

Financial Services in Swedish Price Indices

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Abstract: The paper deals with issues that have been found important for the treatment of financial services in Swedish price indices. In particular the definition of the unit transaction for fund and stock-brokering services with charge proportional to transaction value is crucial. Such services have more than a negligible extent in Sweden, also for consumers, and different definitions of the unit transaction could lead to notably different results for the overall index of consumer prices. The definition of the unit transaction has great impact also on a volume index for financial services.

1. Coverage of financial services

The Swedish CPI (Consumer Price Index) covers insurance services since 1993 and partially banking services since a few years later. The HICP (Harmonised Index of Consumer Prices) for Sweden also covers those services except building insurance, and since 2001 the HICP furthermore covers stock-brokering and fund services. The treatment in the CPI was basically designed by Lönnqvist (1992) and is described by Statistics Sweden (2001). Presently a Swedish Producer Price Index of banking services is being developed.

For 2003 the weight of insurance is 0.96 per cent in the national CPI and 0.64 per cent in the HICP, and the weight of banking services etc. is 0.67 per cent in the national CPI and 1.80 per cent in the HICP. Building insurance is covered in the insurance weight of the national CPI but not that of the HICP, while conversely stock-brokering and fund services are covered in the weight of the HICP but not that of the national CPI.

It may be noted that the mentioned weights for financial services are not really negligibly small, whence large movements in recorded prices for these services may have a notable impact on the overall indices for Sweden.

The present paper focuses on some specific potentially problematic matters of principle which have had to be dealt with and which have also been given consideration in connection to the international harmonisation work for the HICPs and other statistics.

¹ The views expressed in this paper are those of the author solely.

2. Insurance – adjustment for excess, gross vs net principle

Insurances covered in the CPI are home insurance, building insurance, motor-car insurance, and private sickness and accident insurance. The “home insurance” customary in Sweden is a comprehensive insurance for households covering damage or loss of movable property by fire, theft or flooding from pipes, and to some extent also liability etc. The coverage of motor-car insurance includes the compulsory traffic (liability) insurance as well as insurance against material damage and theft. Building insurance is covered in the CPI but excluded from the HICP, as being regarded a part of the capital costs of owner-occupied housing (cf. Council of the EU, 1998).

For the index computation, premium amounts for insurance policies are followed over time. This is done for a sample of policies from the few major insurance company groups. For the premium amounts (the prices) collected, the conditions of each sampled policy, as well as the characteristics of the policyholder, are kept constant over time. In this way the prices followed become comparable over time. (Cf. Statistics Sweden, 2001, p. 58f.)

2.1 Adjustment for excess change

To keep the conditions of the insurance policies constant may not be directly feasible in cases where an insurance company changes the excess. The excess is a fixed amount that the insurance company deducts from the value of damage in its compensation for a case of damage. When the excess for an insurance policy is changed, the tariff may not include any option comparable to the previous excess. Then the change in the excess is taken account of by a form of quality adjustment.

The adjustment is done in the way that the annual premium as of the base period is decreased by subtraction of an amount computed as the difference between the current and the previous excess, multiplied by the annual claims rate. By rough approximation, the subtracted amount corresponds to the change in the actuarial risk premium, i.e., in the mathematical expectation of claims receivable to the policy-holder, due to the excess change. In plain words, it is roughly how much less (or more) the insurance protection becomes worth to the policyholder, by the excess change.

A practical difficulty of this method is that the required data on the claims rate may not be readily available, and previously estimated figures may have to be used.

Those gradual real-term changes in the excess, that result from the inflation, could and should be accounted for in a similar way. This is presently not done and is also less urgent in a time of slow inflation.

To elaborate a little on the conceptual basis, let $F(x)$ denote the cumulate probability distribution function of the values of damages. And let $r(x)$ denote the annual rate of damages of value exceeding x , or in other words, the annual rate of claims if the excess of the insurance is set to x . Then if the excess is set to b , the annual actuarial risk premium, i.e., the mathematical expectation of annual claims, becomes

$$r(0) \int_b^{\infty} (x - b) dF(x) .$$

Now assume that the excess is raised from b to c , say (with $c > b$). Then the resulting drop in the risk premium becomes

$$\begin{aligned} & r(0) \int_b^c (x-b) dF(x) + r(0) (1-F(c)) (c-b) \\ &= r(0) (1-F(b')) (c-b) \\ &= r(b') (c-b), \end{aligned}$$

for some number b' such that $b \leq b' \leq c$, under the reasonable assumption that the function F is continuous.

The method used for quality adjustment with respect to excess change is approximate, since an observed (or guessed) claims rate has to be used as a proxy for $r(b')$, which would ideally have had to be used. In view of this approximation, which might be rather coarse, it might in a way perhaps be just as well if the rate used is not quite recently observed. For a recent estimate would be likely to approximate $r(b)$ rather than the wanted $r(b')$, which might be notably lower.

Viglino (2003) gives a more exact approach, using a parametric estimation of the distribution of the values of the damages. But then again a practical difficulty might be to obtain the statistics on damage values needed for the estimation.

2.2 *Gross and net insurance premium amounts*

A crucial issue concerns the choice between gross and net premium amounts, for the purposes of the price index. As defined by the Commission of the EU (1999), the gross premium is the insurance premium in the usual sense, i.e., the price paid by the policyholder for the insurance policy. The net premium amount or *service charge* is the net amount obtained when claims and changes in actuarial provisions are subtracted from the insurance company's premium income, including the yield on premium reserve etc. ("premium supplements").

By the rules for the HICPs (Commission of the EU, 1999), the weights for insurance shall reflect the service charge, while the prices followed shall be the gross insurance premiums. The use of service charge for weights follows the rules for national accounts. The apparent discrepancy between use of net for weights and gross for prices in the HICPs is obviously motivated by the unfeasibility of collecting monthly data on the current service charge. That is, the readily available gross premium is apparently taken as a proxy for the less available service charge, in the price collection. As is noted by Eurostat (2001, Sect. 4.9.2), it may however be questioned whether the changes over time in the gross premium well reflect those of the service charge.

Admittedly, at least for the Swedish CPI no investigation has been made whether it might be feasible to obtain quarterly data on the service charge from the quarterly financial reporting of the insurance companies. For the use of such quarterly data for a quarterly price index, it would have to be shown that that the available data are both detailed enough and conceptually suited to that use, which a priori does not seem certain.

In contrast to the HICPs, the national CPI for Sweden is meant primarily for compensation purposes (cf. Statistics Sweden, 2001, p. 8; SOU, 1999; Ribe, 2001). Actually, a true cost-of-

living index (coli) is since very long time explicitly stated to be an ideal target for the Swedish CPI. This implies that it should be most relevant to consider the gross premium, rather than the net premium, in the index. The gross premium is the cost for the insurance that is seen and felt by the consumer. From a consumer perspective it seems abstract and artificial to consider only the service charge as a price for insurance, and the rest of the gross premium as some “transfer” rather than a consumer cost.

2.3 Practical implications

Consequently, when insurance was first introduced into the Swedish CPI, the weights as well as the prices were based on the gross premiums. This had some practical implications for the computation of the weights, which is done annually, as the Swedish CPI is a chain index with annually updated weights. The annual weight computation is based on data on household consumption expenditure from the national accounts, where only the service charge is recorded as consumer expenditure for insurance. On the other hand, e.g. expenditure of motor-car insurance claims on car repair is included as household consumption expenditure on car repair, and similarly for other kinds of claims.

So to make the CPI weights follow the gross principle, the CPI staff had to re-distribute some amounts among the expenditure amounts obtained from the national accounts. That is, estimated amounts corresponding to insurance claims were re-distributed, from expenditure on car repair, furnishings, etc., to expenditure on insurance premiums.

From year 2000 however the net principle is followed for the CPI weights, as well as for the HICP weights. This change was made for practical reasons, although it was not ideally desirable in view of the aims of the national CPI. The practical advantages are of course that double procedures, differing between CPI and HICP, are avoided, and that the weight computation is simplified. The governing CPI Board was not entirely happy about the change, but the majority of the Board considered the theoretical drawbacks less important than the practical advantages.

2.4 Negative weights?

An implication of the net principle is that weights for insurance may potentially become negative. Apparently negative weights in a price index would not make very good sense.

In Sweden no problems with negative weights have been encountered. Although claims may exceed premium income, the net becomes positive when the “premium supplements”, i.e., the yields on reserves etc. are also included.

3. Banking services – delineation of the coverage

Banking service prices covered in the CPI include charges for common financial consumer services of banks and the Post, such as transaction charges for payment services, and annual charges for credit card, Internet banking, and safe deposit box. A judgmentally made sample of such services is followed in the price collection, comprising the few major banks and the Post.

Following the rules for the HICPs (Council of the EU, 1998), the coverage in the Swedish CPI and HICP excludes FISIM, i.e., Financial Intermediation Services Indirectly Measured. The FISIM comprise those parts of financial services that are charged for by way of the net

interest earnings of banks etc., obtained in principle by the gap between the interest rates for lending and borrowing.

In banking practice there is however hardly a sharp borderline between FISIM and explicitly charged services. For instance, payment services may be charged for partly by explicit charges, and partly in a hidden way by the interest earned by the service provider on the money handled in the payment flows.

So in a way the price index may show only a part of the price, namely, the part charged for explicitly. It may then be somewhat problematic to interpret the index for bank charges, as changes in the index reflect changes in the explicit part of the price, rather than the full price.

Diagram 1 in the annex displays the HICP sub-index for “Financial services n.e.c.” (Coicop 12.6.2, or essentially banking services), together with the overall HICP index. It is seen that the prices of the financial services in question have shown dramatic rises in the past few years, far beyond what has been the case for consumer prices on average.

At first sight the indicated huge price rises for financial services may seem somewhat strange. But with regard taken to the fact that they may reflect parts of prices rather than full prices, they may not be too unnatural. There may of course also be other explanations, for instance possibly that service providers might raise charges on laborious teller services in order to encourage customers to swap to more cost-efficient services such as internet banking. As teller services and Internet services are treated as different products, the index does not recognise consumers’ possible substitution gains from such swaps.

It may be noted that plans have been reported for an inclusion of FISIM in the Australian CPI (Frost, 2001; Woolford, 2001).

3.1 Currency exchange

Currency exchange services in Sweden are still provided by banks but nowadays mainly by specialised currency exchange companies. Usually no explicit charge is made, but the exchange services are entirely charged implicitly by the spread between the selling and buying exchange rates.

By the rules for the HICPs, such implicit charges for exchange services are to be regarded as FISIM and are thus to be excluded from the HICPs (Eurostat, 2002, Art. 3(2c)). They are also excluded from the national CPI, like brokering and fund services (cf. below).

From a theoretical point of view one might perhaps question whether currency exchange ought not anyway to be covered in a price index, even if indirectly charged for. In practice it might however be problematic to collect prices for the indirectly charged exchange services. The difference between the selling and buying rates might possibly not be an entirely adequate measure. Namely, there might possibly be some asymmetry between selling and buying in the exchange companies’ business aims and turnover vis-à-vis consumers.

4. Stock-brokering and fund services – the issue of unit transaction

The total savings in stocks and in stock and security funds of Swedish households amounted in mid 2001 to 120, and in mid 2002 to 70 per cent of the total annual household

consumption. The fall between the two years is largely due to steeply falling stock-market prices. Anyhow it is seen that Swedish households possess considerable savings in stocks and funds. Accordingly stock-brokering and fund services have more than a negligible role for Swedish households.

Stock-brokering and fund services are provided by banks and specialised brokering companies. Households probably still mostly access these services by way of banks.

Stock-brokerage is charged as a flat minimum rate for small selling and buying transactions, and as a charge proportional to the transaction value for transactions with value exceeding some € 4 500.

Fund savings are charged for by a charge proportional to the asset value, and in many cases also by charges proportional to the transaction value at selling and/or buying of fund shares.

From 2002 the coverage of the HICPs is extended to include also services with explicit charges proportional to transaction value (“ad valorem” charges), and rules for their treatment have been established (Commission of the EU, 2001; Eurostat, 2002). This applies to the Swedish stock-brokering and fund services, for which thus price-collection is now implemented.

For stock-brokerage price collection is made from the few major banks, for a small judgmental sample of service levels. For fund services price collection of charge rates is done from a magazine, by a systematic sample (with random starting-point), from a comprehensive list of savings funds.

A proposal has been put forward to extend the coverage also of the national CPI to include such services (Sjögren, 2000). The governing CPI Board however rejected the proposal for the time being, as it was felt that further consideration was needed whether these services are appropriately to be included in consumption as covered by a compensation index.

4.1 *The unit transaction – definition*

For charges defined as a proportion of the transaction value, the price followed by the index shall be taken as that proportion of a representative unit transaction. This implies that changes in the value of the representative unit transaction, as well as changes in the proportion defining the charge, shall be shown as price changes in the index (as stipulated by Commission of the EU, 2001, Art. 2(2) and 3(1c)).

In practice this means that a sub-index for a service charged in this way is computed as a product of two factors, both indices: One index for the proportion defining the charge, and one index for the value of the transaction unit (cf. Eurostat, 2002, Art. 2).

A crucial issue then consists in the choice of definition for the transaction value. This definition is logically linked to the choice of an adequate index for the value of the transaction value. E.g., for stock-brokerage, a priori a couple of potential main alternatives may here be identified:

- (A) *Alternative:* The unit transaction would be defined as the buying or selling of a constant number of shares. The index for the value of the unit transaction should then be given by a stock-market price index.

- (B) *Alternative*: The unit transaction would be defined as the buying or selling of an amount of shares with a constant value in real terms, that is, an amount of shares with a value that can buy a constant amount of consumer products. The index for the value of the unit transaction should then be given by the overall HICP (or CPI).

The Guidelines agreed for the HICPs (Eurostat, 2002, Art. 4(1b)) imply that alternative (B) is to be followed for the HICPs.

4.2 *The unit transaction – motivation*

There have been some discussions on the choice between alternatives (A) and (B), in international harmonisation work and elsewhere (cf. Woolford, 2001). However there appears to be strong reasons to consider alternative (B), the one chosen for the HICPs, to be the appropriate one for a consumer price index.

The stock-brokerage is a charge for a service, not for the shares bought or sold. But the benefit to the consumer of this service is directly related to the purchasing power corresponding to the value of the shares that are bought or sold. By alternative (B) this benefit is kept constant, in the price comparison over time in the index.

And to keep the consumer benefit constant for prices followed in the index, as is met by alternative (B), is what is needed in a consumer price index. This apparently holds equally well for a pure price index as for a cost-of-living index. Namely, in order to show pure price changes, a pure price index has to compare like with like over time. Here “like” has to be interpreted in a consumer perspective, as a consumer price index is an input index to the consumer sector. The need to compare like with like is reflected in the urge for appropriate quality adjustment in the HICPs (as stated by Commission of the EU, 1996, Art. 5). So alternative (B) is apparently the adequate way, at least for a consumer price index.

Alternative (A) on the other hand seems hard to motivate, for a consumer price index. Lack of theoretical motivation may be acceptable in cases where the practical consequences are negligible. But for Sweden, in the present case, they are not. If alternative (A) had been chosen it could have had notable consequences that could hardly be defended, as will now be demonstrated.

4.3 *Consideration of a stock-market index*

Diagram 2 shows the development of a well-known comprehensive stock-market price index for the Stockholm stock exchange, the AFGX (Affärsvärldens generalindex). This index has been produced since long time by the business magazine Affärsvärlden (2003) and is publicly available for download from their web site. The curve in diagram 2 shows the AFGX only for the 15th of each month (or the first trading day after the 15th), for comparability with the Swedish CPI and HICP which have the 15th as the target day of the monthly price collection.

As is seen in the diagram the Swedish stock prices have been subject to very dramatic fluctuations over the past few years. At an accelerating pace the stock index skyrocketed by a factor of about four in five years between 1995 and 2000. Then it suddenly stopped, turned, and steeply plunged back almost all the way down, to a level of six years ago.

In alternative (A) such dramatic changes in stock-market prices would be shown as price changes for stock-brokering services. This would apparently be an artificial and imaginary effect which says little about reality. For instance, in a situation when stock-market prices rapidly fall down to one third of their previous level, it indeed seems far-fetched to claim that stock-brokering services have become correspondingly cheaper, just because of that. These artificial consequences of alternative (A) apparently make it essential to avoid that alternative.

Volatility should not be feared if it tells the truth, but volatile developments of stock prices hardly tell any truth about stock-brokerage developments.

4.4 *Simulation results*

Diagrams 3 and 4 show results of a simulation to demonstrate the potential effect of alternative (A) on the overall HICP and the corresponding inflation rate.

The grey thick curves in diagrams 3 and 4 indicate how the HICP and the inflation rate might have evolved, if fund and stock-brokering services had been covered by means of alternative (A) during the past years. It is seen that the effect would have been quite notable.

4.5 *Assumed weights etc.*

As is not unusual in index production generally, some rather coarse assumptions have to be made about unknown weights on the lowest levels of aggregation.

For stock-brokerage there is as mentioned both a minimum brokerage and a proportional brokerage. A simple way out is to compute one index for the minimum brokerage and one for the proportional part, and then weight them together. The weights for this weighting have to be rather coarsely “guesstimated”, at best with some support from statistics concerning size-distributions of shareholders’ share possessions. Even so, those weights should in principle be price-updated, to avoid a technical bias.

For fund services there are as mentioned charges proportional to asset value, and often also proportional charges on buying and/or selling of fund shares. Here the index factor capturing changes in the charge proportion is based on a weighted mean price ratio for each fund, computed as a weighted mean of the ratio of asset charge proportions and the ratio of buying plus selling charge proportions. Again the weights have to be “guesstimated”, now from a coarse assumption on the rate of buying and selling of fund shares.

The experience so far shows, for both brokerage and fund services, that changes in the charge proportions may occur but do so very seldom. So the index for fund services with ad valorem charges mostly follows the HICP, even though the very infrequent proportion changes may have a noticeable impact when they do happen.

5. Mortgage interest

For completeness it may be mentioned that changes in mortgage interest are taken account of in the component of owner occupied housing in the national CPI in Sweden, like in some other countries (cf. Statistics Sweden, 2001; SOU, 1999; Goodhart, 1999). However the mortgage interest is here included not as a price of a financial service as such, but rather as a component in one out of some alternative indicators for the capital cost of owner occupied

housing. The treatment of owner occupied housing in price indices is of course in itself a very intricate issue, far from the scope of this paper.

6. Financial services in Producer Price Indices

Presently a Producer Price Index (PPI) for banking services is being developed for Sweden, and one for insurance services is planned. The PPIs for services have quite another main use than both the CPI and the HICP. The PPIs for services are needed primarily in the production of national accounts, for computation of volume indices and time series at constant prices (“deflation”; cf. Eurostat, 2001, Sect. 1.3). The PPIs for services shall cover services to the business sector, not consumer services, which are already covered in the CPI and HICP. Like for the CPI and HICP, FISIM is excluded from the coverage of the PPIs. So for the PPIs too, only explicit charges are to be covered.

Banking services to businesses are to a large extent sold as packages. For small companies there may be standard packages with various options, for which prices might be feasibly followed over time in the index. For large companies on the other hand the banks offer more specialised deals, where negotiated price reductions and special conditions usually come into play. So for the following of prices for banking services to large companies the task seems trickier. Possibly some variant of the “model pricing” method may be used, although elements of judgment may be hard to avoid (cf. Eurostat, 2001, Sect. 3.1.1.1). The development of the survey method has just begun, so it is not possible to be more specific right now.

Like for the CPI and the HICP, the exclusion of FISIM may not be quite unproblematic. In their pricing of service packages to companies, banks are likely to primarily care for their total earnings potential, including earnings both by charges and by interest. So again we may have a price index that covers only a part of the price and could by this show seemingly unnatural movements. Whether such effects may have disturbing consequences of course largely depends on the procedures and contexts where the indices are used. Cf. also TEG-PPI (2002, Sect. L).

6.1 *Ad valorem* charges in PPIs – the issue

Ad valorem charges, or charges proportional to the transaction value, may be of minor importance in banking services to business companies. But to the extent that they do occur, there is of course again the choice between the alternatives (A) and (B) mentioned before. For PPIs the harmonisation rules of Eurostat (2001, Sect. 4.9.1) imply that here alternative (A) is to be used.

With regard to basic principles, the choice here between alternatives (A) and (B) is not perfectly analogous to that for the HICPs. Namely, the PPIs are output indices, while the HICPs are input indices; cf. Triplett (1983, especially Sect. 5.4.2), who recognises how output as well as input can be disaggregated into characteristics, but differently.

For now here *merely* some preliminary remarks will be made on the somewhat controversial issue, reflecting the author’s personal views.

6.2 *Ad valorem charges in PPIs – preliminary discussion*

Considering the use of the index for the national accounts, one may notice that while alternative (A) makes the stock-market price fluctuations show up in the price index, alternative (B) on the other hand makes them show up in the volume index.

It may be then argued that a volume index should be adjusted for all effects of price fluctuations, also fluctuations in stock-market prices. This would be an argument in favour of alternative (A), for this context. By alternative (A) the volume series would tend to be stabilised, and so would derived series on productivity. A stable series on productivity would evidently seem better interpretable than a volatile one.

But again, if volatility shows the truth, it should in principle not be hidden. Apparently the current productivity in agriculture has to depend partially on volatile weather conditions, and not purely on cost-efficiency in farming work. It might then possibly also be considered natural that productivity in stock brokering partially depends on volatile conditions of the stock market. Generally, elimination of volatility cannot be an end in itself, but it is merely artificial and misleading kinds of volatility that should be eliminated. In the context of HICPs alternative (A) would lead to an artificial kind of volatility, as was argued above.

So the question now appears to be whether changes in stock-brokering volume due to stock-market price changes are to be considered true or artificial. It may be argued that higher stock-market prices, *ceteris paribus*, imply a greater importance of both the stock market and stock-brokering services, and thus indeed a greater volume of stock-brokering services. If that argument is valid, it is in favour of alternative (B) for PPIs.

As the PPIs are output indices, the consideration of comparison of “like with like” over time should here be seen from a producer perspective, not a consumer perspective. When *ad valorem* charges are used, this apparently indicates that the producer effort is somehow related to the transaction value, in terms of e.g. the service provider’s responsibility and risk. Namely, if the producer effort would rather consist in the handling at a flat production-cost per transaction, it would seemingly be both unmotivated and uncompetitive for the service provider to charge *ad valorem*, and thus it would then hardly be done – but it is. So also with a producer perspective in mind there appears to be good reasons for alternative (B).

But as mentioned the issue is controversial, and the views given here are the author’s.

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Annex

Diagram 1: HICP/Sweden, Financial services n.e.c. and Overall index

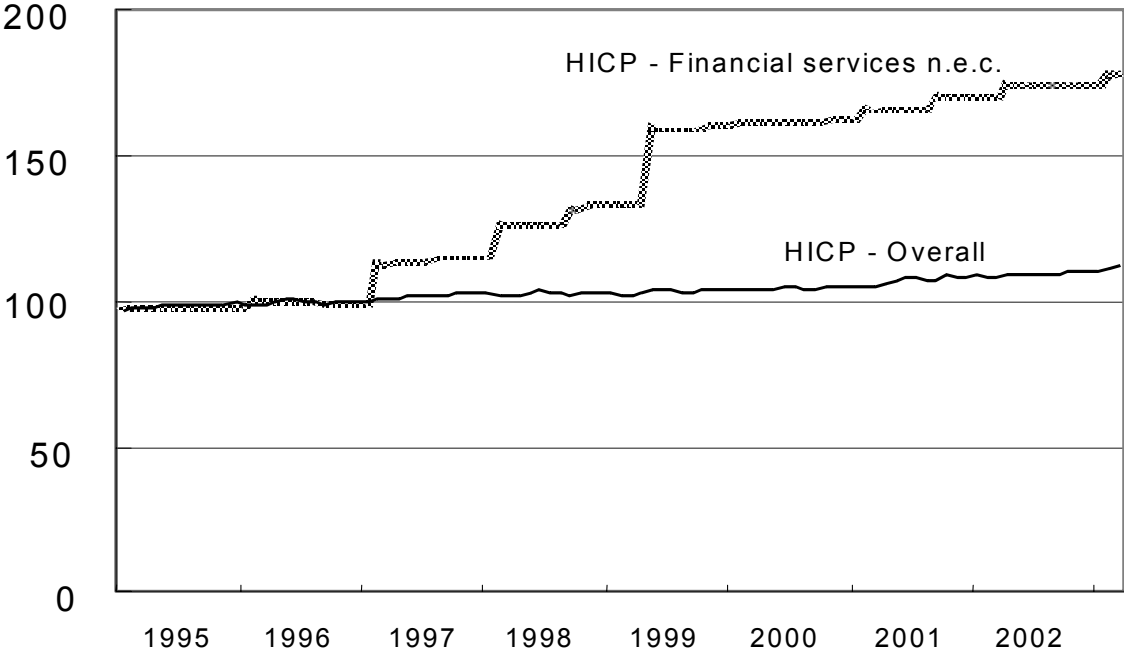
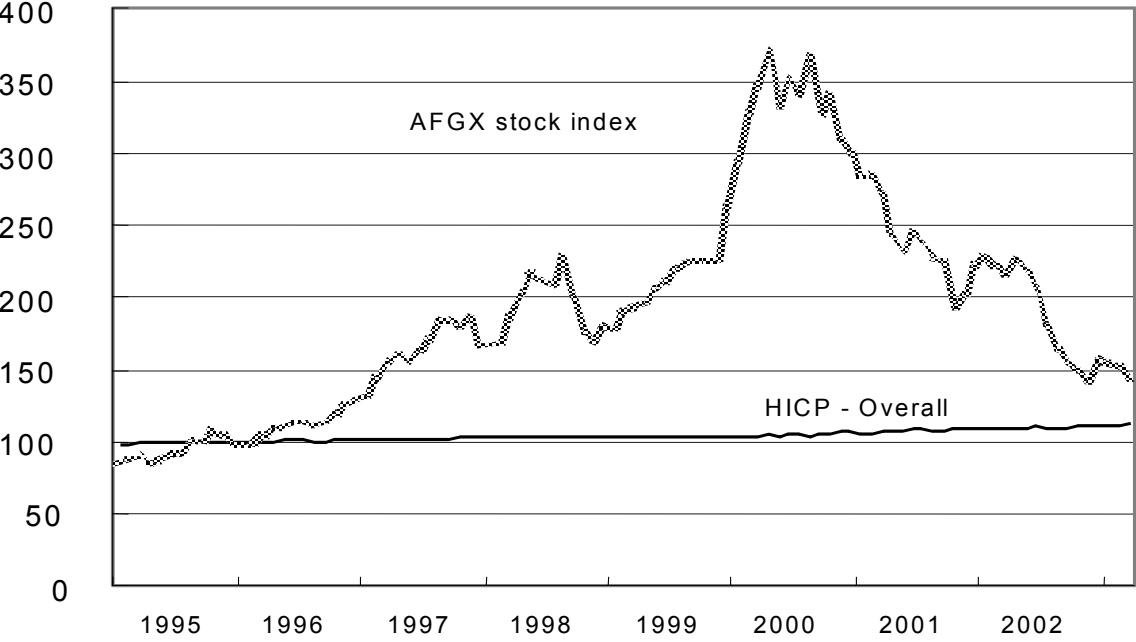


Diagram 2: HICP/Sweden and AFGX stock index



Note: The AFGX stock index levels followed by the curve are those for the 15th of each month.

Diagram 3: HICP/Sweden (Overall), and alternative (A) simulated

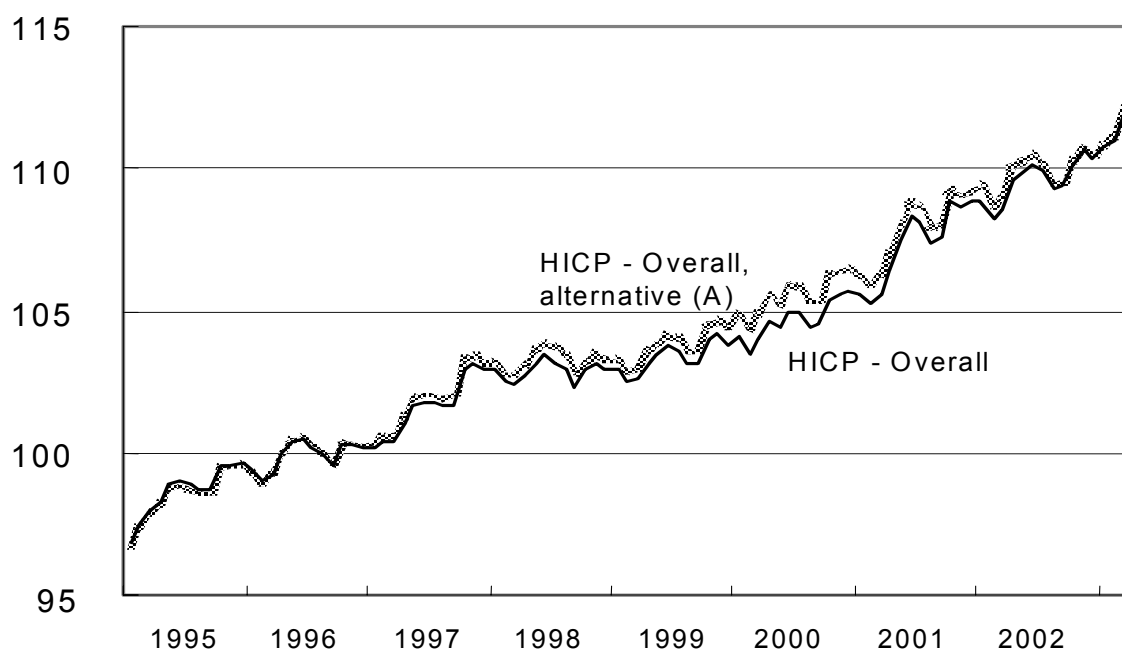


Diagram 4: Inflation rate by HICP/Sweden, and alternative (A) simulated

