirtschaftsforschung, Germany

Presentation of the HICP and Comparison between CPIs and the HICP:

Mr J. Astin, European Commission, Eurostat

Presentation of national CPIs:

Mr L. Hoven, CBS, Netherlands

Ms E. Szabo, Central Statistical Office, Hungary

Mr G. Elbel, Statistisches Bundesamt, Germany

15:20-15:50 Coffee / tea break

15:50 (2) OFFICIAL USERS, ECONOMIC AND MONETARY POLICY

CHAIR: MR D. FENWICK, Office for National Statistics, United Kingdom

Speakers:

Mr W. Bier, European Central Bank

Ms M. Druant, National Bank, Belgium

Discussants:

Mr T. Quinn, Central Bank, Ireland

Mr I. Suoniemi, Labour Institute for Economic Research, Finland

16:40-17:10 OPEN DISCUSSION

17:10 END OF THE FIRST DAY

2nd day - 5 October 2001

(starting at 9:30 a.m)

09:30 (3) MARKET AND BANK ANALYSTS / RESEARCH INSTITUTES

CHAIR: MR P. GEARY, National University of Ireland

Speakers:

Mr E. D'Elia, Istituto di Studi e Analisi Economica, Italy

Mr R. Barrie, CSFB, United Kingdom

Mr P. von der Lippe, Universität Essen, Germany

Discussants:

Mr Y. Vartia, University of Helsinki, Finland

10:30-11:00 Coffee / Tea break

11:00 (4) COLLECTIVE BARGAINING AND CONTRACTING: BROAD PUBLIC

CHAIR: MR P. HASCHKA, Statistical Office, Austria

Speakers:

Mr V. Aalto-Setälä, National Consumer Research Center, Finland

Mr E. Mermet, European Trade Union Institute

Mr J. Lamel, Wirtschaftskammer, Austria

Discussant:

Mr L. Hoven, CBS, Netherlands

11:45-12:15 OPEN DISCUSSION

12:15-14:00 Lunch break

14:00 (5) JOURNALISTS / PRESS

CHAIR: MRS K. SIUNE, Institute for Studies in Research and Research Policy, Denmark

Speaker:

Mr R. Kuls, Börsen-Zeitung, Germany

Discussants:

Mr D. Murphy, Ireland

Mr Zeuthen, Denmark

15:00 (6) PANEL DISCUSSION: NEEDS FOR THE FUTURE

CHAIR: MR J. LAMEL, Wirtschaftskammer, Austria

Panel:

Mr J. Křovák, Statistical Office, Czech Republic

Mr J. Astin, European Commission, Eurostat

Mr W. Bier, European Central Bank

Mr J. Ruiz Castillo, Universidad Carlos III, Spain

Mr L. Biggeri, ISTAT, Italy

16:00-16:30 Coffee / Tea break

16:30 REACTION FROM EUROSTAT

Mr B. Meganck

16:40 SUMMING UP BY THE CHAIRMAN OF THE SUBCOMMITTEE

Ms K. Siune

16:55 CLOSING UP BY THE CHAIRPERSON

Mr J. Lamel,

Vice-Chairman of the CEIES

17:00 END OF THE SEMINAR

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CONTENTS

Documents presented at the seminar on “Inflation in Europe – Different Measures and their Users”

1st day

THEME 1 – STATE OF THE ART

<i>Paper: Mr J. Astin, European Commission, Eurostat</i>	9
<i>Paper: Mr L. Hoven, CBS, The Netherlands</i>	11
<i>Paper : Ms E. Szabo, Central Statistical Office, Hungary</i>	19
<i>Paper : Mr G. Elbel, Statistisches Bundesamt, Germany</i>	27

THEME 2 – OFFICIAL USERS, ECONOMIC AND MONETARY POLICY

<i>Paper: Mr W. Bier, European Central Bank</i>	35
<i>Paper : Ms M. Druant, National Bank, Belgium</i>	39

2nd Day

THEME 3 – MARKET AND BANK ANALYSTS / RESEARCH INSTITUTES

<i>Paper: Mr E. D’Elia, Istituto di Studi e Analisi Economica, Italy</i>	53
<i>Paper: Mr R. Barrie, CSFB, United Kingdom</i>	61
<i>Paper: Mr P. von der Lippe, Universität Essen, Germany</i>	69

THEME 4 – COLLECTIVE BARGAINING AND CONTRACTING: BROAD PUBLIC

<i>Paper: Mr V. Aalto-Setälä, National Consumer Research Centre, Finland</i>	77
<i>Paper: Mr E. Mermet, European Trade Union Institute</i>	83
<i>Paper : Mr J. Lamel, Wirtschaftskammer, Austria</i>	89

THEME 5 - JOURNALISTS / PRESS

<i>Paper: Mr R. Kuls, Börsen-Zeitung, Germany</i>	97
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Summing up by the chairman of the subcommittee

<i>Ms K. Siune, Chairperson of the subcommittee</i>	101
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List of Participants	103
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STATE OF THE ART

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The HICPs started life as a way of meeting the Maastricht Treaty requirements to have a price stability measure for assessing progress towards convergence for membership of the European Monetary Union. The Treaty stipulated that

“Inflation shall be measured by means of the consumer price index on a comparable basis, taking into account differences in national definitions”.

So from 1993 to 1995 we held lengthy discussions with the CPI experts from the member states, and we eventually produced a Council Regulation (Council Reg (EC) 2494/95, 23.10.95) setting out the framework for a new type of CPI, to be known as the Harmonized Index of Consumer Prices (HICP). It was launched in 1997, in preparation for the third stage of Monetary Union in January 1999.

At an early stage in our discussions, it became obvious that the European Central Bank (ECB) would need an aggregate index to enable it to monitor price stability over the eurozone, and indeed this requirement is met by the Monetary Union Index of Consumer Prices (MUICP) which is published monthly. The MUICP is simply a weighted average of the national HICPs.

What sort of index is the HICP? Both from its initial purpose as a comparative index, and from its later use as an aggregate eurozone index, its purpose is clearly macroeconomic. Although it cannot pretend to measure the totality of inflation, it serves as a measure of inflation faced by the household sector, itself often referred to simply as “inflation”.

Nobody can define inflation in a way which is meaningful for statisticians. The accepted definition (“*a persistent increase in the general level of prices*”) is not much help to the index compiler. Phrases like “cost-of-living”, “standard of living” and so on are bandied about without much thought as to what they might mean in detailed reality. In deciding on the concept of the HICP we had to decide on the underlying principle, but we also had to be rather pragmatic on details - as is indeed the case with all national CPIs.

It is perhaps easier to say what the HICP is not, rather than what it is. It is not designed as a compensation index, which might imply that all household expenditure, including such items as mortgage interest should be included. Nor can it be said to be a cost of living index (COLI), which implies that the basket of goods and services comprising the index should be continually changed to reflect changing tastes which may be assumed to relate to utility maximisation, difficult or impossible to measure though this may be in practice.

In fact, the HICP is what one might describe, with some hesitancy, as a “pure” price index: the framework regulation defines it as a “Laspeyres-type” index, implying that it should measure the changing price of a fixed basket of goods and services. Of course, the composition of the basket must be updated to reflect changing markets. And this at once leads to that most difficult of subjects: how to deal with new products, products with altered specifications, and the accompanying issues of quality change. Nobody has the solution to these

questions, and we would not pretend to have the solution for the HICP either, though we are continuing to work hard on finding one.

Some countries, though few in the EU, maintain that their national CPI uses a COLI approach, yet in practice the construction of such indices seems to differ little from those who affirm that they produce a Laspeyres-type index.

Another difference between the HICP and some national CPIs is the approach to population coverage. At a seminar in Madrid earlier this year, Prof Ruiz Castillo showed that there could be some significant differences between a CPI using weights relating to total national consumption as opposed to a CPI using weights obtained by averaging expenditure proportions over the whole population. The former type (sometimes referred to as “plutocratic” because it gives a relatively high weight to the high expenditure of the rich) may be regarded as unsuitable for a compensation index, but is appropriate for a measure of total consumer inflation – and indeed this is the basis of the HICP. The latter type of index, (referred to as “democratic”) which is used in some national CPIs, may be more appropriate for an index which is used as a reference for wage negotiations. I am sure we will return to this topic later in the discussion.

Owner-occupied housing is a traditionally difficult sector for CPI statisticians. There is a wide range of practices among the member states in their national CPIs. Shelter costs (as opposed to the more tangible items such as regular repairs, maintenance and insurance) are currently excluded from the HICP, though we are studying how to include house prices on the basis of acquisition costs. Housing is a capital item in the national accounts (ESA95) and there is consequently a good argument for permanent exclusion. But most users feel that to do so would omit an important aspect of a type of inflation which most certainly faces consumers.

In the limited time available, I will mention only one other important sector where one can find major differences in treatment between the HICP and national CPIs, and that concerns education and health expenditure, much of which is heavily subsidised by the state in most member states. Given that the HICP is intended to measure household inflation, rather than total inflation, we developed the concept of Household Final Monetary Consumption Expenditure (HFMCE). In this case, this is a rather long way of saying that where a consumer purchases a subsidised product (such as a prescription drug), the price (and weight) which enters the HICP is restricted to that part which is finally paid by the consumer. The subsidised part is relevant for a government expenditure price index, if such exists.

Let me finish by showing you some charts which demonstrate the differences between HICPs and national CPIs as they have evolved over the past few years.

One of the persistent questions is: is there evidence of gradual convergence between national CPIs and national HICPs? These charts show that in general there are indeed signs of convergence, but it is not universal, nor are they always present. I would like to emphasise that there is no question – nor I hope will there be – of any compulsion for member states to adopt the HICP as their national index. Of course, there would be advantages for the public in having a single index, but from a technical viewpoint I believe that it is preferable to have separate indicators if there are different purposes to be served.

CONSUMER PRICE INDEXES IN THE NETHERLANDS: AN OVERVIEW

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1. Introduction

The aim of a consumer price index (CPI) is to measure changes in prices of goods and services bought by consumers. Consumer price indexes are used for various purposes. Amongst others, a consumer price index is used as a measure of inflation, as an instrument for indexation of wages, pensions, alimony, rents etc. and for national accounting deflation. This paper presents an overview of the key concepts underlying the Dutch national CPI. It is then compared with the harmonized index of consumer prices (HICP), which was designed to measure consumer price inflation on a comparable basis between Member States of the European Union.

2. The national CPI: guiding principles

2.1. The CPI and cost of living

The CPI is used for various purposes. Measurement of changes in the cost of living is regarded by many as one of the most important purposes. A conceptual framework for an index that monitors the change in the cost of living is provided by the theory of the cost-of-living (COL) index. In economic theory, a (true) cost-of-living index is defined as the minimum ratio of expenditure required to maintain a constant level of utility. Alternative formulations speak of “standard of living” or “well being” instead of “utility”, or define the COL index as an index that measures the cost of remaining on the same indifference curve. It is important to notice that the COL index is a theoretical construct, not a straightforward index formula which can be applied in practice. Nevertheless, the concept of the COL index is a quite useful guiding tool for making decisions about CPI measurement issues. In the Netherlands, COL index theory provides the conceptual framework for the CPI. Several other countries have adopted the COL index framework for their CPI (the United States, Sweden).

In practice, the CPI measures the average change in the prices paid by consumers for a fixed basket of goods and services. The CPI is Laspeyres-type price index. It equals the ratio of the cost of the base-period basket at this month's prices to the actual cost of the base-period basket in the base period. See Appendix 1 for the corresponding formula.

A Laspeyres price index thus answers the question: “What is the value of the base-period basket of goods and services in today's prices? A Laspeyres price index can be regarded as an upper bound of a true COL index. By substituting goods that have become relatively cheaper for goods that have become relatively more expensive, consumers can maintain the same utility level for less than the cost of the base period market basket. The difference between a Laspeyres index and an index that takes this substitution properly into account is known as *substitution bias*¹.

¹ There is a class of index number formulae, known as “superlative” indexes, that account for changes that consumers make in response to relative price changes. These indexes, among which are the Fisher and the Törnqvist indexes, can be regarded as close approximations to the true COL index. See Diewert, 1976. Their estimation, however, requires information on the comparison period market basket. They can only be produced with a considerable time lag, because it takes time to collect and process consumer expenditure data.

2.2. Goods and services covered in the CPI

The goods and services that are customarily included in a country's CPI are (market) goods and services which are bought by the households themselves. This is also the case in the Netherlands. The consumer's standard of living does not only depend on market goods and services, but on other aspects as well, such as goods and services which are provided by the government (education, fire protection, national defense) and environmental quality. It is sometimes argued that such factors should be included in a COL index. This would most certainly create enormous measurement problems. A CPI restricted to market goods and services could be looked upon as (an approximation to) a subindex of the all-encompassing COL index, specifically a subindex that is conditional on the excluded factors.

The scope of the CPI is defined as the set of goods and services which are acquired by the average household for prices which are known to the households at the moment of acquisition. We will elaborate upon this definition in the remainder of this section.

All acquisitions are done by the household itself. The acquisitions are made from net spendable household income, that is gross household income minus obligatory transfers. Obligatory transfers are income tax and social premiums. For households which fall under the compulsory medical insurance (about 63 percent of the total population) the premium is an obligatory transfer, hence is not part of net spendable income. Although the premium for a voluntary medical insurance cannot be conceived of as an obligatory transfer, on account of a unified treatment of both types of households it is deleted from net spendable income as well. This leaves us with the problem that the remaining non-insured medical expenses of both types of households are not defined in the same way. This is caused by the fact that the coverage of the compulsory medical insurance differs from the coverage of the various voluntary medical insurances. The solution chosen is to delete from the net spendable income of the voluntarily insured households also the value of those medical expenses which would be covered by the compulsory medical insurance. For both types of households, own risk is also deleted.

Every transaction corresponds with a price. Thus all transactions with the character of a free donation or a transfer are excluded. In addition, at the moment of transaction the price must be known to the buyer. Thus all transactions where the price is determined retrospectively are excluded.

The scope of the CPI is restricted to those goods and services which are acquired in the base period. Savings which can be regarded as deferred acquisitions, are excluded. Payments which have largely the character of savings, such as premiums for life insurances and pensions, are also excluded.

Some acquisitions imply the payment of tax. Living in a house (owned or rented) implies the payment of property tax, sanitation levy, etc. With a dog corresponds dog tax, with a motor car motor vehicle tax, etc. These consumption-related taxes play an important role in the household's perception of the cost of living and are therefore included in the scope of the index. Government services, such as the supply of a passport or a legal document, are also included.

2.3. Population coverage

Statistics Netherlands calculates the CPI for three population groups. The CPI for *all private resident households* can be considered the most general index. This index serves as the main inflation indicator in the Netherlands. Two indexes are compiled for *households of employees*, one for households with *low income* and one for households with *high income*. The median of the income distribution of households of employees forms the threshold between high and low. The population of households of employees is thus split into two parts of equal size.

2.4. Geographical coverage

The CPI covers all acquisitions of resident private households on the domestic territory or abroad. Expenditure by non-residents on the domestic territory is excluded.

2.5. The CPI exclusive of tax changes

The CPI relates to the prices actually paid by consumers for the goods and services within its scope. Indirect taxes, such as value added tax and excise duties, are thus included. In addition to the CPI which is based on the

actually paid prices, Statistics Netherlands also compiles a CPI exclusive of the effect of changes in the rates of indirect taxes and consumption-related taxes. In price index literature such an index is often referred to as a “net price index”.

The CPI exclusive of tax changes is compiled as the ratio of the cost in the comparison and the base period necessary for the acquisition of the previously defined basket of goods and services, where it is assumed that the tax rates have not changed since the base period. The prices entering the numerator of the index can not be observed. They must be estimated, based on observed prices and information on tax rates. Only the direct effect of tax rate changes is taken into account. Incorporation of the indirect effect (of taxes levied on previous stages of the production process) would necessitate too many, rather arbitrary, assumptions. Statistics Netherlands publishes a “net price index” for the three population groups mentioned in section 2.3.

Apart from analytical purposes, the main use of the CPI exclusive of tax changes lies in (automatic) wage and salary escalation. The main argument is, that when the government decides to increase (or to reduce) an excise duty or tax, for example on tobacco, in order to reduce (or stimulate) consumption, the effectiveness of such a measure should not automatically be reduced.

2.6. *Owner-occupied housing*

Consumer goods are generally not consumed at the very same moment when they are acquired. An index that is supposed to provide an approximation to a COL index should ideally relate to the costs of consumption or use, assuming that not the acquisition as such, but the consumption or use provides utility. Particularly in the case of consumer durables, which can have a lifetime of many years, the distinction between acquisition and use is not unimportant. The purchase of a durable goods can be considered an investment, designed to provide consumption services over a future time span. Since market transactions do not take place each time the service is consumed, a price of the service cannot be observed, but needs to be estimated in one way or the other.

For practical reasons, the distinction between acquisition and consumption is ignored in CPI compilation, with one exception: owner-occupied housing. Reasons for this can be found in the extremely long lifetime of a house and the very high acquisition costs which are usually spread over time by taking out a mortgage. Homeowners usually spend each month a considerable part of their income on housing, or, to put it in other words: an owner-occupier spends money on a house while he is living in it, and not when he first buys it. An acquisitions approach, based on purchaser prices of (new) houses, does not reflect what owner- occupiers spend on housing. Another reason is that the existence of well developed rental housing markets facilitates the estimation of implicit prices for owner-occupied housing. For other consumer durables, these possibilities do often not exist.

There are, it seems, enough reasons to adopt a flow-of-services approach in the treatment of owner-occupied housing in a CPI which is supposed to approximate a COL index. Within a flow-of-services approach, there are two candidates for estimating the implicit prices for owner-occupied housing: the user-cost approach and the rental equivalence approach.

The user cost approach for owner-occupied housing originates from capital theory. A simple formulation of the monthly cost of living in one’s own house is

$$C_t = r^m_t M_t + r^e_t E_t - A_t + Z_t$$

where M_t and E_t are the mortgage and equity amounts which sum up to P_t , the average price of the house in month t , A_t is equal to the change in the average price over the period, r^m_t is the mortgage interest rate, r^e_t is the opportunity cost of equity capital and Z_t represents all other cost components.

The main difficulty with the user cost approach lies in its practical use. Empirical research has shown that user cost estimates can be extremely volatile². The main reason for this is the volatility of the capital gains component A_t . At certain periods capital gains may be that high that user cost become negative.

The rental equivalence approach uses information from rental markets to arrive at an estimation of the costs of housing for homeowners. It can be argued that the cost of living in one’s own house cannot be less than the rent

² See for example Gillingham, 1983.

that one could receive from a tenant. An owner-occupier always foregoes this amount when he lives in his own house. It can also be argued that, over a longer period, the cost cannot be greater than the rent of a similar rental house, assuming the existence of a sufficiently active rental market, since the homeowner always has the possibility of acquiring equivalent housing services at this price.

It is mainly for practical reasons, and not for its conceptual superiority, that Statistics Netherlands uses rental equivalence in its estimation of shelter cost for owner-occupiers. The produced estimates are far less volatile than user cost estimates would be.

2.7. Insurances

For insurances, Statistics Netherlands uses an approach known as “gross-gross”. The weight in the index, as well as the price indicator, relate to the gross premium payments. The alternative is the so-called “net-gross” approach” based on the costs of repair and replacement of damaged or stolen goods and the costs associated with the services provided by the insurance companies. The weight of insurances in the index relates to these services. Usually the change in the gross premium is taken as a measure of price change of the services of the insurance company.

Gross-gross is in our view the correct way to deal with insurances in (an approximation of) a COL index. Gross weights reflect the buying behaviour of consumers; what consumers pay are gross premiums. It is likely that a consumer experiences a rise of the premium of a particular insurance as an increase in his cost of living.

3. A comparison between CPI and HICP

The Harmonized Index of Consumer Prices (HICP) is produced in each Member State using a harmonized methodology. It is the main measure of price stability in the euro-zone.

The HICP can be described as a “Laspeyres-type” or a “pure” price index measuring the average price change for a fixed basket of consumer goods and services. “Pure” means that it is only the changes in prices that are reflected in the measure between the current and the base or reference period.

The coverage of the HICP is defined as those goods and services which are included in household final monetary consumption expenditure, which is defined as that part of final consumption expenditure which is incurred:

- by households irrespective of nationality or residence status, and
- in monetary transactions, and
- in the economic territory of the Member State, and
- on goods and services that are used for the direct satisfaction of individual needs or wants, and
- in one or both of the time periods compared.

Box 1 provides an overview of the main differences between CPI and HICP. While the CPI uses COL index theory as a guiding principle, and the HICP does not, both measures are not very different from each other. The main differences relate to coverage.

As regards the *population* coverage, the HICP includes individuals living in institutional households (retirement homes, homes for the disabled, etc.). The CPI excludes them, mainly for practical reasons: since they are not included in the yearly budget survey, detailed expenditure data for this category are not available. In the HICP, rough estimates for the expenditure shares for persons in institutional households are used.

As regards the *geographical* coverage, it follows from the main purpose of the CPI that all acquisitions of the reference population, on the domestic territory or abroad, should be included. The HICP, its main purpose being an inflation indicator, is restricted to acquisitions on the economic territory, but includes expenditure by non-residents.

As regards the coverage of *goods and services*, the point of departure in the HICP is not really different from the starting point in the CPI. Different choices were made in some borderline/special cases, viz. medical care, owner-occupied housing and consumption-related taxes.

In the Netherlands, the majority of health goods and services is provided to households in transactions described as “*social transfers in kind*”. These transfers are partly or wholly financed by government units or

NPISH's³ out of their general incomes (e.g. taxes, social security contributions) and therefore not included in CPI and HICP. As mentioned earlier, it was decided to exclude privately insured medical care from the scope of the CPI as well, on account of a unified treatment of compulsory insured and privately insured households. Privately insured medical care is included in the coverage of the HICP⁴.

Box 1. Comparison between CPI and HICP

	Consumer Price Index (CPI)	Harmonized Index of Consumer Prices (HICP)
Definition	The CPI measures the change over time in the general level of prices of goods and services that households acquire for consumption.	The HICP measures the average price change of those goods and services which are included in household final monetary consumption expenditure
Guiding principle	Theory of the cost-of-living (COL) index.	The HICP is a “pure” price index.
Formula used	Laspeyres	Laspeyres
Uses	<ul style="list-style-type: none"> ■ Measure of inflation ■ Adjustment of wages and pensions ■ Adjustment of rents, annuities, alimony ■ Adjustment of tax income brackets, child support payments, student grants ■ Deflator of other economic series 	<ul style="list-style-type: none"> ■ Measure of inflation.
Scope		
■ Goods and services	The set of goods and services which are acquired by the average household for prices which are known to the household at the moment of acquisition. The acquisitions are made from net spendable household income, that is gross household income minus obligatory transfers. Excluded from the index are income tax, social premiums and insured medical care. Included are consumption-related taxes (property tax, sanitation levy, motor vehicle tax) and government services. Owner-occupied housing is included.	The set of goods and services which are included in household final monetary consumption expenditure. Included is privately insured medical care. Consumption-related taxes are excluded, unless when they are regarded as prices for services. Owner-occupied housing is not yet included.
■ Population	All resident private households.	All households, including individuals living in institutional households.
■ Geographic	All acquisitions of resident private households on the domestic territory or abroad. Expenditure by non-residents on the domestic territory is excluded.	All acquisitions on the economic territory, by residents as well as non-residents. Expenditure by residents abroad is excluded.
Owner-occupied housing	Flow-of-services approach (rental equivalence)	Not yet included. Rental equivalence and user cost ruled out. Net acquisition index should be developed on an experimental basis.
Insurances	Gross-gross approach	Net- gross approach.

³ Non-profit institutions serving households.

⁴ This makes the HICP susceptible to changes in the health care financing system, which regularly take place. In the Netherlands, the whole system is currently under review. Of course, it should be recognized that there is nothing new in that. Government action can influence the prices that consumers pay in many ways. A recent example was the abolishment of radio and TV license fees in the Netherlands. This reduced measured consumer price inflation by 0.4 percentage points.

Owner-occupied housing is presently not included in the coverage of the HICP.

The issue of owner-occupied housing in the HICP raised a lot of debate. Rental equivalence was ruled out because it was considered an imputation. The argument was, that imputations should not appear in a (consumer price) inflation measure, because inflation is a monetary phenomenon. The HICP should therefore be restricted to monetary transactions⁵.

User cost was also not considered appropriate, because this would introduce interest rates into the HICP. Central banks use interest rates as a tool of monetary policy and therefore do not like them included in an inflation measure: *“If interest rate costs are included in the HICP, policy actions to maintain price stability may, at least initially, have perverse effects on the headline HICP measure of inflation, leading to presentational problems for the communication of monetary policy decisions”* (European Central Bank, 2000). This argument caused surprisingly little debate. There may be good reasons to reject the user cost approach as a practical way to measure owner-occupier’s shelter cost (volatility is a big problem), but there can not be much doubt that interest is a major part of the cost of consuming housing services. If mortgage interest rates go up, owner-occupier’s shelter cost go up. That is a reality.

After the decision was made that user cost and rental equivalence were not appropriate in a consumer price inflation measure, the remaining options were: excluding owner-occupied housing altogether from the HICP or develop an index of acquisition prices of new dwellings. It was concluded that it was unsatisfactory to exclude owner-occupied housing from the HICP. The ECB remarked: *“...considering the substantial expenditures of households required for the use of shelter services, the exclusion of owner-occupied housing from HICP’s is not satisfactory and leaves a gap in the coverage of consumer expenditures for consumption purposes”*. It was also considered unsatisfactory against the background of the comparability requirement for the HICP: *“The owner occupation level differs in the EU between around 40% (DE) and 80% (IE) and the market shares of rental dwellings differ accordingly. Depending on the size of the rental market in the countries, price changes in the housing sector are reflected to a differing degree in HICP’s of different countries. This reduces the comparability of HICP’s”* (European Central Bank, 2000).

This leaves the net acquisitions approach as the only remaining candidate. Last year, it was decided that a net acquisitions approach should be developed on an experimental basis in each Member State and that a pilot time series should be developed, addressing methodological and measurement issues. After a certain time, a decision should be made if this index is to be incorporated in the HICP.

The net acquisitions approach for owner-occupied housing in a consumer price inflation measure is not undisputed. Measuring asset price developments can be considered a quite useful exercise in the context of total inflation measurement, but their inclusion in a consumer price index is controversial. A price index for new dwellings cannot be expected to reflect what owner-occupiers spend on housing. For owners, an increase in house prices has two effects on the cost of housing. The direct effect raises the cost of housing (see the user cost equation in section 2.6), because the house price (which equals unpaid mortgage plus equity) is multiplied by interest rates. But the capital gains effect lowers the cost of housing. Triplett (2001) notes, that *“The common sense of the user cost equation is the widely observed fact that owners like to see house prices go up, but prospective owners do not (for prospective owners, there is only the direct effect, they do not benefit from the capital gain). Including house prices only in the CPI overstates the cost of housing to owners during a period of rising house prices, and understates it if house prices fall”*.

Another problem in the net acquisitions approach concerns weights. It could be argued that a basic requirement should be that countries with a high owner-occupation level have a higher weight for owner-occupied housing in their index than countries with a low owner-occupation level. The net acquisitions approach does not necessarily meet this requirement. According to Eurostat, this is not a serious drawback: *“...although this aspect of weights may seem contradictory to some users, it actually reflects the volume in monetary transactions incurred by the household sector”* (Eurostat, 2000).

⁵ This is a point of controversy. Triplett notes: *“The statement that inflation is a monetary phenomenon is a statement about its causes...But the analysis of inflation, and the determination of its causes, is a different topic from the measurement of inflation...”*. He observes, that the HICP does contain an imputation in the case of insurances, and continues: *“Whether or not the price is imputed should not be the question. The question is whether the occupants of owner-occupied housing are affected by inflation in the housing market, and if they are how should we measure inflation for this portion of the CPI population.”* (Triplett, 2001).

We dwelled upon the issue of owner-occupied housing at some length, because the costs of housing, and the way these are measured, have a big impact on the consumer price index. In the Netherlands' CPI, the weight of housing is more than 20 percent, of which over 12 percent goes to owner-occupied housing. Figure 1 shows a comparison between CPI inflation and HICP inflation (measured as the change in the index over a period of twelve months). Figure 2 shows a comparison between the 12-months change of the HICP and the 12-months change of the CPI excluding owner-occupied housing. These figures show that a considerable part of the difference between CPI and HICP inflation can be attributed to the fact that owner-occupied housing is presently not included in the HICP. These differences might have been larger if a net acquisitions approach had been followed in the HICP. House price have risen quite sharply over the last couple of years, while the increase in (imputed) rents was quite moderate (in 2000 and 2001 below the general inflation level).

Figure 1. Inflation in the Netherlands: comparison between HICP and CPI

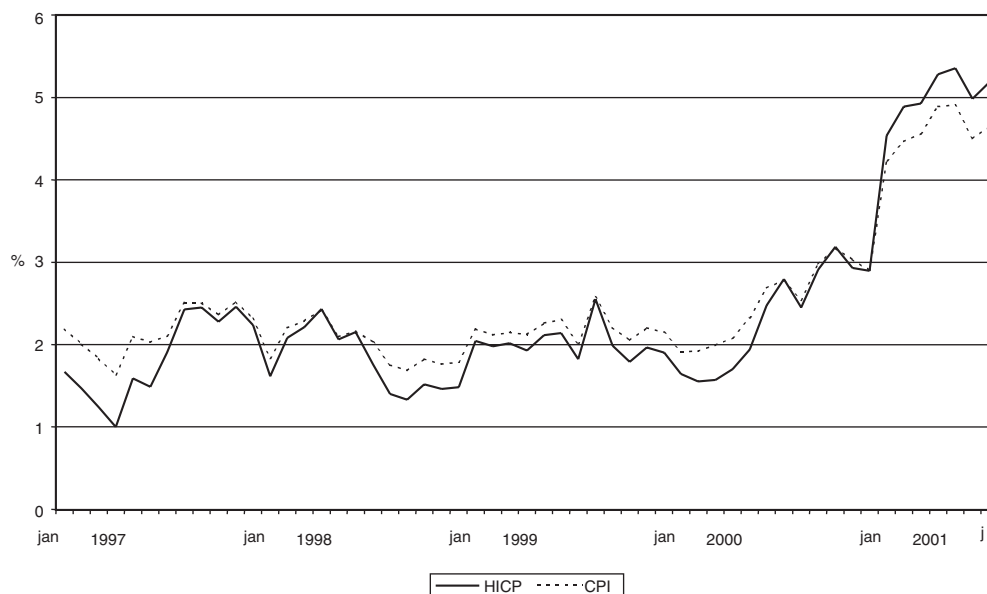
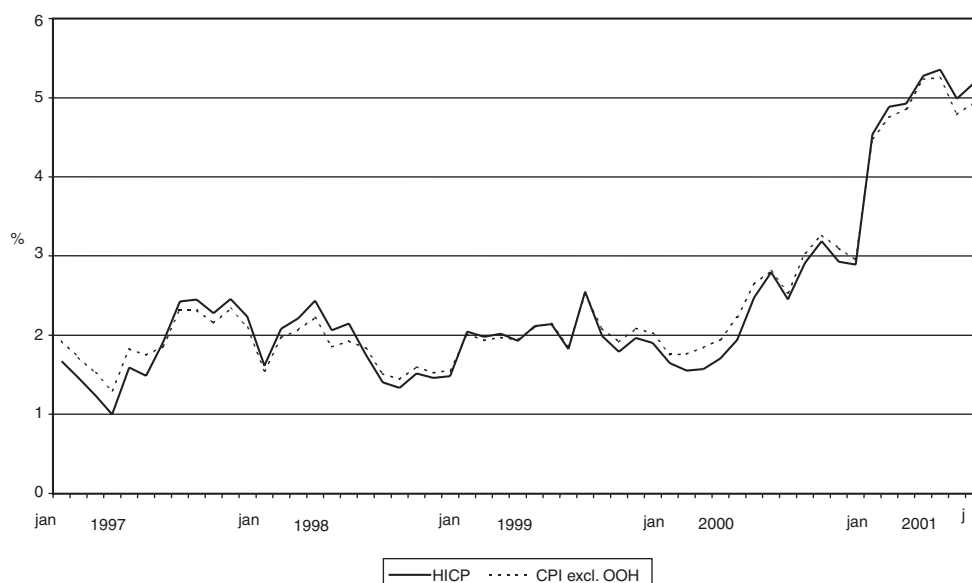


Figure 2. Inflation in the Netherlands: comparison between HICP and CPI excluding OOH



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Appendix 1. The Laspeyres price index formula

The CPI and the HICP are computed using the Laspeyres formula. The Laspeyres price index of period t compared to base period 0 can be written as

$$P_L^t = \frac{\sum_{i=1}^N p_i^t q_i^0}{\sum_{i=1}^N p_i^0 q_i^0}, \quad (1)$$

where p_i^t denotes the price of commodity i in period t , p_i^0 the price in period 0 and q_i^0 the quantity consumed of commodity i in the base period ($i=1, \dots, N$). Formula (1) can also be written as

$$P_L^t = \sum_{i=1}^N w_i^0 \frac{p_i^t}{p_i^0}, \quad (2)$$

where

$$w_i^0 = \frac{p_i^0 q_i^0}{\sum_{j=1}^N p_j^0 q_j^0}$$

denotes the expenditure share of commodity i within total consumption expenditure

METHODOLOGIES OF CONSUMER PRICE INDEX (CPI) IN HUNGARY ¹

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Summary: In Hungary, the Consumer Price Index (CPI) is a measure of the national average price change in the fixed market basket of goods and services purchased by the private households.

The purpose of this paper is to present a general overview of the method applied for the computation Hungarian CPI.

The CPI is the most widely used of inflation indicator in Hungary, the transition to market economy increased its importance since 1990.

Since January 1992 an improved system of the CPI has been introduced. The main target of the improvement was a better harmonisation to the needs of a real market economy to the practice of EU countries.

In 1998, during the statistical screening and starting of accession negotiation with EU, it has become more important for Hungary to consider the harmonised EU procedures in developing our system.

In the way of harmonisation year 2000. was the next substantial year, when the Consumer Price Index is based “fully” on internationally endorsed standards and recommendations. In addition we compute Harmonised Consumer Price Index (HICP) and Core Inflation too.

The main characteristics of Hungarian CPI between 1968-1990:

Responding to changes in the economy introducing of elements of market economy, in the frame in the new mechanism economic reform, in 1968 the so-called “western type” CPI calculation was introduced as well. Until 1991 the method was heterogeneous. In wide areas of economy the regulated prices remained in force but for other areas the prices of selected items were collected from a retail trade survey and services survey, that is to say various departments of the Statistical Office worked on the CPI. The prices of appr. 2500 of important items, so called representative items were recorded in various settlements across the country, once or twice a month. The prices of appr. 600 services were observed quarterly. The Department of Economics in Hungarian Central Statistical Office (HCSO) obtained all these primary statistics and completed them in some respect (e.g. gas, electricity, water charges, local and long distance transport, central heating).

In accordance with the number of representative items, the outlet sample was also big.

The weights were based on National Accounts data.

The Consumer Price Indices has only been made on the basis of the corresponding month of the previous year. It was characteristic to a planned economy.

Following the fundamental changes in the economy, under new circumstances, the significant methodological renewal of the CPI took place in 1991 with respect to the practice of EU countries, and with consideration of the major requirements and earlier experiences of the Hungarian CPI.

¹ Prepared by Eva SZABO, head of Consumer Price Section in HSCO

The main characteristics of Hungarian CPI at the present: CPI methodology involves the following topics:

- 1.Scope
- 2.Official base, calculation method
- 3.Sampling method
- 4.Data sources
- 5.Publication

1.Scope

The index is compiled monthly and covers the whole country and entire population living in private household. It is the measure of the price changes of goods and services intended for household consumption.

2.Official base and calculation method

The Hungarian CPI is a Laspeyres type index. The base (reference) period of the index computation is December of the previous year. In addition, every month the indices are calculated on this basis of the previous month and the same month of the previous year.

All other (quarterly, yearly etc.) indices are calculated as composite chain indices (averaged when applicable) of the above mentioned monthly indices.

For the computation of lowest level indices, the price relatives of the representative items are calculated by dividing the national average price of the given item in the current month by the national average price of the base month. When a price observation is temporarily unavailable in a given month, its price is imputed based upon the price movement of similar products in the same item category in the same localities. The estimated (imputed) price is used for two months.

The price index of the 156 basic headings is the weighted average of the price relatives of the included representative items. The price indices of the major groups and total consumption are the weighted average of 156 basic headings.

The compilation of the Consumer Price Index is carried out by the HCSO with the 19 regional offices.

3. Sampling method

The representative character of data must be considered a requirement in consumer price statistics, as well, to the extent that concentration and its random techniques are employed simultaneously and compromise can inevitably be reached with respect to practical organisational solution.

The sampling methods of price observation are used the following issues:

- 3.1. Selection of items
- 3.2. Selection of localities
- 3.3. Selection of outlets
- 3.4. Number of recorded prices

Sample size is: 1100 selected items, about 100 selected localities, and more than 8000 selected outlets. Random sampling method (except HBS) is not used, so no information is available about sampling errors and non-sampling errors.

3.1. Selection of items

The selection of representative items is realised by the CSO, in a concentrated way.

The selected goods and services are consumed by households and their prices movement are representative for all items.

The list of items is revised every year. The appearance of new products and disappearance of old products are taken into consideration annually.

The selected representative items present the most important elements in the consumption expenditure of the population. Their number decreased considerably while the number of recorded prices per representative item increased. These changes were related to the fact that while the dispersion of the price indices of representative items was abating, as is to be expected, the regional dispersion of the prices of representative items was growing in the wake of the development of a market economy.

The CPI covers the goods and services purchased by the population for the direct satisfaction of human needs in households:

- purchases on the market of durable and non-durable goods, except for houses, apartments, and purchases of tools or special clothing needed for work,
- purchases of market services,
- the imputed rents of owner-occupied dwellings.

The CPI does not cover those elements of consumption which are not purchased: the consumption from the own production of the households, (social) benefits in kind, gifts, domestic services produced for themselves by households. The black market prices are not considered.

Medical and educational costs are included up to the proportion paid by families. Health care system is mainly financed by the government and that expenditure is treated as social benefits in kind of households' consumption.

In the last couple of years there has been a shift to market economy in the financing of health care but its share is still very small. The pharmaceutical products are considered as one item, although it is further subdivided into 500 different specifications.

The same is true for education as well. The universities and high-schools fees are taken from a special book, where these prices are listed. These prices were introduced from 1998.

Housing is very special in Hungary. The share of owner occupied dwellings is higher than in the EU countries (e.g. 92%). Rate of municipal dwellings is about 5%, and the lowest share is the market-type dwelling (rented dwellings).

Data on housing is based on municipal information and the agencies. The treatment of imputed rents, as owner occupied housing in the computation of CPI is a difficult issue, because the real market of rented dwellings is very small and rents practically has not been existing.

Consequently the information about these issues has no adequate economic sense; they could not serve as base for the computation. So, we have made some estimation on imputed rent in NA for 1993 taking into consideration area, age and technology of the dwellings, the price of purchase of dwellings and the length of amortisation periods. The weights are based on these calculations. As far as the price index of imputed rents is concerned in situation mentioned above we take the solution as follows: we use for this purpose the average of price indices of different repair items (goods and services) in connection with dwellings.

Second-hand transactions except cars are excluded.

In 1991, CPI items were classified according to the national needs. There were and still are three levels. The 7 major groups are made up of 156 basic headings (expenditure classes) of which appr. 17 per cent is homogeneous (e.g. eggs, gas, electricity, gas, water charges) of the total. In 2001, the 156 basic headings are divided into 1100 representative items. (Structure of CPI: e.g. Major group: 3 Clothing, footwear, Basic heading: 310 Men's coat, Representative item: 310 01 Men's winter coat, carded wool, 431-500g per sm.)

Between 1991 and 1996 the number of representative items was 1800, this number was reduced in the following years in view of the expected diminishing alterations between the price trends of different goods and services.

The descriptions of the products are available both in a detailed and less detailed form. (E.g. pork liver, fresh eggs, apples or set of furniture: sofa and armchairs, upholstered, 3-4 pieces, hand mixer: 2 dough look, 2 whisk) The composition of the representative items is to allow the price collectors to choose the exact variety of selected item.

From 2000, the CPI structure follows Eurostat regulation for HICP, it means that we use both classifications.

The COICOP classification system is adopted into HBS and NA at the first time in the calculation for the reference year 2000. The earlier classification system does not make possible the easy and simple conversion in all cases.

3.2. Selection of localities

The sample is based mainly on the Unified System of the Household Surveys (HBS). The target population of this survey consists of all Hungarian citizens living in private households in the country.

The unit of sampling of HBS is the dwelling and the unit of observation is the household. The HBS is based on the random sampling. The sampling frame is the updated census data. The sample is taken by multistrata method. This sample covers all settlements with 15000 or more inhabitants. In cases of settlements with more than 2000 and less than 15000 inhabitants in the first stage the settlements and in the second stage the districts have been selected. All districts of the selected settlements with less than 2000 inhabitants are part of the sample. Different sampling fractions have been applied by size of settlements, namely in settlements with more than 10000 and less than 50000 inhabitants the sampling fraction was 4/5, in settlements with more than 50000 inhabitants it was 3/5, while in Budapest it was half of that applied in settlements with less than 10000 inhabitants.

The localities for the price observation for CPI, were selected firstly with respect to the number of inhabitants in each area.

Budapest (2 million) and the counties (8 million) are to be distinguished. Secondly, the geographical distribution of the 8 million inhabitants outside Budapest is to be examined in HCSO.

The concrete localities are selected by the HCSO regional offices in a concentrated way, in Budapest and all the 19 county seats.

In selecting localities, the commercial attraction of cities and other influences distinguishing the distribution of purchases from the measurements of population distribution must be taken into account in addition to population dimension.

The number of selected localities for the calculation of the consumer price index is about 100.

3.3. Selection of outlets

The representative items are priced in more than 8000 outlets. Since we have some difficulties with a central outlets register, the selection of concrete outlets within the localities is the task of the HCSO regional offices.

The outlets are chosen to be representative as far as possible.

Primarily the shops, service places, markets etc. with the greatest turnover and the largest assortment of goods have to be selected in such a way that the standard should be approximated optimally. Small shops are also included in the sample. The observation does not extend to such special forms of trading as marketing by post, shipping trade, automatic vending, tax-free shops, e-commerce, which has small market recently. The new outlet chains, shopping centres are included.

When an item disappears from an outlet and is replaced by an item at an other outlet, the current rule is to treat the replacement as if it had been made at the same outlet.

The sample of outlets is updated every year, in December.

3.4. Number of recorded prices:

The standard number of prices are determined according to the number of inhabitants, consequently respect expenditures too.

The HCSO formed following 4 groups:

- the first group includes the counties where the population is less than 400 thousand (14 counties)
- the second group contains the counties with a population between 400 and 500 thousand (3 counties)
- the third group includes the counties with a population between 500 and 700 thousand (2 counties)
- the fourth group is Budapest with more than 2 million inhabitants.

Due to the higher income situation, the urban population can make more purchases than inhabitants of rural villages which is just such a fact. In addition food shopping in villages is smaller as well because own account production for more of personal consumption.

For these reasons, the number of purchases per inhabitants is much greater in the cities than in the villages. In the case of foods, beverages and tobacco and everyday household wares, the differences are more moderate while with respect to industrial products and services, they are greater.

Consequently, the recording of prices in the counties must be arranged in such a way that the standard of price recording for each representative item is realised, as a general rule, in the following distribution according to localities:

The standard number of prices to be collected per representative item in the counties

type of localities	food beverages and tobacco household articles	services durable consumer goods
1.group		
county seat	2	2
other towns	2	2
villages	1	-
2.group		
county seat	2	2
other towns	3	2
villages	2	1
3.group		
county seat	2	2
other towns	3	2
villages	3	1
4.group		
Budapest	20	20

Exceptions are:

- fruits and vegetables, 8-10 outlets must be selected, of which 3-4 must be markets,
- restaurants, 6-10 must be selected according to the categories of the restaurants,
- representative items with only 1 possible price (e.g. newspaper, gas)

The number of prices to be collected per representative item is nearly 130 (1.group:14x5, 2.group:3x7, 3.group:2x8, 4.group:20) in the country. But these standards are the possible maximum and the number of collected prices depends on the given network of shops, restaurants, and service places. In many cases it could be less than the standard, due to the special conditions of the counties.

This sample size was created in 1991 and the general aspect is as the same at the present too.

The price collection involves each month the observation of the price of selected items in selected outlets.

The goods and services are changing according to the fashion, the technological development, consumer tastes etc. These changes present a real problem in the CPI, in Hungary too (It is difficult to tell where is the limit between good changes and continuity. Can change in packaging be classified as a good change?)

According to EU recommendation the replacements are treated when possible.

In the case of “old” i.e. former representative items, the replacement can be made by the price collectors: the new product replaces the old one and the price difference between the two products counts as price change in the calculation of the consumer price index. When the changes (between old and new items) are significant, the explicit, the expert’s judgement method for quality adjustment are used.

In the case of “new” representative items, there are centrally defined replacements i.e. the introduction of new products follows the annual revision. So, in December each year new product-offers are introduced in overlap pricing.

If a price is missing, imputation is applied. In compliance with the EU requirements, as of 1997, the imputed prices are used for the missing data. The estimated prices are computed from the latest price multiplied by the average regional index of the given representative item. The estimated (imputed) price shall be used for two months.

4. Data sources

4.1. Weights

The weights concerning 156 basic headings are derived from the data of the National Accounts (NA). These data are mainly on Household Budget Survey (HBS) and other additional sources. The regular Household Budget Survey is based on random sample of household.

Weights –expenditure of households- are revised annually and refers to the annual consumption two years prior to the current year. For example, the weights used in 2001 show the expenditure structure of 1999.

The weights of the representative items are derived from macro level sources, expert estimations or other sources. Some representative items have equal weight in the basic heading. This feature is used in the case of relatively homogeneous content and the requisite number (at least ten) of representative items.

The weight structure (except fresh fruits and vegetables) is remaining the same every month throughout the year.

4.2. Prices

The CPI is based on observation of market prices. The actual price paid (charged) on the day (month) of price collecting has to be observed. Consumer credit charges are excluded; seasonal sales are included in CPI. Lower price for pensioner, student's etc. (e.g. air-plane ticket) is excluded.

Price collection is well spread over the area of the counties. There are now about 100 towns, cities in the index. The product-offers (price's observation) is appr. 100000.

The consumer price statistics have three pillars: the HCSO, the regional offices and the HCSO computer center.

In this context, the task of the consumer price statistics section of the HCSO is to determine the requirements and numerical standards of the price collection program.

The task of the regional offices is the collection of the prices. Price collectors work under the guidance of the person responsible for the consumer price statistics. The price collectors are employed partly full-time and partly for part-time labour in the regional i.e. local offices of the HCSO and they use the traditional questionnaire.

The observation time extends from the 2nd to 22nd day of every month. The prices collected are stored by the PC s of the CSO local offices and are transmitted after having been controlled to the CSO computer center.

The deadline for transmission is the 1-st day of the next month.

Most of the representative items are collected in the selected outlets. The rate of their weights is 74,5% of the total and their number is 973. Regarding certain representative items such as railway ticket, television licences, newspaper, telecommunication, insurances, gas, electricity prices are collected centrally. Their weight is 22,5% of the total and their number is 111.

For certain representative items such as rents, local transport, water charges, prices are collected at the local authorities. Their weights amount to 3% of the total and their number is 16.

5. Publication

The HCSO has an advance release calendar for all publications on the Internet website.

The CPI is published on the 11th of the following month. The indices are final when first released.

The present publication contains the indices of 7 major groups of consumer expenditure and the indices of 12 major groups of COICOP too. The price indices of selected items, and groups of commodities are published monthly, quarterly and yearly on difference bases.

The price indices of different types of households by using the weights of the family expenditure structure are also published each year.

Other type of Consumer Price Indices in Hungary are as follow:

CORE INFLATION

Core inflation is basically a communications medium, which attempts to guide economic agents' thinking about inflation and the inflation expectations. In contrast with headline indices, which describe past price movement, core inflation indicators are forward-looking, in harmony with the approach of monetary policy.

So, the resulting index provides a useful additional tool for analysing inflationary pressures.

Since August 1999, the HCSO and Hungarian National Bank (HNB) have been calculating and publishing the core inflation, their own core inflation indicators using different methods.

The HCSO follows OECD's calculation, the only difference is all food product only the non-processed foods are excluded.

Core inflation rate is published by HCSO every month in the same time as the consumer price index.

The scope of HCSO core inflation is narrower than CPI; the following product categories are eliminated:

- non-processed food (pork, beef and veal, mutton, rabbit and other meat, edible offal's, poultry meat, fish, eggs, potatoes, fresh vegetables, fresh domestic and tropical fruits)
- Electricity, gas and other fuels (briquettes, coke, firewood, purchased heat, electricity, natural, manufactured, butane and propane gas)
- Motor fuels and oils

The main differences between the core inflation calculated by the HCSO and NBH are in the coverage:

The HCSO core inflation covers about 80% of items of CPI and the NBH core inflation: about 90%.

This summer the HCSO and NBH have agreed to develop a new core inflation indicator calculated using a standard method.

This index will be calculated by HCSO. The first release of the new indicator will be published by HCSO on February 2002.

From January 2002, core inflation will be delivered from the CPI by eliminating the following product categories:

- non-processed foods and other seasonal goods,
- energy with market-determined price,
- goods and services with regulated price, including energy with regulated price
- services owner-occupied dwelling.

Therefore the coverage of core inflation rate will be about 65 percentage.

HARMONISED CONSUMER PRICE INDEX (HICP)

The efforts to harmonise the methods of calculating the consumer price indices are aiming at making comparable the rate of inflation of EU Member States and Candidate Countries. The EU regulations and Guidelines are setting the legal basis for the establishment of harmonised methodology for compiling consumer price indices. The harmonisation process is led by EUROSTAT in close co-operation with the national statistical offices. This implementing of these methodological changes on the Hungarian Consumer Price Indices is also actual task.

HICPs are not and will never be „fully” harmonised consumer price indices; in as much as the aim is comparability and not full harmonisation.

The HICPs are not intended to replace national CPIs. The countries allowed continue the calculation their existing CPIs for domestic purposes.

The calculation of HICP started with the index for January 1997, in Member States and for January 2000, Candidate Countries.

The HICP are based entirely on modified national CPIs, adjusted solely so as to make the coverage of goods and services as similar as possible.

The major characteristics of the interim Hungarian HICP are the following:

The interim indices were based entirely on existing national CPIs (except owner occupied housing and gambling).

The coverage of HICP is determined by COICOP/HICP.

The domestic concept was introduced from January 2001. This means that the expenditures of foreign tourist and border-shoppers are covered.

The assessment of quality changes has been made from January 2000; this work has been carried out continuously. From 2001, a new price collection form was introduced. Explicit quality codes for replacements is used, which could be analysed. The EUROSTAT rule of maximum 2 months of missing prices is strictly applied.

The common index reference period has been the year 1996.

Reference:

“What is the actual question for Hungarian CPI” Eva Maria Szabo, Statistical Review, Budapest, 2001.

“Harmonisation of Consumer Price Indices” Eva Maria Szabo, Erzsébet Kerékgyártó, Erzsébet Melega, Statistical Review, Budapest, 1999.

“The selection method of items, localities and outlets, the determination of their number and frequency of price collection in Hungary” Eva Maria Szabó Central Statistical Office Budapest, 1996.

“The renewal of the Hungarian Consumer Price Index” Mihály Zafir, Central Statistical Office Budapest, 1991

GERMANY'S CONSUMER PRICE INDEX

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Basic principles

- The German consumer price index (cost-of-living price index) is a fixed-base Laspeyres index that is re-weighted at five-yearly intervals. The price, weighting and index bases are all identical (generally calendar years ending in the digit 0 or 5). The current base year is 1995, and the new base will be 2000 from the start of 2003.
- Germany's consumer price index is based on the domestic approach, i.e. it includes all purchase transactions on the economic territory (particularly purchases by foreign tourists in Germany, but not expenditure by German tourists abroad).
- The German CPI should include all consumption expenditure by private households. Account must be taken of all types of household, including institutional households (as from 2003) and all regions in the economic area.

Purpose and use

The aim of the German consumer price index is to measure inflation from the point of view of private households. It is specifically designed *not* to be a constant utility index (COLI). It is used as an important indicator of economic and financial policy by politicians, the central banks, the two sides of industry, economic research institutes, enterprises and the like. It forms the basis for deflating overall economic parameters (e.g. for the national accounts, though for this purpose it must be adapted to somewhat different conceptual requirements). It is under close scrutiny from the media, and another important use to which it is put is to stabilise the value of regular payments in private-contract laws (rents, transfer of businesses on retirement, etc.).

Derivation of weightings

The weightings used in the German consumer price index are derived primarily from household budget surveys. In Germany, this means the sample survey on income and consumption and household budget survey statistics. Sources also include the national accounts, tax statistics, other official statistics, the Bundesbank's balance-of-payment statistics, departmental statistics, studies by research institutes, figures compiled by associations, etc. Finally, there are the independent studies conducted by consumer price statisticians. In all, weightings are published for around 700 groups of goods.¹

¹ A more detailed report entitled "Die Berechnung der Wägungsschemata für die Preisindizes für die Lebenshaltung" [The calculation of weighting mechanisms for the cost-of-living price index, in German] can be found in *Wirtschaft und Statistik*, No 3/1999. Data on details of weighting schemes can also be downloaded from the Internet.

Calculation of basic aggregates

For these 700 or so groups of goods, monthly prices are recorded, mostly on a decentralised basis in the reporting municipalities but in some cases centrally by the Statistisches Bundesamt. For each group of goods in the decentralised price survey there are also regional weightings for 16 Länder (there are currently still two weightings for West and East Berlin) and in some cases a weighting for the central survey of the mail order business. Within the basic aggregates, efforts are made to apply a self-weighting sample (selection of the most visited businesses in the reporting municipalities, selection of best-selling items in individual businesses).

The Statistisches Bundesamt carries out a central survey of price schedules (e.g. post and telecommunications services, railways, flights, insurance, issue of passports, etc.), of prices that are valid throughout Germany (such as package holidays, newspapers, magazines, cigarettes), of goods subject to price-fixing arrangements (books), of major nation-wide suppliers (e.g. construction enterprises in the social housing sector), of list prices (cars) and of goods and services with a fixed price duration (e.g. cable cars, funicular railways, ferries). For these goods, efforts are made to establish (at least approximately) unpublished volume-based partial weightings (enterprise weightings, weightings for individual survey headings, etc.).

The basic indices are then calculated as measurements of arithmetically standardised mean prices.

Price survey

Every month (between the 10th and the 15th), around 350 000 unit prices are recorded in 190 reporting municipalities (and centrally by the Statistisches Bundesamt). Selection of the reporting municipalities for the decentralised price survey takes account of their regional distribution and number of inhabitants. Changes are not normally made to this sample. The selection of reporting sites is updated every five years, as is the sample of goods, when the changeover is made to a new price base year. If necessary - e.g. if a reporting site closes - a replacement must be found immediately, preferably in the same business category. The same applies to the survey headings: if the price for a particular item can no longer be recorded, the price of a replacement product should immediately be included (preferably the previous month's price too, in order to produce overlapping time series where possible).

Publication of the consumer price indices

Once recorded, the prices are used by the Land statistical offices to calculate price indices for 12 Länder (some of the smaller Länder do not publish their own consumer price indices), whilst the Statistisches Bundesamt calculates the price index for the standard of living of all private households, the retail trade price index and the Horeca price index (the latter are needed primarily to deflate other statistical figures such as retail trade turnover, though they are also used in index clauses). At present, the Statistisches Bundesamt also records eight different price indices for the standard of living for the former territory of the Federal Republic and the new Länder, and for special types of household, though it will only do so until the end of 2002.

In addition to the breakdown according to the Classification of Individual Consumption by Purpose (COICOP) or the Classification of the Income and Expenditure of Private Households (SEA), the Statistisches Bundesamt calculates indices for various special breakdowns and aggregates, e.g. an index for seasonal goods (and an overall index that does not include seasonal goods), an index for administered prices (and an overall index that does not include administered prices), an overall index that does not include heating oil and fuels, and a driver's price index. However, the Statistisches Bundesamt does not designate any of these as indicators of "core inflation". The breakdown of detailed results (for around 700 groups of goods) and their weightings means that users can quite readily calculate special indices for their own purposes.

A provisional result is estimated on the basis of definitive results for six Länder (North Rhine-Westphalia, Hessen, Baden-Württemberg, Bavaria, Brandenburg and Saxony). Use is made of multilinear regression, which provides an overall result for the Federal Republic as a whole (without any type of breakdown) that generally deviates from the final result by a maximum of +/-0.1%.

Most of the findings are published in press releases, in specialist series 17 (rapid report, monthly report, annual report, long time series) and on the Internet (www.statistik-bund.de ⇒ Figures and facts ⇒ Basic data ⇒ Consumer price indices). For a fee, detailed results may be ordered from the time series service (www.statistik-bund.de).

bund.de ⇒ Figures and facts ⇒ Time series). Seasonally adjusted figures (using the BV-4 method) for some aggregates are also available on the Internet (via ⇒ Figures and facts ⇒ Indicators). Some data are also available via a recorded message service (Tel.: 0611/75-2888) and by fax (Fax no: 0611/75-3888), these being updated on a daily basis.

Revisions

During conversion to a new base year, the official consumer price indices back to the start of the new base year are replaced with the new results (for example, when the base year 1995 was introduced at the start of 1999, this meant all results from January 1995 until December 1998). This makes it possible to isolate the way in which changes to methods, reporting circles (e.g. enlargement) or consumer habits affect the final result, these then being charted separately². The main advantage of this procedure, however, is that time series always exist for a minimum of three years without any structural breaks. This is crucial for the analysis of findings, and for their use in, say, safeguard clauses. It is thus almost always possible to calculate payment adjustments independently of methodological changes to consumer price statistics.

Quality adjustments

If a survey heading is dropped, an immediate (one-to-one) replacement must be made. Any quality adjustments are made by the price surveyors themselves. Various options are open to them:

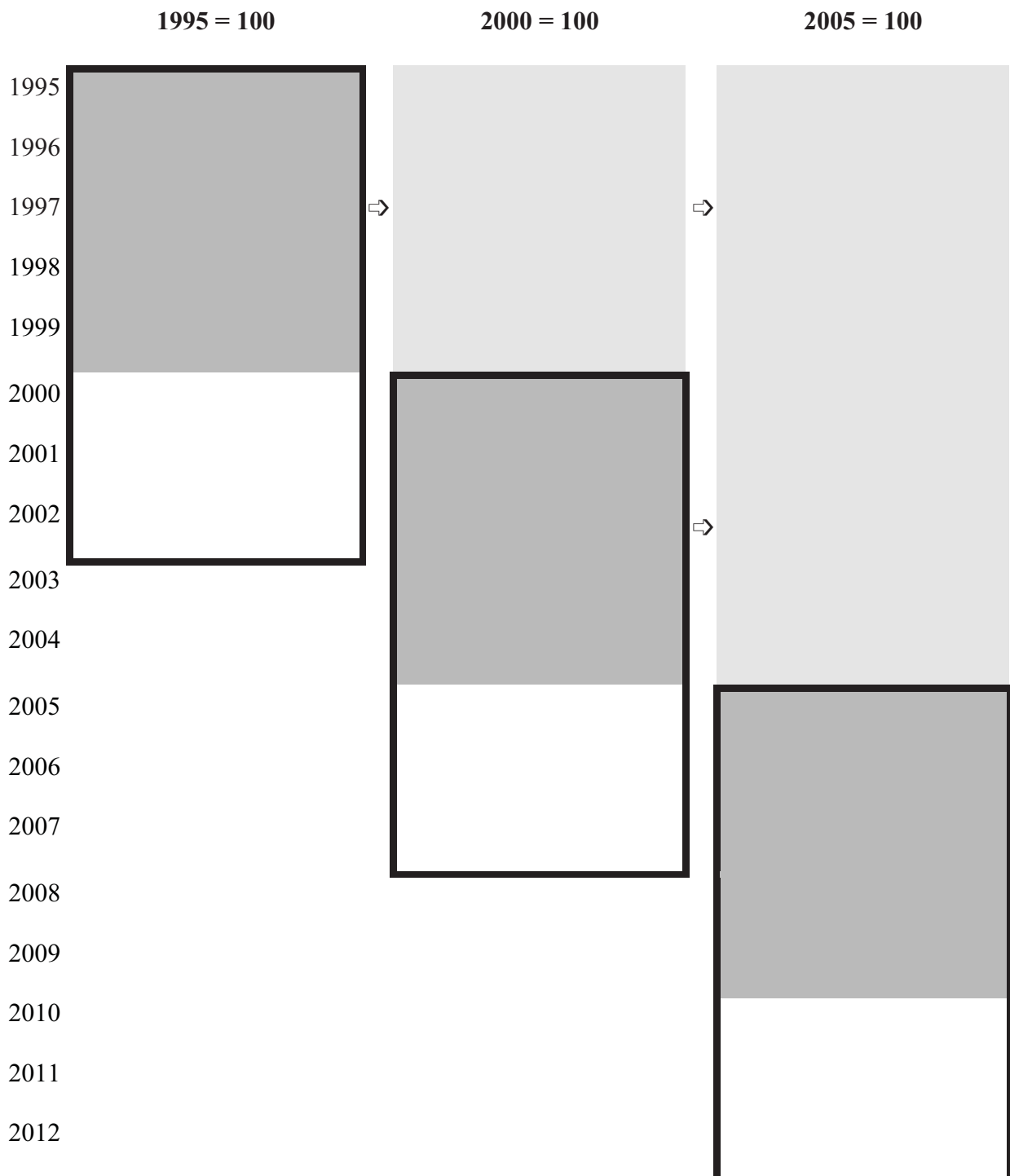
- If the new product differs from its predecessor only in terms of quantity, an adjustment should be made for the change in quantity.
- If there is a no difference in quality between the latest model and the previous model, a direct price comparison should be made without a quality adjustment being carried out.
- If the old and new products are on offer simultaneously, the price surveyor may, under certain circumstances, produce an overlapping time chain. This is the preferred option in the event of changes being made to the range of goods carried by commercial enterprises.
- The price surveyor may also carry out indirect chaining (using a bridge), though he must comply with a number of additional conditions.
- The price surveyor may, perhaps with the help of a product specialist (specialist salesperson, manufacturer or expert), subjectively evaluate the difference in quality and adjust the price of the old product accordingly.
- An options adjustment may be made if options on a predecessor are standard on the new model. This procedure is particularly useful for recording car prices, for example.
- He can try (on the basis of various assumptions) to determine the monetary value of a change in a feature - assess, for example, the lower water consumption of a washing machine or the lower petrol consumption of a car).
- If prices for the individual components of a commodity are available, the price surveyor can look at the individual components and assess them separately (e.g. by temporal overlap chaining). Germany currently uses this type of procedure for PCs.

To date, use has not been made of hedonic techniques in German consumer price statistics. The Statistisches Bundesamt has commissioned a research institute to investigate their potential use for official statistics.

² Cf., for example, G. Elbel's "Zur Neuberechnung des Preisindex für die Lebenshaltung auf Basis 1991" [Re-basing the price index to 1991 for the standard of living, in German], in *Wirtschaft und Statistik*, No 11/1995.

Attempting to quantify methodological and conceptual differences in the national consumer price indices

The German practice of revising the cost of living index (the German consumer price index) means that consumer price statistics can be used to measure the extent of methodological and conceptual changes. The figure below illustrates this revision practice:



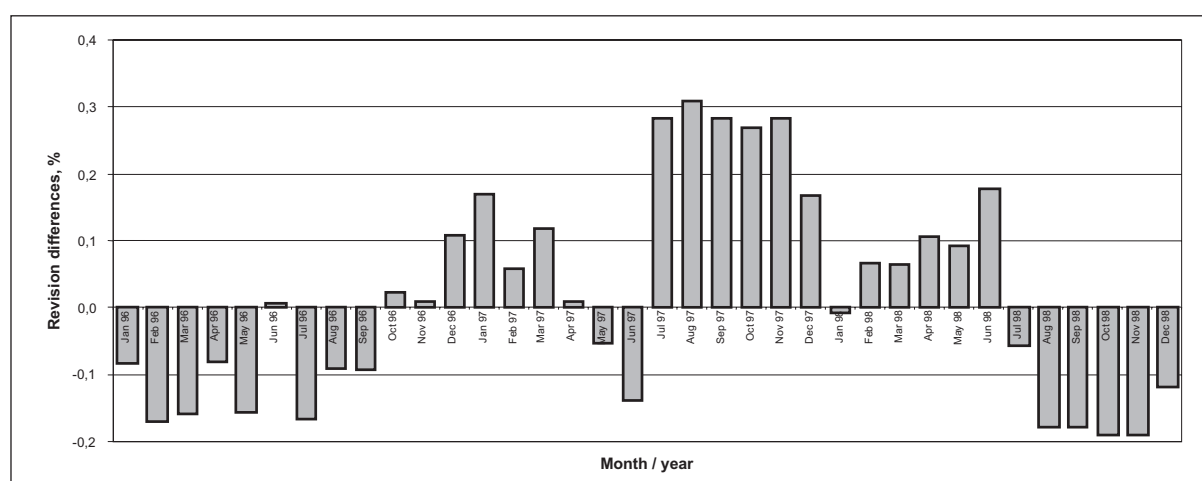
With the next conversion to base year 2000 at the beginning of 2003, the results from January 2000 to December 2002 calculated up to now (with 1995 as the base year) will be declared invalid and replaced by new calculations (base 2000). The results to December 1999 will be converted to the new base year (a simple, calculated rebasing with the results for January 2000). With this method, time series for three years (showing annual rates for two years) will be available - without any structural break - as soon as the first results on the new base become available.

This practice also enables revision differences to be analysed, i.e. the differences between the former (old) and the new calculation can be broken down according to the reason for the difference.

However, it has to be borne in mind that the results presented here are, strictly speaking, for Germany only (or for the old *Länder*, as the case may be) and apply only to one specific period. They can nevertheless provide a few pointers to the importance of certain aspects of this methodology.

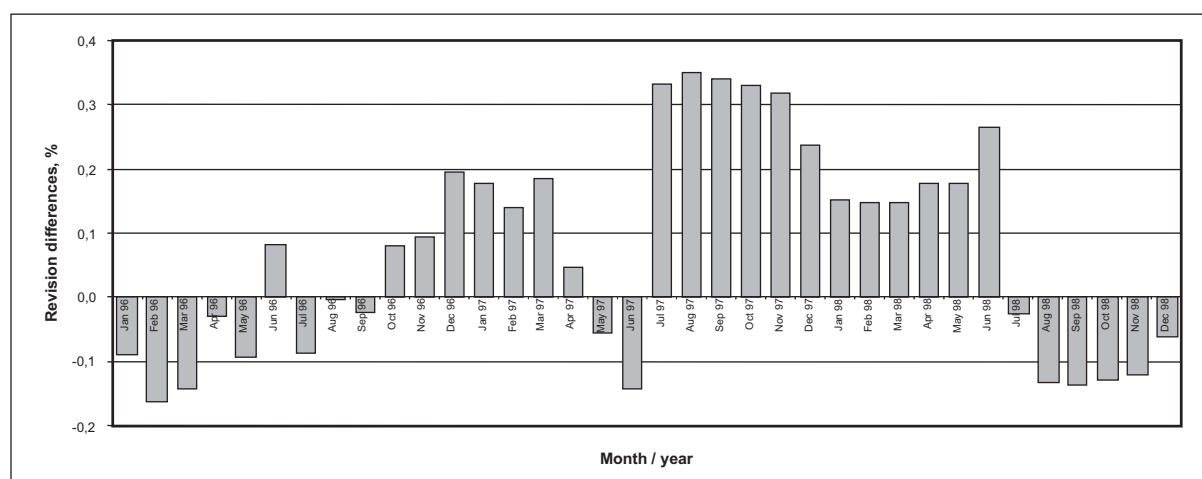
Whilst the **conversion to price base year 1995** did not lead to any radical changes in the health services included in the German consumer price index, the index was much extended and improved. Own contributions for health care goods and services were previously on a very small scale, and it was only in the second half of the 1990s that there was a massive increase in these extra payments. At the same time, rules were introduced on exemption for the socially disadvantaged and the chronically sick, and with the revision at the beginning of 1999 these were also taken into account when the consumer price index was calculated.

Analysis of the revision differences, 1995 all revision points



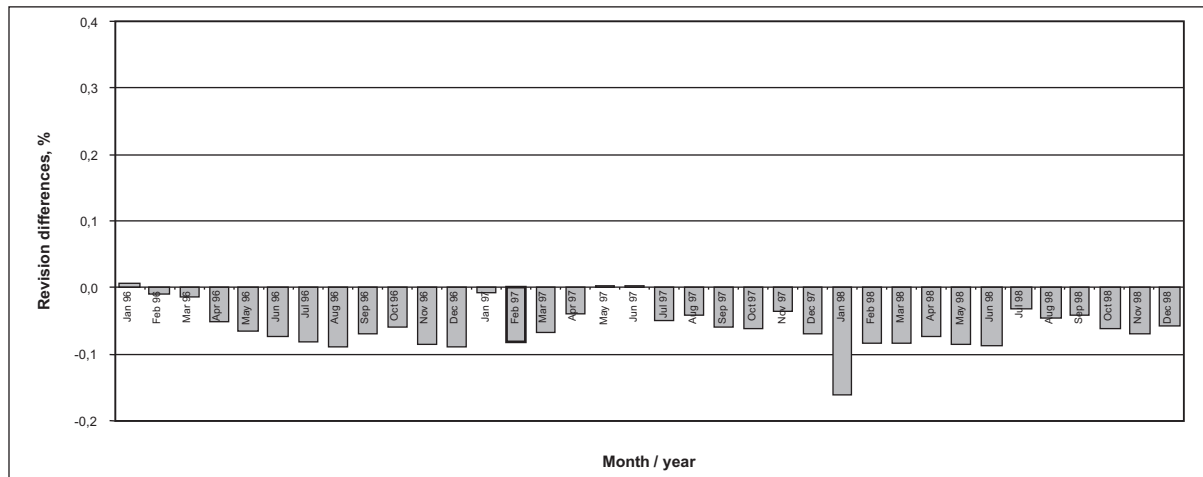
As from July 1998, some of these additional payments were then withdrawn, and this also had an effect on the index.

Revision of health services



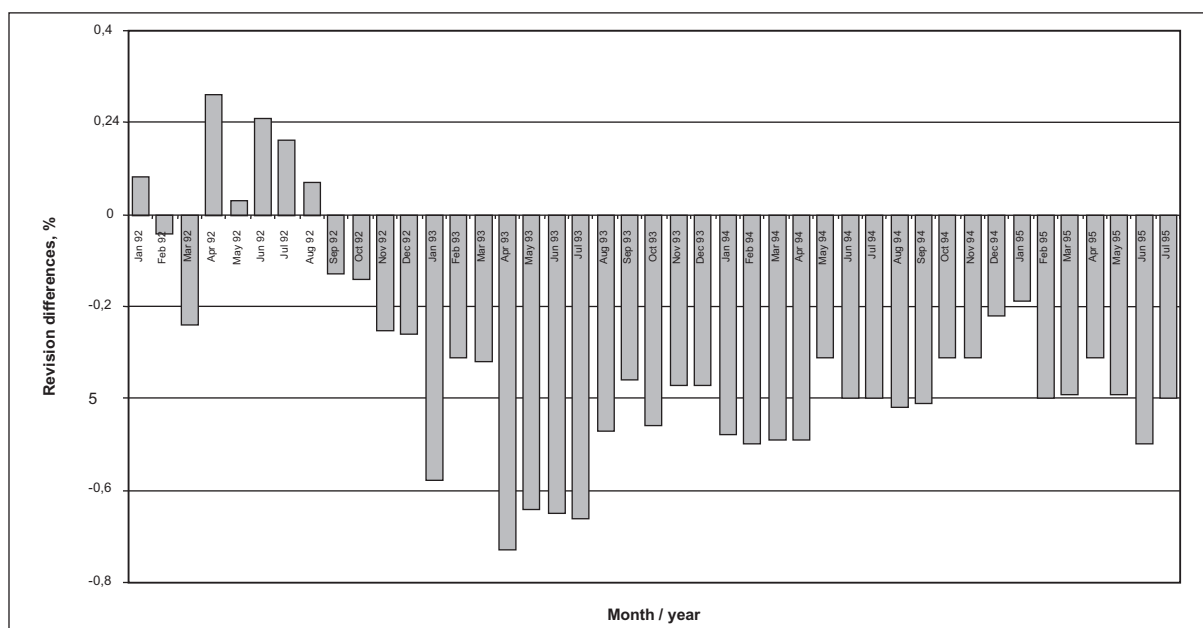
Compared with the extended inclusion of health care in the German consumer price index, all the other revision points (e.g. methodological changes in the treatment of rents, the revision of the sample and the inclusion of more up-to-date weightings) had a negligible effect:

Other revision points (excluding revision of health care)



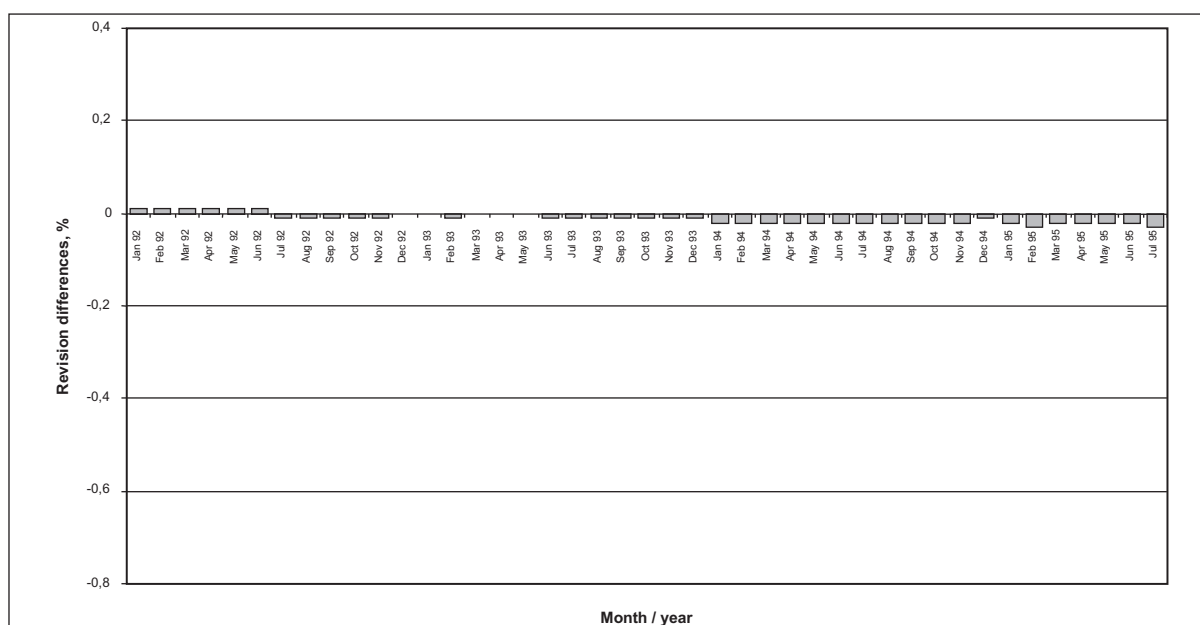
With the **conversion to price base year 1991** (the base year should have been 1990, but had to be changed owing to German unification), the German consumer price index switched over to the domestic concept (there were other methodological changes as well) and the weighting of insurance services became “net”. The results shown here refer only to the old *Länder*.

Analysis of revision differences, 1991 (annual rates) all revision points



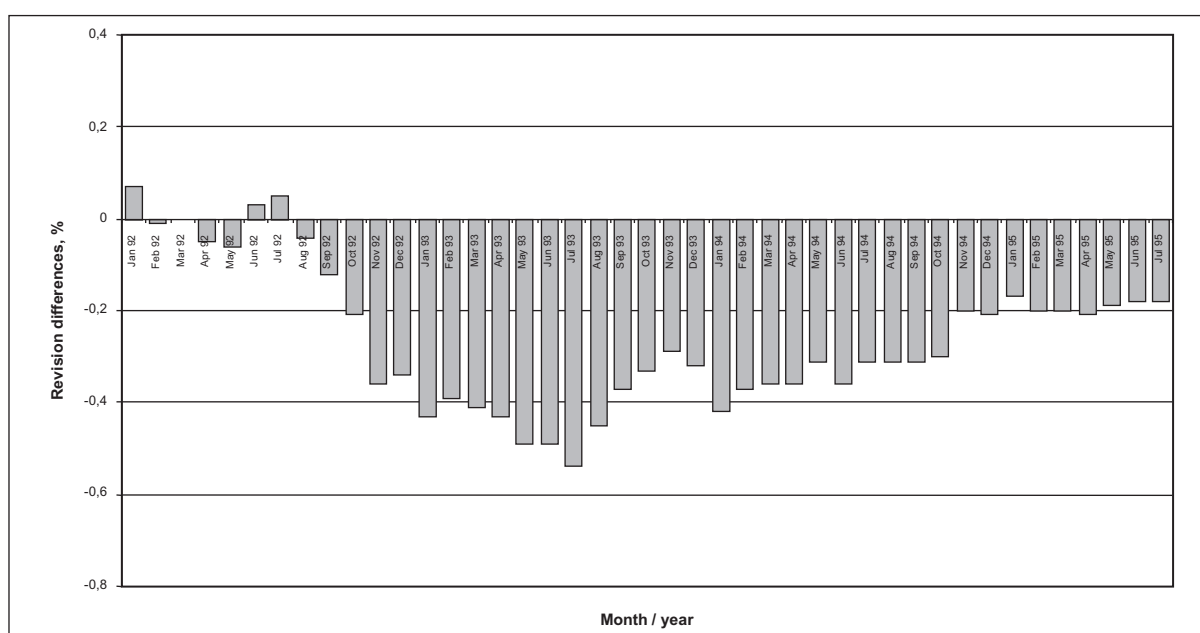
The conversion to the domestic concept had very little effect on the results. This may generally hold true for large countries where tourism is relatively unimportant but would not be the case for small countries where tourism is a very important item.

Introduction of the domestic concept



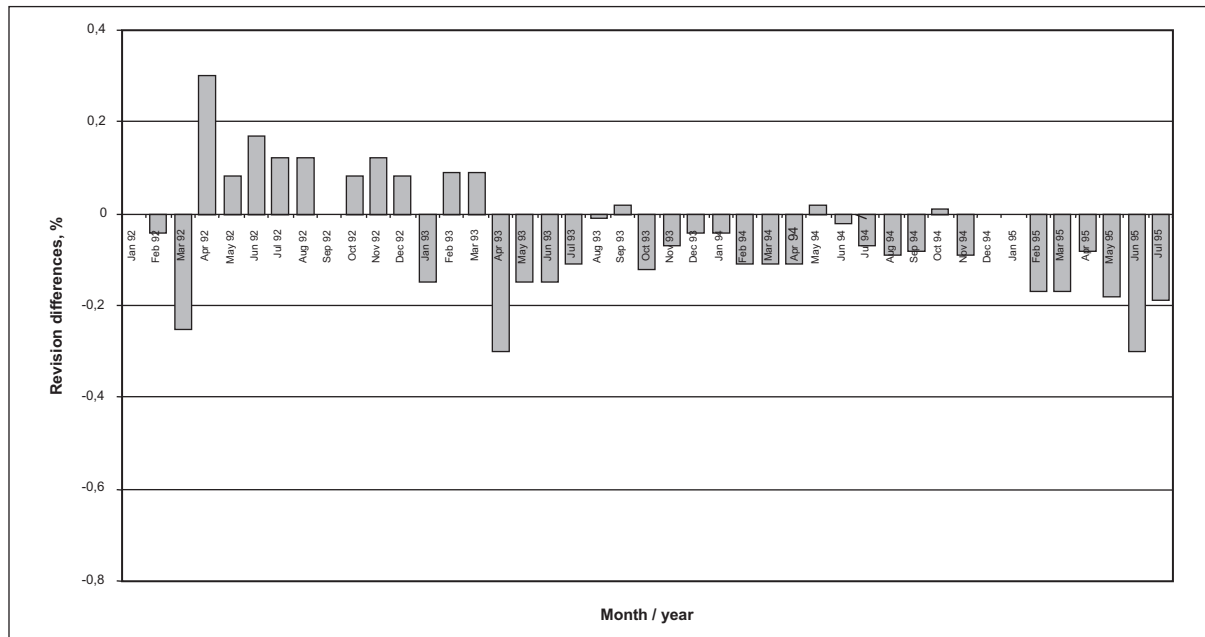
The very noticeable effects of including insurance in net terms are due – in part, at least – to the general conditions at that time. At the beginning of the 1990s, the volume of insurance claims (e.g. the incidence of car theft) shot up, partly as a result of the opening of the borders to the east, and this led to much higher premiums. Although these premium increases could hardly be interpreted as rises in the price of the service involved, the whole of the increase was included in the consumer price index. This weakness in consumer price statistics could not be eliminated completely by the change in methodology, but it had a much smaller impact on the index as a whole after the revision.

Insurance weighting, net terms



The relatively large “other” revision differences in the conversion to base year 1991 are due to further conceptual changes not detailed here - in package holidays, for example.

Other revision points (excluding insurance and the domestic concept)



MEASUREMENT OF INFLATION: THE CHOICE OF THE EUROPEAN CENTRAL BANK

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Introduction

First of all, I would like to thank CEIES for organising this seminar, as well as the CEIES HICP sub-committee, in particular the chairperson, Ms Karen Siune, for all the work carried out. The seminar takes place at an important point in time: the forthcoming introduction of euro banknotes and coins and the denomination of prices in euro will facilitate further price comparisons between euro area countries and will therefore raise the importance of the Harmonised Index of Consumer Prices (HICP) for measuring inflation. My presentation will explain the use of the HICP by the European Central Bank (ECB), and will address some issues related to national consumer price indices (CPIs) which, I hope, can be further discussed during this seminar.

The ECB's definition of price stability and the choice of the HICP

The *Treaty establishing the European Community* states in Article 105 that the primary objective of the ESCB shall be to maintain price stability, but leaves the choice open for analysis of the best measure of this. Furthermore, with regard to the convergence of the EU economies, the Protocol on the convergence criteria referred to in Article 121 (1) of the Treaty requires price convergence to be measured in terms of the consumer price indices on a comparable basis. As the EU Member States had different national CPI definitions and the results did not meet the comparability requirement of the Treaty for the convergence assessment, the European Commission (Eurostat) took the initiative, together with the national statistical institutes, and eventually introduced the HICP in 1997.

In preparation for Monetary Union, which started in January 1999, the Governing Council of the ECB decided to assign the HICP an essential role in monetary policy and used it as the basis for the quantitative definition of price stability for the euro area. Indeed, the HICP was the obvious choice. First, the index was the only price indicator that was available on a sufficiently harmonised basis in the EU, and available for all, initially eleven, euro area countries. Moreover, further harmonisation steps were under discussion or had already been agreed. Harmonisation of national practices is essential for statistics that are used for euro area monetary policy and a prerequisite for compiling meaningful euro area aggregates. Second, the HICP was published monthly and in a timely manner, which was important for the monetary policy decisions of the Governing Council. Third, the HICP was a reliable inflation indicator and revisions were rare. Fourth and most importantly, the use of the HICP was also consistent with the public's focus on consumer prices and the practice of most national central banks (NCBs) before the start of Monetary Union of referring to some national measure of consumer prices when explaining monetary policy decisions. All these considerations still apply today.

* I should like to thank Henning Ahnert and Mariagnese Branchi for their valuable contributions.

In accordance with the Treaty mandate, the Governing Council of the ECB adopted the following *definition of price stability* in autumn 1998: “Price stability shall be defined as a year-on-year increase in the Harmonised Index of Consumer Prices (HICP) for the euro area of below 2%”. At the same time, the Governing Council stated that price stability “is to be maintained over the medium term.”

The upper limit of “2%” reflects the strong commitment to price stability as a means to ensure the best conditions for economic prosperity in the euro area. The definition is in line with the monetary policy objectives of the euro area NCBs before 1999. Furthermore, the emphasis on the term “increase” means that deflation, i.e. prolonged declines in the level of the HICP, would not be deemed consistent with price stability.

By defining price stability in terms of the “HICP for the euro area” as a whole, the ECB has made it clear that with a single monetary policy, policy decisions must reflect conditions across the euro area in its entirety, rather than specific national or even regional developments.

In addition, the time horizon within which the ECB conducts monetary policy in order to pursue its primary objective is the “medium term”. The medium-term orientation acknowledges, inter alia, the existence of short-term volatility in prices (such as that caused by changes in energy prices or taxes) which cannot and should not be controlled by monetary policy. It also reflects the need to conduct monetary policy in a forward-looking, pre-emptive manner given the time lags in the transmission of monetary policy impulses to the price level.

In order to fulfil its primary objective of price stability, the ECB follows a strategy based on two *pillars*. The *first pillar* assigns a prominent role to money as signalled by the announcement of a reference value for monetary growth (specifically, for the growth of the broad monetary aggregate, M3). It consists of a detailed analysis of potential deviations of monetary growth from the reference value, supported and complemented by an examination of the information content of monetary aggregates and their components and counterparts for future price developments. The *second pillar* consists of a broadly based assessment of the outlook for price developments and the risks to price stability in the euro area based on a wide range of other economic and financial indicators including, in addition to the HICP, producer and commodity prices, wages, exchange rates and indicators of economic activity.

Macroeconomic projections, produced jointly by staff from the ECB and the NCBs, on GDP growth and price and cost prospects, including the HICP, are part of the analysis under the second pillar. The overall HICP development is projected over a two-year horizon, and based on “conditioning assumptions” with regard to, inter alia, unchanged short-term interest rates and bilateral euro exchange rates, the development over the projection horizon of oil prices and of other non-energy commodity prices. The staff projections are included twice a year in the Governing Council’s assessment of price developments and were published for the first time in the December 2000 issue of the ECB’s Monthly Bulletin.

In the *assessment of the euro area price developments* under the second pillar, the ECB analyses both the geographical and the product breakdown of the euro area HICP. While the focus is on the euro area as a whole, country data are taken into account to analyse the consequences of regional developments for the entire euro area. As regards the product breakdown, the ECB uses, in addition to the detailed sub-indices for individual consumption categories, a breakdown by goods and services with further details. For these analyses, the ECB also uses different measures that exclude particular sub-components from the HICP. This is done in an attempt to eliminate volatile temporary effects and to support the analysis of the overall index change.

Caveats and advantages of the HICP

Detractors of the HICP mainly refer to the coverage or the method of calculation of the indices. I will mention below two sources of *criticism*. However, this occasional criticism reflects the difficulties and differences involved in the compilation of national CPIs and points to the main sources of non-comparability between national CPIs in the EU.

A controversial item regarding the coverage of the HICP is the inclusion or exclusion of *owner occupied housing*. It is currently excluded, as this is the practice in the national CPIs of eight EU Member States. Economists and statisticians have discussed for years the relevance of this item in CPIs. It is uncontroversial that housing can be considered both as shelter and as an investment, and that a CPI should – if at all – include only the part related to the current shelter costs. Its price measurement is difficult in practice because actual prices for the shelter provided are not observable. The extension of coverage of the HICP in this respect is an

issue on which Eurostat and the national statistical institutes are working extensively. They are seeking to compile an index for owner occupied housing costs and will later decide whether, and if so how, to introduce it in the HICP. The ECB has given support to this initiative and favours in principle this further extension of coverage using the transaction approach for price measurement. The idea is to reflect the change in the price level of housing acquired by the household sector (mainly new dwellings) and to avoid any imputed prices or the inclusion of interest payments, because the latter would not be suitable for monetary policy purposes.

A second controversial item with regard to the HICP – and most other price statistics – are the potential *measurement biases*, which have attracted considerable attention, especially since the publication of the Boskin Report on the US CPI in 1996. Most experts agree that the quality change bias might be non-negligible for a number of goods and services. When a new and technically enhanced product appears on the market in place of a product that no longer exists or has a diminishing market relevance, the true price difference between the two products, excluding the quality change, needs to be estimated. The quality change bias might occur when the true price change is overestimated as this is often assumed for high-tech goods. There are also cases in which the true price change may be underestimated. These effects offset each other to some extent. As a result, it is not clear whether and how the headline HICP, particularly at the euro area level, is affected by a measurement bias, because neither its quantitative range nor its direction has been clarified. It is worth noting that Eurostat and the national statistical institutes are carrying out substantial research in order to be able to further harmonise and improve the national practices for quality adjustment, both for a better measure of inflation as well as for a better measurement of real growth in the EU.

From a more practical point of view, the lack of sufficient HICP *backdata* and the lower *level of detail* of the HICP as compared with some national CPIs are also sometimes criticised. Yet efforts have been made to ensure that there is a minimum of ten years of backdata, starting from 1990, for the euro area, and the HICP has a level of detail up to the three-digit COICOP indices.

The HICP has many *advantages* as an inflation measure, which explains its prominent role in the context of monetary policy. The HICP is *harmonised* for all EU Member States and therefore allows the analysis of inflation developments in the EU on a comparable basis. Only from harmonised data can meaningful euro area aggregates be compiled. This harmonisation is even extended to countries outside the EU. As from this year, eleven accession countries are compiling HICPs largely comparable to those published in the EU. It is a great advantage to be able to identify the developments in these economies on the basis of comparable indicators, particularly in view of the future process of EU enlargement.

Moreover, the HICP has the advantage of sharing the common ground on which a number of other indicators are constructed, that is the *European System of Accounts 1995* (ESA 95). During the harmonisation process of the HICP, the index was deliberately linked to the national accounts standards in many ways, thereby improving the consistency and usefulness of different but connected statistics. Most importantly, the HICP coverage definition refers to the scope of household final monetary consumption expenditure. This is a sub-set of the national accounts definition for private consumption. It includes only actual monetary transactions and therefore excludes any imputed values.

The HICP covers the *population* as a whole. This is not always the case for national CPIs, which focus on the representation of a specific group of consumers, such as urban consumers or consumers in a certain age group.

Concerning the *geographical coverage*, the HICP refers to expenditure within the euro area territory. By contrast, many national CPIs use the national (or resident) concept, i.e. exclude expenditure of foreign residents in the country and sometimes include the expenditure of the country's residents abroad. The definition for the HICP is more appropriate for monetary policy purposes, as it is more precise and avoids potential double counting at the level of the euro area, even though the differences between the two concepts for such a large economic area are small. The difference for national data may, however, be significant in some Member States, e.g. Spain and Luxembourg.

The HICP and National CPIs

All EU Member States publish national CPIs as distinct from the HICP. For most, though not all EU Member States, the divergence between national HICP series and national CPIs is relatively small. The differences diminish as measures introduced for the HICP are also applied in national CPIs. Two different collection and

compilation systems would be impractical and too expensive. Remaining conceptual differences mainly result from differences in coverage, in particular with regard to owner occupied housing, and in some cases from the method of calculation of index weights or prices. However, *the dichotomy between comparable and harmonised HICPs on the one hand and national, non-harmonised CPIs on the other is increasingly hard to justify*. The HICP and national CPIs are compiled from the same sources, and although some differences exist in the calculation of aggregate results from this source data, a tendency towards further convergence between the two is apparent.

What might the *future system of consumer price indices* in the EU and particularly in the euro area look like? Is there sufficient justification to continue with the separate use of the HICP for European and euro area purposes and national CPIs for national purposes?

Only national experts can answer whether or not national CPIs will be needed in the future for national purposes. Nevertheless, I should like to make a number of observations on this occasion. It is confusing to have similar, but at the same time different, measures for the same phenomenon, not only for the public at large, but sometimes even for expert users. The co-existence of the two measures at the national level is difficult to understand in a period of broad economic convergence of EU Member States and, in particular, in a single currency area. I am not aware of considerations in any of the EU Member States, even the largest ones, or in the United States to produce conceptually differing CPIs for different regions of their economies.

Whilst I put for your consideration the need to produce national CPIs in addition to the HICP, there are arguments in favour of having *variants of the HICP* in order to take into account the needs of specific national uses or purposes. For example, Luxembourg had adopted the HICP as its national CPI until the geographic coverage of the HICP was modified in order to apply the domestic concept. As the difference between domestic and national concept definitions is relatively large in Luxembourg on account of the high level of cross-border shopping (around 15%), Luxembourg decided to compile a national variant of the HICP, which differs from the (Eurostat) HICP only in terms of geographic coverage.

There is good reason to develop a *vision* for consumer price statistics in the EU. The most important step forward would be for consumer price indices – those used mainly for European and euro area purposes as well as those used for national purposes – to form an integral part of a *European System of Consumer Price Indices* (ES CPI). The HICP could provide the backbone for the ES CPI. This would not only help users to better understand the reasons for differences between the HICP and national CPIs, but would also provide bridges between different national CPIs.

Conclusions

The HICP has enduring advantages. By contrast with the national CPIs, the HICP is based on methods comparable across EU Member States. It covers a large share of private consumption expenditure. It is available for all euro area countries to a good degree of detail. It is a measure which attempts to isolate “pure” price changes and enjoys, with good reason, high public confidence. The headline HICP and its sub-indices are a well-defined set of indicators appropriate for monetary policy purposes.

There are at the same time reasons to further develop and improve the HICP, particularly in the fields of owner occupied housing and quality adjustment. In both areas Eurostat, in close co-operation with national statistical institutes, has already carried out research work and is expected to provide results in the coming years. Nevertheless, the HICP is already well known and is followed closely by the public as a measure of price developments. In conclusion, there is a continuous need to communicate the HICP methods and data to the interested public.

Moreover, in the medium term the HICP could provide the backbone for a European System of Consumer Price Indices. If there is a need, variants of the HICP may be defined for specific purposes, but may best be embedded in this harmonised framework. Spending resources on national CPIs following a methodology substantially different from that applied for the HICP may be increasingly difficult to justify in the future. While headline measures of inflation must have sound statistical features, they also need to be understood by the citizens of a democratic EU.

BELGIAN HICP : A MAJOR STEP FORWARD IN THE ACCURATE MEASUREMENT OF INFLATION

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The views expressed in this paper are those of the author and do not necessarily reflect the views of the National Bank of Belgium.

The author would like to thank Leo Ponteur for providing detailed information regarding the calculation of Belgian CPIs, as well as Luc Aucremanne for his valuable comments on the first draft of this paper and Emmanuel Dhyne for the illustration on substitution and income effects.

Abstract

This paper is a case study on the application of Eurostat methodology to Belgian HICP. Although the author's aim has not been to submit an exhaustive analysis, some major HICP concepts regarding coverage, price-recording methods and aggregation of individual prices have been tackled. Moreover, important differences between the Belgian national CPI and HICP have been highlighted in order to show that HICP is a major step forward in accurate inflation measurement. Systematic inclusion of newly significant products and the annual revision of weights are in particular an important improvement. The extension of the coverage to owner - occupied housing and harmonising adjustments for quality changes seem to be the most important challenges for the future.

1. INTRODUCTION

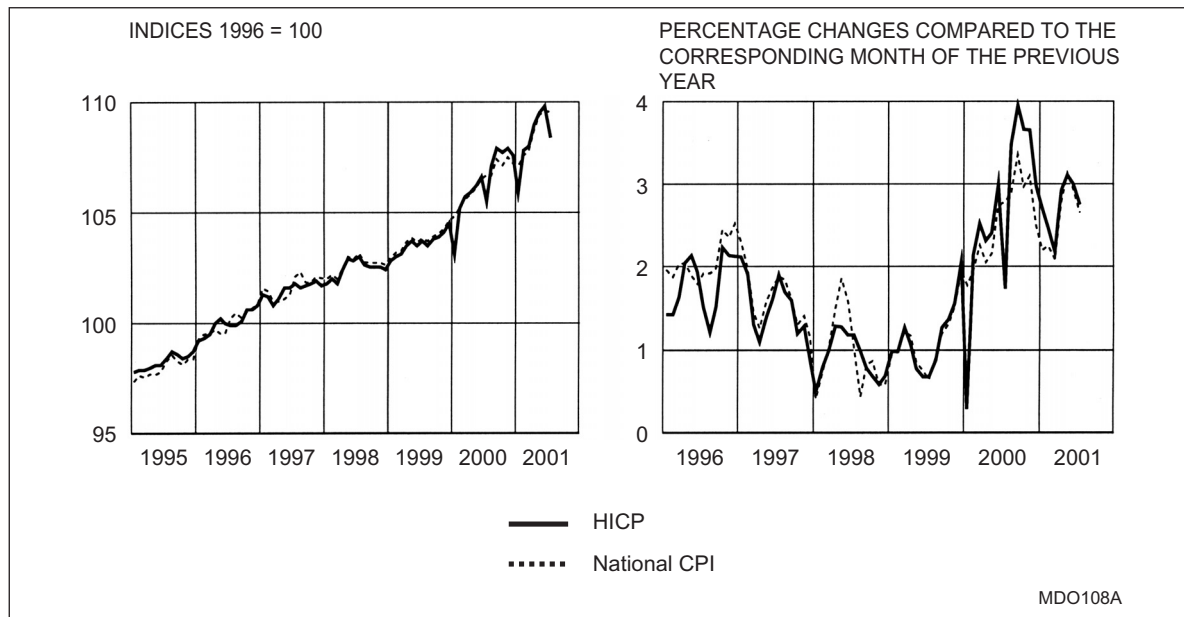
The harmonised index of consumer prices (HICP) is a crucial economic indicator in Europe. This is particularly true from a monetary policy perspective. Initially, HICP was used to measure the convergence of inflation rates in the EU, one of the Maastricht criteria for entry in the EMU. Nowadays it is at the heart of the single monetary policy which, under the Treaty, has price stability as its primary objective, the latter being defined by the Governing Council of the ECB as "a year-on-year increase in HICP for the euro area of below 2 p.c.". The Belgian HICP, which will be discussed in this paper, contributes to the extent of 3.3 p.c. in weight to the HICP of the euro area.

HICP was developed in order to obtain comparable CPIs for inflation measurement in the EU member states. The existing national CPIs did not meet this requirement. In a first stage, interim indices were calculated, based entirely on existing national CPIs, adjusted solely to make the coverage as comparable as possible. In March 1997, completely new HICPs were published. In contrast to the interim indices, HICPs have a harmonised methodology and coverage. However, it should be stressed that HICPs are not fully harmonised, inasmuch as the aim is comparability¹ and not full harmonisation. National differences will thus continue to exist as long as

¹ The comparability requirement is, on a case by case basis, defined as a threshold. Comparability is held to be : any difference in practices used by member states accounting for less than one part in a thousand of the total expenditure covered by HICP (for coverage matters) or accounting for less than 0.1 percentage point on the average annual rate of change (for price matters) (Eurostat 2001: "Report from the Commission to the Council on harmonization of consumer price indices in the European Union, 21.11 2000") .

they do not infringe upon the comparability requirement, which states that “HICPs shall be considered to be comparable if they reflect only differences in price changes or consumption patterns between countries” (Council Regulation No 2494/95)². The indices are being calculated from January 1996 onwards (rates of change from January 1997 onwards) but backward series have been computed for 1995 (indices) and 1996 (rates of change) according to the HICP methodology. The methodology for the calculation of HICP has been established by Eurostat in cooperation with the member states. However, HICP has not been defined once and for all. Several methodological changes have been made in the meantime in order to further enhance the coverage and comparability. As this is an ongoing process, more changes may be expected in the future.

Chart 1 - Belgian inflation



Sources: EC, MEA, NBB.

This paper focuses on the current situation. Though the aim is not to be exhaustive, some major HICP concepts will be discussed in order to show how Eurostat methodology has been applied to Belgian HICP. Moreover, important differences between the Belgian national CPI and HICP will be highlighted. Due to differences in coverage, price-recording methods and aggregation, which will successively be discussed in the following chapters, both indices have shown divergent movements in the past (see Chart 1) and this will undoubtedly continue in the future. Although, in Belgium, the national CPI remains an important measure of consumer price inflation, mainly because the so-called “health index”³ is used for the automatic indexation of wages and social benefits, HICP is a better indicator for monetary policy makers. In addition to its international comparability and its more complete coverage of household consumption expenditure, HICP is better suited to face some major problems of accurate inflation measurement.

The remainder of this paper is structured as follows. Section 2 describes major coverage issues, Section 3 deals with price-recording methods, Section 4 comments on the aggregation of individual prices and Section 5 provides concluding remarks.

2. COVERAGE

As far as the coverage of HICP is concerned, the following aspects may be highlighted.

² Harmonisation does for instance not mean that there is a uniform basket applying to all member states. The weights of each product in HICP vary from one country to another depending on the relative importance of consumers’ expenditure for each good or service.

³ The “health index” is calculated as the national CPI, excluding the effect of changes in the prices of products considered harmful to health, mainly tobacco, alcoholic beverages, petrol and diesel.

2.1. Household final monetary consumption expenditure

The agreed concept for HICP coverage is “household final monetary consumption expenditure” (HFMCE). It consists of “expenditure incurred on goods and services that are used for the direct satisfaction of individual needs or wants by households” and “accounting for more than one part in a thousand of the total expenditure covered by HICP” (Council Regulation No 1687/98). For a complete list of products, classified according to COICOP/HICP (classification of individual consumption by purpose adapted to the needs of HICPs), as well as a detailed description of the HFMCE concept, we refer to the Annexes 1a and 1b of the aforementioned regulation.

The notion “monetary” in HFMCE deserves particular attention. “A monetary transaction is an economic flow that is an interaction between institutional units by mutual agreement, where the units involved make or receive payments” (Council Regulation No 1687/98). The requirement that a monetary transaction is involved in order to include a product in HICP, is consistent with the view that inflation is a monetary phenomenon. Moreover, it has made it possible to extend the coverage in the areas of health, education, social protection services and insurance on a harmonised basis (Council Regulation No 2166/1999). For several of those items, the consumer does not cover the full price and institutional arrangements, as well as existing methodology in national CPIs, are quite different between member states, hampering comparability. That is why these services were initially not included in HICP. Later it was agreed that, according to the monetary concept, prices recorded in HICP should reflect the amount paid by the household minus the reimbursement (social transfers in kind). On the basis of this principle, medical products and services, education and social protection services were introduced on a harmonised basis in HICP in 2000, and hospital services and additional social protection services in 2001.

It should be mentioned that the extension of HICP to the monetary transactions for the aforementioned products has led to more convergence between Belgian HICP and the national CPI, as they were already recorded in the latter on a net basis. Moreover, it increased consistency with the concept of “household final consumption expenditure” in the European System of National Accounts (ESA 95)⁴.

Because of the monetary concept, two major exceptions subsist between HICP and ESA 95. First, prices of products received as “income in kind”⁵ are not covered by HICP because of their non-monetary character. Moreover, for the same reason, HICP does not cover imputed rents for the service provided by owner-occupied housing, whereas national accounts do. According to national accounts, the latter type of non-monetary transactions represent approximately 12 p.c. of overall Belgian final household consumption in 1999, which is substantially higher than the share of actual rents. They amount to 5 p.c. according to national accounts and to 6 p.c. in HICP.

It seems inappropriate to exclude such a major expenditure from the inflation measure. Moreover, the exclusion of owner-occupied housing endangers comparability between member states, as there are large differences in the percentage of the population owning or renting their dwelling. For these reasons, Eurostat is currently re-examining the treatment of owner-occupiers’ housing. Although this process has not yet come to an end, there seems to be agreement now to use the “net acquisition approach”. This means that HICP would include the price of newly purchased owner-occupied dwellings weighted by the net purchases by consumers, i.e. their purchases of newly constructed houses and of existing houses from other sectors less their sales to other sectors. In contrast to imputed rents, this approach is consistent with the monetary nature of HICP. A third option would have been to rely on the payments approach, measuring the cash-flows on mortgage reimbursements and interest payments. However, interest payments are in principle not included in HICP, as it is the aim to measure consumption prices and not the cost of financing the purchase of consumption goods. Moreover, the inclusion of interest payments would have had the drawback that it interferes with monetary policy.

⁴ “Household final consumption expenditure” in ESA 95 excludes government final consumption expenditures which can be individualised (education, health, ...), the so-called social transfers in kind, and is thus consistent with HFMCE in HICP. “Household actual final consumption expenditure” in ESA 95, on the other hand, includes those individualised government final consumption expenditures and thus focuses on what households actually consume, rather than on what they actually pay. As a consequence, government consumption expenditure in the latter case is limited to collective consumption expenditure, such as justice, defense, ...

⁵ This ESA 95 concept refers to goods and services received as income in kind by employees or produced as outputs of unincorporated enterprises, owned by households, that are retained for consumption by members of the household.

Table 1 - Coverage of Belgian CPIs and national accounts

	HICP	National CPI	National accounts: household final consumption
1. Household final consumption expenditure			
Final monetary consumption expenditure	Yes	Yes	Yes
Final non-monetary consumption expenditure	No	No	Yes (including “imputed rents” and “income in kind”)
2. Geographic coverage			
Domestic concept	Yes	No	Yes
National concept	No	No	Yes
3. Population coverage			
Including individuals living in institutions	Yes	No	Yes
4. Newly significant goods and services	Yes ¹	No	Yes
5. Other coverage issues			
Taxes on the use of vehicles	No	Yes	No
Life insurance and pension funding services	No	No	Yes
Gambling	No	No	Yes
Financial intermediation services indirectly measured	No	No	Yes ²

Sources: MEA, NAI, NBB.

¹ See Table 2 for a list of newly significant products included in HICP and not in the national CPI.

² The breakdown of FISIM into consumer spending of the various sectors is still in progress.

2.2. Geographic and population coverage

The geographic coverage of the HICPs of all member states and, as a consequence, of the euro area aggregate, refers to the consumption in the domestic territory of the respective member state and the euro area (Council Regulation No 1688/98). This means that the expenditure of visitors (mainly tourists) within the country or the euro area is covered by HICP and the expenditure of residents abroad is excluded. The choice of the domestic concept was necessary in order to achieve comparability and to avoid gaps or overlapping when aggregating HICPs of individual member states. It is the counterpart of the national concept, according to which all expenditures by residents of a country are measured, regardless whether they are made in the domestic territory or abroad. In this case, prices paid by resident consumers when they are out of the country would have to be included in the index. Both the national and domestic concept are used in ESA 95, but none of them is used in the Belgian national CPI (expenditure of visitors nor expenditure of residents abroad is included), leading to a different coverage compared to Belgian HICP.

The implementation of the domestic concept in Belgian HICP, more specifically the inclusion of the expenditure of foreign visitors (amounting to 4 p.c. of total consumption expenditure covered by HICP), occurred in two steps. In 2000, almost all expenditure of foreigners was added to a very limited number of HICP-items (restaurants, hotels and other accommodation). This had however as drawback that seasonal price movements, which are typical of this kind of products, were unduly accentuated. From January 2001 onwards, expenditures of foreigners are spread over a larger range of goods and services.

Rather small differences between the Belgian national CPI and HICP result from the harmonisation of population coverage in HICP. According to this concept, expenditure of all households, including expenditure by individuals living in institutions (e.g. retirement homes) should be covered (Council Regulation No 1688/98).

2.3. Newly significant goods and services

With a view to ensuring that HICPs remain up-to-date in terms of market developments, in order to cover as completely as possible all household consumption expenditure compatible with the HFMCE concept, “member states shall systematically seek to identify newly significant goods and services” (Commission Regulation No 1749/96). These are products not yet included in HICP and for which the estimated consumers’ expenditure has become at least one part per thousand of the total expenditure covered by HICP.

Table 2 - Newly significant goods and services included in HICP (and not included in national CPI)

	Introduction year	Weight in HICP of 2001 ¹ (in p.c.)
<u>Processed food</u>		<u>0.64</u>
Champagne and additional kinds of beer	1999	0.33
Biological food and additional kinds of food	2001	0.18
Baby food	2001	0.13
<u>Non-energy industrial goods</u>		<u>1.58</u>
Personal computers	1999	0.22
Disposable contacts	2001	0.13
Battery for car and windshield wiper	2001	0.14
Additional durables for recreation, sports and culture	2001	0.35
Additional products for personal care	2001	0.74
<u>Services</u>		<u>1.99</u>
Refuse collection	1999	0.15
Fee for driving school and driving tests	2001	0.07
Aeroplane tickets	1999	0.18
Mobile phone (equipment and communication)	2001	0.38
Veterinary surgeon	1999	0.20
Additional services for recreation and culture	2001	0.29
Additional catering	2001	0.64
Additional services for personal care	2001	0.08
<u>Total</u>		<u>4.21</u>

Sources: MEA, NBB.

¹ Weights are based on the household budget survey of 1999.

As Belgian HICP weights are now updated each year on the basis of the results of the annual household budget surveys (see Section 4 for a more detailed comment), newly significant products are automatically included as soon as they reach the 0.1 p.c. threshold. That is why items such as biological food, personal computers, disposable contacts, aeroplane tickets and mobile phones are included in the Belgian HICP, whereas they are not yet part of the national CPI. As a result, 4 p.c. of consumer expenditure has been added to the existing coverage since 1999. A complete list of these newly significant goods and services can be found in Table 2.

The timely inclusion of newly significant products is primarily relevant for highly innovative markets. New products and especially the highly innovative ones, often show sharp price declines shortly after their market introduction. They are introduced at a high price and sold in small quantities. Prices come down as manufacturing techniques are optimised and sales increase. Later on in the product cycle, the product reaches maturity and prices stabilise. It is often only at that stage that the new product reaches a sufficiently large share in consumption expenditure in order to be introduced in CPIs. Ignoring the initial sharp price decrease entails an upward bias in CPIs, called the new product bias.

Table 3 - Weight of some selected newly significant products in household consumption expenditure

(percentages)

	Household budget survey			
	1995-1996	1996-1997	1997-1998	1999
Mobile phones - equipment	0.00	0.01	0.03	0.14
Mobile phones - communications	-	-	-	0.29
Personal computers	0.35	0.38	0.34	0.23
Subscription to the internet	0.00	0.01	0.02	0.02

Sources: NAI, NBB.

The national CPI does not at all take into account price developments of the new products listed in Table 2, for its coverage still reflects the consumption basket of the base year 1996. HICP is thus a major step forward in accurate price measurement, although it does not completely eliminate the new product bias because of the aforementioned reason. Mobile phone equipment and telecommunications are only covered since January 2001. Although historical price series are hard to find, one can easily imagine that large price declines had already occurred by then. The same holds for subscriptions to the internet. As this item reached only 0.02 p.c. of household consumption expenditure in the most recent household budget survey (see Table 3), it is not included in the Belgian HICP. As a result, the substantial price decreases which have recently taken place are not reflected in HICP. Another example is personal computers. They were only introduced in HICP in 1999, which was even later than the 0.1 p.c. threshold requires, as they already reached 0.35 p.c. of household consumption expenditure in 1996.

2.4. Other coverage issues

Some subsisting differences in coverage between HICP, the national CPI and national accounts need to be explained. First, the national CPI includes taxes on the use of vehicles, which are covered neither by HICP nor by national accounts. Second, national accounts' household final consumption expenditure comprises life insurance and gambling and will include financial intermediation services indirectly measured (FISIM), which are for several reasons not covered by CPIs, the latter being considered as interest-like charges.

3. Price recording methods

3.1. Frequency and timing

HICP must be compiled each month and prices shall be recorded with a frequency of once a month (Council Regulation No 2494/95). As to the timing of price-recording, a distinction has been made between goods and services. Whereas prices for goods must be entered "into the HICP for the month in which they are observed", prices for services "shall be entered into the HICP for the month in which the consumption of the service at the observed price can commence" (Commission Regulation No 2601/2000).

Although the timing concept for goods seems quite obvious, it is not always easy to apply. Monthly price-recording for products such as gas and electricity is based on the yearly tariff-fixing. Hence, the price for a specific month corresponds in fact to the moving average of the last twelve months. Tariff changes are thus introduced gradually, the full effect being felt only twelve months later. This "smoothed" character of the inclusion of tariff changes has specific consequences for economic analysis. It increases the already existing lag by which crude oil price movements affect the recorded consumer prices for gas and electricity.

The timing for entering services prices into HICP deserves particular attention. First of all, it differs from ESA 95, in which expenditure on services is recorded when the delivery of the service is completed. Moreover, some time can elapse between the moment a new service price is first observed and the start of consumption or between the time of the making of the purchase and the time of consumption. This is for instance the case for package holidays abroad. In Belgian HICP, brochure prices are taken for a sample of summer (April until

October) and winter (November until March) holiday destinations. This means that the index of August for instance contains the prices in summer brochures for departures in August, although the holiday can have been booked months before. Anyhow, the consumer pays the indicated price for August ultimately two to three weeks before departure.

Box 1 - Recording of individual prices and calculation of Belgian CPIs

The Index Office of the Ministry of Economic Affairs is charged with the price recording and with the computation of Belgian CPIs. At about the same time each month, 20 employees collect prices for a large amount of the various items in the index basket. The national CPI consists all in all of 481 items, whereas HICP includes more than 500 items. This is done in almost 10,000 outlets (always the same) spread over 65 locations, amounting to more than 105,000 price observations each month. Besides the local price quotations for 67 p.c. (according to their weight) of the index items, 33 p.c. are observed centrally, such as electricity, rents, cars, telephone services, package holidays abroad, newspapers, ... Price recording takes place during the first 20 days of each month.

The calculation of the national CPI for each month comprises three stages. First, an index is calculated for each item in each location ($481 \times 65 = 31,265$ item indices). Second, in each location, a weighted average of these item indices is calculated. The weights are based on the results of the household budget surveys. Finally, the country index is calculated as the weighted average of the 65 location indices. Geographic weights are based on population figures as of the first day of the base year of the index.

HICP is calculated in a slightly different way. Only one index is calculated for each item, based on the 65 geographically weighted prices. HICP is the weighted average of the more than 500 item indices. HICP figures are sent to Eurostat and published by Eurostat around the 17th of the following month.

3.2. Price reductions

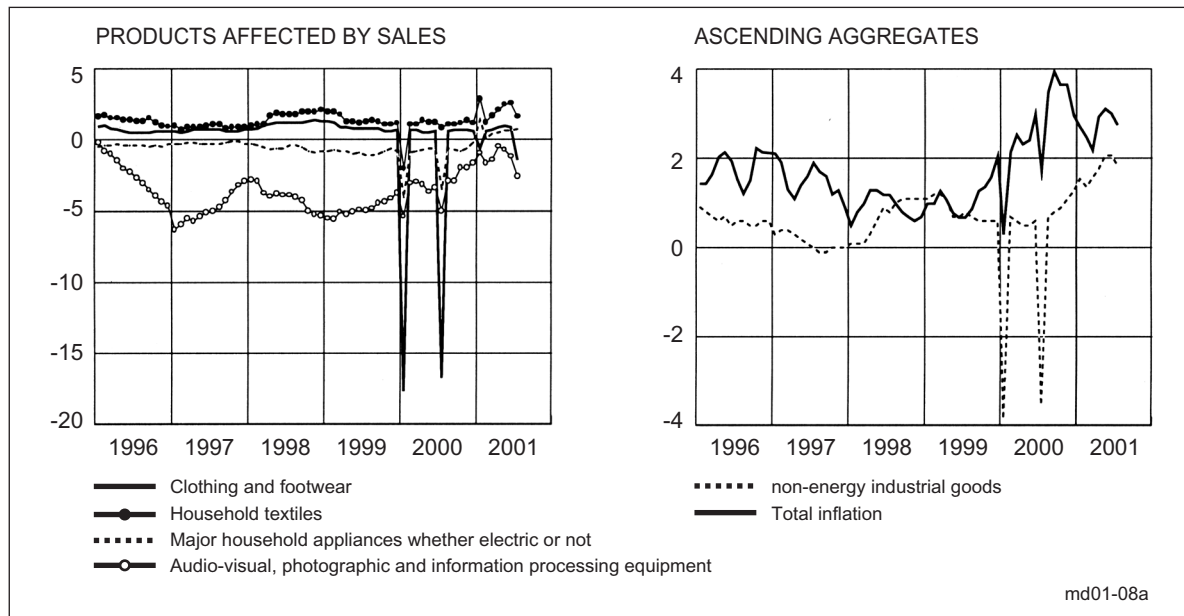
Reductions in prices of individual goods and services should be reflected in HICP if “they are available to all potential consumers with no special conditions attached (non-discriminatory)” and if “they can be claimed at the time of purchase or within such a time period following the actual purchase that they might be expected to have a significant influence on the quantities purchasers are willing to purchase” (Commission Regulation No 2602/2000). Reductions in the prices of products, which are likely to be available again at normal prices or are available elsewhere at normal prices, shall in particular be taken into account in HICP.

In January 2001, sales have been introduced in Belgian HICP and the index series have been revised appropriately for the year 2000. As sales take place in the months of January and July, the year-on-year rates of change for January and July 2000 have fallen sharply for products affected by off-peak discounts. The monthly profile of the ascending aggregates has accordingly been influenced (see Chart 2). As sales have not been introduced in the national CPI, large differences are observed since 2000 between HICP and the national CPI for the months of January and July (see Chart 1).

A special problem might arise in January 2002. Because of the euro cash changeover, sales will be postponed for some weeks. They will start on the 19th of January and last for one month. As price recording takes place during the first 20 days of each month, the effect of discounts would not at all be felt in the index of January 2002 and only to a minor extent in February, because the effect of sales on HICP becomes very weak at the end of the period, discounted products becoming too scarce to be available to all potential consumers. This would cause another break in the series, similar to the one observed in January and July 2000. However, it has been decided to make an exception by extending the price recording period for HICP until the end of January 2002.

Chart 2 - The effect of sales on Belgian HICP

(percentage changes compared to the corresponding month of the previous year)



Sources: EC, NBB.

A second specific application concerning price reductions in Belgium is applied to both HICP and the national CPI. It consists of the survey on discounts on cars. Price recording for new cars is based on prices mentioned in catalogues. However, twice a year, in May and November, the index for cars is adjusted for the results of the aforementioned survey, in which car dealers are asked to specify the actual discounts they give on the purchase of new cars.

Particular attention should be given to the increased volatility of CPIs, due to the inclusion of price reductions. Year-on-year percentage changes are not only affected at the moment of the first recording, as was the case for sales in January and July 2000, they experience large swings each time price reductions are more or less important than the previous year. As these swings are typically short-lived, they are not very relevant from, for instance, a more medium-term-oriented monetary policy perspective. Chart 2 illustrates the short-lived nature of the impact of sales in January and July 2002.

3.3. *Adjustments for quality changes*

The accurate measurement of price changes for products is complicated by the fact that the characteristics of goods and services change in time or by the replacement of old products by new ones. When these practices result in a significant difference in utility to the consumer, quality change occurs. It is crucial to the comparison of prices in two different periods that identical products are being considered. It should therefore be possible to distinguish between the pure price change and the quality change due to the improved characteristics of existing products or to the replacement by new products, the quality change being excluded from the observed price used to calculate CPIs.

Nowadays, making appropriate adjustments for quality change is considered the most important challenge in the construction of price indices (HICPs, as well as national CPIs and national accounts price deflators). From a practical point of view, the problem is closely linked with the aforementioned new product bias, a product having undergone a major quality change being essentially a new product. Insufficient adjustment of raw price data for quality change gives rise to the so-called quality bias. This bias is commonly considered to overestimate inflation, as new models tend to be of a better quality than the products they replace. This is definitely so for IT goods, such as personal computers and mobile phones. They are characterised by a constant replacement of old models by new and more powerful models, which moreover are often cheaper. If their quality improvement is not completely taken account of, the price decreases recorded in the CPI will be smaller than they should be.

The quality bias can not only lead to an overestimation of price developments. It can also cause an underestimation of economic activity and productivity measures, insofar as overestimated price indices are used to compute volume developments from nominal variables.

HICP methodology currently only excludes extreme practices of quality adjustment, providing that “in no case should a quality change be estimated as the whole of the difference in price between the two items, unless this can be justified as an appropriate estimate” (Commission Regulation No 1749/96). In this case, quality adjustment may lead to an underestimation of inflation as it is assumed that a price increase from for instance one model of a car to a new model, which has airbags and costs more, is entirely due to a quality change and, therefore, reflects no price change at all. Inflation would vice versa be overestimated if the replacement item was systematically treated as being of the same quality as the old item and if the whole price difference was reflected in the CPI. In many cases, the value of the quality difference will be somewhere between these two extreme examples and must be estimated, which is not an easy task to do. Eurostat is fully aware of this difficulty and of the large investment required by member states in order to obtain appropriate estimates. Thus, HICP methodology states that “in the absence of national estimates of the quality change, Member States shall use estimates based on information provided by the Commission (Eurostat) where these are available and relevant” (Commission Regulation No 1749/96). Estimates made by Eurostat are not yet available. However, considerable efforts have been made to get an overview of quality adjustment practices used by member states. Moreover, a data base of implicit quality indices (IQIs) is being developed. These IQIs are compiled as the ratio of the raw, unadjusted price observations and the final and adjusted prices that are used to calculate the index. They are an indication of the intensity of quality adjustment carried out by member states. This data base should ease the future correct application of HICP methodology.

Table 4 - HICP for goods characterised by rapid quality changes

(cumulative relative price¹ changes between 1996 and 2000, percentages)

	Belgium	Euro area	Euro area countries with highest price decreases
Cars	-2.6	-4.1	Ireland (-8.3) France (-6.9) Finland (-6.9)
Equipment for the reception, recording and reproduction of sound and pictures	-25.1	-21.0	France (-30.1) Netherlands (-28.3) Finland (-24.1)
Photographic and cinematographic equipment and optical instruments	-20.6	-17.5	Austria (-31.6) Luxembourg (-26.6) France (-26.5)
Information processing equipment	-33.0	-37.1	Netherlands (-70.0) Ireland (-69.3) France (-61.9)
Telephone and telefax equipment	-29.3	-32.3	Austria (-63.0) Finland (-60.7) France (-40.8)

Sources: EC, NBB.

¹ Deflated by the overall HICP of the member states considered.

Adjustments for quality change are currently a large source of non-comparability between member states, as there are major differences in national practices. These differences have an impact on the HICPs of member states. This may be illustrated by considering price changes for products characterised by rapid quality changes and by short product life cycles, such as personal computers, telephone and photographic equipment. Since markets for such products in Europe are fairly similar and highly competitive, price developments may be

expected to be broadly the same. However, Table 4 shows that large differences exist between countries, a rather stable group of member states showing the strongest price declines (France, Finland, the Netherlands, Austria and Ireland). Belgian price developments for these goods are generally less pronounced than those recorded in the above-mentioned countries, but similar to those for the euro area. These national differences indicate that there is scope for further harmonisation of methods.

4. Aggregation of individual prices

Once a basket of products has been compiled and prices have been collected according to the required methodology, these data must be aggregated.

4.1. Lower level aggregation

In a first stage, elementary aggregate indices are computed. “Elementary aggregate refers to the expenditure or consumption covered by the most detailed level of stratification of the HICP and within which reliable expenditure information is not available for weighting purposes” (Commission Regulation No 1749/96). More colloquially, it consists of the calculation of one price for, for instance, spaghetti, based on prices recorded for different brands of spaghetti.

The aforementioned commission regulation leaves in principle the choice between two formulas for the calculation of the elementary aggregate indices. Either the ratio of arithmetic mean prices or the ratio of geometric mean prices may be used ⁶. Alternative formulas are however also accepted, provided that they meet the comparability requirement. In Belgium, only the first formula is used. However, it may be shown that, under certain circumstances, the geometric mean is a better choice for reducing the so-called substitution bias at the lower level of aggregation.

Consumers respond to price changes by turning from products that have become relatively more expensive, to products for which prices have shown a relative decline. At the lower level of aggregation this for instance means the replacement of a more expensive brand of spaghetti by a cheaper one. At the upper level of aggregation, it for instance may imply the replacement of beef by chicken. The substitution bias is the overestimation of inflation because - by using no weights (at the lower level of aggregation) or fixed weights (at the upper level aggregation, see below for more details) - the replacement, in due time, of relative more expensive products by relative cheaper products is not taken into account. Later on, the relative more expensive products will be overrepresented in comparison with actual consumption expenditure, leading to an overestimation of inflation.

4.2. Upper level aggregation

In order to obtain CPIs, elementary aggregate indices have to be aggregated, taking into account the share of each item in the total basket of products covered by HICP. According to HICP methodology, this should be done using a Laspeyres-type index (Council Regulation No 2494/95). This means that the elementary aggregate indices are aggregated using fixed weights, which reflect the consumption pattern in the weight reference period.

In order to prevent weights from becoming completely obsolete, minimum standards for the quality of HICP weights have been established. “Each month Member States shall produce HICPs using weightings which reflect consumers’ expenditure patterns in a weighting reference period ending no more than seven years before the preceding December”. Moreover, “each year, Member States shall carry out a review of weightings in order to ensure that they are sufficiently reliable and relevant to meet the comparability requirement” (Commission

⁶ The exact formulas are as follows :

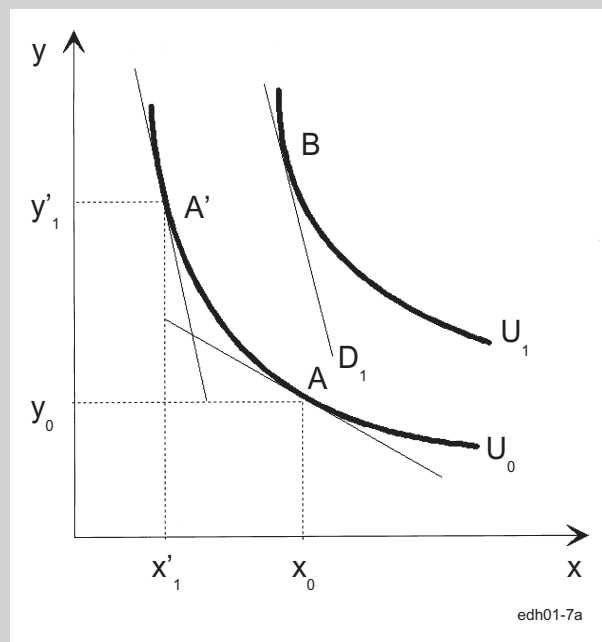
the ratio of arithmetic mean prices $\frac{\frac{1}{n} \sum p^t}{\frac{1}{n} \sum p^b}$ and the ratio of geometric mean prices $\frac{[\prod p^t]^{\frac{1}{n}}}{[\prod p^b]^{\frac{1}{n}}}$, were p^t is the current price, p^b the reference price

and n the number of such prices in the elementary aggregate.

Regulation No 2454/97). If important changes since the weighting reference period are detected, an adjustment is required if the change in weights would affect the annual inflation rate by more than 0.1 percentage point. The choice of method for reviewing the weights is left to the member states.

Box 2 - Substitution and income effects and their impact on CPIs

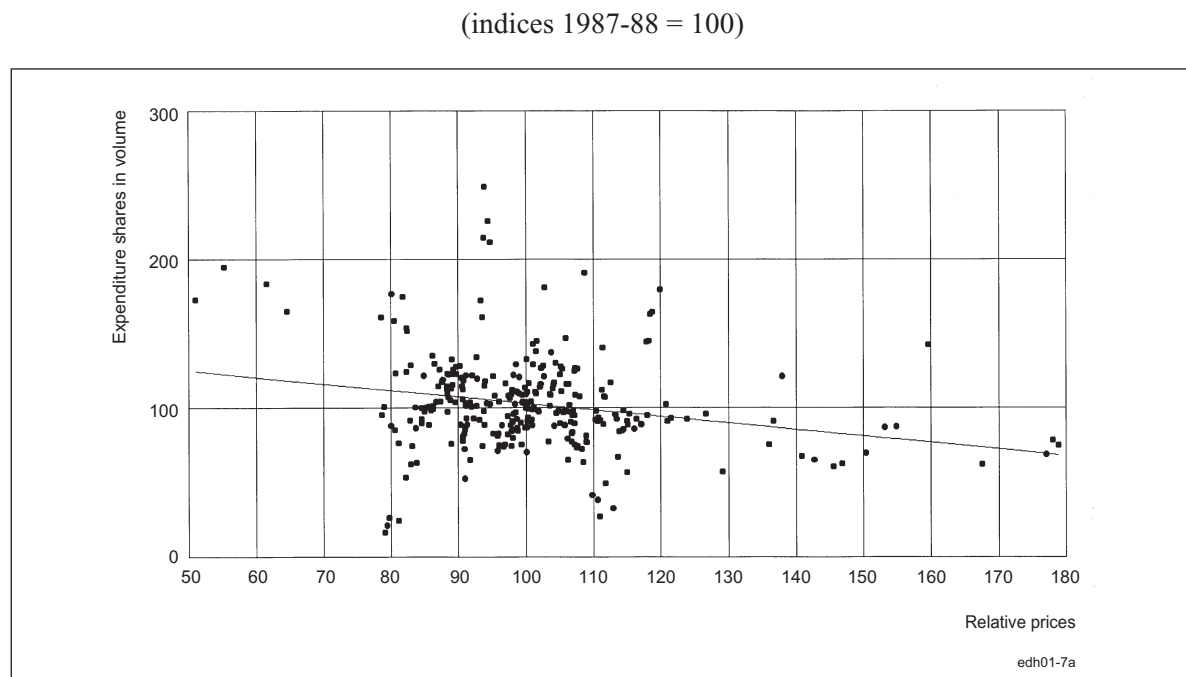
Let us assume that a consumer maximises utility, characterised by indifference curves such as U_0 and U_1 , by choosing between 2 goods x and y , subject to his budget constraint. In period $t=0$, his budget constraint (line D_0) is defined by his income Y_0 and the prices of the two goods. In the subsequent period $t=1$, when for instance the results of a new household budget survey are available, his income has increased to Y_1 and the price of good x has increased relative to the price of good y . This defines the new budget constraint, which corresponds to the line D_1



The optimal allocation between goods x and y in $t=0$ and $t=1$ is provided by the points A and B respectively. Between the two periods considered, the consumption of good x has decreased, whereas the consumption of good y has increased. This change in the allocation simultaneously represents the impact linked with the change in relative prices (change in the slope of the budget constraint) and the impact related to the change in income (budget constraint shifting to the right). Point A' characterises the change in allocation due to the change in relative prices under the constraint that the level of utility is kept constant to the one achieved in A . In fact, the shift from point A to B breaks down in a substitution effect from A to A' and an income effect from A' to B .

The substitution effect always shows a negative correlation between quantities demanded and relative prices. The intensity of this effect depends on the curvature of the utility function. In contrast, the impact of the income effect is unclear, as the importance of some goods tends to increase when income increases, whereas other goods become less important.

Chart 3 - Correlation between relative prices and expenditure shares in volume¹



Sources: MEA, NSI, NBB.

¹ Expenditure shares in volume are based on a 66 items breakdown and were proxied by deflating the nominal shares of the household budget surveys of 1978-79, 1987-88, 1995-96, 1996-97, 1997-98 and 1999 by the corresponding prices recorded in the CPI. In order to correct for differences in levels, they were subsequently expressed as indices.

From 2000 onwards, Belgium has adopted an annual review of HICP weights, based on the results of the most recent annual household budget survey. The resulting indices are subsequently chained. This has reduced the age of the weighting structure to 2 years, as HICP data for 2001 make use of the 1999 budget survey. This contrasts sharply with the practice for the national CPI. Its weighting structure, based on the budget survey covering the period June 1995 - May 1996, is currently 5.5 years old and in the past weights were used up to 10 years after the period they refer to. The frequent updating of weightings not only reduces the new product bias, as has already been emphasised in Section 2, it is without doubt also the most practicable way to reduce the substitution bias at the upper level of aggregation. Chart 3 illustrates, on the basis of the pooled data from the household budget surveys of 1978-79, 1987-88, 1995-96, 1996-97, 1997-98 and 1999, the negative correlation between relative price movements on the one hand and expenditure shares in volume on the other hand. This negative correlation, underlying the substitution bias at the upper level of aggregation, is however not very pronounced, as other factors, such as the impact of income increases, affect quantities as well (see also Box 2).

5. Conclusions

This paper has reviewed some major HICP concepts and the way they have been put into practice in Belgium. Besides, important differences between HICP and the national CPI have been highlighted. Although the national CPI continues to play an important role in Belgium, HICP is, from a monetary policy perspective, without doubt a major step forward in accurate inflation measurement. Systematic inclusion of newly significant products and the annual revision of weights are in particular an important improvement, compared with the national CPI, enabling HICP to face the new product bias and the substitution bias at the upper level of aggregation. The extension of the coverage to owner-occupied housing, which is currently under examination, seems to be the next step in the ongoing process of improving HICP methodology. Finally, appropriate adjustments for quality changes appear as the most important challenge in the computation of price indices in general and of HICP more in particular. However, additional harmonisation in that respect is to be expected and will further enhance the accuracy of HICP.

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MEASURING INFLATION WHEN PRICES CHANGE SLOWLY

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1. Introduction

Inflation is currently low and falling in the OECD area, even after the recent tragic events in USA. As a matter of fact, this is not a short run occurrence, but the result of several structural changes, mainly concerning markets flexibility and increasing competitiveness. Globalisation, privatisation, liberalisation, fiscal consolidation and tight monetary policies worked together to achieve such results.

A side effect of these facts is that they made harder the task of price index compilers, since the demand for information about inflation is evolving. The transformation is twofold and, in a sense, is contradictory as well. On the one hand, increasing integration of international markets pushed for harmonised measures of inflation, to be used in international comparisons. On the other hand, researchers and analysts are moving their attention from aggregate price dynamics to price differentials (among products, markets, consumers groups, and countries), since relative differences among single prices did not tend to narrow as inflation falls. Thus the distribution of price changes (and underlying price dispersion) has become more and more relevant for users.

In the European countries, HICP provided an answer to the first request. While, until now, the breakdown of national CPIs for markets and consumers groups sometimes satisfied the demand for information on price differentials within few countries.

Figure 1 below tries to summarise the current awkward condition of price compilers. First of all, they have to cope with some practical, but not trivial, problems raised by low inflation itself, such as rounding. Secondly, statistical agencies must devote huge resources to ensure international comparability of national price indexes. Actually, international organizations are capable of harmonising national indexes *ex-post* only up to a point, since data collection, definitions and data processing can be harmonised only *ex-ante* at national level. The complex regulatory process behind the compilation of HICP exemplifies how hard this task can be. On its turn, a fine breakdown of price indexes requires comparable classifications as well.

In addition, important factors, such as market segmentation and consumers stratification, should be taken into account both in CPIs and in harmonised indexes, above and beyond usual “consumption purpose” of goods and services, underlying COICOP classification. For instance, the relation between price level, on the one side, and price dynamics cannot be disregarded as well, as Section 4 below will show. Furthermore, price dispersion requires the dissemination of new indicators on inflation dynamics, notably those based on the concept of “core” inflation.

Of course, this paper can only touch upon few of these points. In the following section the “trivial” problem of rounding is considered. Section 3 provides some empirical evidence concerning price changes dispersion and its effects on economic analysis. Section 4 deals with the dependency of inflation from initial price level.

2. New outcomes of an old problem: rounding

Price index rounding is a very old problem, but never solved as well. Usually only rounded inflation figures are disseminated to the public and to the researchers. This may be a relic of times when computation was a heavy duty, and dealing with one decimal figure made far simple the task of statistical agencies. In addition, during mid or high inflation, rounding did not turn out so disturbing for analysts, since monthly price index changes largely exceeded rounding approximation. Hence rounding “noise” did not conceal the signal of inflation. Nowadays the noise to signal ratio is much more unfavourable. Provided that index figures are usually rounded up to the first decimal place, it implies an “extra” variance of price index of $0.01/12$ (0.001 percentage points¹, which seems apparently negligible, compared to sample variance and Boskin-type systematic bias. However, it implies, for instance, that in 50% of cases the true index differs from the rounded one more than ± 0.025 percentage points. If a fixed base index is compiled, this error has only transitory effects, but if a chained index is used, then the rounding inaccuracy occurred in the chaining month (usually December) potentially carries over forever. If statistical agencies are unlucky enough, one half decimal point drift may occur in 10 years.

What is more, inflation rate is usually computed by using rounded index, and the result is rounded again. Hence, in 50% of cases the published inflation rate diverges from the unrounded one more than $\pm 2 \times 0.015 = \pm 0.03$ percentage points, that is one third of monthly price changes currently observed in many countries. Such inaccuracy seems unimportant again, and it might be in fact if it was a random noise added to the true figures. Unfortunately this is not the general case, since the double rounding creates pseudo-periodic oscillations around the true inflation rate. As a consequence, the turning points of inflation, if any, may be moved, and further spurious cycles are introduced in the time series of inflation. It is easy to show that rounding produces a series of “saw-tooth” waves around the true inflation rate whose width is 0.1 percentage points, and the period changes over the time according to a highly non-linear function of annual inflation rate. Non-linearity implies that even a small change of long run inflation rate may change dramatically the pattern of spurious waves. For instance, even considering the very simple case of three constant inflation rates (i.e.: 1.5%, 2%, and 2.5% per year), it is apparent in Figure 2 that shapes and periods of spurious waves induced by rounding vary completely from one case to the other. Hence it is almost impossible to deduce from rounded data the “true” underlying inflation dynamics. This is enough to confuse every analyst.

Furthermore, noise and cycles added to price index may disturb usual seasonal adjustment procedures. First of all, it is possible that such cycles have a near-seasonal period, but this is only a minor problem (and a lucky chance, indeed), since in this case seasonal adjustment is generally able to cancel out rounding influence from adjusted time series. Nevertheless, sometimes the noise component added by rounding may hinder the detection and estimation of seasonal pattern. Specifically, rounding may worsen the estimation and projection of time series models on which most seasonal adjustment methods are based.

Of course there is a trivial remedy to these drawbacks: namely to publish unrounded data, or at least data with 2 or 3 decimal places, in order to make negligible the size of rounding noise. It is not by chance that other indexes, widely used by analysts, such as the stock market indicators, have a base near 10,000, that makes almost negligible rounding effect on decimal places, and nevertheless the daily changes of these indexes are published by using 2 decimal places at least. However, only few statistical agencies adopt this convention, and even the recent agreements on HICP compilation suggest rounding indexes and inflation rates to the first decimal place. Notably, the base of HICP has been fixed to 100 in 1996. Furthermore, in most cases, European statistical agencies are allowed to adopt different compilation procedures, other than the agreed one (e.g.: they may use a different aggregation formula), under the condition that the results differ from the baseline less than one tenth of a percentage point. Only in computing average yearly changes of HICP it is required to use unrounded figures of annual index averages.

¹ By the way, this result was reported by Sheppard more than a century ago in his article published in the Proceeding of the London Mathematical Society, 1989, vol. 29: “On the calculation of the most probable values of frequency constants for data arranged according to equidistant divisions of a scale”.

3. Price changes dispersion

To compile a price index means necessarily computing average prices for a number of products. On their turn, products sub-indexes are aggregated by using a system of weights, derived from households' budget surveys, national accounts, and other wide-ranging sources. Of course this practice provides an accurate measure of average price changes from the viewpoint of a representative consumer, who has average preferences, average income, and so on. As a matter of fact, this average inflation applies to other consumers as well, if price dynamics of different goods and services do not differ too much from the average one. Unfortunately, it has been remarked that this is not the most frequent case nowadays; hence different consumers groups bear very different purchasing power reductions.

Of course this is a well known (and maybe unavoidable) drawback of every aggregate statistical measure. According to the mainstream economic theory, market enlargement and improved competition should narrow the differences within every product market, while the same factors could widen the divergence of price changes among different products as well. In fact, general equilibrium requires that prices adjust very fast in each market. As a result, global competition lowers general inflation, on the one hand, while it tends to increase prices dispersion on the other.

Figure 3, reporting some distribution indicators for HICP compiled for the European Monetary Union, provides a very rude exemplification of this fact. Specifically, the breakdown in 89 product groups has been used to compute each month the second and eighth deciles of 12-month price changes distribution.

First of all, it is worth noticing that price dispersion does not increased too much during the oil crisis: the distance between second and eighth deciles remained by 2-2.5 percentage points, as during the previous period. It means that price dispersion does not depend mainly on transitory shocks on special prices, but is determined essentially by structural factors. One reason may be the fast and strong adjustment of prices on markets that become more and more flexible and reactive. If it is so, analysts need some measures of overall price dynamics that are less sensitive to changes in price distribution than the headline average inflation rate. Otherwise, it would be very difficult understanding the true signals coming from the markets. Hence statistical agencies should make an effort to provide researchers and analysts also with some indicators about price changes distribution, such as quantiles, median, trimmed mean, and the like. Incidentally, the last two indicators are standard core inflation measures as well.

It can be argued that average European inflation almost always stayed within the aforementioned quantiles, even during the latest oil price rise. Nevertheless, the distribution of price changes became pretty asymmetrical since the mid of 1999. It implies that, at the same time as the average inflation speeded up by 2.5 percentage points from the end of 1998 to April 2001, the large majority of prices, included between the second and the eighth deciles, accelerated by less than 2 percentage points. What is more, until September 2000, the prices of one fifth of products fell or rose less than 0.5% per year, as the dynamics of the second decile shows. Namely inflation, in its narrowest definition, regarded only 80% of products. On the other hand, even when average European inflation was below 1%, one fifth of products displayed annual price increases over 2% (as the level of eighth decile confirms), that is more than twice the average inflation rate.

Adopting a narrow statistical viewpoint, an estimated average associated to such dispersion might not differ from zero significantly. Of course, nobody questions seriously that inflation was, and still will be, a problem for European countries. However, it should be stressed that deflating consumers' expenditure by using a single average inflation indicator could be misleading. Furthermore, headline inflation rate may provide a poor (noisy) signal about general price dynamics. As a consequence, analysts need, first of all, very disaggregate price sub-indexes in order to evaluate properly purchasing power of different consumer groups and, secondly, they would appreciate some "robust" measure of inflation, such as "core" indicators.

4. Market competitiveness, price convergence, and price index compilation

Increasing market integration, competitiveness and flexibility play a crucial role in determining price dynamics. The so-called "law of one price" states that in a perfect competitive market the same commodities must be exchanged at the same price. If this were not the case, the market would not be in equilibrium, there would be a scope for arbitrage, and therefore the price would not be stable. This law holds also in most of actual markets, even though they are far from being competitive. For instance, in the case of indifferianciate

monopoly, the monopolist sets a single price in order to maximise his profits. The same happens in collusive oligopolistic markets for commodities that can be hardly be differentiated (such as fuels).

In other cases the law of one-price holds because of the strategies followed by firms. For instance, sometimes the same price is set on different markets in order to “fidelise” clients. This is the case of several brands such as McDonald, Swatch and Benetton, that sometimes make use of a rude PPP rule too. Occasionally, firms use one-price policies to reinforce the look of their products. For instance, most luxury goods producers impose a single highest price in all shops, to the aim of granting customers about quality and originality of their products. In other cases, prices tend to follow a reference benchmark, set by the price leader, which can be a true dominant firm or a “barometric” one, which simply has better information about the market. Furthermore, in each instant of time prices could differ only owing to the staggering of price variations among the firms and outlets. Anyway, even in a perfect competitive market, the prices of the same commodity are allowed to diverge if consumer incurs in search costs. Thus the law of “one stable structure of price” holds instead.

In any case, it could be put forward the general hypothesis that prices variations exhibits a negative correlation with the initial level of prices, or, specifically, with the difference between initial price and the average (or reference) one. Figure 3 illustrates this hypothesis in the case of six models of a given product, whose prices differ in the beginning, but tend to converge in the long run. To do so, higher initial prices must rise at a slower pace, while lower prices must increase speedier. Of course, price variations should also depend on the usual structural factors, such as the nature of goods, the place of selling, type of outlet.

If convergence hypothesis is not false, a series of consequences for the estimation of inflation rates follow. First of all, price changes are not independent from price levels, as price index compilers usually assume. Thus surveyed products should be chosen taking into account also the price frequency distribution in the market. Specifically, the selection of “best selling” products only could bias the inflation rates. As far as “best selling” items have the best quality price ratio (otherwise rational consumers did not prefer them), this class of products has also a price above the average (taking into account quality and other relevant characteristics). Thus, if the one price law holds, then bestseller prices tend to rise faster than the others. As far as I know, this possible upward bias of CPI (not only of COLI) has not been regarded yet in Boskin Report and related literature.

Furthermore, it is likely that the adjustment of prices toward some equilibrium configuration is faster as price stickiness lessens. Notably, this is the case when search costs incurred by consumers decrease, and when “menu costs” for firms reduce. The next changeover in Europe is likely to cut both types of costs: consumers will be able to compare prices of the same item all over Europe, without incurring in any exchange fee; and firms may take advantage of the changeover to adjust their prices exactly to the optimal level, since in any case they have to bear (not trivial) menu costs to switch their national prices in euros. As a consequence, the selection of price sample for 2002 will be crucial. Inflation measures in Europe could be biased if the sample provided an out of focus picture of current prices structure.

Namely, some statistical evidence in favour of one price hypothesis is provided by the analysis of Italian data collected in order to estimate HCPI during 1995 and 1996 in 9 cities, for over 400 products. The author will be happy to provide further details about this study to the interested people. Table 1 reports the price changes of different classes of items, grouped according to the difference between their own price level and the related average price (computed for the same item sold in the same city and in the same type of outlet). Price changes are given as difference to the average inflation rate, which was by 6%. It is self evident that items that are sold at a higher price show price increases far lower than the others, and vice versa. In addition, the effect of initial price on future price dynamics seems to be substantial.

By using the same data, the half-life of a prices divergence has been estimated approximately in 13 years, which is slightly longer than convergence time found among general price levels in several US cities. Sharp differences in convergence rates hold among various outlet categories. Notably, mean reversion effect seems stronger in big commercial centres and in street markets, maybe because these are the (polar) cases in which competition is stronger and search costs for consumers are negligible. Quite the reverse, convergence is slower in traditional, specialised, one brand and chained outlets, where product differentiation is a common practice. Furthermore, goods prices tend to revert toward the average faster than services do, and this fact is consistent with the scarce competition in most service markets in Italy.

5. Some conclusive remarks

Of course this paper expresses the views of a user, rather than a data producer. Statistical agencies usually complain with analysts and economists for their insatiable demand for new and more detailed data. Furthermore, they grumble for the variety and volatility of such demand. It should be acknowledged that statistical agencies improved dramatically their capability to satisfy the demand for information during the last few years. They emulated firms, which have got used to cope with such problems for a long time now.

As a matter of fact, the additional burden demanded to statistical agencies by this paper does not seem so heavy. Nevertheless, the gain in accuracy and pertinence of information about inflation would not be negligible, as it has been shown above. In the very end, the main requests concern: the dissemination of indexes rounded to the second decimal place; a fine breakdown of price indexes, which enables analysts to compute almost every non-standard indicator by themselves; and possibly the computation of some core inflation indicators. In addition, section 4 suggests some practicable improvements to the current sampling strategy, which could be very relevant during the changeover in Europe, as far as prices adjustment will speed up.

It should be pointed out that such requests are neither extemporaneous or a short run curiosity. They basically derive from a consensus analysis about long-term tendency of word economy. Thus one can expect that information demand on inflation outlined above will not change dramatically in the next years. In a sense, this is the “core” demand faced to the statistical agencies. In addition, a fine breakdown of price indexes potentially satisfies in advance most on the spot requests put forward by analysts. Hence investment required to statistical agencies on this project is likely to have a good and durable return. Last, but not least, some warnings and suggestions about price index compilation seem to be relevant right now, in view of the European changeover.

FIGURE 1 – THE CHALLENGES FOR PRICE INDEX COMPILERS

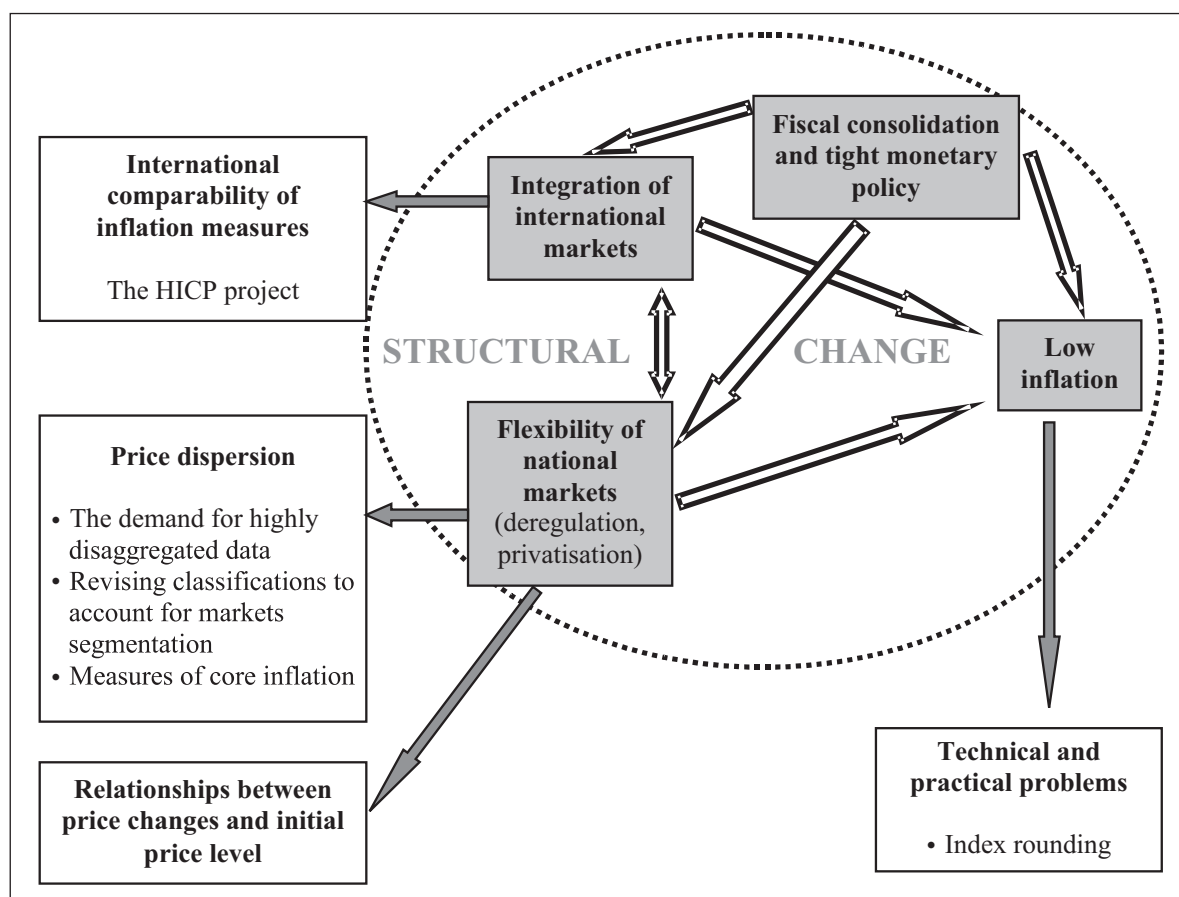


FIGURE 2 – EFFECTS OF ROUNDING ON PUBLISHED INFLATION RATE

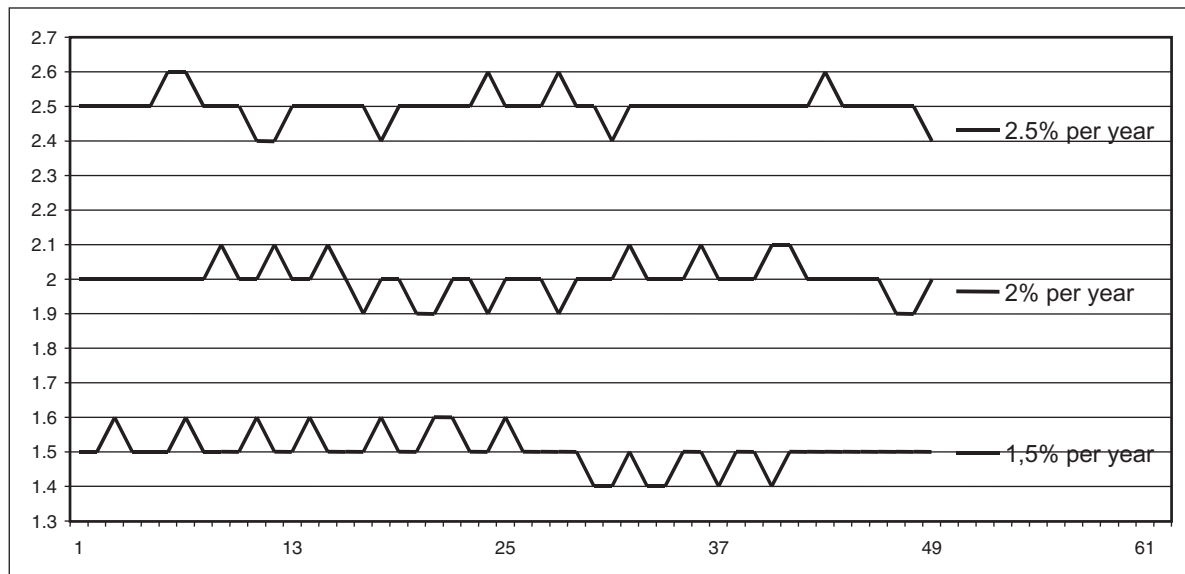


FIGURE 3 – DISTRIBUTION OF SECTORAL 12-MONTH PRICE CHANGES IN THE EURO AREA

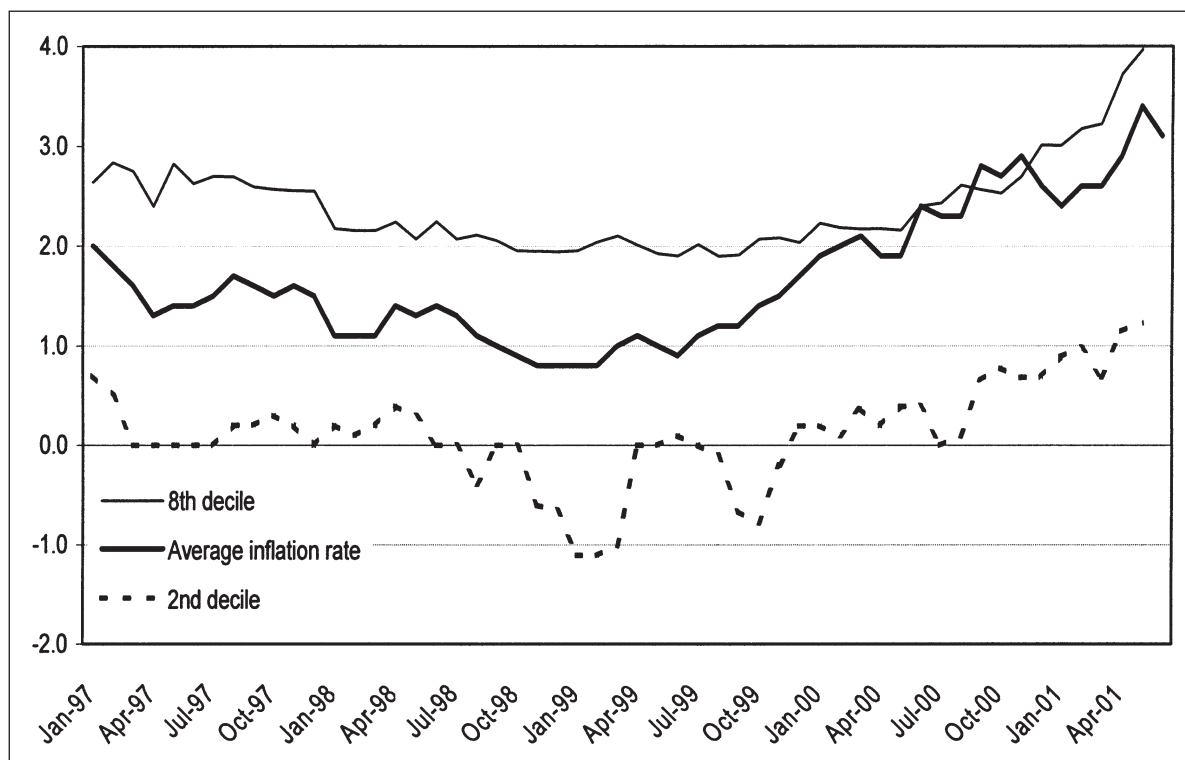


FIGURE 4 – PRICES CONVERGENCE AND PRICE CHANGES

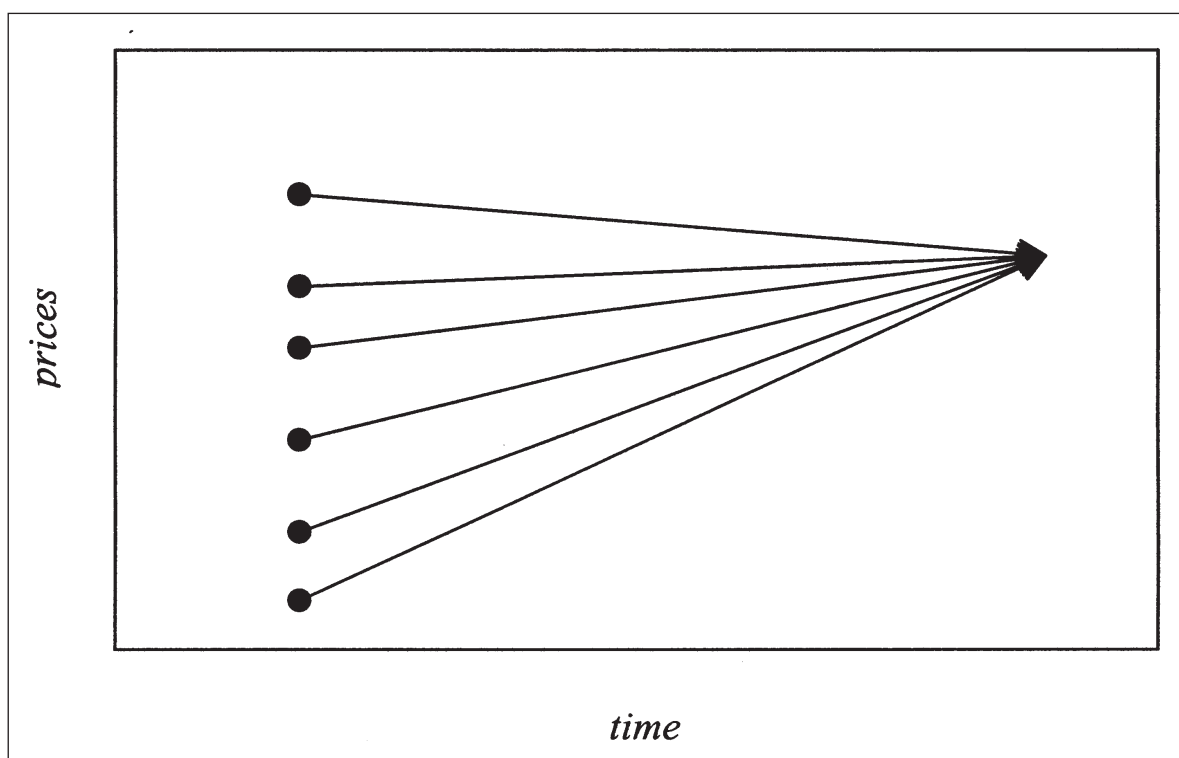


TABLE 1 – RELATIVE LEVEL OF PRICES AND THEIR RATE OF CHANGE

Percentage difference respect to the average price	Difference respect to the average annual rate of inflation
more than 30% lower	+3.94%
from 20% to 30% lower	+2.91%
from 10% to 20% lower	+1.98%
from 0% to 10% lower	+0.92%
from 0% to 10% higher	-1.34%
from 10% to 20% higher	-2.54%
from 20% to 30% higher	-2.68%
more than 30% higher	-2.02%

USING INFLATION STATISTICS IN FINANCIAL MARKETS

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Using inflation statistics

Short-run cyclical issues: what is inflation now, and what will it be in future?

Not all inflation is equal: the importance of core inflation.

Taking inflation into account: the calculation and comparison of real interest rates, including those on index-linked securities.

The UK example

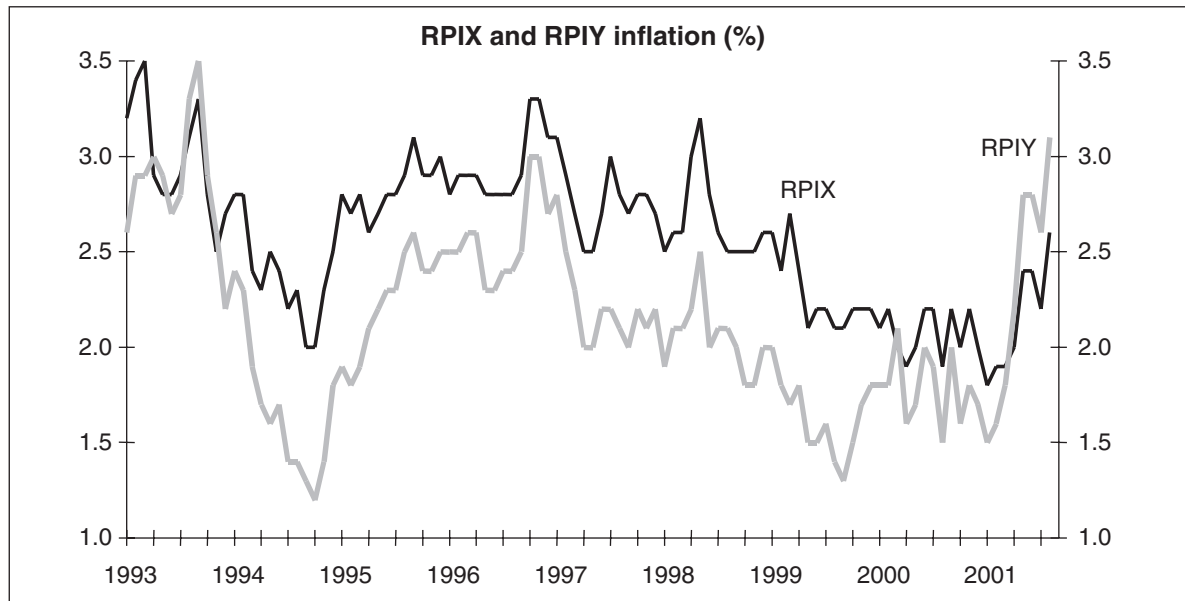
Inflation can be measured in many ways. The UK target measure is RPIX. Table shows a number of statistical and structural measures of inflation at different levels relative to each other and compared to own recent past.

RPIX and ten key core inflation measures (%)	Latest rate	Three mth ave	Six mth ave	Twelve mth ave	Five year ave
RPIX	↑ 2.6	2.4	2.3	2.1	2.5
RPIY	↑ 3.1	2.8	2.6	2.1	2.0
HICP	↑ 1.8	1.6	1.5	1.2	1.5
RPIX ex food and energy	↑ 2.9	2.7	2.4	2.1	2.7
Median RPIX	↑ 2.4	2.3	2.0	1.8	1.8
RPIXP	↑ 2.1	2.0	1.8	1.5	1.7
Core goods prices	↑ -0.2	- 0.6	- 1.2	- 1.8	- 0.6
Service prices	↑ 4.2	4.1	3.8	3.5	3.3
GDP deflator	↓ 2.0	n/a	2.2	1.9	2.6
Average earnings	= 4.6	n/a	4.9	4.6	4.6
Unit labour costs	↓ 2.1	n/a	1.9	1.7	2.7

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Core inflation I

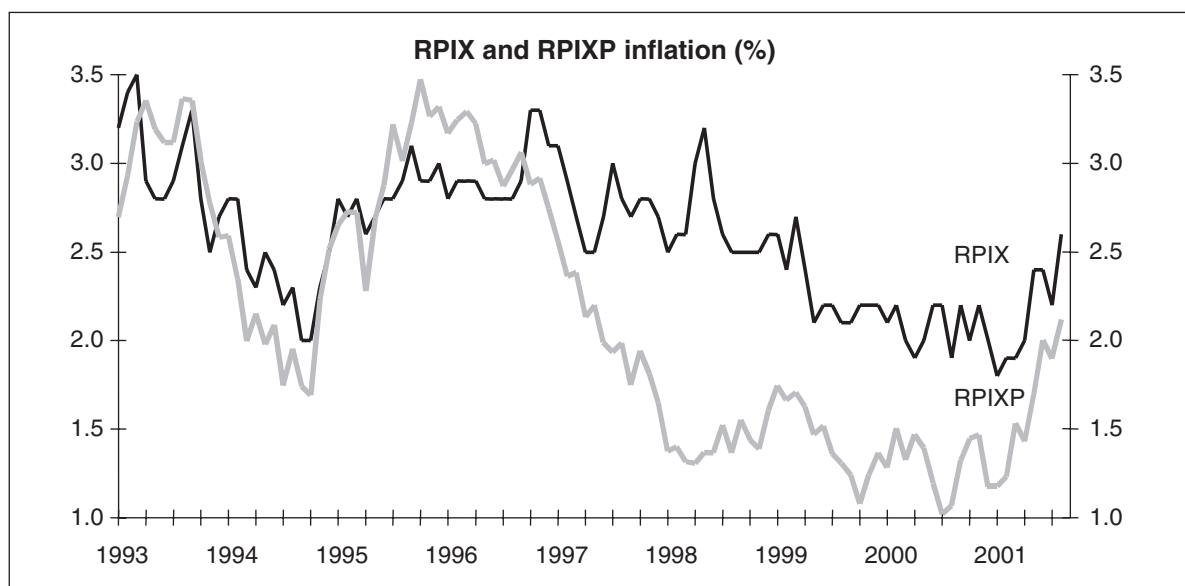
RPIX is the target measure of inflation. It's defined as the RPI excluding mortgage interest payments. RPIY is a related measure which also excludes the effect of indirect and local authority taxation.



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Core inflation II

RPIXP is a slightly different measure of inflation which weights RPIX components together according to their inflation persistence rather than their weight in consumer spending.



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Core inflation III

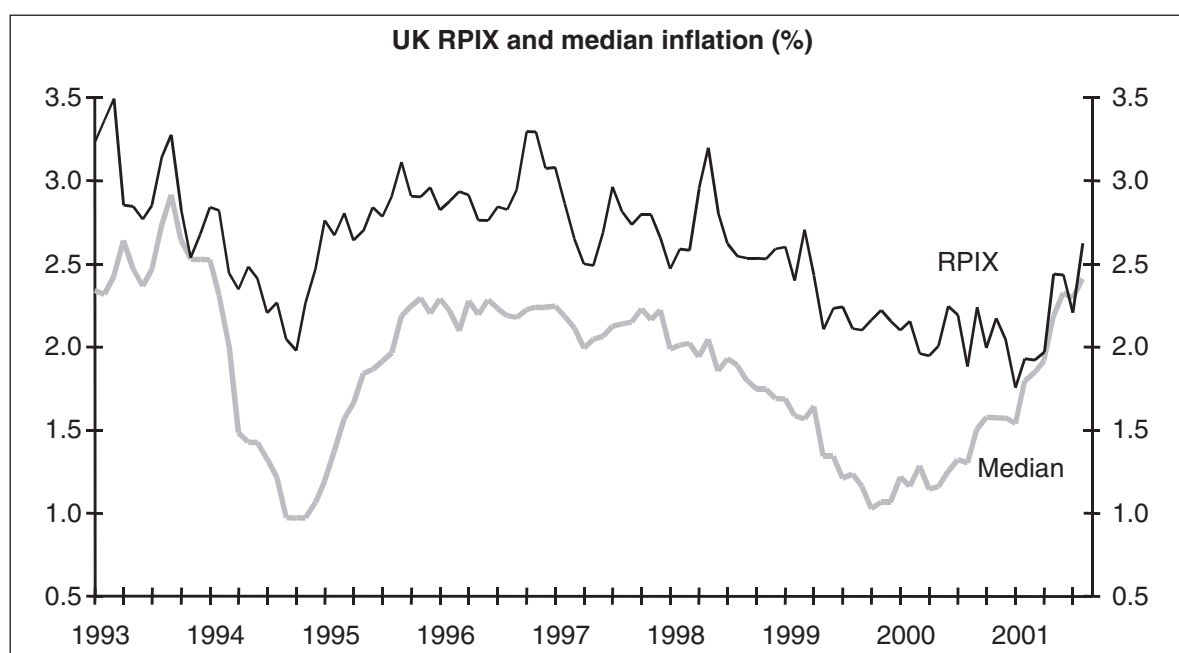
The RPIY and RPIX measures of core inflation appear to have useful predictive properties, as do core goods prices and average earnings. Interestingly, RPIX ex food and energy does not have those properties.

Predictive power of key core inflation measures	RPIX 3 months ahead		RPIX 6 months ahead		RPIX 12 months ahead		RPIX 24 months ahead	
	Coeff	t-stat	Coeff	t-stat	Coeff	t-stat	Coeff	t-stat
RPIY	0.295	1.33	0.677	1.89	1.421	2.54	1.638	2.66
HICP	0.006	0.06	-0.016	-0.11	-0.071	-0.30	-0.133	-0.63
RPIX ex food and energy	-0.112	-0.51	-0.315	-0.82	-0.453	-0.78	0.492	0.64
Median RPIX	-0.056	-0.53	-0.138	-0.81	-0.281	-0.94	-0.397	-1.21
RPIXP	0.186	1.65	0.393	2.03	0.728	2.15	0.755	2.02
Core good prices	0.045	0.96	0.087	1.16	0.211	1.71	0.545	1.84
Service prices	-0.055	-1.04	-0.092	-0.96	-0.095	-0.64	0.065	0.29
Average earnings	0.175	4.57	0.332	4.31	0.6100	4.12	1.010	4.30

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Cross-section inflation I

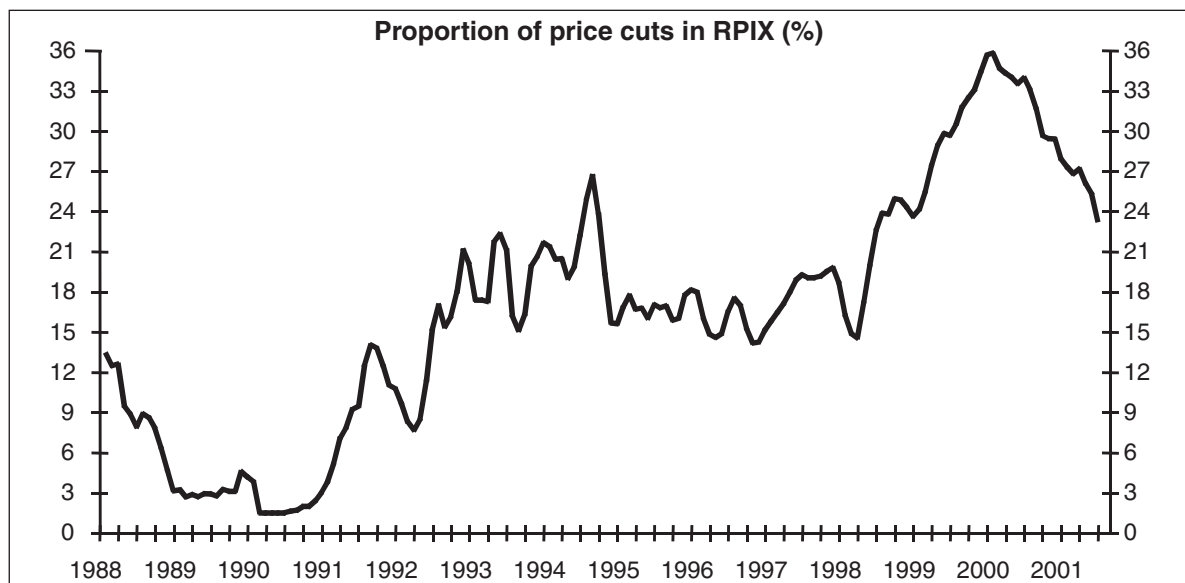
Some have suggested that median or trimmed mean core inflation measures may be more useful than conventional measures.



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Cross-section inflation II

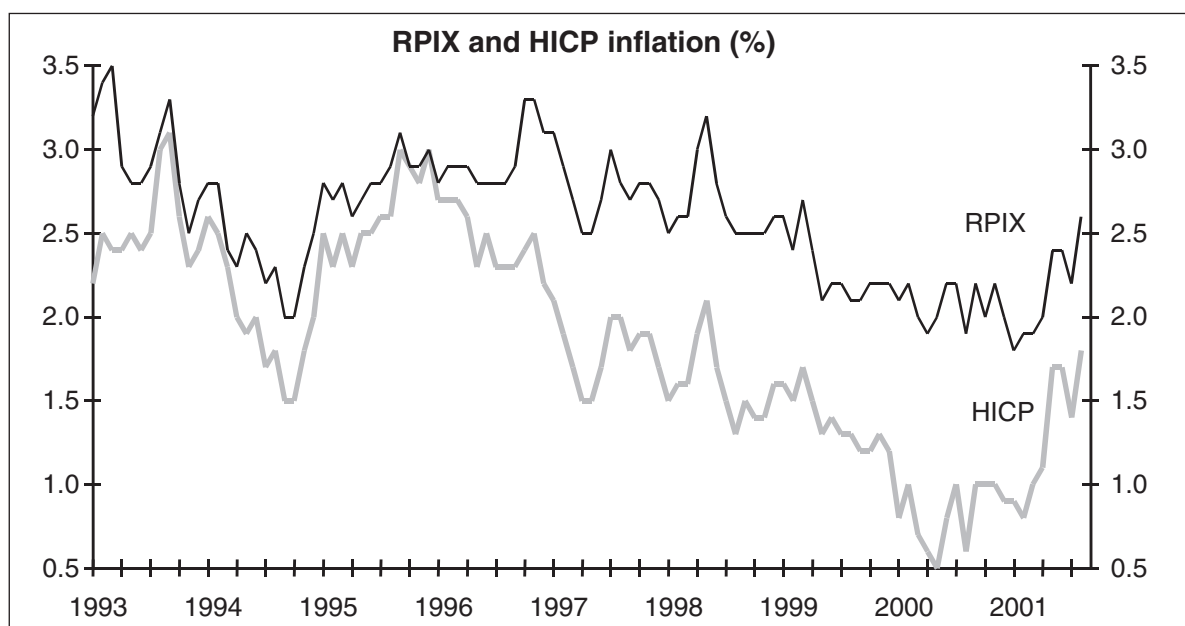
Other measures may also be of interest. For example, increases or reductions in the dispersion of inflation may suggest what sort of shocks the economy has been subject to.



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Compare and contrast I

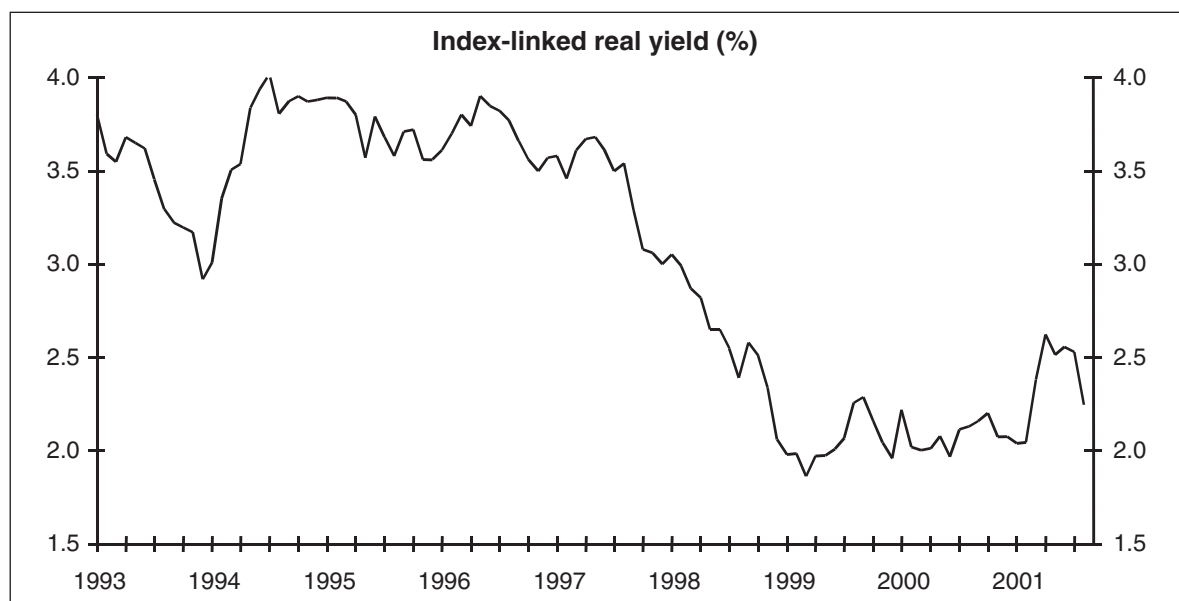
UK HICP inflation has recently been up to 1% lower than RPIX inflation, largely as a result of the housing component and the aggregation method.



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Compare and contrast II

The real yields on index-linked gilts have typically been lower than those in other index-linked bond markets. There are a number of possible explanations, but differences in inflation measurement is clearly one of them.



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CONCEPTUAL PROBLEMS WITH THE HARMONISED INDEX OF CONSUMER PRICES (HICP)

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1. Background to my critique of the HICP

When studying the harmonised index of consumer prices (HICP), we must distinguish between two quite different things:

1. Endeavours to produce standardised and comparable methods for compiling national indices of consumer prices (ICPs) or the special index needed for the European HICP (or ICP for short), and
2. The aggregation of national ICPs based on the European Union Member States or countries belonging to the European Monetary Union (EMU) into an HICP that is officially used as the basis for, or measure of, ECB¹ monetary policy.

There are similarities between these two topics in that the methodological approach to the HICP played a decisive role in shaping the contents of the regulations adopted as part of the harmonisation process. This is particularly true of the HICP's main feature, namely the fact that it is a chain index based on national baskets of goods that change over time. Had an entirely different approach been chosen, the harmonisation regulations would have looked very different in terms of their contents.

This is also true of a second feature of the HICP methodology - the role played by enthusiasm (particularly in the USA) for the "economic theory of index figures" and the "True Cost of Living Index" (COLI), which very much shaped the Boskin Commission's thinking².

In my critique of the conceptual premises of the HICP I will thus be concentrating on these two points, because:

- the HICP is designed as a chain index - which, whilst consistent with the SNA³, has a number of drawbacks that clearly receive only scant attention in the SNA, and because
- although it does not profess to be a COLI (unlike the USA's ICP), it is very much influenced by COLI-type thinking.

The HICP may well provide a valuable service, and a solution that is more satisfying from a theoretical point of view might prove quite elusive. Nevertheless, the quality of a statistical measure is difficult to assess if it is not clear what exactly is being measured, and if the result (in this case the measured "rate of inflation") depends on such a *wealth* of factors.

2. Harmonisation strategy and the concept of comparability

Notwithstanding criticism of the underlying concepts, the object of harmonisation can be wholeheartedly endorsed - "HICPs shall be considered to be comparable if they reflect only differences in price changes or

¹ European Central Bank.

² The Boskin Commission also thought COLI a worthy goal, in theory at least.

³ System of National Accounts.

consumption patterns between countries”. The fact that different national CPIs also reflect differences in consumption patterns hardly needs to be pointed out. Another question is whether the common (country-aggregated) HICP rate of inflation should be affected by such differences.

Criticism has recently been levelled at the HICP for the monetary union (hereinafter “MUICP”, or Monetary Union Index of Consumer Prices), particularly by Georg Erber of the DIW Berlin, basically because the MUICP rate of inflation, which the ECB also uses as a guideline, has *two* components:

1. The price increase measured using a common European basket of goods (as is done when calculating purchasing power parities [PPPs], comparisons being made for two countries - or one country plus the Community - on the basis of the *same* basket of goods⁴), and
2. Differences between the national baskets of goods that make up the MUICP.

Alignment of consumer patterns in the EMU countries will gradually eliminate the second component of the MUICP rate of inflation, which in this respect is naturally “too high”. It has been argued that the existence of this structural component should be a reason for the ECB to base itself on a 2.5% rather than 2% annual increase in the MUICP, so that countries with large national weightings (such as Germany) are not unintentionally exposed to deflationary tendencies.

It is certainly right that comparability between countries (which in itself presupposes an ability to make country-based aggregations) is contingent upon there being no differences in inflation rates that can be attributed to divergent *methods*. It is also right that this type of comparability can only be achieved by means of agreements and regulations on methods to be uniformly applied.

The principles of harmonisation drawn up at EU level in this field are laudable, at least in terms of intent - the quest for “best practices” (but how should we define these?) or the laying down of rules, not in detail, but just to the extent necessary to ensure that certain “minimum standards” are observed. The phased introduction of the HICP is, in any case, to be welcomed. It should likewise be accepted that, when regulations are being drawn up, a country may be outvoted. This is, after all, the price of integration and increased international co-operation.

However, the contents of individual regulations and their theoretical (and sometimes political) *raison d’être* are a different matter. Here criticism is perfectly in order.

3. The concept of “pure price comparison” (temporal comparability)

Why not simply compare two specific average prices (values) at two different points in time in order to measure the rise in prices? The reason is that, in addition to price changes, a whole series of other structural changes influence the comparison. This is clear from the reasons that the SNA advances for not using the unit value index. The SNA rejects this approach on the grounds that it is “affected by changes in the mix of items as well as by changes in their prices. Unit value indices cannot therefore be expected to provide good measures of average price change over time” (para 16.13).

It is one of the abiding secrets of the SNA why it - correctly - acknowledges the disadvantages of the unit value index but then goes on to recommend chain indices, failing to realise that the very same objections can be raised against these. The basic objection here is that chain indices are not based on pure price comparisons. The comparison is not “pure” in the sense that the result is influenced merely by the change in prices, not by other variables too. Nor is it “pure” in the sense that the outcome is influenced only by the periods 0 and t used in the comparison, not by the intervening periods (1, 2, ..., t-1) with their prices and volumes.

In index theory, there are basically two ways of constructing situations such that prices related to these reflect the *actual* increase in prices in a certain sense. We can either:

⁴ Much has been written on international comparisons of this type, the best known contributions in this field being the methods devised by Geary and Khamis (GK) and by Eltető, Köves and Szulc [EKS]. These works clearly played no role in the creation of the HICP. Why not? Though true that the HICP is an aggregation of countries rather than a comparison between countries, why does the comparability of goods and baskets of goods play a role in the latter but not in the former?

1. Compare expenditure on a *basket of goods* which, on paper at least, is the *same* (in terms of type, volume and quality of goods), or
2. Compare the theoretical minimum expenditure required to purchase a selection of goods of the same value in terms of its *utility* during periods 0 and t,

concluding that an increase in prices has taken place (i.e. inflation has occurred) between periods 0 and t if expenditure (defined in one way or another) has increased.

The first approach is the famous Laspeyres' index, $P_{0t}^L = \frac{\sum p_{it}q_{i0}}{\sum p_{i0}q_{i0}}$
or, more simply, $\sum p_t q_0 / \sum p_0 q_0$,

where p stands for the prices and q the quantities of goods and services $i = 1, 2, \dots, n$ during the base period 0 (in the case of HICP, 1996) and reporting time t. The second approach produces a constant utility index (or COLI), where inflation is lower than the figure generated by P_{0t}^L

if and when households make rational substitutions, i.e. consume relatively less (or more) of goods that are becoming relatively more (or less) expensive.

Temporal comparability is thus guaranteed by the uniformity of the basket of goods or of "utility", though a uniform situation may be more readily established in the first instance (the same basket) than in the second (the same level of utility).

This is not the place to compare these two approaches, especially since neither the HICP - nor indeed its country-based aggregated equivalent, the MUICP - really corresponds to either. Although, as has already been said, the HICP does not claim to be a COLI, unlike the American CPI, at least one of the regulations imposed on the Member States as part of the harmonisation programme, namely Commission Regulation No 1749/96 of 9 September 1996 on the inclusion of "newly significant goods and services", smacks of usefulness and constant utility indices.

This is very much in line with the thinking behind the Boskin Commission's "new product bias" (akin to "outlet bias"), the assumption being that a CPI should also reflect the added usefulness of new goods or forms of selling (which the US CPI did not do at the time, hence the mention of "bias"). However, it is precisely this, i.e. the inclusion of new goods (except for the regular re-basings), that the Laspeyres' approach urges us to avoid, as it adversely affects the comparability of the basket of goods.

Including new goods as quickly as possible is an action motivated by considerations of usefulness. Thus we find the Boskin Report⁵ saying that petrol is not as expensive as the index suggests because credit cards now make paying easier. Likewise, the prices given for eating out are too expensive, as there is now a large selection of frozen food that can be prepared at home. Or the increase in the price of books overestimates inflation, since it is now easier than ever to borrow books. And so the arguments continue - a consumer price index should also reflect a greater selection of goods, a cleaner environment, longer life expectancy and so forth.

There is no end to discussions of this nature if the ultimate aim⁶ is not to achieve price comparability but to calculate for consumers an increase in usefulness that is not reflected in an increased price. The problem is not how to deliberately under-calculate inflation⁷, the problem is whether there is any point in price statistics moving ever further away from observable prices for specifically defined goods.

4. The obsession with weightings that are as up-to-date as possible

Neither of the above-mentioned approaches - pure price comparison or COLI - justifies the use of a chain index, the desired means to the HICP end. At the forefront of attention here is the constant updating of the basket of goods and the ability to alter the basis of comparison (selection of goods and businesses and so forth) at any

⁵ All the examples included in my critique of the economic-theory-index are taken from the discussions held in the US.

⁶ When taking account of quality changes, for example.

point in time - something that should *not* happen with the \bar{P}_{0t}^L Laspeyres' formula with weightings (q_0) that are fixed in the interests of a pure price comparison for the duration of an index with base 0.

It is sometimes said that the index is no longer appropriate in an age in which everything is changing so quickly - so much so that weightings may have to be changed yearly. This was clearly the thinking behind Commission Regulation No 2454/97 of 10 December 1997 on "minimum standards for the quality of HICP weightings". For "the quality of", read "recent"!

It should also be borne in mind that, since all the countries aggregated under the MUICP are constantly changing their weighting schemes, the index for all the countries together (i.e. the MUICP) represents not just a wealth of baskets, but also baskets of differing ages. And if the "1996-base" index currently stands at 120, this does *not* mean that something that cost 100 in year 0 (i.e. 1996) now (i.e. in year t) costs 120 (the "something" is, in reality several baskets of goods from 1996 [*not just one* constant basket], and these baskets have been *changed repeatedly*, all of them being $k \times t$ baskets of k countries in t periods (1996 to the present, t).

In a chain index, a comparison between two periods 0 and t is produced not directly⁸ but indirectly, i. e. by *chaining* (multiplying) the links (the individual factors), e.g.:⁹

$$\bar{P}_{0t}^L = \frac{\sum P_1 q_0}{\sum P_0 q_0} \frac{\sum P_2 q_1}{\sum P_1 q_1} \dots \frac{\sum P_t q_{t-1}}{\sum P_{t-1} q_{t-1}} .$$

5. The disadvantages of chain indices

In my book on chain indices¹⁰, I endeavoured to critically review all arguments normally advanced in favour of chain indices¹¹ and investigated as many characteristics of chain indices as possible. It was primarily the realisation that not one of the arguments in favour of such indices is watertight that made me into more and more of a non-chainer. I will not go into details of this here, though I will list the drawbacks of chain indices that gradually became clear to me:

1. The theory on which they are based is inconsistent.
2. Chain indices violate almost all the axioms generally applied to indices, since
3. They are "path-dependent", which explains numbers 1 and 2;
4. They reflect no less than *four* types of influence (rather than just one, as is ideally the case with a pure price comparison).
5. They do not lend themselves readily to aggregation, and
6. They cannot therefore be used for deflation.
7. Finally, continued calculation of these indices by official statistical bodies will probably prove considerably more troublesome¹².

⁷ Which is perfectly feasible if the base on which indices are calculated can be changed at will, as was done, for example, by the former GDR where there was virtually never any official inflation. If the price of a product increased, the increase was either explained away as a concomitant increase in quality, or the product was replaced by an item whose price had not increased. Keeping a basket of goods stable for a number of years does have an advantage that should not be underestimated: it throws up a compelling conceptual barrier to manipulation of any sort. By doing away with this, we open the door to manipulation.

⁸ We prefer the term "direct" index and thus speak of a "direct Laspeyres' index". The term "fixed-base index" is a misnomer here, quite apart from the fact that "fixed" has negative connotations in the view of many people.

⁹ As can be seen, this type of index - in this case a Laspeyres' chain index comprises not just one basket but several (t). We will not go into the reasons advanced by supporters of chain indices in favour of this approach. On closer inspection, none of the comparisons are either accurate or sound (a favourite move is to erroneously compare just one of the product's links with the index. It is not the chain component [the link] that is the problem, it is the multiplication of components [i.e. the chain]).

¹⁰ P. von der Lippe, Chain Indices, A Study in Price Index Theory, Vol. 16 of the Publication Series "Spectrum of Federal Statistics", (published by the Statistisches Bundesamt, Wiesbaden), Stuttgart 2001.

¹¹ op cit., chapter 6 (pp 218).

¹² Particularly in view of the increasing frequency with which baskets of goods must be determined (as a result of, for example, household surveys). On the other hand, chain indices may be more convenient to calculate than direct indices, as no attention need be paid to comparability between more than two adjacent periods at any one time. It is generally accepted that chain indices involve a lot more survey work. However, there are clearly no real cost/benefit analyses. This matter will not be discussed any further under point 7.

Re 1: One theoretical aspect (though mention could be made of several other inconsistencies) is as follows: chainability (or transitivity) means that an interval (0, t) can be divided up into subintervals *at will* and, since $P_{0t} = P_{0s} P_{sz} P_{zt}$, the results will be the same. Importantly, this equation should hold for *every* s and z. Thus, two six-month results or four quarters always produce the same *annual* results. Integration can thus be done consistently over time. However, this is definitely not the case with chain indices, basically because chainability and the continuing modification of the weighting scheme (for quantity q) are incompatible. Not only is the

product of annual chaining with an interval of 0 to 4 $\frac{\sum p_1 q_0}{\sum p_0 q_0} \frac{\sum p_2 q_1}{\sum p_1 q_1} \frac{\sum p_3 q_2}{\sum p_2 q_2} \frac{\sum p_4 q_3}{\sum p_3 q_3}$

different from the direct index P_{0t}^L , i.e. $\frac{\sum p_4 q_0}{\sum p_0 q_0}$,

it is also different from a biennial chaining $\frac{\sum '2 q_0}{\sum '0 q_0} \frac{\sum '4 q_2}{\sum '2 q_2}$.

Thus chain indices rely on chaining (multiplication)¹³, but they are not chainable.

Re 2: In view of the above, the index will not necessarily read 100% when all prices in 0 and t are exactly the same. Depending on the prices and quantities recorded during the intervening periods, the chain index may be more or less than 100% (in other words, it breaches the identity axiom), whereas a direct index (in fact *any* direct index) where $p_{it} = p_{i0}$

for all values of i will obviously always read 100%. Similarly, chain indices breach almost all the axioms that make indices meaningful¹⁴. The point is that, whilst a link *is* an index within the meaning of index theory, the chain is *not*. It does not possess the requisite properties (i.e. it breaches axioms), though each individual link does (i.e. it complies with the axiom in question).

Re 3: Chain indices do not just breach the identity axiom, they may also swing up or down at random as a result of even short-term (cyclical) changes in prices. A chain index does not really compare two situations as at 0 and t, it is a composite measure of a time series' shape. As such, it is dependent on what happened before (it is "path-dependent"), whereas a direct index will always provide an independent¹⁵ and pure comparison between two periods. This path-dependency is the direct opposite of chainability (i.e. consistent aggregation over time)¹⁶.

Re 4: the result of a chain index is influenced by no fewer than four variables:

1. variations, during periods 0 and t, in the prices of weighted goods¹⁷ that are as similar as possible,
2. shifts in weightings caused by substitution (households maximising utility) between periods 0 and t, i.e. q_{i0} (q_{it} , as well as two biases specific to chain indices, viz.:
3. path dependency, and the fact that
4. for the summation of goods $i = 1, 2, \dots, n$ over the periods 0, 1, ..., t, the i-th item need not always be identical (i.e. changes in the "domain of definition" of the index function).

For the MUICP, there is a fifth source of variation, namely the country weightings that change over time¹⁸.

¹³ Indeed, they can *only* be calculated by multiplication, so errors in one link affect the chain calculated up to that point in all subsequent periods. Direct indices, by contrast, can be compiled either by multiplication *or* "directly" (usual in practice only).

¹⁴ It is largely up to the individual to decide which axiom violation is most serious. In a review of my book, W. Krämer singles out violation of the mean value property: a chain index may be larger than its largest constituent link (partial index) or smaller than the smallest. This affects aggregation and deflation, problems discussed in points 5 and 6.

¹⁵ i.e. independent of what happened in the intervening periods.

¹⁶ basically, all my objections come down to problems of aggregation, be it in time (i.e. over intervals of time) or for goods (i.e. partial indices).

¹⁷ again, "goods" also includes services.

¹⁸ or even changes to the group of countries as a whole. With the MUICP, it is assumed that the problem of new countries joining the EMU can be circumvented by "linking in" (as if this did not adversely affect comparability with previous periods!). The same applies to methodological changes, e.g. broadening coverage. The index continues to be calculated, with the inclusion of, say, certain insurance services that had previously not featured in it. If, as has happened, people are less than scrupulous when it comes to comparability, what appears to be an inflation rate may be attributable, in part at least, to a simple change in methodology.

“Pure price comparison” could be taken to mean that the first source of variation should be isolated. If we attempt to do just this with the direct Laspeyres’ index, we are not denying the enhanced dynamics of the world of merchandise. We are not acting out of nostalgia, we are merely acknowledging that the fact that the pace of change has quickened does not mean that we should start comparing chalk with cheese, we are acknowledging that the purpose of a price index is still to measure changes in *prices* and not changes in, say, volume, which is the job of a volume index.

It may be objected that fictitious price developments of this type are not of interest. This can be countered by arguing that, for analytical purposes, it is better to have separate and “pure” measures for different phenomena, and to correlate these, than to have a single measure that somehow includes everything.

In order to take account of substitution effects when measuring inflation, i.e. the second of the four sources of variation listed above, there may well be micro-economic reasons, which we will not go into here, which call for a COLI approach (as in the USA). The only important thing to realise is that the standard objection to the *fixed* (and possibly outdated) basket of goods can also be countered with indices which are under discussion as COLI approximations and which take account of the most recent basket of goods in each case (in much the same way as the direct Fisher or Törnquist indices).

If it were merely a question of taking current volumes (q_{it}) into account in addition to those of the base period (q_{i0}), use could be made of such indices, obviating the need for a chain-index approach and eliminating the third source of variation (path-dependency), which is not only unwanted but also very difficult to justify in theoretical terms.

However, the main difference between the direct Fisher index P_{0t}^F and the chain index, e.g. a Laspeyres - (\bar{P}_{0t}^{LC}) or Fisher chain index (\bar{P}_{0t}^{FC}) is not just the fact that P_{0t}^F can be interpreted as a COLI, whereas the chain index manifestly cannot, but also the fact that the i -th values for P_{0t}^F in 0 and in t are *for the same commodity*¹⁹ (or at least should be), which in practice is not easy to achieve, whereas such considerations do not apply to chain indices.

However, the price of the much-vaunted “flexibility” with a chain index is another source of variation (the fourth) of unknown magnitude. This means that the definition domain of the index function can be changed at virtually every link. At t , say, inflation may thus be greater or smaller (by an unspecified amount) than with the pure price comparison P_{0t}^L , because the conceals a selection of goods that has been changed repeatedly over time²⁰.

6. The analytical value of chain indices

If, as reports suggest, the ECB is under pressure to depart from its two-pillar approach with its focus on the volume of money and concentrate on targeting inflation directly, it is obviously important to know which influences in particular the index represents, to what extent they can be called “inflationary” and to what extent they react to the central bank’s instruments. Seen in this light, a complex and flexible method of measuring a target parameter is not necessarily advantageous.

Aggregates of partial indices are useful not just as targets, but also for analysing the causes of inflation. The fact that chain indices cannot be consistently aggregated (using partial indices) and do not therefore show price linearity²¹ detracts from their analytical value. Poor aggregation properties (cf. point 5 above) mean that laymen and external analysts who do not perhaps have access to the detailed data held by Eurostat or the ECB cannot calculate and compare ad hoc variants of the HCPI with or without certain components (e.g. administered prices, highly volatile prices, etc.) - something that they were previously able to do with conventional mechanisms for measuring inflation (i.e. direct indices).

¹⁹ This is true of all direct indices, but not of chain indices.

²⁰ Not that this was done with reluctance owing to practical difficulties with meeting the requirements of the Laspeyres formula. Indeed, it was done quite consciously in the light of the obsession with ultra-recent weightings and with the virtually instantaneous inclusion of “newly significant goods”.

²¹ This is a particular requirement as aggregation consistency.

Then there is the problem of the usefulness of chain indices as deflators (cf. point 6 above), i.e. the properties the resultant “volumes” possess. The SNA identifies this as a shortcoming (though it plays it down), as the *volumes*²² are not “additive”, i.e. do not satisfy the same definitions as the *values*²³ from which they are derived by deflation. There are other disadvantages too²⁴.

The volumes generated by chain indices are not, for example, proportional in terms of volume, which is why the identity axiom does not hold: even if all quantities in periods 0 and t are identical, the “volume” (i.e. the proxy for the sum of individual quantities which is not defined) may well be larger or smaller in t than in 0, which is again a corollary of path-dependency but obviously impairs interpretation of the “volumes”.

7. Country-based aggregation

In addition to chaining (for which there is no real justification²⁵), the HICP also features country-based aggregation (e.g. in the case of the MUICP²⁶, this means using the EMU countries to produce a European inflation rate)²⁷. The simple idea of constructing the MUICP links as a weighted²⁸ mean of national HICPs was reached, with country weightings (c_m) for k member states ($m = 1, \dots, k$) thus:

$$M_{0t} = \left(\sum_{m=1}^k c_{m1} H_{m1} \right) \cdot \left(\sum_{m=1}^k c_{m2} H_{m2} \right) \cdot \dots \cdot \left(\sum_{m=1}^k c_{mt} H_{mt} \right) = M_1 \cdot M_2 \cdot \dots \cdot M_t,$$

where H_{mt} is the link (from t-1 to t) for country m (i.e. its HICP increase).

The problem with this index is as follows: if the annual national inflation rates are similar, the MUICP is basically redundant, but if they are different - which is likely to be the case, since the constituent countries (k) will have very different standards of living, and some goods cannot be traded across borders (housing rents, for instance) - what is the MUICP actually measuring? Nor is it clear exactly how the aggregation (or more precisely: the averaging) of price level based on countries with changing weightings should be interpreted in terms of economic theory.

The MUICP is *influenced by a number of factors* that may be more or less interpreted as manifestations of “inflation”:

- aggregation of the **country** price levels,
- aggregation over **goods**, the type and weighting (in the baskets) varying from country to country and from period to period, and
- aggregation over **time**, which because of path-dependency, always has a deleterious effect in a chain index, and finally
- the constantly changing **calculation bases**, e.g the inclusion of new goods or sales outlets.

We do not share the widespread obsession with ultra-topical index weightings. Instead, we think the most important thing is to produce a pure price comparison and let the indices (e.g. expenditure ratio or mean increase in prices) speak for themselves. After all, experience shows that the more opaque a measuring approach is, the greater the tendency will be to manipulate findings to suit political ends and to attack the method itself²⁹. Nor should we forget that the ECB and the euro-currency have yet to undergo the acid test.

²² i.e. as aggregates “at constant prices”, in so far as this has any meaning in connection with chain index deflators.

²³ aggregates at constant prices.

²⁴ For details of these, cf. chapter 5 of my book “Chain Indices”.

²⁵ as can be seen from the concepts discussed above - pure price comparison and COLI (i.e. the idea of the need for income compensation so that the household (what household?) can maintain the same level of utility). The formula contains not just one, but kt baskets of goods, nor is there a constant utility function for a “European” household living everywhere simultaneously.

²⁶ Monetary Union Index of Consumer Prices (MUICP).

²⁷ Politicians are never happy to look at more than one figure at a time. The tendency is always therefore to take several figures and combine them into one, even if they measure completely different things.

²⁸ True to the obsession with weightings generally shown in the field of indexing, experts concentrated on topics such as how to produce country weightings that were as up-to-date as possible, and how to prevent a high-inflation country disproportionately affecting the overall inflation rate.

²⁹ cf. the example of the Boskin commission.

THE EFFECT OF EURO ON PRICES

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This paper shows that nominal prices have strong impact on pricing of firms. Because euro will change nominal it will affect pricing at least in retailing sector. In fact, adjustment process of prices has already started. The crucial issue in the adjustment process is average price level. Does adjustment of single prices cause average price level to increase? This study shows that this is not necessarily the case.

1. Introduction

Psychology of consumers and nominal prices affect pricing a lot. The reason is that firms believe consumers' price knowledge to be inaccurate and biased. In other words, consumers do not know prices of even frequently bought products (Conover, 1986; Dickson and Sawyer, 1990) and consumers often believe that prices with 9-digit endings are cheap (Stiving and Winer, 1997; Blattberg and Neslin, 1990; Blattberg and Wisniewskil, 1987).

Both of these issues are very important in a process of changing national currencies to Euro. As a result of Euro, retail firms will change (I mean change – not convert with official rate) in practice prices of all products. The dangerous fact is that consumers' price knowledge will be even worse than normally due to new currency. This combination may cause inflation peak at the beginning of 2002 in the countries where national currency will be replaced by Euro.

This paper describes the importance of nominal prices in pricing decisions of firms. Further, the paper examines possible effect of Euro on prices already in year 2001. The data used in the analysis is Finnish grocery retailing data.

2. The Data

The paper examines Finnish grocery retailing data from years 2000 and 2001. Both of the cross-sections have been collected at May. The cross-sections include the same 43 stores around Finland and 148 products in each store¹. In other words, both of the cross-sections include 6364 price observations.

The observations in the data have been specified in two different ways. Part of the products are branded products and very strictly defined (for example 1 liter of Coca Cola). Another part of the products are not strictly specified, instead they are cheapest products of certain product category (for example the cheapest wheat flour 2 kg). This characteristics of the data is very important. The interpretation is that price data of strictly specified products can be seen as a random sample of prices. Instead, the cheapest price observations are not random sample of prices. They present typical prices of low priced items.

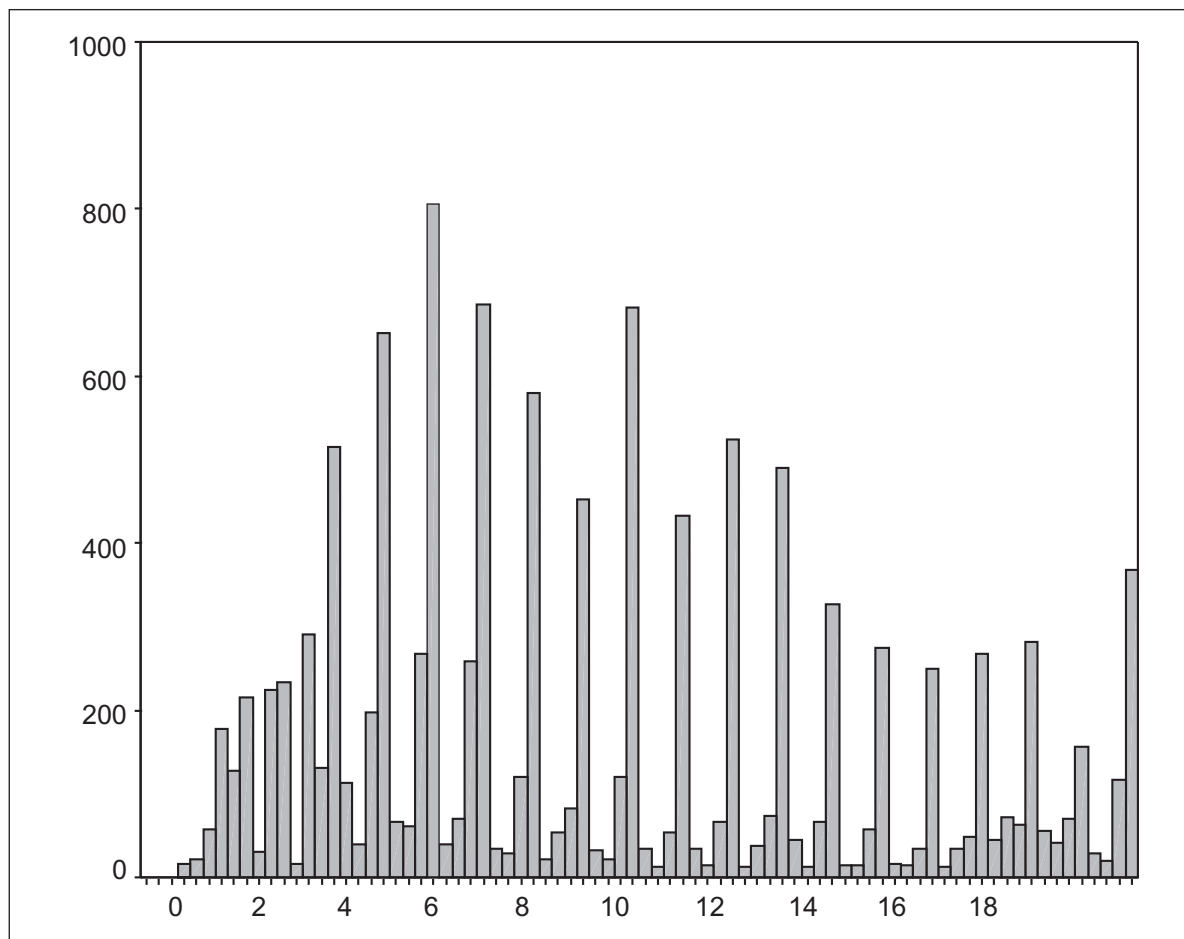
¹ The total number of observations in both of the cross-sections is larger. This paper presents only price distributions of exactly same products and stores in both years. However, the price distributions based on the whole data are very similar the distributions presented in this paper.

3. Pricing Decision of Firms

The effect of nominal prices

Figure 1 presents distribution of prices in 2001 (the figure shows only prices under 20 marks) and reveals how strongly nominal prices affect pricing: frequency of prices little bit under integer is much higher than little bit over integer. Interval of every class in figure is $\frac{1}{4}$ Finnish marks. After 3 marks the distribution pattern of prices is clear: the highest class is integer minus $\frac{1}{4}$ and the lowest integer plus $\frac{1}{4}$. In other words, psychology matters: grocery retailers believe that consumers' scale of prices is biased (for example, 5,90-5,70 < 6,10-5,90). Probably retailers' beliefs are correct.

Figure 1. Price distribution of grocery products under 20 FIM (3,364 euro).



It is clear that euro will change pricing pattern showed by figure 1. The old frequently used prices (like 9,90 FIM) will disappear and there will be new frequently used prices. New frequently used prices will be probably little bit under 1 euro and 2 euros.

The effect of euro in 2000

It is possible that retailers adjust prices towards “europrices” already in 2001 (though figure 1 does not suggest it). Figures 2 and 3 present distribution of all prices in 2000 and 2001. The class interval in these figures is 1 mark.

Figure 2. Year 2000, all products

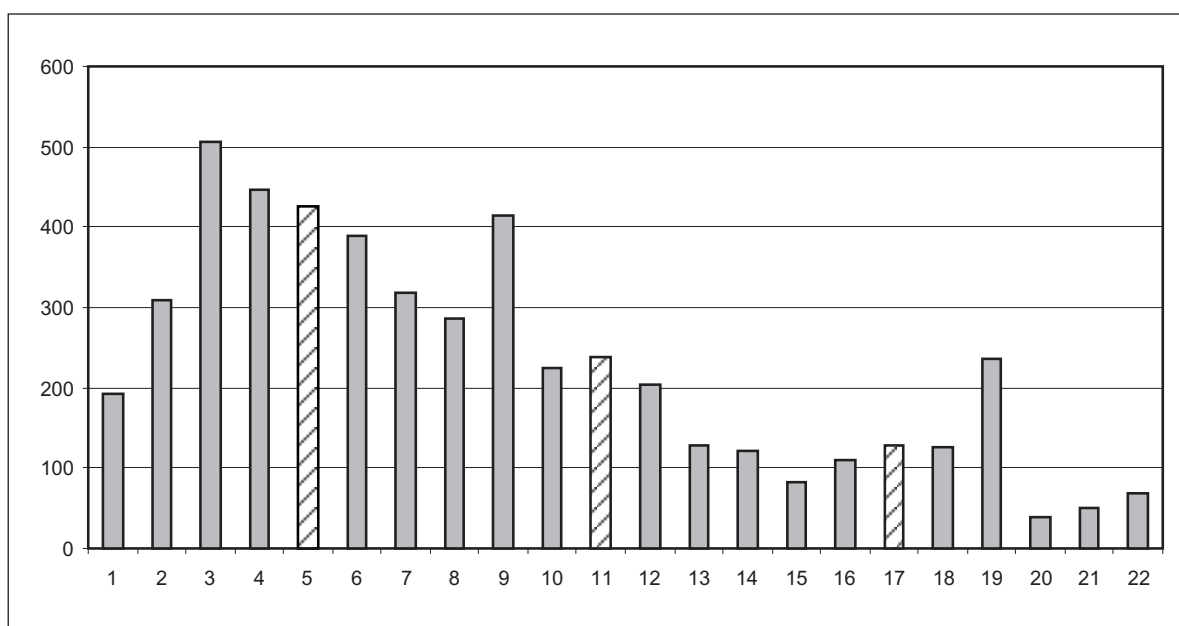
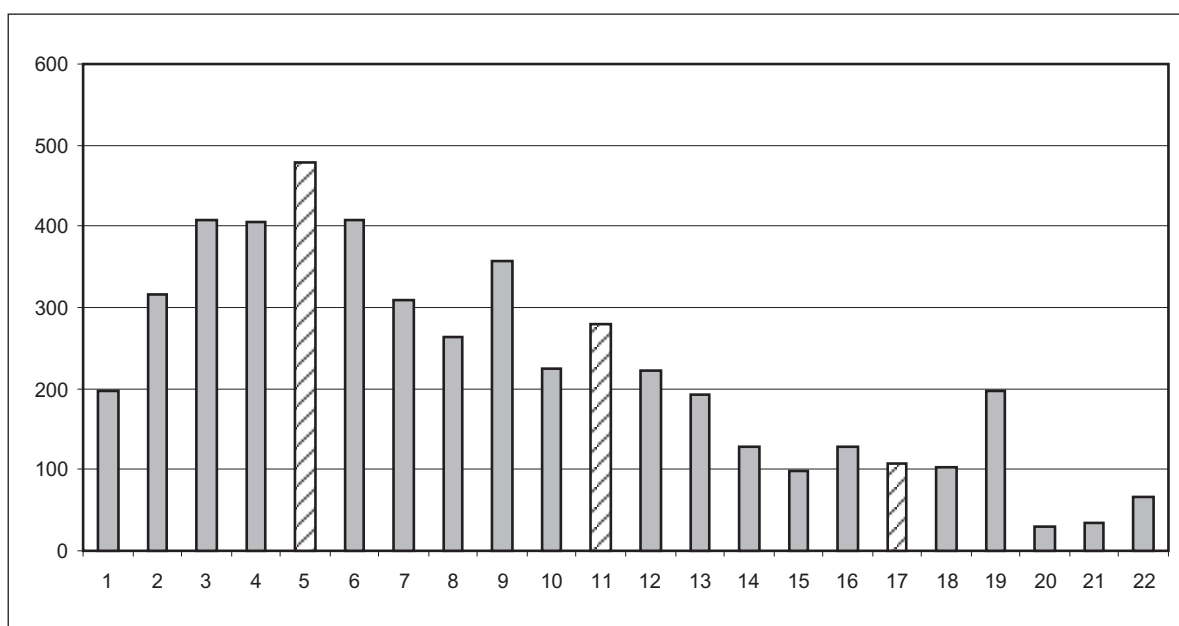


Figure 3. Year 2001, all products



The effect of euro in figure 3 is not clear though prices in classes of 5.00 – 5.99 (1 euro = 5.94573 marks) and 11.00 – 11.99 (2 euros = 11.89146 marks) are little bit more frequently used in 2001 than in 2000. However, remember that data in figures 2 and 3 are not random sample. Instead, it is combination of random sample and sample of lowest prices in certain category.

Figure 4. Year 2000, brands

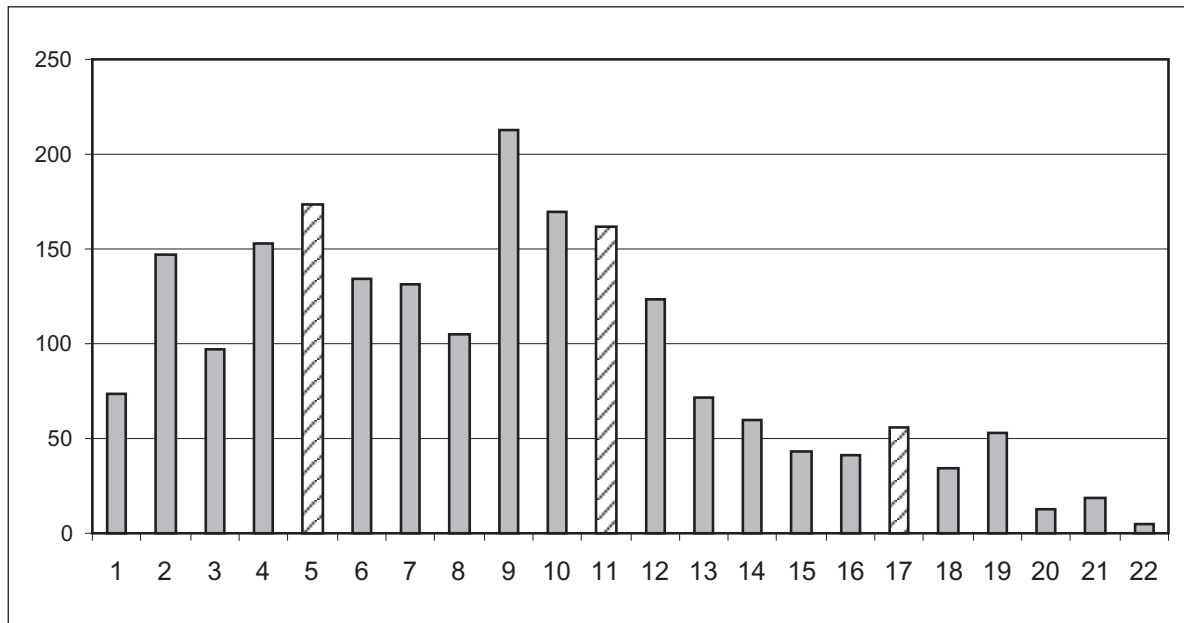
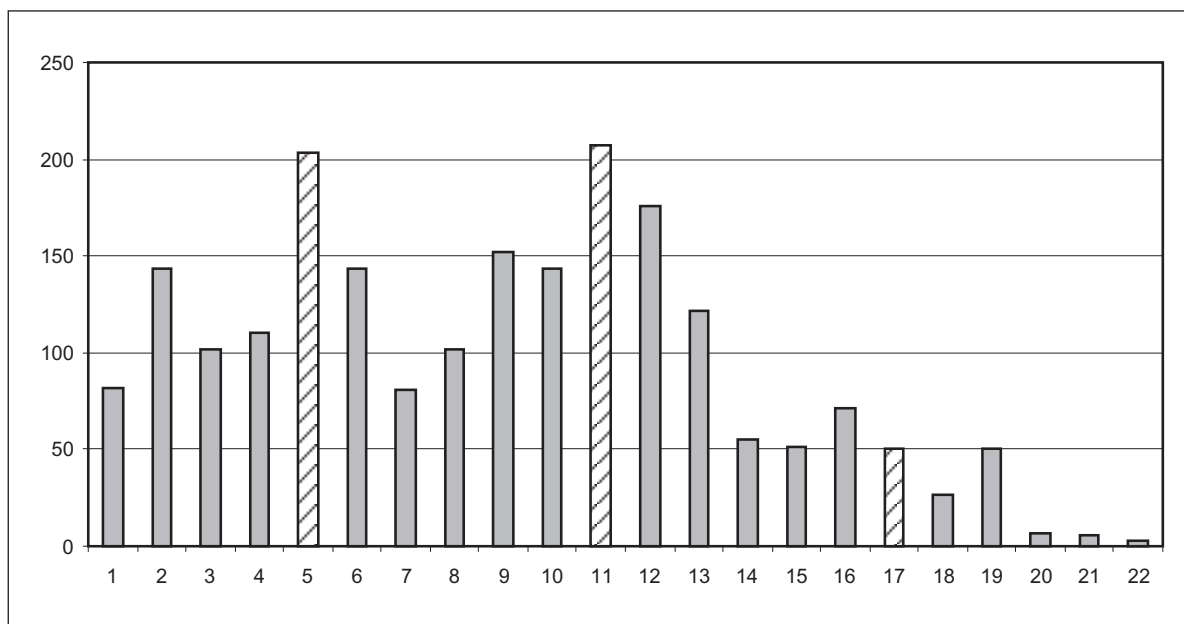


Figure 5. Year 2001, brands



Figures 4 and 5 presents price distribution of branded products in years 2000 and 2001. In other words, products in the sample are strictly defined branded products. The effect of euro is quite different in this sample. It looks clear that forthcoming euro has affected prices of these branded grocery products already at May 2001. Prices in classes of 5.00 – 5.99 (1 euro = 5.94573 marks) and 11.00 – 11.99 (2 euros = 11.89146 marks) have increased distinctly while prices in the other frequently used classes (like 9.00 – 9.99) have decreased.

The important question is the change of price level. Has price level increased because prices have adjusted towards “europrices”. Little bit surprisingly average price (weighted by average consumption in Finland) of branded products has increase only 1.2 % in one year. In other words, though prices have concentrated towards “europrices”, price level has not increased significantly, meaning that prices of quite many products have lowered as well.

4. Concluding Remarks

This study has shown that nominal prices affect pricing a lot. Thus, the change of national currencies to euro will result huge change in single prices. It is realistic to assume prices to fall (or at least inflation to be moderate) due to euro in the long run. Instead, at the short run euro may result general price level to rise. The reason is that price rigidity disappears at the beginning of 2002 and at the same time consumers' price knowledge will probably decrease.

This kind of large change in pricing requires naturally very careful price level measurement. The question is can we take into account all the important aspects to carry out valid measurement and to provide enough information to public about price changes.

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COLLECTIVE BARGAINING AND CONTRACTING

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This paper aims at giving an overview of the potential use that trade unions, and the social partners can make of statistical information. As the focus of this conference is focusing on inflation and its different measures, we propose that this presentation focuses on three main issues linked to the role of inflation measures in the wage formation process (1st part). The following section will review the new situation in which bargaining on wages and working conditions is taking place from a European perspective, and how it fosters the need for good statistical evaluation of the economic situation (2nd part). Lastly, we will review the existing measures of inflation which already exist and the needs for improvements, linked to the wage formation process (3rd part).

1. The role of inflation in wage setting

Inflation is defined as the yearly rise in consumer prices and therefore has a role in wage formation. A rise in inflation reduces the purchasing power of the wage earners. Therefore it is necessary to limit the inflation rate as well as to ensure that wages increase at the minimum as the inflation. The role of inflation in wage setting is therefore very important.

In practical terms, trade unions currently use inflation as a determinant of wage demands in all the 15 EU countries.

It is determinant in 10 countries, alongside productivity or economic growth.

It is the major determinant in 5 countries (France, Greece, Luxembourg, Sweden and the UK).

Nevertheless, trade unions are generally relying on national inflation figures (published by National Statistic Institutes), rather than on harmonised figures as published by Eurostat.

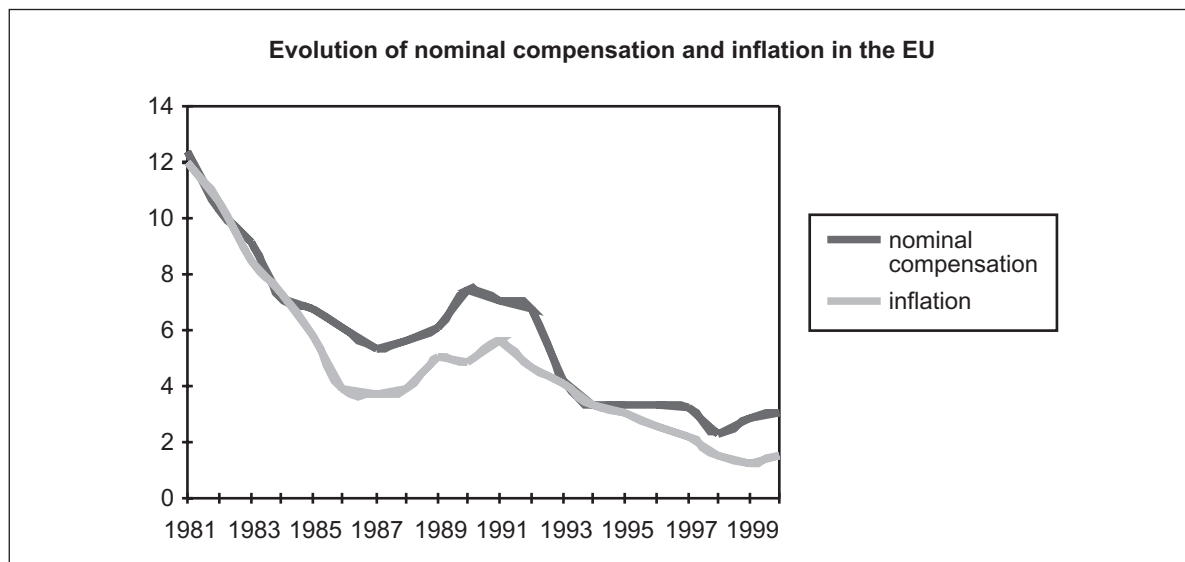
Table: Factors used in Wage Formation (inflation and productivity)

Country	Inflation	Productivity
Austria	Factor used	Factor used
Belgium	Determinant factor	Commitment (Doorn initiative)
Denmark	Factor used	Factor used
Finland	Determinant factor	Determinant factor
France	Determinant factor	—
Germany	Determinant factor	Determinant factor
Greece	Determinant factor	Factor used
Ireland	Factor used	Factor used
Italy	Determinant factor (<i>sectoral level</i>)	Determinant factor (<i>Enterprise level</i>)
Luxembourg	Determinant factor	
	Indexation	
Netherlands	Determinant factor	Determinant factor
	Producer prices	
Portugal	Determinant factor	Determinant factor
Spain	Factor used	Factor used
Sweden	Determinant factor	—
United Kingdom	Determinant factor	—

Source: “Wage Formation in Europe”, Mermet (2001)

The following chart shows the rate of increase in nominal compensation and inflation in the European Union. It shows that inflation is one of the leading determinants of wage evolution.

However, it is noticeable that nominal wages are rising at rates which are similar or higher than that of inflation. This is due to the impact of the productivity-based determinants of wage evolution. However, it should be noted that there was almost no real wage rise in the period 1981-1984 and 1993-1995 as nominal wages were increasing at similar rates as for inflation.



Source: European Commission, European Economy

The result of this chart showing a good correlation between inflation and wages is confirmed by econometric regressions calculated for the European Commission in 1996 (McMorrow 1996).

These regressions link wage levels to the levels of prices, unemployment, productivity, the terms of trade and variations in unemployment.

Estimated regression for factors explaining the increase in nominal wages (W)¹:

$$W = 6.03 + 0.91 P - 0.5 U - 0.45 dU + 0.03 Pty - 1.07 ToT ; R^2 = 0.97$$

Source: EC, Economic Papers, 1996.

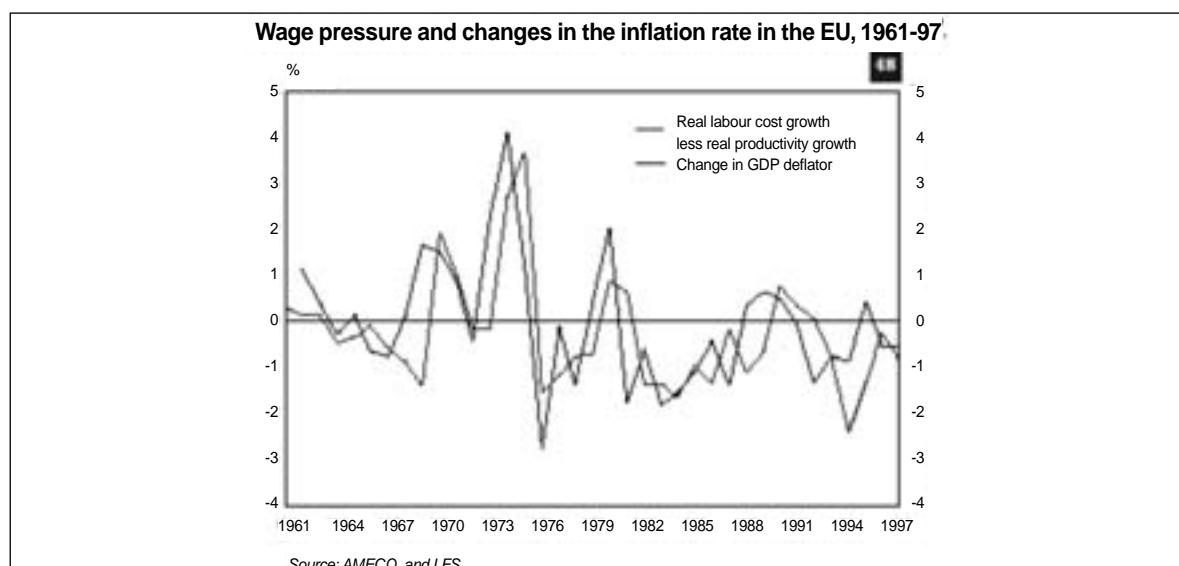
Consequently, prices are estimated to be more relevant to an explanation of wage increases than productivity as the coefficient is lower for the latter.

The main determinants of wages are therefore prices, and particularly terms of trade.

- When terms of trade are increasing, European export prices are increasing at a higher rate than import prices: the European economy is losing competitiveness. In this situation, wages are pushed down in order to restore competitiveness (this is why the coefficient is -1.07: when terms of trade are increasing by 1%, wages are pushed down by 1.07%).
- The second determinant is the level of prices, e.g. inflation. When inflation is increasing, it is driving higher wages (with a 0.91 coefficient, when prices increase by 1%, wages increase by 0.91%).
- Productivity is the lowest determinant of wage variation (coefficient 0.03), as could be observed from the statistical data shown in the previous graph. This means that over the long term, productivity is not sufficiently taken into account in wage developments at the European level.

It should also be noted that the historic evolution of wages and inflation shows that the correlation has a specific direction: inflation impacts on wage evolution and not the reverse, according to this analysis. Pressure for higher wages can be measured by the difference between the year-on-year change in labour compensation and the annual productivity growth. If the increase in compensation exceeds productivity growth, then workers are increasing their share of national income. Conversely, if productivity growth exceeds pay rises, then we observe wage moderation.

There is a close link between wage pressure or moderation and changes in the inflation rate. The following chart shows both the indicator for wage pressure/moderation and the change in the inflation rate (GDP deflator). It is interesting to notice that the rise in inflation usually preceded the increase in wage pressure.



Source: *Industrial Relations in Europe 2000, Report DG EMPL 2000.*

¹ W= wage, P= Consumer prices, U= Unemployment, dU= variation of unemployment by comparison with the previous year, Pty= labour productivity, ToT= terms of trade, Source: EC, Economic Papers, 1996

2. The euro-zone: wage policy as one pillar of the European policy-mix

On the political side, it should be stressed that now, the wage policy has entered in the field of the policy mix. The launching of the Macroeconomic Dialogue at the Cologne Summit in 1998 gave importance to this new political environment. The Dialogue gathers together the representatives of the European Social Partners (UNICE for private employers, CEEP for public employers and the ETUC) together with the European Central Bank, the European Commission (DG Economic and Financial Affairs, and DG Employment and Social Affairs), and the European Council (Committee for Economic Policy, as well as for Economic and Financial Affairs and Employment and Social Affairs). In this Dialogue, forecasts of the economy are discussed and each side is responsible for its own pillar. The ECB is responsible for the single monetary policy, the Commission and the Council for the budgetary policy and the European Social Partners for the wage policy.

Therefore, the concept of “policy-mix”, which was understood as the linkage between monetary and budgetary/fiscal policy now encompasses the wage policy as well. The dialogue can be the place for discussion and exchange of views on the forecasted wage evolution and its sustainability and coordination with the other pillars of this enlarged policy-mix. At the Dialogue, debate can tackle the issue of the evolution of wages in the European Union. However, from a European point of view, the ETUC is the main interlocutor of the ECB and the Commission on the wage issue. As a consequence, the whole process of coordination has to be linked to a general reflection on the European policy-mix and the links between wages, budgetary and monetary policies.

At the same time, the advent of EMU gave more importance to the Broad Economic Policy Guidelines (BEPGs) which are issued annually. Particularly, it should be noticed that the BEPGs are an important vehicle of the Commission’s thought on wage evolution. For example, back in 1998, the BEPGs stated unequivocally that “wage increases in the whole Euro area that are incompatible with price stability will inevitably lead to a tightening of monetary conditions in the euro zone, with adverse effects on growth and employment” (European Commission 1998).

Moreover, the ECB will consider excessive wage increases as a pressure on prices, leading to inflation. The concept of the European Central Bank on inflation risks is clear: “a situation marked by high rates of national inflation as a result of excessive wage increases, an unsustainable expansion of profit margins and/or an expansionary stance in fiscal policy (...) would lead to a loss in competitiveness and, eventually, to a loss in output and employment growth” said Mr Duisenberg (ECB 2001). Thus, it can be argued that social partners will assume a new responsibility in relation to the way monetary policy reacts to their wage bargaining. Accordingly, should monetary policy become restrictive (e.g. higher interest rates), this development will be blamed upon the social partners, and hence upon the workers and their trade unions.

This also means that national bargaining for wages will have to be consistent with the inflation target chosen by the European Central Bank.

However, another focus of wage bargaining is also the sharing out of productivity gains between workers and employers. Here, the 2001 BEPGs state that “from a macroeconomic perspective, it is necessary to set nominal wage increases consistent with price stability and job creation; this implies taking due account of the ECB’s price stability objective whilst ensuring that real wage increases do not exceed productivity growth” (European Commission 2001). This new formulation gives more room for manoeuvre to bargainers, particularly in the use of productivity.

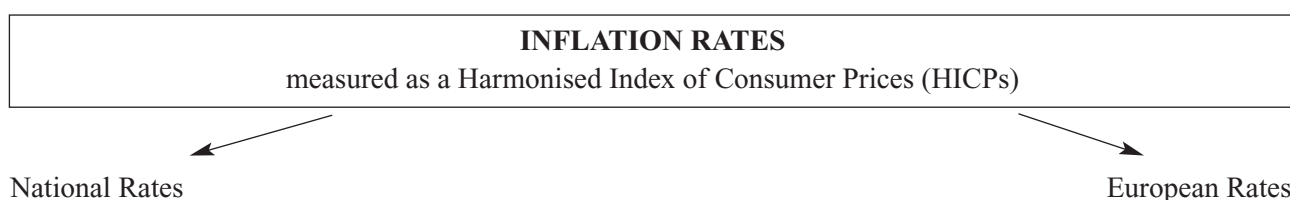
Under these circumstances, it is important for the trade unions, and the social partners in general to have good and up-to-date information on both inflation and productivity, past and forecasted trends.

3. The trade unions’ needs on inflation rates and other determinants of wage setting

Inflation is taken into account in all the studied countries (14). However, it is of interest to wonder which rate of inflation shall be used by unions. For example, it may be assumed that a multitude of rates are published, from the national central banks, the ECB, Eurostat, the national statistical offices or the Commission’s services.

Before, it should be reminded that the use of specific rates of inflation is almost compulsory when dealing with European comparison. European institutions, including Eurostat, the ECB and the Commission, are using Harmonised Index of Consumer Prices. “HICPs are harmonised inflation figures required under Article 109j

of the Treaty establishing the European Community. They are designed for international comparison of consumer price inflation”². Nevertheless, several HICPs rates already exist, either at EU or national level.



July 2001

From 1.4% to 5.2%
 Accross the Euro zone

Euro-Zone (EU-11): 2.6%
 EU (EU-15): 2.8%

Alongside HICPs, other sources also publish other rates, which give different results from the “official” Eurostat figures. Although differences are rather small, this contributes to enhance the general confusion of actors, particularly those which are not very well aware of the European context.

One example of different measures of inflation is given for one Member State:

Inflation figures for France

Eurostat	INSEE Figures	ECB
June 2001 HICP: +3.0%		June 2001 HICP: +3.1%
July 2001 HICP: +2.2%	July 2001 HICP: +2.2%	
	IPC: +2.1% IPC energy excl.: +2.3% IPC tobacco excl.: +2.0%	

On the forecast side, the situation is also confusing. Whereas the Commission issues twice a year its “Macroeconomic Forecasts”, it is publishing HICP forecasts only recently. One year ago, forecasts were dealing with the macroeconomic aggregate “Private consumption deflator”. The ECB is publishing “projections” which indicate a range of possibilities for the following year rate of inflation. There are no forecasts available from the statistical office Eurostat.

Forecasts

European Commission	Eurostat	ECB
Macroeconomic Forecasts May 2001 2001: +2.1% 2002: +1.8%	No forecasts	Staff economic projections Dec 2000 2001: 1.8% - 2.8% 2002: 1.3% - 2.5%

Another important determinant of wage evaluation is the evolution of productivity. In this area, the situation at European level is also difficult. Eurostat and the Commission are only publishing rates per head and not per hour.

² Eurostat, “Euro-Zone Annual Inflation stable at 0.8%”, News Release n° 26/99, 25/03/99.

LABOUR PRODUCTIVITY GAINS

Productivity per employee
Measured as GDP/employee

Productivity per hour
Measured as GDP/hour
*Difficult to find at the
European level*

The main disadvantages of productivity per capita are:

- The number of employees influences productivity. An increase in employment figures can be achieved with a reduction in working time or by an increase in the number of part-timers. In this case, productivity per capita falls, however workers also work fewer hours.
- It is difficult to compare with wage rates which are generally calculated by the hour (hourly wage costs, etc.).

This is why productivity per hour is preferred, although there is as yet no existing data at the European level.

Particularly, it should be stressed that this evaluation of hourly productivity is important. The project of creating a “Labour Price Index” which is a pure labour cost index per hour will lead to comparisons with the HICP. However, this would lead to biased view of the results of bargaining as wages are driven by both inflation and productivity. If the LPI measures wage evolution per hour, a calculation of productivity per hour will also be needed in order to compare the wage increase with both inflation plus productivity.

4. Conclusion: more efforts demanded on inflation forecasts and other indicators related to wages

The role of inflation in the wage formation process is very important, as it constitutes one of the main determinants of wage evolution. However, other users also need up-to-date information on inflation (banks, retails, financial sector, government...). At the same time, the economic environment has recently changed. Nowadays, the economic actors, particularly firms, are responding more quickly to any change in the economic sphere, due to the development of the information society as well as of the integration of the different national economies. All these circumstances speak in favour of improved information on economic indicators. Although the timeliness has improved, some harmonisation among institutions remains to be done. At the same time, the need for forecast indicators has increased. However, the field of inflation is one of the most developed due to the set-up of the Economic and Monetary Union. One message to this conference is therefore linked to other indicators very important for the social partners which are linked to the wage formation process, i.e. wage measurement itself as well as labour productivity and other aspects linked to capital productivity of profitability.

PRICE INDICES IN COLLECTIVE-AGREEMENT NEGOTIATIONS AND SAFEGUARDING VALUE: THE EXAMPLE OF AUSTRIA

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1. Collective-agreement negotiations

The regular adjustments to wages and salaries are among the most important routine decisions in economic policy. They have a decisive influence on macroeconomic complexes, since the wages and salaries of employed persons are the most important source of finance for private consumption, which in turn is an important element in macroeconomic demand. Wages and salaries as cost factors also have a direct influence on the competitiveness of an economy or its individual sectors and branches, and hence affect developments in the production structures. Finally, they form the basis for taxation or social contributions and their development is an important reference for many social benefits.

However, since wage adjustments can lead to conflicts between employees and employers, or between the organisations that represent them, certain regulatory mechanisms for settling disputes have emerged in many countries. The Austrian “social partnership” system has managed to settle employment issues - including working hours and conditions as well as wages and salaries - with a minimum of conflict. This paper briefly outlines the system and particularly the role of measuring inflation in connection with wage policy.

1.1. The institutional framework for Austria's wage policy

Austria's social partnership is based on the “Chambers” - organisations set up by law that represent the interests of certain groups of employees. Except in very few special cases, anyone taking up a given occupation must join one of these organisations. The two biggest for self-employed persons are the Agricultural Chambers (for all self-employed persons in agriculture) and the Economic Chambers (for all self-employed persons in commerce and industry). There are also various Chambers for the professions, such as the Medical and Legal Chambers. All employed persons, except for civil servants, are members of the Chambers of Workers and Employees. Together with the Federation of Austrian Trade Unions [*ÖGB*], the leading organisations of the Agricultural Chambers, the Economic Chambers and the Chambers of Workers and Employees form the nucleus of the social partnership. Unlike the Chambers, which are set up by law, the *ÖGB* is an association.

Negotiations on wages and salaries and other terms of employment take place between the specialised subdivisions of the Trade Unions Federation (“specialised trade unions”) or of the Economic Chambers (“specialised associations”). By law, all the Chambers have the right to conduct such negotiations on behalf of their members and to ensure that they comply with the agreements reached. Normally, negotiations of this kind are conducted by selected representatives of the members (“officials”). The Chambers of Workers and Employees have ceded their collective-agreement negotiating rights to the *ÖGB*. In principle, any group that is sufficiently representative and so wishes may be eligible for a collective agreement. A public body examines the representativeness of the group and acknowledges or rejects its eligibility.

Wage-policy initiatives generally come from a specialised trade union or the *ÖGB*. The specialist trade union informs the *ÖGB* of its wish for collective-agreement negotiations. The *ÖGB* then applies - in the Subcommittee on Wages [*Lohnunterausschuss*], which comprises representatives of employers and employees - for permission to take up negotiations. This Subcommittee on Wages is a subcommittee of the once powerful Joint Committee on Prices and Wages [*Paritätischen Kommission für Preis- und Lohnfragen*], which used to be the most important coordinating body for the social partnership. The Subcommittee usually authorises negotiations, which implies consent on the part of the employers too. The existence of the Subcommittee on Wages enables the *ÖGB* to coordinate collective-agreement activities by branch and to influence the ideas of the individual specialised trade unions, partly with an eye to the “solidarity in wage policy” which is one of its goals. Despite this coordinating function, however, there are no official wage guidelines.

The *ÖGB* comprises a total of 13 specialised trade unions. The breakdown by branch is more detailed among employers than in the *ÖGB*. For example, the industry section of the Economic Chamber alone comprises 22 specialised associations, and all the branches taken together comprise some 130 specialised organisations. However, negotiations with the trade unions are to some extent conducted jointly, while the individual specialised associations nevertheless retain their autonomy. The important “collective-agreement association for the metal industry”, for example, comprises seven specialised industrial associations.

1.2. Austria's wage negotiation system in an international perspective

In the literature of political science and economics, wage negotiation systems are usually classified in terms of their degree of centralisation and coordination, and often examined in terms their impact on inflation and employment and unemployment. Price trends and trends in employment and unemployment are not, however, directly discussed in wage negotiations; they are external factors. Whether two of the classical objectives of economic policy, i.e. price stability and full employment, are taken into account at all depends on the extent to which wage policy is based on, and coordinated in terms of, macroeconomic considerations. A wage policy based on macroeconomic considerations that takes account of these external factors, and must thereby be intersectoral, nevertheless needs to be implemented by the actual bodies that take the decisions on wage policy - in other words, at the level of negotiation.

In a classification of wage-negotiation systems, Kittel/Draxler (2001, 22) have made a distinction, for the formulation of a macroeconomic wage policy, between coordination by an umbrella organisation, authoritative coordination, sectoral wage leadership and non-coordination. Wage policy can be most effectively implemented and hence managed if the enforceability of, or compliance with, collective agreements is standardised by law. Otherwise its manageability is low. These considerations led to the development of five categories of wage-negotiation systems:

- coordination by an umbrella organisation on the basis of low manageability
- coordination by an umbrella organisation on the basis of high manageability
- sectoral wage leadership
- authoritative coordination
- non-coordination

In their study of wage-negotiation systems in 20 OECD countries since 1970, Kittel/Draxler classify the system applied in Austria since 1983 as “sectoral wage leadership”. Before then it had been “coordination by an umbrella organisation on the basis of high manageability”.

This classification clearly rests on the leadership of the metal industry, and hence of a branch of the exposed sector. Because of the degree of exposure of this industry in the world economy, there is particularly great incentive to gear wage policy to macroeconomic elements and hence to internalise external factors, and indeed Austria's “metal-wages round”, in which negotiations begin in the second half of September and the collective agreement usually takes effect as from 1 November, has considerable influence on all other wage negotiations. The same is true of the salaries for industrial white-collar workers, which are negotiated at the same time in the “global round”. However, the results of this are not reported and discussed so prominently in public as the agreements concluded for the metal-workers. In 2000, the collective agreement sector comprising the iron and metals industry covered 142 000 blue-collar and 83 000 white-collar workers, or a total of 225 000 employees. Thus, if the additional 42 000 employees covered by the “global round” are also included, wage and salary

negotiations are conducted for around 267 000 employees, or 65% of the total 411 000 persons employed in industry.

It is worthy of note in the international context that the agreements reached in these negotiations concern not only minimum wages and salaries under the collective agreements but also the adjustment of the amounts actually paid. There are also frequent changes to the framework rights, which are usually cost-effective for the businesses.

1.3. The theoretical basis of wage policy

Austria's wage policy is fundamentally geared to productivity with solidarity, and this approach is based on the idea that all its citizens should be equally involved in increasing productivity, while the relative wage share should remain constant. In practice, this should mean that actual wages keep pace with increasing productivity in the economy as a whole. If overall inflation, measured by means of the GDP deflator, is also taken into account, there is a nominal increase in wages under collective agreements.

A result of this gearing to increasing macroeconomic productivity is that prices tend to rise in branches that fail to achieve the average increase in productivity and to fall in branches where the increase is above average, as this gives them more room to manoeuvre. Nor does this type of policy result overall in wage-pressure on prices and hence a "wage-price spiral" can be avoided.

The new international economic environment (internal market, greater capital mobility etc.) has increased the competitive pressure on large areas of the Austrian economy enormously, as can be seen particularly in the divergence of the exposed and protected sectors. The criticism has also been made that gearing wage policy to productivity takes no account of yield. This problem becomes particularly acute when exposed branches are faced with falling prices on the world market and increased costs for intermediate consumption from the protected sector. Employers are therefore calling for a wage policy that is more geared to yield, along the lines of the cost-neutral policy originally developed by the German Expert Group [*Deutscher Sachverständigenrat*] in 1982.

As far as wage and profit shares are concerned, this cost-neutral approach to wage policy is more flexible than a policy geared to productivity. It can therefore help to maintain a profit share that is regarded as vital for full employment, economic growth or competitiveness and thus takes account of the call for a policy more geared to yield. Cost-neutral scope for wage increases also takes account of changes in non-wage labour cost, payroll structures and changes in working hours. Particular account is taken of the inflation rate: if the change in the price level is measured using the real GDP price index, the figure must be adjusted to eliminate the elements resulting from the introduction of, or an increase in, indirect taxes. Price increases of this kind show a redistribution in favour of the State, compensation for which is not compatible with a cost-neutral approach. Moreover, it would impede any attempts to exert influence (e.g. environmental taxes), if compensation were made for the corresponding price increases.

If the change in the macroeconomic price level is measured using the consumer price index rather than the real GDP price index, changes in terms of trade also need to be taken into account. "Terms of trade" is defined as the ratio between the price index for export goods and the price index for import goods. If the terms of trade deteriorate - in other words, if there is a redistribution in favour of other countries - it is also not possible for a resultant price increase to be compensated for in a cost-neutral fashion. To put it another way, a flow of purchasing power to other countries cannot be compensated for once more in the country of origin. An example of a possible source of deterioration in the terms of trade is the trend in energy prices, and particularly oil prices.

1.4. The role of inflation rates

The purpose of this contribution is not to discuss wage policy but to show the significance and role of the various ways of measuring inflation in connection with wage negotiations. Focusing on the Austrian system has made it necessary to give a brief description of the institutional background to this system and the theoretical basis of wage policy. It has also become clear that the measurement of inflation is basic to any approach to wage policy, be it geared to productivity or to the price level in the economy as a whole. We now need to concentrate more on the practical aspects of wage negotiations, taking the example of the metals industry, since this, as mentioned previously, acts as a leader.

The “Benya formula” continues to be a useful reference for the scope for wage increases - not only for the *ÖGB*, but also for many economic journalists and interested members of the public. Anton Benya was President of the *ÖGB* from 1963 to 1987 (having previously been Vice-President and President of the Metal, Mining and Energy Workers’ Trade Union) . From 1971 to 1986 he was also President of the Austrian National Council (Parliament). According to this formula the scope for wage increases is derived from “productivity plus inflation”, or more precisely from the change in macroeconomic productivity and the change in the consumer price index (CPI). The consumer price index is therefore an important reference not only for theoretical reasons but primarily because of its use in wage negotiations in practice. It is determined by Statistics Austria. Ever since price indices have been calculated in the second republic, the two sides of industry have always been involved. In the Central CPI Committee [*Zentrales Redaktionskomitee für den VPI*], which meets each month, any points of contention are discussed and solutions are established jointly with the statistical authorities. There can therefore be no disputes between the two sides of industry over the methods used for calculating the consumer price index and the results.

The equally important price forecasts are based on those of the Austrian Economic Research Institute [*Österreichisches Institut für Wirtschaftsforschung*], which operates fully independently under the aegis of the two sides of industry (its President is the President of the Economic Chamber and its Vice-Presidents are the President of the Federal Employment Chamber and a Professor of the national economy at the University of Vienna). One of its most important tasks is to draw up the short-term economic forecast, which is revised each quarter. This contains not only the forecasts for the consumer price index, but also data on the trend in productivity for the economy as a whole. The forecast for trends in consumer prices is generally more accurate than the productivity forecast, which is not surprising as the consumer price index is determined each month, so recent values are always available for the forecast. The annual rates of change are also taken into account so that the influence of a known price change on the index can be calculated relatively easily. No such recent data are, however, available for the trend in productivity and, in addition to GDP, forecasts must also be made of the number of economically active persons in order to forecast productivity, since the forecast value required is the quotient of these two values.

It is often unclear, however, which forecast value is used in the negotiations - particularly in the case of the consumer price index. At the time the negotiations are conducted - i.e. in the autumn of a given year - the price trend for that year is still the subject of the forecast, although by September or October the CPI for the year is relatively easier to estimate. Since the result of the wage negotiations primarily concerns wages and salaries for the coming year, they should be geared to the CPI forecast for the coming year. However, since the outcome of the negotiation is ultimately the result of a bargaining processes and can no longer be split into components, it is not possible to ascertain the inflation rate it was based on.

1.5. Current developments, HCPI

It should be clear from the above that wage negotiations are geared to the consumer price index. Employers in particular have not questioned this basic approach, but a number of considerations have repeatedly been discussed.

1.5.1. GDP deflator

As already argued, it would make more sense to use the GDP deflator than the consumer price index in the approach to wage policy, as the extent of imported inflation or the influence of terms of trade would no longer be relevant. The main practical problems arise from the lack of data and the difficulty of making forecasts.

1.5.2. The concept of core inflation

This is a question of isolating from the change in price level the elements that are attributable to outside events. Recently the ECB has identified the trends in prices for energy and unprocessed foodstuffs as “shocks” that have resulted in a considerable increase in the price level in the economy as a whole. The extent of temporary shocks of this kind is identified in order to be able to assess the need for monetary measures. These shocks should not, however, boost inflation through effects on wages. The idea of taking account of the remaining core inflation only goes beyond disregarding imported inflation.

1.5.3. *Increased taxes and levies*

It has already been argued that increased indirect taxes, levies and charges that affect the price level should not be compensated for in wage increases and should therefore be eliminated from price level calculations. The question of the extent to which the higher prices resulting from environmental measures should be treated as an improvement of quality (either in the products or in the environment itself) so that they do not have the effect of pushing up the price level has also been discussed.

1.5.4. *HCPI and CPI*

In Austria the result obtained by measuring the change in the price level using the harmonised consumer price index (HCPI) tends to be lower than the figure obtained using the CPI. This is because of the different concepts on which the two indices are based. In terms of the orders of magnitude alone, therefore, employers are likely to prefer the harmonised index. Unfortunately for arguments in this direction, however, the Economic Chamber frequently does not, in its deliberations, recommend that its members use the harmonised consumer price index for national purposes nor do the members regard it as appropriate. This will be discussed in Section 2 (safeguarding value).

The trade unions regard these considerations as somewhat academic and concentrate on the CPI in the wage negotiations. Their main argument is that apart from enabling workers to share in the benefits of increased productivity, one of the purposes of wage negotiations is to offset loss of purchasing power resulting from price increases, which, whatever their source, place a burden on the total budget of a worker's household and should therefore, in the view of trade unions, be compensated for.

2. **Safeguarding value with price indices**

This Section also describes the specific situation of Austria. It is very important to stress this since, for historical reasons, different countries attach very different importance to stability. In both Austria and Germany, the gulf that emerged between the nominal value of money and the quantity of goods available in the 20th century led to very painful experiences. The whole of society had a negative, not to say traumatic, experience with the inflationary crises in the period between the first and second world wars, with the result that very high priority was given to stability in the political discussions following the second world war.

2.1. *Safeguarding the value of money*

Our money nowadays – usually paper money – is evidence of our claim for a share in the goods and services available in a national economy; no satisfaction is to be had from the material value of the money. One of money's many functions is that of storage. Any claim to goods or services – irrespective of how it was acquired – can be kept for later in the form of money, and this is where the problem of safeguarding value arises. The claim embodied in units of money remains constant only in nominal terms. The amount of goods or services that can be bought with a unit of money may increase or decrease over time. If it increases there is no direct problem for the individual. The situation becomes problematic, however, if, at a later date, a unit of money can only buy fewer goods and services than when it was acquired. In this case we speak of depreciation or inflation. For the sake of accuracy, however, these terms should be clearly distinguished. “Depreciation” is shown by measuring the amount of goods that can be bought with a nominally unchanged amount of money at two points in time. Inflation is the change in the price of a given basket of goods between two points in time.

Price changes are an element in the competitive model for the market economy. A change in the price of a good reflects a change in scarcity relationships. Relative prices in an economy are therefore continually subject to change, but the macroeconomic price level should not be affected by these changes. This is what is meant by the economic-policy objective of price stability.

The price level in a national economy and the way it changes can be measured, totally or in part, at various points in the economic process. This usually requires the development of indices, and consumer price indices are a prominent example of such statistical constructs.

2.2. *The effects of inflation*

Without going into the reasons for inflation, we can at least make a distinction in our minds between its effects on distribution and on allocation, although these interact in practice. The main effects on distribution concern earned income. These have already been dealt with separately. Persons receiving nominally fixed incomes are also affected. These include all groups who receive transfers from the State - pensions, for example - as well as people receiving life annuities or yield on monetary assets. There is no simple answer to the question of whether the State is among the winners or the losers if there is inflation, but it is certain that, with a progressive taxation system, inflation causes State revenue to outpace the actual capacity of the taxpayers.

The effects on allocation primarily concern investment. “Taking refuge in property” clearly means a misallocation of resources that would not have happened in a stable situation. The effects on employment are explained in the literature not least by the “Philips curve”, which primarily analyses a relationship between the unemployment rate and the rate of change in wages. If it is assumed that inflation is also reflected in rate of change in wages, this yields a connection between inflation and employment trends. It was once thought that this connection was almost a law of nature, from which one could also deduce how more inflation could be used to reduce unemployment, but we have learnt from painful experience that this is not the case and that, in the long term, inflation is a threat to employment.

Not least, this very brief description of the negative effects of inflation on distribution and allocation should make it clear once more why the Treaty on European Union describes maintaining price stability as “primary objective of the ESCB”. It is also an indication of why measuring inflation at European level is so important.

2.3. *Safeguarding the value of claims*

2.3.1. *Capital markets*

This is mainly a matter of protecting savers or investors from losses in real value. It can be assumed that the agreed interest on monetary assets includes a component designed to offset inflation as well as a real-yield component. A question that is repeatedly asked is whether or not index-linking would be better in this case, the argument being that, since investors cautiously tend to think in terms of higher rates of inflation, the interest rate tends to be higher in the absence of index-linking. This can apply, if at all, only in the case of longer-term investments. With short-term investments it is always possible, by means of a reassessment, to make the corresponding market interest rate profitable. Because of the lower nominal interest rates, longer-term investments over a period of high inflation will be subject to exchange losses - which will cause investors to hold on to the securities. Index-linking of loans would in principle mean establishing a real interest rate, and it is not immediately obvious how this should be done. There are many practical reasons, therefore, for regarding index-linking of loans as unworkable. We might mention as a curiosity that in Austria in the 1950s there were energy loans that were linked, for servicing purposes, to the average electricity rates. Experts refer reservedly to the “bonification” of Austrian loans at the beginning of the 1970s as a “marginal phenomenon” of index-linking. In today’s international financial markets, all such ideas are a thing of the past.

2.3.2. *Debtors/creditors*

The capital market is only one prominent example of debtor/creditor relationships. These also exist in many other areas such as renting, leasing, annuities etc. The corresponding contracts often contain an agreement on the stability of the value of the claim and link this to changes in an indicator to be specified by the parties to the contract - preferably an officially calculated index. This is very useful in social terms if the political system authorises such safeguarding of value, since expected inflation plays a smaller role, although agreements on safeguarding the value of goods or services can admittedly themselves encourage inflation (because of the way such goods and services - for example, rents - influence the index). The advantages - not the least of which is consolidation - outweigh the disadvantages, however.

2.4. *Instruments for safeguarding value*

The best way of safeguarding value depends on the type of monetary transaction involved. At the microeconomic level, individuals are often interested in data that are of everyday significance. In business, it might be a question of how the value of fixed-term contracts should be calculated over time. Households need documents in order to meet contractually-agreed financial commitments - for example, in the form of leases or

annuity policies, or maintenance payments. After a period in which value was safeguarded on the basis of the prices for foodstuffs and goods (e.g. the price of bread or wood, wages for bricklayers), it is the consumer price index or specific indices for certain areas which tend to be used nowadays.

The building price index or building cost index, producer prices for agricultural and forestry products and special breakdown of the wholesale price index can be used for this purpose. Occasionally the collective wage index or partial series from it are used as the yardstick for safeguarding value. In this case, however, the parties to a contract must realise that wage indices tend to rise more steeply than the inflation rate, and that this results in a kind of “overindexing” compared with the consumer price index. The difference could be interpreted as an element in the higher standard of living.

In industry and commerce, producer price indices are often required for safeguarding value. Since Austria is still lagging behind in the calculation of these indices, the German series are generally used. We also repeatedly encounter “combined solutions” - in other words, safeguarding value by means of a price index for the materials component and a wage index for the labour component (in a fixed ratio) for contracts and supplies.

However, the universal yardstick for safeguarding value is the consumer price index. In their deliberations on stable-value clauses, the Economic Chambers generally recommend the consumer price index rather than the harmonised consumer price index for use in Austria, for reasons relating to the conceptual and methodological differences between the two. Austria’s CPI is based on the concept of “national residents on national territory”, i.e. weighting and price observation for Austria are based on the consumption patterns of the resident population. The HCPI, on the other hand, is based on the concept of “national territory” and therefore comprises private consumption within the national borders, thus including expenditure by foreign tourists in Austria. In Austria’s CPI, each individual price is, in principle, compared with the corresponding basic price, and the relative change is calculated. The arithmetical mean of these relative changes gives the regional relative for the product in question (relatives method). In the HCPI, on the other hand, the geometric mean is used instead of the arithmetical mean. Moreover, Austria’s CPI is calculated using the usual international procedure involving a Laspeyre index, which means that the percentage change in the price level for the basket of goods of an average household is determined, the composition of the basket remaining constant throughout the index period. Since the beginning of 2000, Austria’s HCPI has, on the other hand, been calculated as a chain index.

The main reasons for the predominant use of the CPI, however, are sure to be habit and the fact that the HCPI is still relatively little-known. On top of this, the majority of value-safeguarding agreements that are still in force use the CPI, and people consequently still have most experience with that index.

3. Further reading

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THE ROLE OF CONSUMER PRICES IN REPORTS IN THE *BÖRSEN-ZEITUNG* [STOCK EXCHANGE JOURNAL]

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Not everyone at this seminar will be familiar with all the facets of the *Börsen-Zeitung*. I would therefore like to give a brief account of the main issues it addresses, given its readership. A description of the readership structure will also be illuminating, as it will go a long way to explaining the special demands that the journal makes on the raw materials for its report and analyses - not least inflation data.

The readership of the *Börsen-Zeitung* includes bankers, consultants, lawyers, accountants, private investors, investment funds, insurance companies, industry and, not least, the stockbrokers. It is certainly not a popular journal with a wide range of readers, but rather sees itself as a “daily paper for decision-makers”. Its reputation depends not so much on how many readers it has, but on who these readers are. They often occupy leading positions in businesses. The readership is made up of the following:

Banks	44%
Institutional investors	28%
Industry	17%
Private readers	8%
Intermediaries etc.	3%

It has emerged from a consultation of readers that reliability and credibility top the list of qualities that they ascribe to the *Börsen-Zeitung*. If one bears in mind that the readers of the *Börsen-Zeitung* are no strangers to the cost-benefit approach – if only in connection with the relatively high price of the publication and the effort of reading it - it will obviously have to provide precise and correct information and sound analyses, since another special feature of the *Börsen-Zeitung* is that it clarifies backgrounds and interconnections and draws possible conclusions for further developments, particularly in the financial markets, not only in the traditional commentaries but in the reports too.

According to the *Börsen-Zeitung*, inflation data are among the most important indicators for the national economy. They are particularly important for the financial markets. Changes in the rate of price increases, for example, directly affect the real yield on loans, which in turn leads to an immediate reaction in interest rates. The European Central Bank’s consumer prices are also used for measuring price stability, for which the ECB is primarily responsible. For measurement purposes, it uses the harmonised consumer price index (HCPI) for Euroland. Consequently, it is vital for any observer of the ECB’s monetary policy – the *Börsen-Zeitung*, for instance – to closely examine the HCPI. The *Börsen-Zeitung* also uses the HCPI when describing and analysing short-term developments in Germany. To give a topical example, a higher rate of inflation has meant that, despite tax reductions, developments in private consumption have not been as favourable as had been assumed in many forecasts up to spring. The HCPI is also preferable to the individual indices, which are calculated

differently in different countries, since it is the only index that makes price developments in the individual countries of the euro area mutually comparable. This, as well as the trend in the price-increase rate in Euroland, is of interest to the financial markets, since “the difference between the highest and the lowest inflation rate in the individual countries ... is a source of information on possible differences in developments in the individual regions of the currency area. The smaller the differences, the greater the ECB’s room for manoeuvre in the implementation of its monetary policy.”¹

The HCPI crops up directly or indirectly in many places in the *Börsen-Zeitung*. I cannot go into them all in detail here, but let me, by way of example, describe the reporting for one month of the inflation figures published by the various statistical offices. The *Börsen-Zeitung* has for a long time concentrated on aggregated indices in its presentation of economic indicators for Euroland. Only if no standardised data were available did it use national figures (obtained by means of a variety of national methods). In the case of consumer prices, this means mixing up data and methods, and this is something that we at the *Börsen-Zeitung* are not happy about, but are unable to avoid because it is our job to be up-to-the-minute.

The monthly price series start shortly after the 20th of a given month, usually with the first price data from the big cities in Italy, which can also be published over several days and – depending on the space available and how “dramatic” the developments are – can also be mentioned in the *Börsen-Zeitung* on each occasion. At the same time, or only slightly later, come the first price data from the six big German *Länder*: the cost-of-living figures for private households, calculated according to the national method. These can also be published all at once or spread over several days. The most interesting figure is usually the first, from which the financial market can usually tell the way inflation is going compared with the previous month. It can also give an idea of the likely order of magnitude of the change in the price-increase rate. The *Börsen-Zeitung* tends to be somewhat reticent about publishing data published by the statistical offices of the other *Länder*, as these data are only really useful for checking the initial estimate of price developments. If they are in line with the trend, there is little point in publishing them. A vital figure, on the other hand, is the provisional inflation rate for Germany as a whole, which the Federal Statistical Office calculates at frequent intervals on the basis of the data from the six *Länder*. These used to be merely the “provisional cost-of-living figures” (according to national method), which the *Börsen-Zeitung* published in the absence of harmonised figures for the EU but, since the middle of 2000, the Federal Statistical Office has also provided the provisional HCPI, which now takes pride of place in the *Börsen-Zeitung*’s reports on price developments at consumer level. We see this as a major step forward, since Germany represents a good third of the HCPI for Euroland and we know from experience from that the provisional HCPI tends to be very close to the definitive figure, which means that an initial estimate, based on actual figures, can already be made of the Euroland HCPI.

In the following days and weeks, further HCPI become available from various Euro countries. These too are briefly reported by the *Börsen-Zeitung* – although not regularly and here too – as with the data on the rate for Germany as a whole from the German *Länder* – the first estimate for the euroland HCPI is checked and, if necessary, adjusted. The same applies in the case of the definitive inflation figures from Germany, which arrive around two weeks after the provisional figure. Here, as a rule, we do not merely examine how the Euroland HCPI is likely to develop in the light of the definitive figures for Germany, but we also get an indication of the groups of products that particularly tend to drive - or stabilise - prices, although only according to the national method and in relation to the cost of living. The HCPI is published in the Federal Statistical Office’s usual press release only in the form of the general HCPI without partial indices. Finally, the Euroland HCPI is not published until almost four weeks after the first national price data. Only a few days after the Euroland HCPI, the first national inflation figures for the following month become available. These then become the centre of attention on the markets.

This sequence also explains why the Euroland data usually offer no surprises as far as the general HCPI is concerned when they are published by Eurostat. Of greater interest are the partial indices, since these can show the subsectors in which inflationary pressures are increasing or easing off. However, they reveal less about what is ultimately driving price increases: shortage of supply, an increase or abrupt change in demand, or

¹ Conrad Mattern, „Praktiker-Handbuch Investment Research“. Stuttgart 2000, p. 331

administrative action. Estimating the quality of the price increase is, however, decisive for any analysis regarding monetary policy. Revealing the reasons for the phenomena is therefore one of the things we might wish the HCPI to do for us - but this is to disregard the question of whether this would not be ultimately placing too heavy a burden on statistics. It should perhaps be mentioned in this connection that the monthly reports of the European Central Bank, which could possibly perform this analytical function, have not hitherto done so in a satisfactory fashion. In any event, they are published even later than the Euroland HCPI.

Another thing one might wish European statistics to do is perhaps similarly ambitious as far as the likelihood of it happening is concerned - i.e. replace the disparate national indices by a harmonised coverage of price developments in the individual euro countries down to regional level, if the regions publish their data before the national central offices. It should be stressed that this is not a plea for holding back the regional data (e.g. the data from the *Länder*). Indeed, as soon as information is available on price increases it should be published, since the sooner the financial markets can adjust to changes in their basic data, the more effectively they can do their job. There are many reasons for this second wish:

- a) There could presumably be savings for the public if there was no longer a need for so many parallel surveys and calculations.
- a) Estimates of trends in inflation for the financial markets would become more reliable. Admittedly, the national index and the HCPI in Germany, for example, tend to vary by no more than 0.1 percentage points, if at all, but even a change of one-tenth of a point in the inflation rate can be significant - and not only when it affects whether the price-increase rate is above, at or below the ECB's much-quoted - and psychologically sensitive - 2% stability threshold. The direction in which inflation is moving is also of relevance.
- a) Mixing data obtained using harmonised survey methods with those obtained using national methods not only makes the information less precise, it is also a constant source of confusion and error – not least in the media. Unfortunately - let us make no bones about it - the *Börsen-Zeitung*, despite all its efforts, also sometimes makes mistakes, which particularly distresses us, given the high standards we strive for, and ultimately damages our reputation. At any rate, it does not help our readers. Mixing the data like this means that differences need to be explained in the reports, and this calls for a lot of patience on the part of the reader and sometimes results in such indigestible monstrosities as the following sentence: “While the inflation rates of the six big *Länder* collected using the national methodology had still led us to expect a change of x percentage points in the provisional price-increase rate for Germany as a whole, the harmonised consumer price index calculated according to the EU standard has now shown a change of y points...”

To sum up: the *Börsen-Zeitung*, which keeps a very close eye on the inflation figures, sees no reason why national price data should continue to be collected and published alongside the HCPI, except for the special case of scientific research, which does not move in the same public realm as financial journals and other media. It would be more useful for ourselves and our readers if only the HCPI were used.

SUMMING UP

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The CEIES Subcommittee on the Harmonised Index of Consumer Prices (HICP) organised a seminar for users of price statistics in the European Union with a focus on the HICP at the premises of the German Chamber of Industry and Commerce in Berlin on 4 and 5 October 2001. The seminar aimed at supporting the public understanding of the HICP and its relation to other measures of inflation, in particular national Consumer Price Indices (CPI). This is, at least presentationally and for the sake of public credibility of the results, particularly important shortly before the euro banknotes and coins are introduced and in a period where the denomination of consumer prices changes from national currencies to the euro.

The 70 to 80 participants in the seminar came from European Union Member States and Candidate Countries and represented a variety of users as well as producers of price statistics. The seminar was organised in five sessions followed by a panel discussion on the needs for the future between users and producers of the HICP and national CPIs.

In the first session (“state of the art”) Eurostat presented the HICP and comparisons between the HICP and the CPIs in general. The comparison was further elaborated by contributions from the Dutch, Hungarian and German National Statistical Institutes. The second session (“economic and monetary policy, official users”) covered presentations from the European Central Bank and the National Bank of Belgium. In the third session (“market and bank analysts / research institutes”) and the fourth session (“collective bargaining and contracting: broad public”) representatives of Italian, British and German economic research institutes commented on the HICP, followed by representatives from the Finnish consumer research center, the European trade union institute and the Austrian Wirtschaftskammer. The fifth session was dedicated to communication to a wider audience, in particular via the press. The seminar concluded with a session on future needs.

Main messages arising from the seminar

- The discussions showed a general acceptance and support for the HICP, which plays an essential role in the monetary policy of the European Central Bank.
- Different measures of inflation may be needed for different uses. There is however a strong need for harmonisation of these measures where possible.
- The HICP should be better explained to the interested public. Unjustified differences between the HICP and national CPIs should be eliminated, in particular in euro area countries. Remaining differences are to be explained by national authorities.
- The medium term objective of a European System of Consumer Price Indices (ESCPI), with the HICP as its backbone, gained broad support.
- There was strong encouragement for further work to settle the issue of owner occupied housing. Clarifications of concepts and practical issues are imminent.
- Quality adjustment was recognised as highly important and further work in this field is necessary and already scheduled.

- The forthcoming cash changeover in the euro area countries and the much easier comparison of prices and wages in the euro area will strengthen the HICP as a harmonised measure of consumer price inflation. This requires an intensified co-operation between users and producers of price statistics.

Further statistical issues addressed in the sessions by individual speakers

- Price index rounding may be a problem when inflation is low. In this case the inflation rate calculated on rounded indices may be affected by the rounding approximation. A proposal to improve this situation could be to introduce a publication policy with a precision of two decimal places.
- Some of the statistical and technical properties of the chain index formula used in the compilation of the HICP were critically examined.
- The good timeliness of the HICP is considered important and efforts are made to further improve it.
- Different price collection periods in the EU countries is a known problem, as it implies that some price changes may be recorded in the index with a lag for a country depending on the collection time within the month.
- The need for additional information on regulated prices and tax changes was expressed.
- The importance of core inflation measures for analysts was underlined. Users may want to develop the necessary indices where possible, but may need support from producers when the construction of core inflation measures becomes technically demanding. The desire for a common strategy was expressed.
- Interest was expressed in the availability of short-term and medium-term HICP forecasts based on sound and transparent methods.

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