FORECASTING THE RATE OF INFLATION BY MEANS OF THE CONSUMER PRICE INDEX

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I. INTRODUCTION

In the last few years inflation has become a crucial problem in the management of the Spanish economy. Very often inflation is defined as a rate of growth on a global price index, such as the consumer price index. But this is a bad way to discuss prices because there could be two inflationary situations with very different characteristics but with a similar rate of growth level in the consumer price index. Two situations can be different from an inflationary point of view mainly because the outlook for future inflation or the measures required to cure it are different in both cases. We need then to characterize the expected inflation and the means to fight inflation. The latter will depend on the rate of growth of the prices of different types of goods and services.

(*) We are very grateful to José L. Malo de Molina and J. José Camio for their comments to a previous version of this paper. The points of view expressed are those of the authors and are not necessarily related to those of the Banco de España. Paper to be presented at the Fourth International Symposium on Forecasting, London, July 1984.

We should look then at wholesale prices, consumer prices, factor costs and economic policy variables and try to relate them, as well as other economic indicators, by econometric models. Also, we are interested in following the movements of these variables very closely and therefore we will try to observe them at short intervals of time, like a month.

At this point we find that monthly observations are not available for all the variables mentioned and proper price econometric models for the Spanish economy must be constructed with quarterly or yearly data. In this paper we shall confine ourselves to the monthly tracking of inflation and therefore we are not going to pursue the question of econometric models.

Another important aspect in our aim of the prompt assessment of a new monthly observation of prices is the speed at which the data is available. However data on consumer prices is not available until six weeks after the month in question and wholesale prices are not available until four months after. For this reason we will concentrate on consumer prices only.

Accepting that we are going to study only consumer prices, the remark that we made at the beginning, that inflation depends on the rate of growth of different goods, implies here that we should not look only at the global consumer price index but at its components. These are the food (40.52%) and non-food (59.48%) consumer price indexes that we will further break down into processed food (19.97%) and non-processed food (20.55%) indexes and manufactured goods (25.96%), energy (5.32%) and services (28.20%) indexes, respectively. In brackets we have indicated the percentage that each partial index represents in the global index. Therefore our measure of inflation will be given by a vector of the rates of growth of the last five partial indexes mentioned.

We are going to study these indexes by univariate Time Series methods. Energy has regulated prices and its corresponding index just moves by steps. We consider it as if it was a deterministic index(1) and the forecasts for it will be judgemental. The univariate models for the remaining indexes are presented in section II. These models are used to forecast, each month, the rate of growth, for the current year, corresponding to the four indexes. In the forecasting exercise we are also interested in estimating the underlying velocity and acceleration and the expected inflation for each price index. We deal with these questions in section III.

This univariate analysis of prices is not efficient because it ignores information on the relevant variables in the formation of prices, but its results for forecasting and for rates of growth of the underlying trends are very useful because they define a

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(1) This index moves by steps but certainly is not deterministic because the steps are due to movements on stochastic economic variables. The problem is that the precise moment at which the step takes place is a goverment decision and makes it very difficult to model the behaviour of this index. This is why we will consider it as if it was deterministic.

framework into which we can introduce corrections. These corrections are especially important in situations with relevant changes in the trends. The corrections will be based on subjetive evaluation of the extra information and on econometric results for price models with quarterly or yearly data. We see then that this systematic information provided by the univariate analysis enables us to make, at a monthly level, a more efficient use of the ideas and results that we have for inflation, after considering a wide set of variables, in situations where the non-price variables are observed at longer intervals of time.

As we said above, the situations with changing trend rates need to be assessed with the help of econometric models. In some cases models with leading indicators could be a useful substitute for the econometric models. In this respect we are experimenting with models for the food indexes using monthly indicators for the agriculture prices, and we expect to be able to report on them in a later paper. But confining ourselves to the univariate framework of this paper, we discuss in section IV how the problems of changing trends can affect the univariate analysis and what could be done in these situations. Finally in the appendix we comment on the forecasts we made with the observations up to April 1984 and the possibilities of achieving the official objective for inflation for 1984.

II. UNIVARIATE MODELS FOR THE PRICE INDEXES.

II. 1 Univariate models for the food price indexes.

The processed food (PF) and non-processed food (NPF) price indexes are represented in figure 1 and their rates of growth, measured by the first differences in the logarithmic transformation, are given in figure 2. In what follows we will work with the logarithmic transformation of the series. Some aspects of these indexes and of the global food index (F) are summarized in table 1. In the F and NPF series the operator $\Delta\Delta_{12}$, where Δ in the operator for first differences and Δ_{12} the operator for annual differences, transforms them into stationary series. In the PF series the stationary operator is Δ^2. This means that all the three series are dominated by pseudo-linear trends and that the F and NPF series also show seasonal mean oscillations, but this last feature is not detected in the PF series. For the stationary transformations we observed that the variance of $\Delta\Delta_{12}$logNPF is more than seven times the variance of Δ^2logPF. The correlograms of the stationary series are given in figure 3 and the models that we have estimated for these series are the following:

$$\Delta\Delta_{12}\ln F_t = \underset{(0.008)}{(0.039}+\underset{(0.008)}{0.039L}+\underset{(0.008)}{0.032L^2)}\Delta_{12}DJN77_t +$$

$$+(1+\underset{(0.1)}{0.22L}-\underset{(0.1)}{0.26L^3})(1-\underset{(0.04)}{0.86L^{12}})\, a_{1t}, \quad (1)$$

residual standard deviation = 0.008,

Box-Pierce-Ljung statistic with 15 and 24 residual autocorrelations: 5.5 and 21.2,

Figure 1

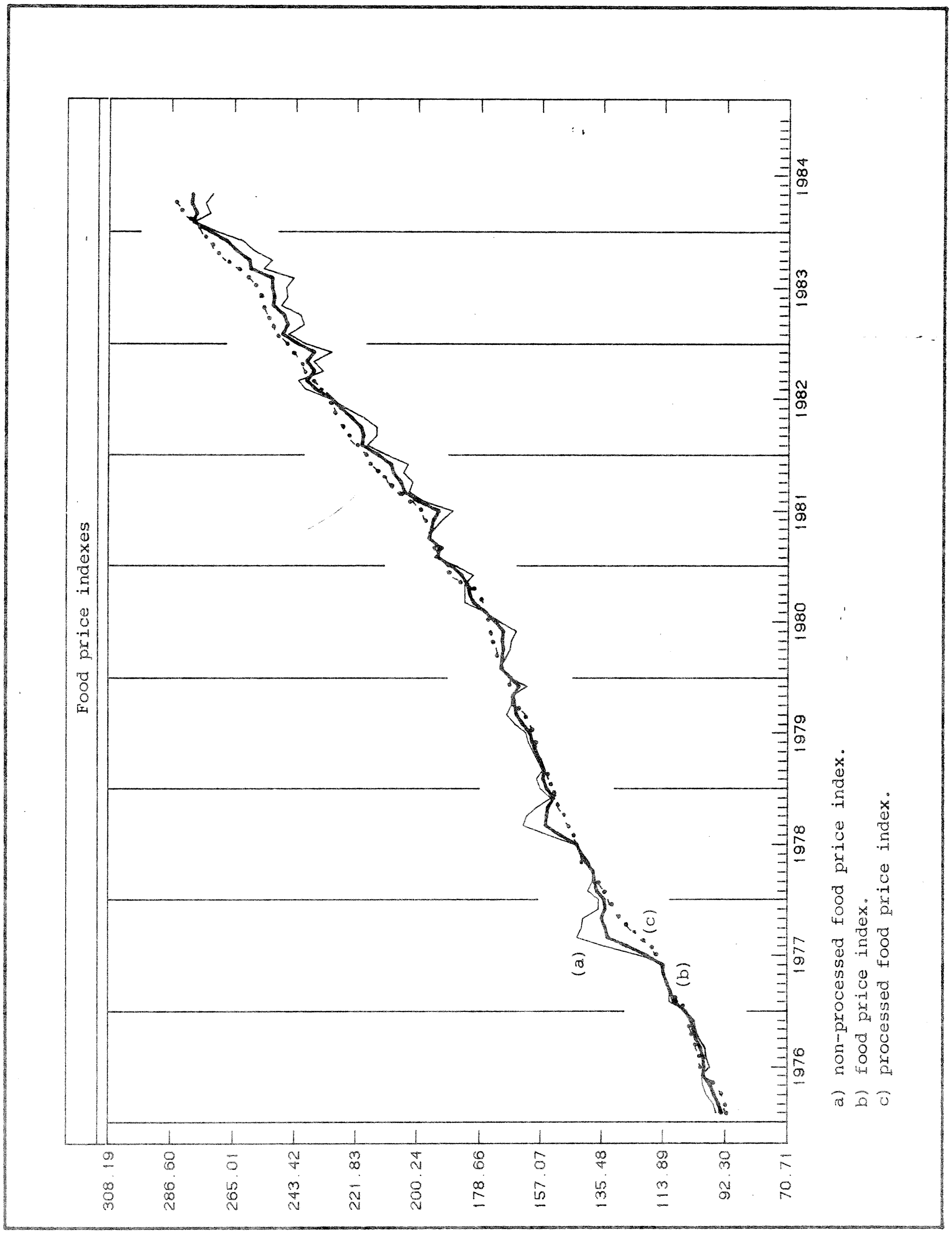
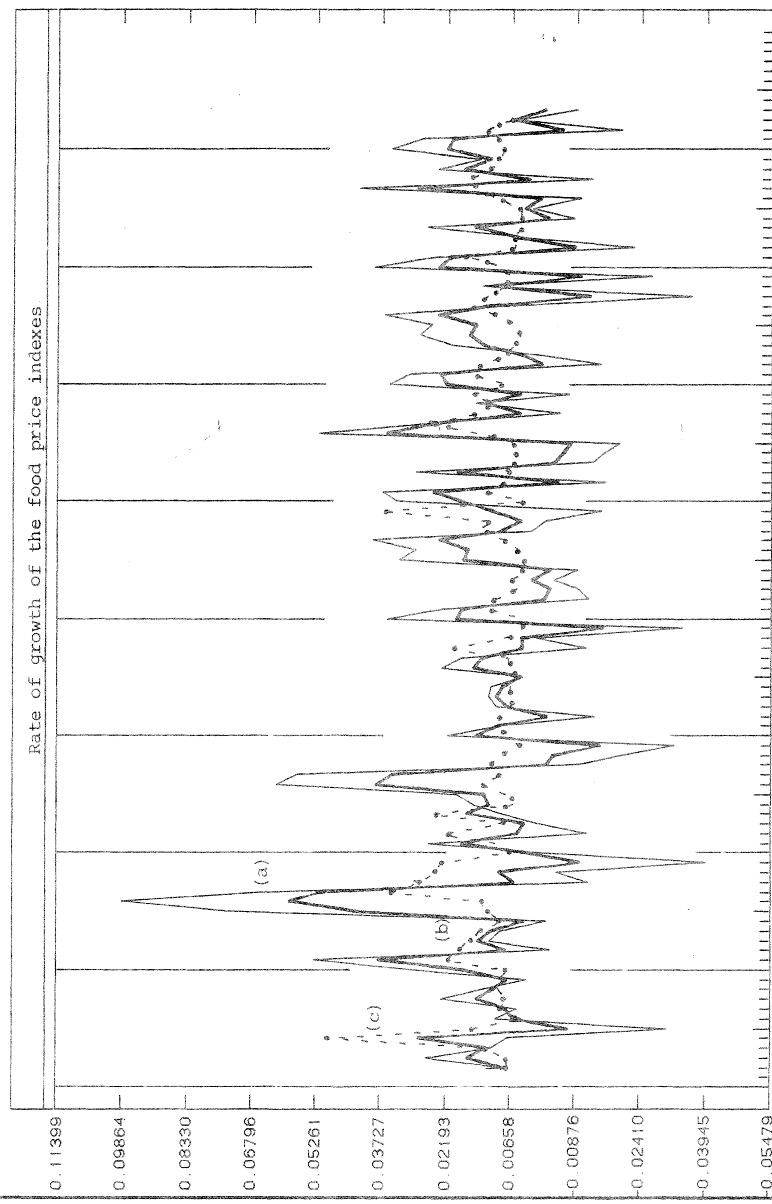

Food price indexes
308.19
286.60
265.01
243.42
221.83
200.24
178.66
157.07
135.48
113.89
92.30
70.71
1976
1977
1978
1979
1980
1981
1982
1983
1984
(a)
(b)
(c)
a) non-processed food price index.
b) food price index.
c) processed food price index.

Figure 2



a) non-processed food price index.
b) food price index.
c) processed food price index.

FIGURE 3

FOOD PRICE INDEXES

(Correlograms of the stationary series with anomalous observations corrected)

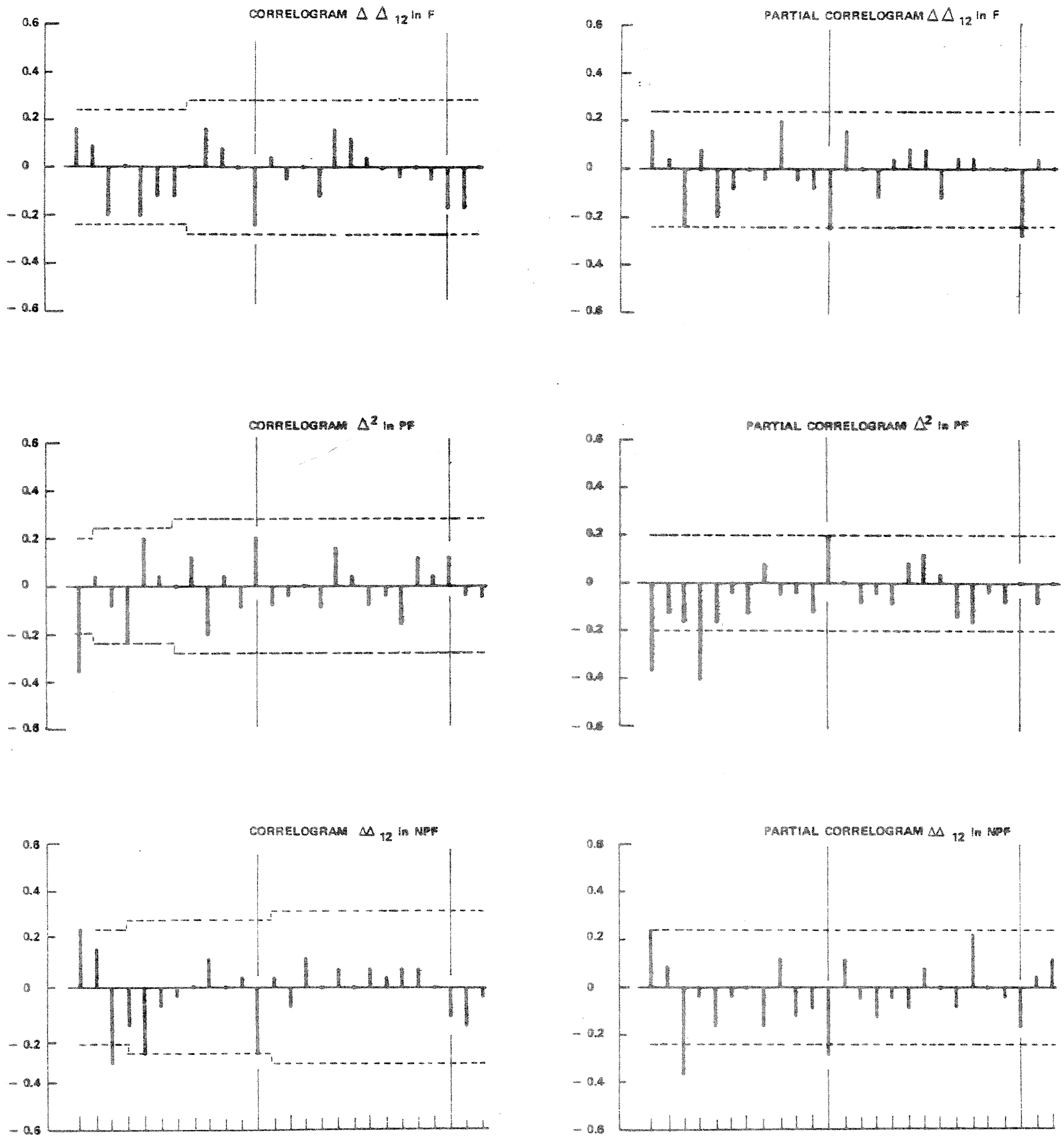


Table 1

	Food index (F)	Processed food index (PF)	Non-processed food index (NPF)
stationary transformation	$\Delta\Delta_{12}\ln$	$\Delta^2\ln$	$\Delta\Delta_{12}\ln$
standard deviation of the:			
a) uncorrected stationary series	0.016	0.010	0.027
b) corrected stationary series(*)	0.012	0.007	0.022
c) residual series	0.008	0.004	0.015

Table 2

	Manufactured goods price index	Services Price index
stationary transformation	$\Delta\Delta_{12}\ln$	$\Delta\Delta_{12}\ln$
standard deviation of the:		
a) uncorrected stationary series	0.0044	0.008
b) corrected stationary series	-	0.007
c) residual series	0.003	0.005

(*) The correction has consisted in applying to the stationary variable a regression on the dummy variables that appear in the corresponding univariate model of this section.

$$\Delta^2 \ln PF_t = \underset{(0.02)}{0.066}\Delta DMY76_t + \underset{(0.004)}{0.016}\Delta DAG81_t + \underset{(0.004)}{0.031}\Delta DNO80_t + \frac{(1-\overset{(0.08)}{0.75}L)}{(1-\underset{(0.1)}{0.2}L^{12}-\underset{(0.1)}{0.2}L^{24})} a_{2t}. \qquad (2)$$

residual standard deviation = 0.004,
Box-Pierce-Ljung statistic with 15 and 24 residual autocorrelations: 9.7 and 16.1.

$$\Delta\Delta_{12} \ln NPF_t = (\underset{(.16)}{0.053} + \underset{(.16)}{0.049}L)\Delta_{12}DJN77_t + \frac{(1-\overset{(0.12)}{0.55}L^{12})}{(1-\underset{(0.12)}{0.26}L+\underset{(0.12)}{0.22}L^3)(1+\underset{(0.13)}{0.25}L^{12})} a_{3t}. \qquad (3)$$

residual standard deviation = 0.015,
Box-Pierce-Ljung statistic with 15 and 24 residual autocorrelation: 11.3 and 18.6.

In these models variables starting with D have the value one in the month of the year which is abbreviated after the D and zero otherwise. These dummies correct the series for anomalous increases. The values in brackets above or below the estimated coefficients are their corresponding standard deviations.

II.2 Univariate models for the non-food price indexes.

The manufactured goods price index (M) and the services price index (S) are represented in figure 4, their rates of growth in figure 5. Some characteristics of these indexes are summarized in table 2 and the correlogram and partial correlogram of the stationary series are given in figure 6.

The models estimated for these series are the following:

$$\underset{(0.13)}{(1-0.27L}\underset{(0.13)}{-0.21L^2}\underset{(0.13)}{-0.32L^3})\Delta\Delta_{12}\ln M_t =$$

$$=(1-\underset{(0.10)}{0.69}L^{12})a_{4t}, \qquad (4)$$

residual standard deviation= 0.003,
Box-Pierce-Ljung statistic for 15 residual autocrrelations = 16.8;

$$\Delta\Delta_{12}\ln S_t = \underset{(0.005)}{0.041}DOC76_t + (1 \underset{(0.11)}{+0.27L}\underset{(0.12)}{+0.32L^9})$$

$$(1-\underset{(0.10)}{0.76}L^{12})\ a_{5t} \qquad (5)$$

residual standard deviation: 0.005,
Box-Pierce-Ljung statistic with 14 and 26 residual autocorrelations: 10.6 and 18.9.

Figure 4

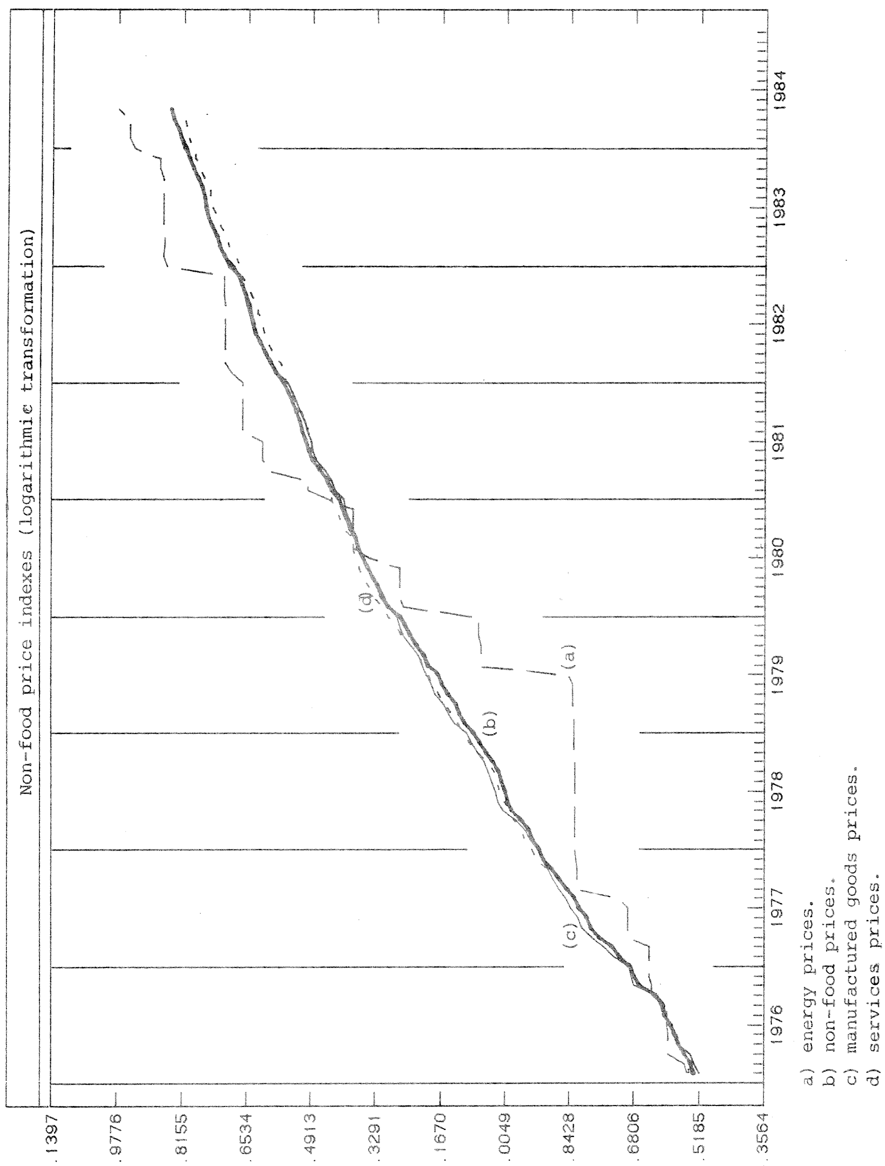
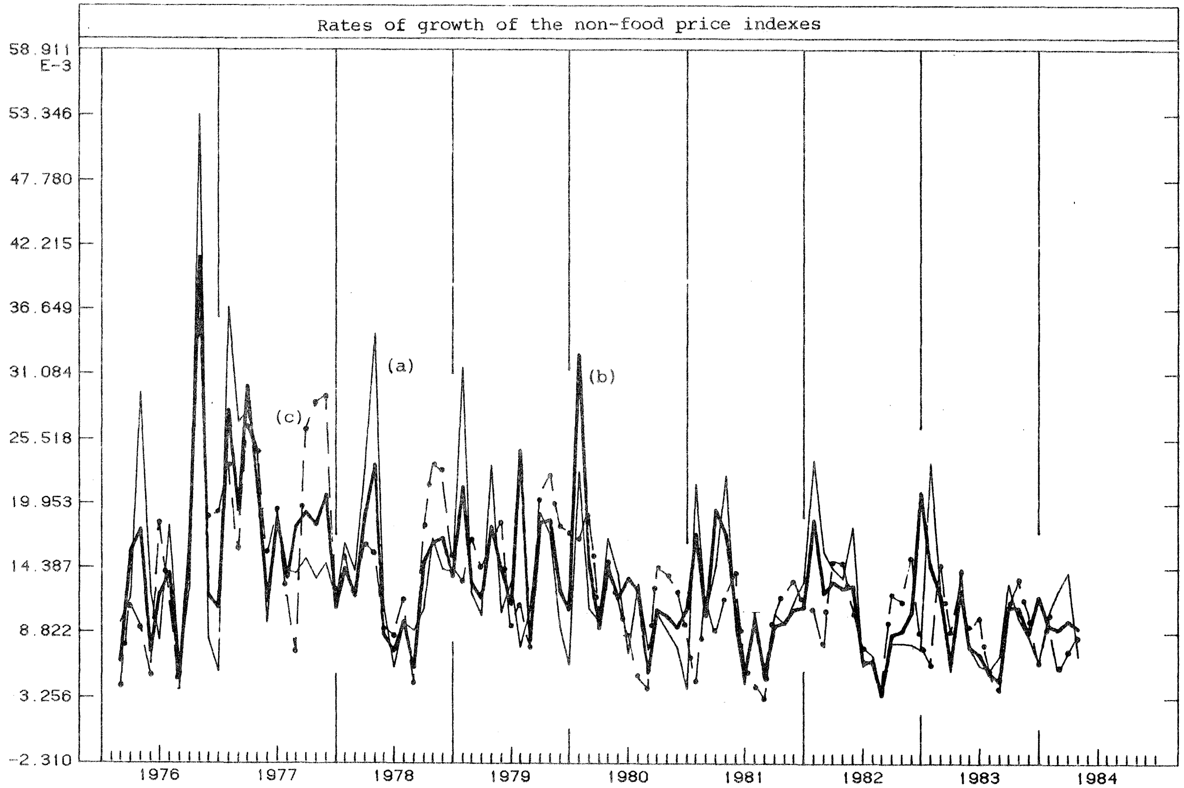

Non-food price indexes (logarithmic transformation)
6.1397
5.9776
5.8155
5.6534
5.4913
5.3291
5.1670
5.0049
4.8428
4.6806
4.5185
4.3564
1976
1977
1978
1979
1980
1981
1982
1983
1984
(a)
(b)
(c)
(d)
a) energy prices.
b) non-food prices.
c) manufactured goods prices.
d) services prices.

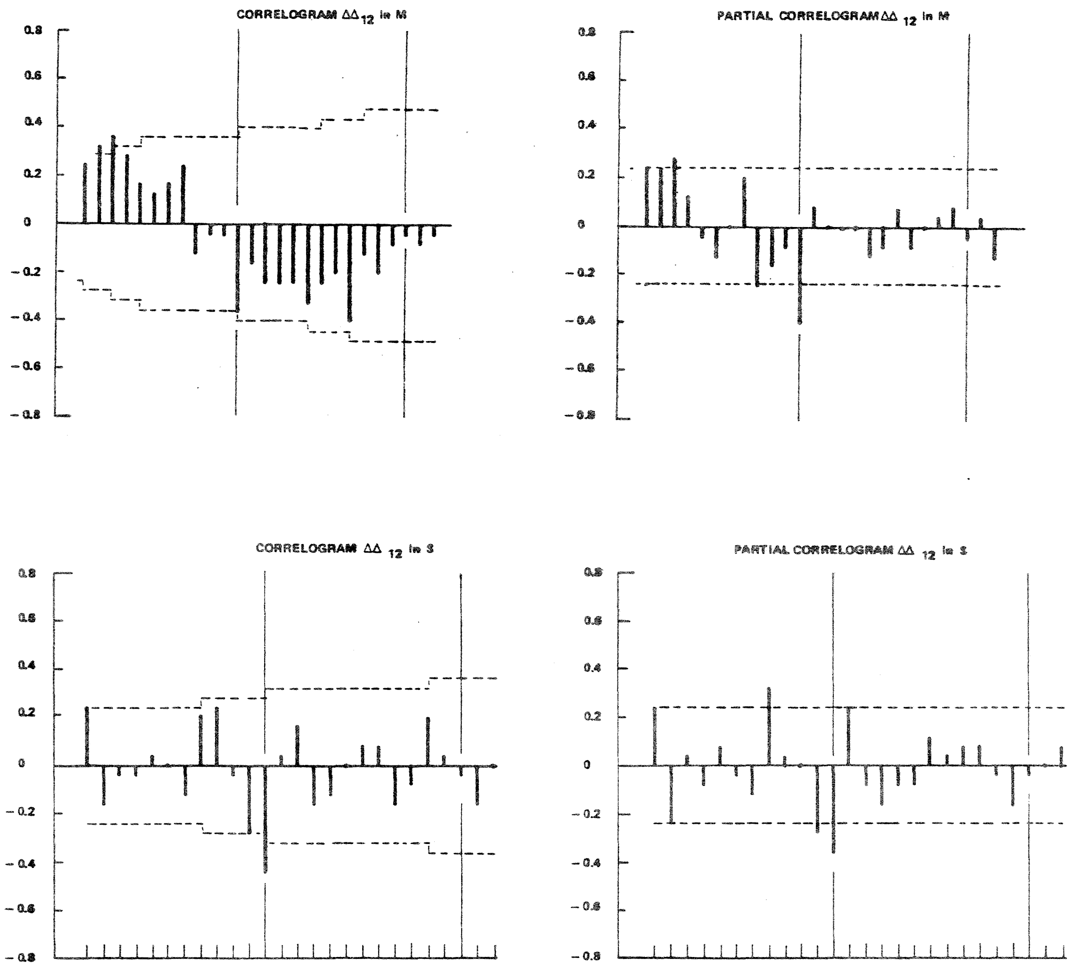
Figure 5



a) Services price index.
b) non-food price index.
c) manufactured goods price index.

FIGURE 6

NON–FOOD PRICE INDEXES
(Correlograms of the stationary series with anomalous observations corrected)



The manufactured goods price index registers several anomalies during 1976 and 1977 and model (4) has been estimated from January 1978 onwards only.

III. FORECASTING CONSUMER PRICE INDEXES

Models (2) to (5) are used each month to forecast the processed food, non-processed food, manufactured goods and services price indexes, several months ahead.(*) These forecasts with the judgemental forecast for energy prices give us a complete picture of the behaviour expected for consumer prices in the immediate future. These basic forecasts are also aggregated to obtain forecasts for the food index and for the non-food and non-energy index. Finally aggregating these forecasts for the last two indexes with the judgemental forecasts for the energy prices we get forecasts for the global index.

In the forecasts for each index we are mainly interested in the rates of growth of the annual average of the current year over the annual average of the previous year and the rates of growth for December of the current year over December of the previous year. These forecasts are interesting to evaluate the acceleration or deceleration of prices throughout the year. This can be done in several ways. One consists of comparing the present forecast with the forecasts made in the previous months. Table 3 collects the forecasts for 1983 made from January to October. These forecasts show a deceleration in all the indexes in the first part of the year followed by an acceleration in the remaining months.

(*). Since April 1984 we are using revised models for the manufactured goods and services price index.

Table 3

FORECASTS OF THE CONSUMER PRICE INDEXES

Rate of growth for December 1983 over December 1982 (*)

Forecasting Base period	Global Index (100)	Food (40.52)	Processed food (19.97)	Non-processed food (20.55)	Non-food (59.48)	Energy (5.32)	Non-food and non-energy (54.16)	Services (28.20)	Manufactured foods (25.06)
January	12.7	13.4	14.5	11.6	11.9		13.2	14.3	12.1
February	12.6	11.7	12.8	10.6	12.6		14.0	14.1	13.8
March	12.1	11.1	11.7	10.4	11.9		13.2	13.6	12.8
April	12.0	12.1	10.6	13.4	11.4		12.7	13.0	12.3
May	10.8	10.7	10.0	11.4	11.0		12.2	12.5	11.7
June	11.3	10.3	9.7	10.9	11.6		12.9	12.8	13.0
July	10.5	8.2	10.2	6.0	1.1		12.3	11.7	12.9
August	11.1	10.1	11.0	9.2	11.4		12.7	12.5	12.5
September	11.0	10.6	12.8	8.4	11.2		12.5	12.4	12.5
October	12.0	11.0	12.8	9.2	12.6	11.1	12.8	12.8	12.8
November									
December	(12.6)	(12.7)	(12.4)	(13.0)	(11.9)	(8.5)	(12.3)	(12.6)	(12.0)

Rate of growth for the annual average of 1983 over the annual average of 1982 (*)

Forecasting Base period	Global Index (100)	Food (40.52)	Processed food (19.97)	Non-processed food (20.55)	Non-food (59.48)	Energy (5.32)	Non-food and non-energy (54.16)	Services (28.20)	Manufactured foods (25.06)
January	13.3	12.4	13.7	11.1	13.2	15.2	13.3	13.7	12.3
February	13.0	11.3	12.4	10.1	13.7	15.1	14.1	13.5	13.5
March	12.7	10.9	11.8	9.9	13.3	15.1	13.6	13.2	12.8
April	12.7	11.8	11.3	12.3	12.9	15.4	12.7	12.7	12.6
May	11.0	10.9	11.0	10.8	12.7	15.4	12.2	12.4	12.3
June	12.1	10.6	10.9	10.2	13.0	15.4	12.7	12.6	12.9
July	11.7	9.3	11.1	7.6	12.7	15.4	12.5	12.1	12.9
August	12.0	10.2	11.9	9.1	12.9	15.4	12.6	12.4	12.9
September	11.9	10.3	11.8	8.8	12.8	15.2	12.6	12.3	12.8
October	12.1	10.4	11.8	9.0	13.0	16.4	12.6	12.4	12.9
November									
December	(12.1)	(10.7)	(11.8)	(9.6)	(13.0)	(16.1)	(12.6)	(12.6)	(12.8)

(*) The finally observed values are in brackets.

Another way of assessing the inflationary situation at present is by comparing the current forecasts of the rate of growth of prices with the observed rates in previous years. In figure 7 we compare the 1984 forecasts for food prices with the observations for 1982 and 1983. The figure also includes the forecasts made at the end of 1983 in order to evaluate the deceleration of prices in the observations for 1984 as a whole.

All the previous comparisons are intended to give us an idea of how the original data is performing. But if we think of inflation as composed of three components: trend, seasonal and irregular, there are questions, which, in order to answer, we should be more interested in the underlying trend of the inflation than in the real inflation itself.

For this purpose we need to estimate the trends of the price indexes and from them we obtain the inflation trends. This should be done on a model base framework, see for instance Hillmer and Tiao (1982) among others. But for these price series it is very easy to observe that a moving average of twelve terms can be taken as an approximation of the corresponding underlying trend. If in addition we measure inflation by annual rates of growth, we see that the annual rates of growth of the aforementioned moving averages will give us a picture of how the underlying inflation has been behaving. This measurements of the trend inflation, which we call the T_{12}^{12} growth rate, for a given price index, say X_t, then has this expression:

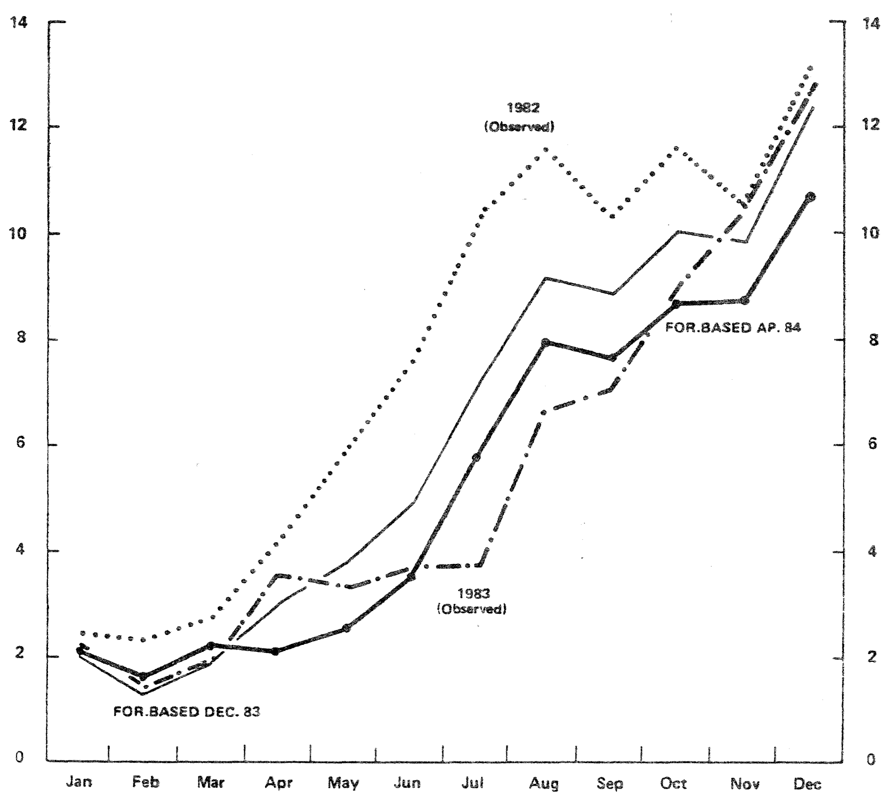
FIGURE 7.

UNIVARIATE FORECASTS

FOOD PRICE INDEX

RATES OF GROWTH FOR DECEMBER OVER DECEMBER OF THE PREVIOUS YEAR

Month	1982 (Observed)	1983 (Observed)	1984 (For.Based Dec.83)	1984 (Observed)	1984 (For.Based Apr.84)
January	2.4	2.2	2.0	2.1	
February	2.3	1.4	1.3	1.6	
March	2.7	1.9	1.9	2.2	
April	4.1	3.5	3.0	2.1	
May	5.9	3.3	3.8		2.5
June	7.5	3.7	4.9		3.5
July	10.1	3.7	7.1		5.8
August	11.5	6.6	9.1		7.9
September	10.2	7.0	8.8		7.6
October	11.5	8.9	10.0		8.7
November	10.5	10.3	9.8		8.4
December	13.1	12.7	12.3		10.7



$$T_{12}^{12}\ (X_t) = \left[\frac{\Sigma_{j=0}^{11}\ X_{t+j}}{\Sigma_{j=1}^{12}\ X_{t-j}} - 1 \right] .100.$$

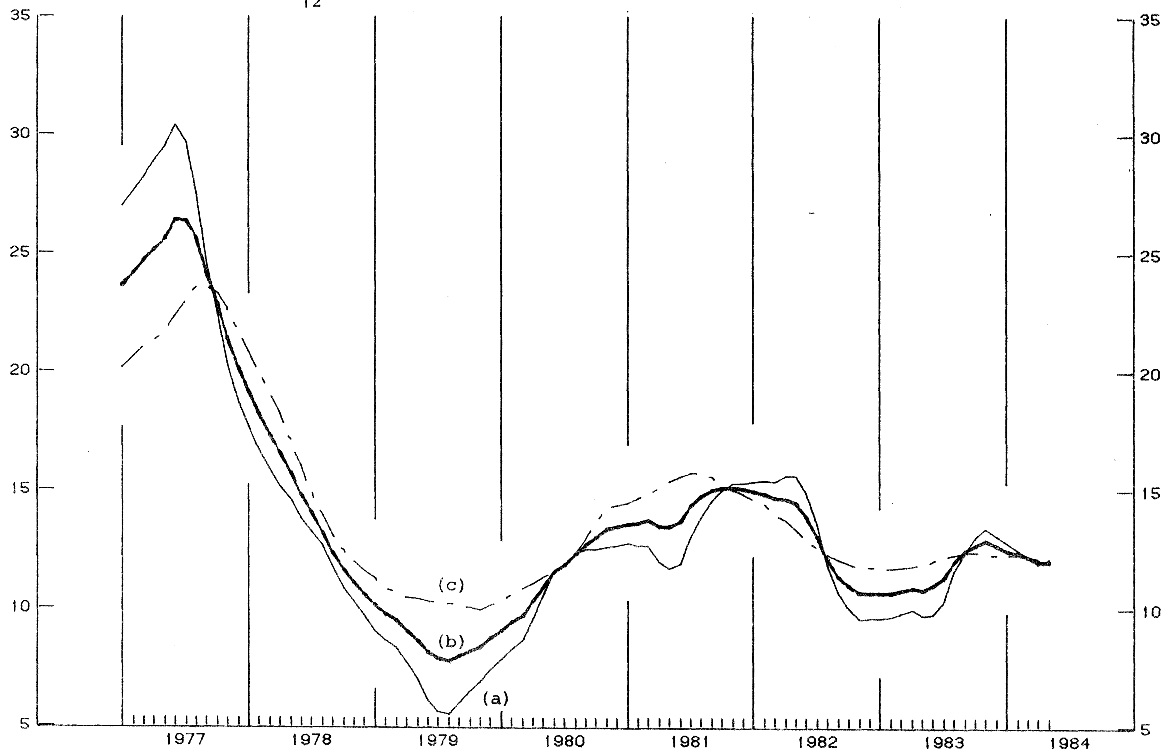
The trend inflation for the moment t, evaluated by $T_{12}^{12}(X_t)$ depends on the future observations of prices, $X_{t+1,\dots,}X_{t+11}$, and therefore when we have only observed X_t we cannot calculate $T_{12}^{12}(X_t)$. We will solve this by substituting $X_{t+1,\dots},X_{t+11}$ in the formula for T_{12}^{12} by the forecasts of those future observations, that we are making at t. In figure 8 we give the T_{12}^{12} growth rate for the food, processed food and non-processed food indexes, in figure 9 the T_{12}^{12} for non-food, services and manufactured goods indexes and in figure 10 the T_{12}^{12} for the global index and the four basic components.

These figures are also useful to see which prices are accelerating and which are decelerating. So we can say that, at present, manufactured goods prices and non-processed food prices are decelerating and services and processed food prices are in a situation of more or less constant increase.

This picture of the underlying inflation and its velocity, interesting though it is, is still not enough. We also need to estimate the value to which the underlying inflation in each component index tends for the medium term future. In other words we need to estimate today's medium term expected inflations. At the univariate level that we are working at, we can estimate this expected inflation by the rate of growth of the trend of the forecasts, which can be easily estimated.

T^{12}_{12} rates of growth of food prices

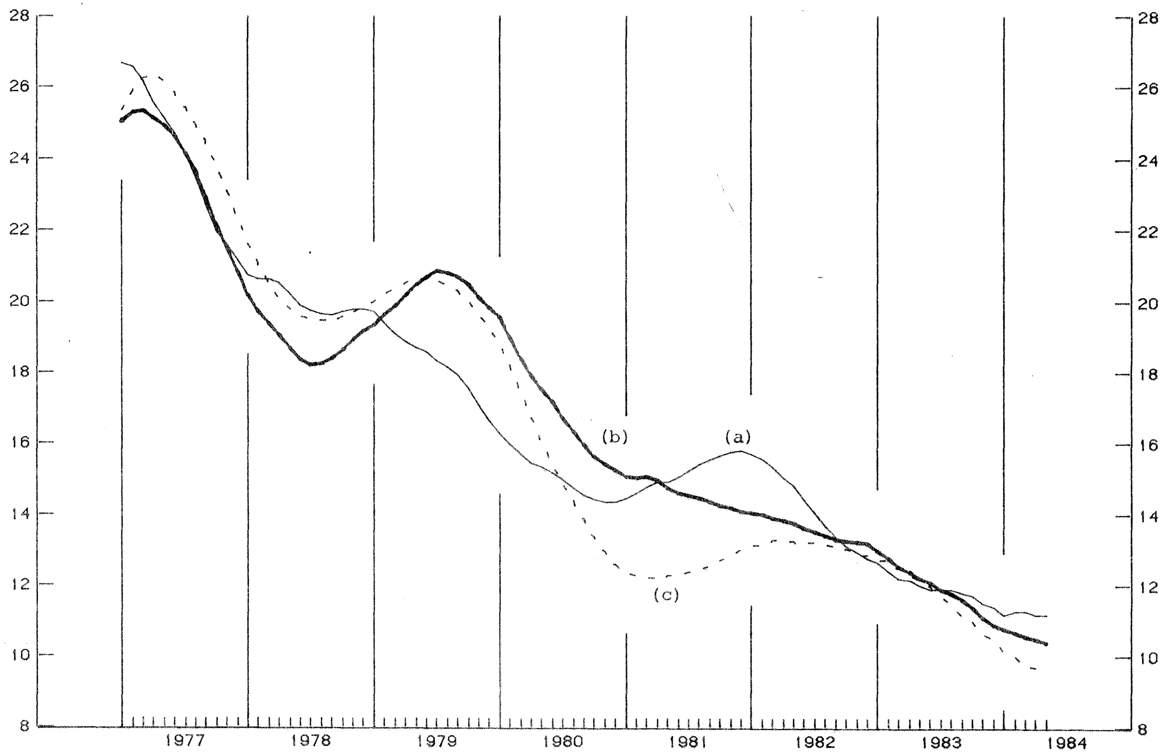
Figure 8



a) non-processed food price index.
b) food price index.
c) processed food price index.

Figure 9

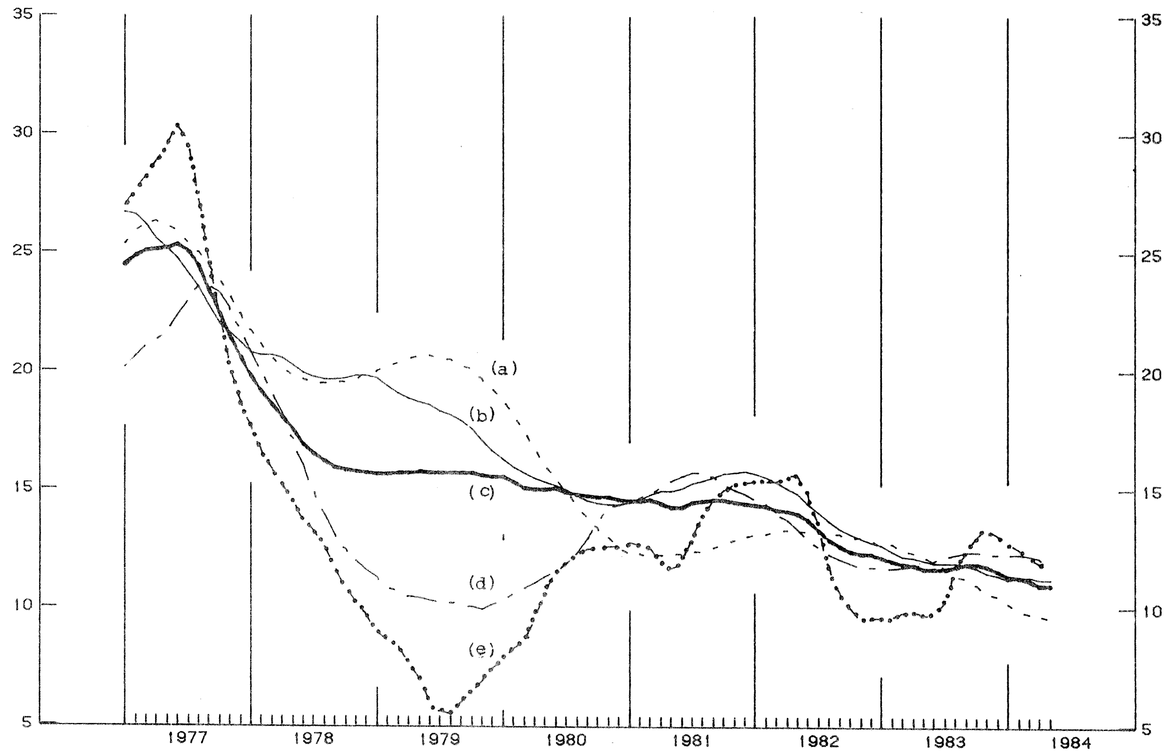
T_{12}^{12} rates of growth of non-food price indexes



a) services price index.
b) non-food price index.
c) manufactured goods price index.

T^{12}_{12} rates of growth of consumer price indexes

Figure 10



a) manufactures goods price index.
b) services price index.
c) consumer price index.
d) processed food price index.
e) non-processed food price index.

In fact, the forecast function of an ARIMA model has two elements, one stationary the contribution of which tends to zero and another, non-stationary, the contribution of which will not vanish with time. For the ARIMA models of this paper, the non-stationary part of the forecasting functions of the logarithmic transformation of prices are straight lines with fixed seasonal factors added on to them. Therefore the slopes of these straight lines give us the medium term expected inflation for the corresponding indexes. These slopes can be calculated by comparing the forecasts for the same month in two consecutive years once the contribution of the stationary element has desappeared.

With the trend estimations given in figures 8 to 10 and with these expected values we can complete the picture for the underlying inflation. In table 4 we sum up these results obtained with a sample till April 1984. The figures 8 to 10 for the trend inflation, and the estimation of the medium term expected inflation given in table 4 illustrate the usefulness of studying inflation by components when their trends are so different. We easily realize that two moments with similar values of the rate of growth of the global index can reflect very different situations. For instance, early in 1979 the rate of growth of the trend of Spanish consumer prices was 15.7% with a rate of growth of around 20% for the non-food price index and a rate of just 9% for the food price index, and late in 1980 the rate for the whole consumer price index was 14.6% with rates of 15.5% and 13.5% for non-food and food prices, respectively.

Table 4

The underlying inflation from consumer price indexes
in April 1984

Component	State of inflation	Medium-term expected inflation
Processed food	Constant	11.0
Non-processed food	Decreasing	11.7
FOOD	Decreasing	11.3
Services	Constant	12.0
Manufactured goods	Decreasing	9.6
NON-FOOD	Decreasing	10.3
GLOBAL	Decreasing	10.7

The importance of distinguishing between the trends of the components relies on the fact that these trends are affected by economic factors with very different intensities. So without trying to be very precise we can say that the non-processed food prices depend mainly on agriculture prices and import prices for seeds and fertilizers; processed food prices depend on the non-processed food prices, food import prices and industrial wages; manufactured goods prices depend on industrial wages and import prices and the service prices depend on the wages of the service sector and also are the prices most affected by the demand because the demand for sevices oscillates more than the demand for goods. Besides each of these indexes depends in a different way on the economic policy variables. We can see now that the univariate outlook for the prospects of inflation for the different component indexes is a useful instrument to implement the ideas, of the effects of economic variables on inflation, obtained by subjective and econometric evaluation of the data on those variables. Also, it is worth commenting that the forecast values for the aggregate indexes are much better using the forecast of the components than forecasting them directly with a univariate model for the corresponding aggregate index. In our experience this is something that occurs when the components have different trend evolutions.

IV. SHORT TERM AND MEDIUM TERM FORECASTS

Long term inflation is a phenomenon with so much uncertainty that its prediction, no matter which method we use, will have such wide intervals that it will be of no use at all. In fact, as far as inflation is concerned people usually talk only about the short and medium term prospects. And for the medium term, two to four years, generally, we are not so much interested in precise forecasts as in an evaluation of the mean inflation level.

If we are going to rely on a model to forecast, it must produce good results for the short term and reasonable estimates for the medium term level. In fact, to investigate if a model fulfils this latter requirement is a useful way of validating it for short term forecasting. In section III we have proposed a way of estimating this medium term expected inflation.

In forecasting the services prices with the model presented in section II for the sample January 1976 till December 1982 we found that in 1983 the short term forecasts were acceptable but with an excessive number of negative errors and the estimation of the medium term expectations were too high.

In fact, of the four partial price indexes, the services price index is the one that has registered a bigger systematic reduction in the rate of growth of its trend since 1982.(see figure 9) and consequently the mean of $\Delta \ln S$ has registered a significant change since the middle of 1982. Because model (5) does not include this change in the mean level of $\Delta \ln S_t$ the predictions made with it have a negative error mean.

In order to correct the aforementioned change in the mean level we have introduced into the model for services prices a step dummy variable with value one since April 1982, denoted by SAP82. In the process of obtaining a new model for the S series we realized that the world cup football competition produced an increase in Spanish services prices and this effect is captured by an impulse dummy variable with value one in May 1982, denoted by DMY82.

We also observed that the behaviour of prices before 1979-80 and after is different and we get better results estimating the model with a sample from 1979 onwards than with the whole sample used in section II. With this reduced sample the exact maximum likelihood estimation of the ARIMA model with the aforementioned interventions gives a unit value for the parameter θ_{12}, that would cancel the annual difference operator of the left hand side of the model and we would end up with a model with deterministic seasonality. This result can be interpreted in the sense that with the restricted sample we have too few observations to estimate a stochastic seasonal structure and we are only able to detect its deterministic approximation. But it does not necessarily mean that the seasonality is deterministic, and even when the deterministic or stochastic nature of the seasonality does not affect the fit too much, it could have non-negligible effects in forecasting. On the other hand just removing the SAP82 variable from the model the estimate for θ_{12} is 0.75, which is practically the same value obtained for model (5).

On the evidence of these results we will assume that the seasonal structure has not changed in the whole sample and we estimate the proposed ARIMA-with-dummies model fixing θ_{12} to the value of 0.75. The results obtained have been the following:

$$\Delta\Delta_{12}\ln S_t = \underset{(0.003)}{0.011}\Delta_{12}DMY82_t - \underset{(0.001)}{0.0031}\Delta_{12}SAP82_t +$$

$$+ (1+\underset{(0.14)}{0.22}L)(1-0.75L^{12})\, a_{6t} \qquad (6)$$

residual standard deviation = 0.0032

Box-Pierce-Ljung statistic with 15 residual autocorrelations: 0.19

Models with deterministic trend corrections need to be watched continuously because the correction will not have a permanent character and we will need to reconsider its structure when the evolution of the trend terms start to behave in a smooth way again. In these cases it is important to be able to construct econometric models in which the changes in trend are explained by economic variables. If these models are not possible, at least we should tend to construct models with leading indicators for the trend. As we have already said, at certain levels of time disaggregation we do not observe leading indicators and then relying on univariate models only we are forced to consider deterministic trend corrections, because the real world, which we try to represent, does not behave smoothly and cannot be approximated by linear ARIMA models alone.

In conclusion we can say that in situations where the trends of prices are showing important changes, it is imperative to observe the variables affecting prices on the same time unit on which we observe prices. If this is not done, a prompt assessment of the inflation situation once a new price observation is made is very difficult and can only be based on univariate models; this will only be useful to the extent that we will be able to include appropriate deterministic elements in them.

Appendix: Official objectives and univariate forecasts for the Consumer Price index for 1984.

The univariate forecasts, which, on the basis of what was observed until April 1984, are made for the global consumer price index (IPC) are a growth rate of 11.4% for the annual average for 1984 over the annual average for 1983, and a rate of 10.3% for December 1984 over the same month in the previous year. For the food index these rates take on the values of 12.5 and 11.9% and for the non-food index (59.48%) the values of 10.7 and 10.1%.

The fact that the December rates are lower than the yearly average rates reflects a slowing down in inflation. This slowing down can be seen most clearly if we observe that the forecast of the December rates for the global, food and non-food indexes made on the basis of what was observed until December 1983 were 11.3, 12.3 and 10.7, respectively. This means that the rate of inflation for 1984 has being reduced by one point in four months, this reduction being more marked in the non-food index than in the food index.

Although this news of the deceleration of the price index is good, it is not enough to be able to say that the rate of inflation is in line with the 8% set as the objective. It might be useful to discuss the possibilities of achieving this objective by examining the most recent observations and the trend projections of prices. On the basis of what has been observed until April these trend projections for the global, food and non-food indexes are 10.7, 11.3 and 10.3 respectively.

These rates suppose a fall with respect to those that were projected on the basis of what was observed until February 1984, which were 11.2, 12.7 and 10.4.

From what we have seen in preceding paragraphs we can say that inflation is falling in the short and medium term. Deceleration in prices in the short term has been more marked in the first four months of 1984, in the non-food index and deceleration in the medium term has been more noticeable in the food index. This projection of the rate of growth of the trends serves, therefore, to quantify to what extent the drop in inflation has been assimilated in a more permanent form.

The fall in inflation during the last few months can be illustrated by calculating the rate of growth for April 1984 over December 1983, and converting it into an annual rate. These rates for the global food and non-food indexes, seasonally adjusted, are 8.1, 8.7 and 7.8, respectively. To consider these rates as a measure of inflation means considering that the irregular components, in the observations of prices for the last four months, are not completely irregular but they reflect a fall in trend, which is sharper than that which univariate models show. These considerations are possible as long as there is an objective foundation, based on more information, for them.

We have seen that prices are undergoing an important deceleration, but that it is still not sufficient to state that they are growing at 8%. Nevertheless, insofar as this deceleration continues and the seasonal effects corresponding to the mid-year months reduce their impact on food prices, it could be possible to reach a rate of inflation between 8 and 9%, measured in December 1984 over December 1983.

The evolution of nominal wages for which it is estimated a rate of growth of 7.8% in the private sector (6.2% in the public sector) during 1984 instead of the 11.6% during 1983 will suppose with the estimated evolution for employment, an important reduction on the rate of growth of the labour unit cost. On the other hand, for import prices a rate of growth of 6% is estimated for 1984 instead of the 24.5% rate registered during 1983. This extra information (*) indicates that the aforementioned trend reduction of inflation is going to continue and the recently announced agricultural measures will also palliate the seasonality of food prices.

(*) We are grateful to J.L. Malo de Molina for drawing our attention to this information.

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