Inflation, Unemployment and the Position of the Central Bank: the Opinion of the Public *

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1. Introduction

Recent developments in the theory of monetary policy are based on the view that the interaction between the behaviour of the monetary policy-makers and the behaviour of the private sector is decisive for the effectiveness of monetary policy. In this approach, optimal monetary policy and the possible desirability of central bank independence are directly related to the assumptions regarding the information and opinion of the private sector. This is why it is useful to test to what extent these assumptions are realistic. This paper presents the results of two recent surveys conducted at my request by NIPO (Dutch institute for public opinion polls) among households in the Netherlands and by Demoskopea (Italian institute for public opinion polls) among households in Italy. These surveys were aimed at gaining insight into the knowledge and opinion of the public regarding the objectives of the government and the central bank and the institutional framework of monetary policy. The paper is constructed as follows. In the next section, a brief explanation is given of the theoretical framework which the surveys are supposed to verify empirically. Section 3 describes the purpose of the surveys and motivates the choice of the countries. In Section 4 the poll results are

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presented and analyzed. Section 5 summarizes the similarities and differences observed between the countries and draws final conclusions.

2. Theoretical framework

Kydland and Prescott (1977) showed that monetary policy has an inflationary bias as a result of time inconsistency. The monetary policy-maker wants to create surprise inflation in order to generate real economic effects. However, the latter fail to materialize because the public anticipates the optimal discretionary inflation, which means that there is no surprise effect. The model is as follows:

$$y = y^* + \pi - \pi^e \qquad (1)$$

with y and y^* being the actual and the 'natural' output, respectively, and π and π^e actual and expected inflation. The model of equation (1) is in accordance with two totally different views of the functioning of the economy. It was originally developed by Lucas (1973), who assumes an economy with full price flexibility. He assumes that individuals are not able to directly interpret price signals correctly. Because of these misperceptions, monetary policy may have temporary real effects. An alternative interpretation is that of Keynesians like Fischer (1977) and Taylor (1980). They assume nominal rigidities as a result of (wage) contracts, based on inflation expectations. In principle, the model may be used as a theoretical abstraction by both economists believing in full price flexibility and market clearing and economists assuming that the economy is characterized by rigid wages and prices.

The policy-maker (the government) maximizes the social welfare function. This is as follows:

$$W = -\tfrac{1}{2}a\pi^2 + b(y - y^*) \qquad (2)$$

with $a, b \geq 0$.

Maximization of (2) with respect to inflation under the constraint given by (1) results in an optimal rate of inflation equal to $\pi = b/a$. This ratio is an indication of the relative preferences of the policy-maker: the higher b/a, the stronger the emphasis on stimulation of output at the expense of higher inflation.

The public is by assumption aware of the policy-maker's intentions and anticipates the 'surprise inflation'. Therefore, the inflation expectation is equal to actual inflation ($\pi^e = b/a$), hence inflation does not have any real output effects ($y = y^*$) and the social welfare, measured by the welfare function (2), is $W = -\frac{1}{2}b^2/a$. This is lower than the welfare if zero inflation is realized and anticipated, as in that case $W = 0$.

Subsequent studies show that the inflationary bias may be reduced by convincing the public that it is not the monetary policy-maker's aim to create surprise inflation (Backus and Driffill 1985, Rogoff 1985). From this theoretical discussion ensues the debate on the desirability of central bank independence. The underlying view is that a central banker has a greater aversion to inflation than the government. If the central banker is independent, he will use monetary policy for optimizing his own objective, not the social welfare function. In terms of equation (2) this implies that the central bank has a smaller b/a ratio. If the public is aware of this, it will anticipate lower inflation. Theorists assume that agents know the policy maker's preferences or learn about them in a consistent way. If this hypothesis is not true, there is no point in reforming monetary institutions: disinflation will have high output costs.

3. The purpose of the public opinion polls

In view of the above, it is important to be aware of the public opinion on the preferences and competences of the government and the central bank. There have been studies of public opinion polls on the cost of inflation and unemployment, especially in the United States. Fischer and Huizinga (1982) find that the public regards inflation as a more serious problem than unemployment. Shiller (1996) studies differences in (absolute) inflation aversion between economists and non-economists, between individuals in different countries (United States, Germany, Brazil) and between different age groups. He concludes that non-economists have a larger dislike of inflation than economists. Research among monetary economists in

the United States has shown that many of them consider the fight against unemployment and the achievement of price stability equally important (Hoskin 1993).[1] A different line of research is undertaken by Friedlander (1973), Lippi and Swank (1995), Eijffinger, van Rooy and Schaling (1994) and Barro and Broadbent (1995), who all attempt to estimate preferences or targets behind policies. These studies have not examined the public's view of the policy-maker's preferences, however. This is the main purpose of the present study. In addition, it is worthwile to examine whether the public would accept an independent central bank that pursues objectives other than the social welfare function. This question touches upon the basic role of policy institutions from a democratic perspective. Already in 1962, Friedman pointed out in an essay on the desirability of central bank independence that monetary policy should not become the football of political manipulation on the one hand, while, on the other hand, it is too important to be left to an institution over which society has no control at all.

Of course, the question arises who is meant by "the public". The interpretation of the model introduced in Section 2 as a misperceptions model would advocate a survey among the whole of the population, as it describes an economy with many individual economic agents. On the other hand, one may wonder whether the average individual bases his behaviour on anticipated inflation. Another option would be to conduct a survey among institutions which are specifically involved in determining strategies in the macro-economic area (unions, employers' organizations). This would be most in line with the interpretation of the above model as a model with nominal rigidities. We opted for a survey among the whole population in two countries, the Netherlands and Italy. The results should be interpreted with some caution, as it could be argued that a few important agents dominate economic decision-making.

The reason to choose the Netherlands and Italy as countries in which to conduct the polls was the following. In a lot of respects, these countries are similar: they are both industrial democracies, are part of Western Europe and have the desire to participate in the Economic and Monetary Union (EMU). In other respects, especially those that are important from the point of view that is of interest

[1] In the Netherlands, empirical research has been conducted into the social and economic preferences of political parties. See Merkies and Vermaat (1981).

here, the countries differ, however. Italian inflation has been among the highest in Western Europe, whereas inflation in the Netherlands has been quite low, often even lower than that in Germany. The Dutch guilder has closely followed the Deutsche Mark ever since 1982, while the Italian lire has not, and has left the ERM in September 1992. As a result, the Netherlands is generally considered to be certain of membership of the EMU whereas Italy is not. That the reputation of the Netherlands central bank governor is generally regarded to be very good is perhaps reflected by his nomination for president of the European Monetary Institute. Furthermore, Italy can be qualified as a politically unstable country, as it has had more than 50 successive governments in the past 50 years. The opposite holds for the Netherlands, where it is an exception if a government falls before its term ends.[2] Given these characteristics, the theory would predict the poll results to differ between these two countries in a number of respects. Especially, one would expect for Italy a worse reputation for its policy-makers in the sense that the public believes price stability to be a less important objective of economic policy.

4. The setup of the polls

By means of interviews by telephone, the NIPO, the Dutch institute for public opinion polls, questioned 704 persons of 18 years and over. In order to ensure that the sample is representative, the results have been weighted on the basis of the composition of the population according to the standard method of the NIPO. The questionnaire is included in Appendix A. In addition to questions about the public's opinion on the preferences of policy-makers and the actual independence of the Nederlandsche Bank (DNB), questions were also included regarding the desirability of an independent monetary authority. It was finally examined whether the public is aware of actual inflation, to what extent it pays attention to inflation and what serves as the basis for inflation expectations. The survey was

[2] However, some authors define political instability in a different manner and conclude that the Netherlands is politically unstable. See e.g. Grilli, Masciandaro and Tabellini (1991).

conducted from 26 April 1995 to 12 May 1995, that is in the period immediately following the publication of DNB's 1994 annual report. The reason for selecting this period was that during this period the public was expected to be best informed of monetary policy and the role played by DNB. Therefore, the results regarding the information available to the public may be a little bit biased.

In Italy, the poll was conducted by the Demoskopea institute by means of face-to-face interviews among 962 persons of 18 years and older. This approach instead of a telephone survey has been chosen for three reasons. The first, and perhaps most important, is that a large fraction of the population is not in possession of a telephone. In this respect there are large differences between the North and the South of Italy. Whereas in Northern Italy about 97% possess a telephone, in the South about 22% does not have a telephone. The second reason is that Italian people tend to overstate their own social class. The method of face-to-face interviews enables the interviewer to make his own assessment of the respondent's social class by considering some additional information according to a standard procedure developed by the research institute. Finally, for reasons of tax evasion, people in Italy tend to declare a far lower income than they do actually receive. Again, the interviewer makes his own estimate of the respondents income class. Although it has disadvantages, in terms of comparability, that the poll has been conducted differently from that in the Netherlands, the three reasons mentioned here seemed important enough to choose for a face-to-face approach. This is even more so, as social class and income level turn out to be significant explanatory variables. The poll was conducted in the period from 9 to 29 February, 1996. The questionnaire is given in Appendix B.

When interpreting the results a few things should be kept in mind. First, in this period, Italy went through a period of political instability. There was no stable political coalition and the country was governed by a technical government. Second, the then Prime Minister, Dini, is a former vice-president of the Banca d'Italia. The Dini government was supported by the center-left since its confidence vote. Third, the political spectrum had changed enormously since the then latest parliamentary elections (of 1994). At the time, anticipating new elections, the political parties attempted to form coalitions which, should they get a majority vote, would be able to govern the country. Two large coalitions had formed this way, the center-left

(Ulivo) and the right (Polo). The communist party promised to support a center-left government. For that reason, the respondent's political orientation was determined by asking to which of the two coalitions they felt closer, instead of asking for which party they had voted at the parliamentary elections of 1994. The other questions were identical to those in the Netherlands' questionnaire.

5. A first look at the results

5.1. *Preferences*

Theorists assume that the government aims at maximizing the social welfare function, whereas the central banker gives a higher weight to price stability. The public is supposed to be aware of this fact. In order to determine whether these assumptions are realistic, the respondents were requested to indicate both their own preferences and those they ascribe to the government and the central bank, represented by its governor. They were asked to state on a scale from 1 to 10 how important they regard unemployment and inflation themselves as problems to be faced by economic policy, and how serious they think the government and the (governor of) the central bank regard these phenomena.[3] Table 1 gives the sample means corrected for discrepancies between the sample distribution and the distribution of the total population in the Netherlands and Italy, respectively.[4] Before turning to the results, a few words of caution are in place. It must be stressed that in the framework of the model, the

[3] It was explained that the issue was not how serious unemployment and inflation actually are, but how important these phenomena are as policy objectives. For technical reasons, the figures in the original questionnaire (see Appendix 1) indicate the opposite: 10 is not serious, 1 is very serious. Therefore, the answers have been subtracted from 11 in order to get higher values if the problem is considered to be more serious.

[4] The weighting procedure by NIPO and Demoskopea implies that some respondents are excluded or given a lower weight whereas others are weighted more heavily. Obviously, the weighted means are a better reflection of the opinions of society. However, they are less appropriate to examine whether the differences between the own preferences, those ascribed to the central bank and those ascribed to the government are significant. A t-test on the unweighted results reveals that they are significant at the 99% level. Hence an absolute inflation aversion of the central bank does indeed exist according to the public: the α of the central bank is the highest.

utility function given by equation (2) is completely identified by the relative weight b/a. This should be taken into account when judging the relevance of the outcomes in terms of absolute preferences. Moreover, in what follows it is implicitly assumed that the ideal targets for output (or unemployment) and inflation are identical in the two countries and equal to y^* (u^*) and zero.

TABLE 1

IMPORTANCE OF INFLATION AND UNEMPLOYMENT.[a] RESPONDENT'S OPINION AND PERCEPTION OF POLICY MAKERS IN ITALY AND THE NETHERLANDS

	Weighted sample means[b]					
	The Netherlands			Italy		
	α	β	β/α	α	β	β/α
Respondent	6.58	8.54	1.30	8.43	9.22	1.09
Government	6.33	7.35	1.16	5.96	6.08	1.02
Central bank	7.70	7.72	1.00	6.95	6.49	0.93

[a] On a scale from 1 to 10; 1 = not serious, 10 = very serious.
[b] I.e. corrected for a divergence between the structure of the sample and that of the population as a whole.
α = importance of inflation as problem to be faced by economic policy.
β = importance of unemployment as problem to be faced by economic policy.

In terms of absolute preferences, reflected by α and β, it is obvious that in Italy the public believes that both the government and the central bank care insufficiently about inflation and unemployment. In the Netherlands, the government is assumed not to care enough about both policy goals, whereas the central banker is assumed to focus too much on price stability and too little on unemployment. In both countries the central banker is believed to be more inflation averse than the government. A surprising result is that in both countries the public on average assumes that the central bank also cares more about unemployment than the government. Although this at first glance seems to be in conflict with the theoretical assumptions, it may still – in part – be interpreted as a confirmation. The reason is that what ultimately matters is the *relative* weight of unemployment and inflation. This ratio is smaller for the central bank governor than for the government in both countries. Although the β/α ratio found may not be equated with b/a from the target function of equation (2), it offers an indication of the relative preference for the fight against unemployment over that against inflation. As such, it

may also be considered a criterion for "optimal" inflation: the higher the β/α ratio of the monetary policy-maker, the higher the level of inflation. And although the public in both countries feels that the central bank is more concerned about unemployment than the government, the relative stress the former wants to place on the fight against inflation exceeds that of both the public and the government.[5] Table 1 also reveals that the discrepancy between the own absolute preferences and those ascribed to the policy-makers is much larger in Italy than in the Netherlands, which could indicate less confidence in government institutions in Italy. That the respondents' relative weight of unemployment over inflation is lower in Italy than in the Netherlands can be explained by the Italian inflation history. The β/α ratios shown in the third column of Table 1 are the ratios of the average β and α, respectively. This approach was opted for because the average of the individual ratios is a less reliable measure for the average preference.[6] However, the disadvantage is that nothing can be said about the significance of the differences found, as there are no distributions available. The same problem occurs when dividing the respondents into subgroups. In Section 5, this problem will be tackled by constructing a reliable indicator of individual relative preferences, which corrects for use of the scale.

The respondents can be classified according to a number of socio-economic characteristics. Tables 2a and 2b suggest a relationship between preferences and level of education. In both countries the absolute importance of inflation as viewed by the respondents falls with education level. As a result, the β/α ratio rises with level of education. In both Italy and the Netherlands the β/α ratio ascribed to the central bank falls with education level. This result is primarily due to a positive relationship between education level and the central banker's perceived inflation aversion. As the Tables also show, the

[5] A central bank that is more concerned about inflation than the public is not necessarily sub-optimal. Rogoff (1985) and Lohmann (1992) show that it may be optimal for society to select a central banker who has a stronger aversion to inflation than the public itself.

[6] This may be illustrated by means of a simple example. Suppose that 50% of the respondents considers inflation ten times worse than unemployment ($\beta/\alpha = 1/10$) and the other half finds unemployment ten times worse than inflation ($\beta/\alpha = 10$), the average population considers inflation and unemployment to be equally bad. However, the average of the individual scores in this case is $0.5 \cdot 1/10 + 0.5 \cdot 10 = 5.05$, in other words, unemployment is considered five time worse than inflation.

difference between the own relative preferences and those ascribed to the central bank or the government increases with education. The perceived difference between the objectives of the government and the central bank also rises with education level. This is true for both Italy and the Netherlands. These outcomes suggest that the assumption made in the theory applies more to higher educated.

TABLE 2A

IMPORTANCE OF INFLATION AND UNEMPLOYMENT BY LEVEL OF EDUCATION (THE NETHERLANDS)

Education	α			β			β/α		
	Resp.	DNB	Govt	Resp.	DNB	Govt	Resp.	DNB	Govt
LO	6.6	6.9	6.3	8.0	7.1	6.7	1.21	1.03	1.06
LBO	6.8	6.9	5.4	8.2	7.5	6.6	1.21	1.09	1.22
MAVO	6.3	7.1	6.0	8.3	7.3	6.9	1.32	1.03	1.15
MBO	6.2	7.5	6.1	8.2	7.4	6.9	1.32	0.99	1.13
HAVO/VWO	6.0	7.5	6.4	7.7	7.4	7.1	1.28	0.99	1.11
HBO	6.3	7.6	6.1	7.9	7.3	7.0	1.25	0.96	1.15
WO	5.9	7.8	6.3	8.4	7.6	7.7	1.42	0.97	1.22

α = importance of inflation as problem to be faced by economic policy.
β = importance of unemployment as problem to be faced by economic policy.
Resp. = respondents.
LO = primary education, LBO = lower vocational education, MAVO = lower general secondary education, MBO = intermediate vocational education, HAVO/VWO = higher general secondary education/pre-university education, HBO = higher vocational education, WO = university.

TABLE 2B

IMPORTANCE OF INFLATION AND UNEMPLOYMENT BY LEVEL OF EDUCATION (ITALY)

Education	α			β			β/α		
	Resp.	BdI	Govt	Resp.	BdI	Govt	Resp.	BdI	Govt
Elem.	8.6	6.6	5.7	9.3	6.5	5.9	1.08	0.98	1.04
Med. inf.	8.5	6.8	5.9	9.3	6.3	6.0	1.09	0.93	1.02
Med. sup.	8.5	7.5	6.1	9.3	6.8	6.3	1.09	0.90	1.03
Univ.	8.3	7.4	6.5	9.3	6.8	6.6	1.12	0.92	1.02

α = importance of inflation as problem to be faced by economic policy.
β = importance of unemployment as problem to be faced by economic policy.
Resp. = respondents.
Elem. = primary school, Med. inf. = lower medium school, Med. sup. = higher medium school, Univ. = university.

Classified by income level, the results are ambiguous, as Tables 3a and 3b show. In the Netherlands, the respondents' β/α ratio rises with income, whereas the opposite is true for Italy. It will be shown later that this result holds in a multivariate regression analysis. A possible explanation is that, first, in the Netherlands people with higher income levels benefit from inflation through a lower real rate of interest on their mortgage loans, whereas in Italy these loans are indexed and, secondly, that the system of unemployment benefits in the Netherlands is more generous. Another result from Tables 3a and 3b is that in the Netherlands the β/α ratio ascribed to the central bank governor falls with income level, whereas there is not a clear picture for Italy in this respect.

TABLE 3A

IMPORTANCE OF INFLATION AND UNEMPLOYMENT BY INCOME LEVEL (THE NETHERLANDS)

Income[a]	α			β			β/α		
	Resp.	DNB	Govt	Resp.	DNB	Govt	Resp.	DNB	Govt
< 15,000	6.1	5.8	6.0	7.1	6.7	6.8	1.16	1.15	1.13
15-20,000	6.7	6.8	5.8	8.6	7.0	7.5	1.28	1.03	1.29
20-30,000	6.6	7.4	6.0	8.8	7.4	7.5	1.33	1.00	1.25
30-43,000	7.1	7.7	6.1	8.5	7.7	6.9	1.19	1.00	1.13
43-50,000	6.2	7.5	5.9	8.1	7.4	6.6	1.30	0.98	1.12
50-60,000	6.5	7.7	6.2	8.1	7.6	7.0	1.25	0.98	1.13
60-75,000	6.2	8.0	6.3	8.4	7.9	7.7	1.35	0.98	1.22
> 75,000	5.8	7.5	6.0	8.1	7.3	7.1	1.46	0.97	1.22
no answer	6.7	7.0	6.3	8.4	7.1	6.7	1.29	1.01	1.07

[a] Gross annual income in guilders.
α = importance of inflation as problem to be faced by economic policy.
β = importance of unemployment as problem to be faced by economic policy.
Resp. = respondents.

TABLE 3B

IMPORTANCE OF INFLATION AND UNEMPLOYMENT BY INCOME LEVEL (ITALY)

Income[a]	α			β			β/α		
	Resp.	BdI	Govt	Resp.	BdI	Govt	Resp.	BdI	Govt
< 12,000	8.8	6.6	6.2	9.8	6.1	5.9	1.11	0.92	0.95
12-24,000	8.7	6.8	5.8	9.6	6.4	5.9	1.10	0.94	1.02
24-36,000	8.4	7.1	5.9	9.2	6.8	6.1	1.09	0.95	1.03
36-48,000	8.4	7.2	6.2	9.1	6.6	6.4	1.08	0.92	1.03
> 48,000	8.3	7.2	6.1	8.9	6.5	6.2	1.07	0.90	1.01

[a] Net annual income in 1,000 Italian lire.
α = importance of inflation as problem to be faced by economic policy.
β = importance of unemployment as problem to be faced by economic policy.
Resp. = respondents.

The population can also be ranked according to social class. In the approach of NIPO this is a classification in five groups according to education and profession. Demoskopea uses a socio-economic class division in five groups according to three criteria, namely consumption pattern, education and profession. As the upper and lower classes are quite small, they are taken together with upper middle and lower middle class, respectively. Thus a division in three classes results. The results are given in Tables 4a and 4b.

For the Netherlands it is obvious that the higher the social class, the more important the respondents consider unemployment relative to inflation. The setup of NIPO implies that higher social classes are not out of work. Hence the relatively strong aversion to unemployment expressed by higher classes does not have to do with their own employment situation. For Italy, the own relative preferences do not markedly differ with socio-economic class. The perception of the central banker's β/α ratio falls with social class in both countries.

All in all, it may be concluded that the opinion of the public with regard to the relative preferences of the government and the central bank assumed in the theory seems to apply notably to the higher social classes, possibly as a result of higher education and political awareness. It is furthermore remarkable that the higher the social class, the larger the perceived difference between the own preferences and those of the central banker. This result holds in the context of multivariate regression analysis, as will be shown below.

TABLE 4A

IMPORTANCE OF INFLATION AND UNEMPLOYMENT BY SOCIAL CLASS (THE NETHERLANDS)

Social class[a]	α			β			β/α		
	Resp.	DNB	Govt	Resp.	DNB	Govt	Resp.	DNB	Govt
D	6.7	6.3	5.7	7.7	6.7	6.1	1.15	1.06	1.07
C	6.6	7.1	5.7	8.2	7.5	6.5	1.24	1.05	1.14
Bo	6.4	7.2	6.2	8.2	7.2	7.2	1.28	1.00	1.16
Bb	6.1	7.6	6.1	8.2	7.6	7.0	1.34	1.00	1.14
A	6.2	7.7	6.2	8.1	7.2	7.3	1.30	0.93	1.17

[a] A ranking by NIPO based on a combination of education and profession: D = low, A = high, o = under, b = upper.
α = importance of inflation as problem to be faced by economic policy.
β = importance of unemployment as problem to be faced by economic policy.
Resp. = respondents.

TABLE 4B

IMPORTANCE OF INFLATION AND UNEMPLOYMENT BY SOCIAL CLASS (ITALY)

Social class[a]	α			β			β/α		
	Resp.	BdI	Govt	Resp.	BdI	Govt	Resp.	BdI	Govt
Below middle	8.7	6.7	5.8	9.5	6.5	5.9	1.09	0.97	1.02
Middle	8.4	7.1	6.0	9.2	6.5	6.1	1.09	0.92	1.02
Above middle	8.4	7.5	6.4	9.0	6.7	6.5	1.07	0.89	1.02

[a] Based on consumption pattern, education and profession with respective weights 0.5, 0.3 and 0.2. The pattern of consumption is assessed by the interviewer by evaluating housing, furniture, clothing, etc.
α = importance of inflation as problem to be faced by economic policy.
β = importance of unemployment as problem to be faced by economic policy.
Resp. = respondents.

5.2. *Central bank independence*

So far, it is evident that the public in both Italy and the Netherlands believes the central bank to be more inflation averse than the government. According to the theory, inflation expectations will thus be lower if – in the opinion of the public – the central bank instead of the government has the power over monetary policy. Therefore, the question was asked who has the final say in case of conflicts over monetary policy. In the Netherlands, pursuant to the right of direction laid down in Section 23(5) of the Bank Act (De Nederlandsche Bank 1948), the Minister of finance has the final say in case of conflicts, although over-ruling the central bank's decisions implies a 'cost' in the form of the obligation to explain this to Parliament. Moreover, the Minister of finance controls the exchange rate. As maintaining a fixed exchange rate with the Deutsche Mark is the key target of monetary policy in the Netherlands, the actual power over monetary policy is in the hands of the government. In Italy, the Bank Law incorporates the so-called 'divorce agreement' between the Treasury and the central bank, and states that responsability for setting the discount rate lies with the Banca d'Italia. The majority of the public in the Netherlands (66%) is aware of the fact that the Minister of finance has the final say, while in Italy about 50% believes the government has the final power over monetary policy.

The Maastricht Treaty provides for the establishment of an independent European central bank. Without asking the respondents directly what they think about the European central bank, the survey

contained a question to find out how the public feels about an autonomous monetary authority. The question was who should have the power in case of a policy conflict. In both countries the majority of the population wants the government to have the final say. Whereas in the Netherlands the population has a clear opinion on this matter, a large fraction of the Italian population (about 25%) does not have an opinion about the actual power over monetary policy nor about whether the central bank should be independent. There are no noteworthy differences by social class, education level or income level. There are, however, differences by political orientation, both in Italy and in the Netherlands. This is shown in Tables 5a and 5b.

TABLE 5A

ACTUAL AND DESIRED POWER OVER MONETARY POLICY BY POLITICAL ORIENTATION (THE NETHERLANDS)

Political orientation[a]	Who has the final say? (%)			Who should have the final say? (%)		
	Govt	DNB	Don't know	Govt	DNB	Don't know
PvdA	74	23	3	81	18	1
D66	68	31	2	72	28	–
CDA	63	34	3	58	35	7
VVD	73	25	2	56	41	4
Other	62	32	6	58	32	10
Have not voted	56	38	8	63	30	8
Don't know	57	30	13	63	30	7
Total	66	30	4	64	31	5

[a] It was asked for which party the respondents voted in the latest Parliamentary elections.

TABLE 5B

ACTUAL AND DESIRED POWER OVER MONETARY POLICY BY POLITICAL ORIENTATION (ITALY)

Political orientation[a]	Who has the final say? (%)			Who should have the final say? (%)		
	Govt	BdI	Don't know	Govt	BdI	Don't know
Polo	54.5	27.2	18.3	52.5	32.4	16.0
Closer to Polo	54.4	26.8	18.8	55.1	26.4	18.5
Closer to Ulivo	51.2	27.9	20.9	56.9	29.0	14.1
Ulivo	59.3	22.2	18.5	63.6	24.8	12.0
None of these	46.4	17.0	36.6	47.4	17.7	34.9
Total	50.9	21.4	27.6	52.0	23.3	24.7

[a] It was asked to which coalition the respondent felt more attracted.

In the Netherlands, supporters of the PvdA (social democrats) have a stronger preference for a situation in which the government has the final say on monetary policy, while the opposite is true for the VVD (conservatives): they have a higher preference for central bank autonomy, although the majority (56%) is in favour of the government having the decisive power. Supporters of the confessional party, CDA, do have preferences that are quite close to those of the conservatives: a moderate majority is against autonomy. The greater support for autonomy among VVD supporters may be underlain by the liberal view that the power of governments in general should be limited.[7] For Italy it is obvious that supporters of the center-left Ulivo coalition have a stronger preference for a situation in which the government has the final say on monetary policy. It should be noted, finally, that the majority of the supporters of any of the political parties in both countries is in favour of the government having the final say in monetary policy matters. This is an important result in view of the independent position granted to the future European central bank.

5.3. *Inflationary expectations*

As is evident from the model of equation (1), inflationary expectations are important for the effectiveness of monetary policy. That is why questions about the importance of inflation for the public's economic decisions are included. In addition, it has been examined – partly to assess the quality of the respondents' answers – whether the public is aware of the actual level of inflation. In the Netherlands, 20% say they never pay attention to anticipated price rises, while 42% answer that they regularly or often do. A large group (32%) reported that they had no idea of the rate of inflation. On average, actual inflation is estimated at 3.8%. This is a serious overestimation, as the rate of inflation at the time of the survey was around 2.5%. If the answers between 2.0 and 2.9% are considered correct, 23% of the respondents estimates inflation correctly, 13% underestimates inflation and 32% overestimates inflation. Higher-income groups are better informed of the actual level of inflation than lower-income

[7] The paradox is that an independent central bank would have a lot of power, as it would not be subject to control by Parliament.

groups. Division by social class and educational level gives similar results. All sub-groups overestimate inflation on average, however. In Italy, inflation has been among the highest in Western Europe in the past decades. Therefore, it can be expected that the public pays a lot of attention to inflation and is aware of its actual level. Indeed, only 7.3% say they never pay attention to anticipated price rises, while 26.9% reports to pay sometimes attention to inflation and 57.4% answer that they regularly or often pay attention to price developments. Still, 43.7% stated they had no idea of the current level of inflation. On average, actual inflation in Italy is estimated at 5.5%, which is correct as actual inflation in January 1996 was 5.5%.

6. A closer look at the results

In Section 4 the poll results were assessed on the basis of aggregates and average values. A more thorough analysis requires an analysis of the poll answers at the individual level. By applying multivariate regression, the answers can be explained by various characteristics of the respondents simultaneously. As far as the relative preferences of inflation and unemployment are concerned, it was pointed out in Section 5 that the individual β/α-ratio is perhaps not appropriate to analyze relative preferences (see footnote 6). In order to be able to analyze the relative preferences further, it is useful to construct the following indicator:

$$\gamma_i^{own} = \beta_i^{own}/(\beta_i^{own} + \alpha_i^{own}) \qquad (3)$$

where β_i^{own} and α_i^{own} are the weights given by respondent i to unemployment and inflation, respectively. The respondents could assign 'votes' to inflation and unemployment separately, on a scale from 1 to 10. The γ ratio of equation (3) expresses the weight given to unemployment as problem to be faced by economic policy as a fraction of the sum of the weights given by the individual respondent. This ratio has several advantages. First, it implies that all values lie in between 0 and 1. In this respect it should be kept in mind that a γ^{own} of 0.5 indicates that the respondent finds the two goals of economic policy equally important, and that even small deviations from this value indicate that these weights differ to a large degree. Thus, a γ ratio

of for example 0.67 reflects the preferences of a respondent who finds employment twice as important as price stability. Second, the γ ratio corrects the answers for the use of the scale. This implies that information of the use of the scale is lost. However, for the analysis of relative preferences this is not a disadvantage. Analogous to the γ^{own} ratio for the respondents own preferences, ratio's for the preferences ascribed to the government and the central banker can be constructed. Thus, $\gamma_i^{gov} = \beta_i^{gov}/(\beta_i^{gov} + \alpha_i^{gov})$ and $\gamma_i^{cb} = \beta_i^{cb}/(\beta_i^{cb} + \alpha_i^{cb})$. Table 6 presents the mean and standard deviations of the distributions of the γ ratios in the Netherlands and Italy. The Table also gives the ratio $\gamma^j/(1-\gamma^j)$ (j = own, govt, cb). This is done to get an idea of the β/α ratio corresponding to the mean values of the γ ratio. If these figures are compared to those obtained by using the ratio of the average β and α (see Table 1), it is obvious that the latter was a good approximation.

Table 6 gives the unweighted results as well as the results that are representative for the population as a whole. The weighted results imply higher γ ratios, but do not change the fundamental conclusion that the central bank governor is regarded as being the most inflation averse. Irrespective of whether the weighted or unweighted results are used, the mean values indicate that in both countries the public

TABLE 6

RELATIVE IMPORTANCE OF INFLATION AND UNEMPLOYMENT MEASURED BY $\gamma = \beta/(\alpha + \beta)$[a].
RESPONDENT'S OPINION AND PERCEPTION OF POLICY-MAKERS

	Netherlands		Italy	
	Mean	$\gamma/(1-\gamma)$[a]	Mean	$\gamma/(1-\gamma)$[a]
Respondent	0.57 (0.10)	1.33	0.52 (0.06)	1.08
Government	0.54 (0.10)	1.17	0.50 (0.09)	1.00
Central bank	0.50 (0.10)	1.00	0.48 (0.09)	0.92
	Weighted mean			
Respondent	0.59 (0.21)	1.44	0.52 (0.13)	1.08
Government	0.56 (0.22)	1.27	0.50 (0.14)	1.00
Central bank	0.53 (0.21)	1.13	0.47 (0.14)	0.89

α = importance of inflation as problem to be faced by economic policy.
β = importance of unemployment as problem to be faced by economic policy.
[a] Measure of the ratio β/α corresponding to the mean γ.
Standard deviations in parentheses.

believes that its own relative weight of unemployment is the highest, whereas that of the central bank governor is the lowest. A t-test of the differences between the γ ratios (taking into account that they are the result of paired observations) reveals that these are statistically significant at the 99% level. Hence the poll results confirm the assumption that the public believes the central bank to put a larger weight on inflation in its objective function than the government and society itself. For Italy this result is a bit surprising as, first, the technical government did not aim at being re-elected and, second, that the prime minister, Dini, was a former vice-governor of the Banca d'Italia. A remarkable result is furthermore the finding that the public obviously is of the opinion that the government places too little weight on creating employment relative to price stability.

Thus far, the analysis focused on assessing differences in relative preferences as perceived by the public. Another question is, of course, where the public's own preferences, as well as its opinion about the objective functions of the central bank and the government, come from. It is useful to note here that the estimation coefficients of the regressions can be expected to be very small. This is because the dependent variable measuring the relative preferences, γ, is a number in between 0 and 1, whereas the explanatory variables are usually rankings (according to income, social class, etc.) and are hence measured in larger units. Our hypothesis is that the respondents' own preferences are related to political orientation as well as certain socio-economic characteristics. Table 7 shows for the Netherlands the results of various regressions of the own γ ratio on a range of possible explanatory variables.

Before commenting on the coefficients and significance of the explanatory variables, it is useful to remark on the R^2 of the equations. As Table 7 reveals, these are very low. However, this is by no means a disturbing result given that we are studying microdata for very large samples. As Cramer (1964, 1969) has pointed out, the use of large samples of individual data inevitably implies a very large dispersion and low R^2. This, however, does by no means imply that the explanatory variables are insignificant.[8]

[8] That for very large samples the explanatory variables, taken together, may significantly contribute to explaining the dependent variable even if R^2 is low can be seen from the relationship between the R^2 and the F-statistic of a regression: $F = [(n - k)R^2]/[(k - 1)(1 - R^2)]$, where n and k are the sample size and the number of explanatory variables, respectively. In our regressions, $n - k$ is always a very large number. See Stewart and Wallis (1984, p. 199). Another way to look at this issue is grouping of data and using group means as explanatory variables. This increases considerably and systematically the R^2 – e.g. from 0.03 up to 0.55 –, while the properties of the regression estimates are hardly affected. See Cramer (1969, Table 12, p. 153).

TABLE 7

RESPONDENT'S OWN RELATIVE PREFERENCES[a] AND PREFERENCES ASCRIBED TO POLICY-MAKERS EXPLAINED BY INDIVIDUAL CHARACTERISTICS (THE NETHERLANDS)

γ^{own}	$= 0.53 + 0.01YL - 0.02VVD - 0.01SRW + 0.03PENS + 0.03WW$	n	= 614
	(45.22) (3.18) (2.04) (0.09) (2.91) (1.14)	R^2	= 0.03
γ^{ch}	$= 0.47 - 0.01EDUC + 0.09\gamma^{own}$	n	= 627
	(21.12) (2.12) (2.56)	R^2	= 0.02
γ^{gov}	$= 0.44 + 0.18\gamma^{own}$	n	= 657
	(18.89) (4.42)	R^2	= 0.03
$\gamma^{gov} - \gamma^{ch}$	$= 0.01EDUC + 0.01PROF$	n	= 429
	(2.36) (1.62)	R^2	= 0.0105

[a] Measured by $\gamma_i^{own} = \beta_i^{own}/(\beta_i^{own} + \alpha_i^{own})$.
YL = income level.
VVD = dummy for political orientation: VVD (conservatives) = 1, other = 0.
SRW = dummy for political orientation: small right wing parties (SGP, RPF, GPV) = 1, other = 0.
PENS = dummy for source of income: retirement benefit = 1, other = 0.
WW = dummy for source of income: unemployment benefit = 1, other = 0.
EDUC = education level.
PROF = profession ranked from low to high.
t-values in parentheses.

The results presented in Table 7 indicate that income level (YL), income source (PENS) and political orientation (VVD) do significantly influence the respondent's own relative preferences reflected by γ^{own}. Additional regressions, of which the results are not presented here, indicate that social class and education are not significant as explanatory variable, not even if income is removed. Therefore, the effect of income level should indeed be attributed to the income level itself and not to characteristics that may be related to income. As we observed in Section 5, the γ^{own} ratio may rise with income because higher income groups benefit more from a low real rate of interest on their mortgage loan. In addition, they may be more aware of the possibilities to protect oneself against the disadvantages of inflation. Also, irrespective of the effects on their personal financial situation, higher income groups may be more convinced that there is not much rationale for inflation aversion. If one of these explanations holds, the higher γ ratio should be due to a lower value of α. Second, it may be

that people with higher incomes are concerned with unemployment because of the higher social contributions and tax payments involved by unemployment benefits. This would have to be reflected in a relatively higher value of β. To determine which of these explanations holds, the variables α and β are regressed separately on income and a variety of other explanatory variables. The results of those regressions – not shown here – reveal that there is no significant effect of the income level on β^{own}, whereas the effect on α^{own} is significant with the expected negative sign. Hence γ^{own} increases with income level primarily because higher income classes are significantly less inflation averse. The regression results presented in Table 7 also reveal that respondents with a right-wing political orientation (VVD, conservative party) have a significantly lower concern for unemployment relative to inflation. This needs no further explanation, as it confirms the general intuition that inflation aversion is essentially a conservative attitude.[9] This result does not hold for supporters of the small confessional parties (SRW). This could be explained by the fact that religious considerations, rather than socio-economic preferences, are the factors dominating the political orientation of these small groups. Third, it is obvious that people with income from retirement benefits (PENS) have a significantly higher γ^{own} ratio than people with other sources of income. Separate regression of the weight of unemployment, β^{own}, and that of inflation, α^{own}, have shown that the higher γ^{own} ratio for retired people is primarily due to a significantly higher concern with unemployment. This result differs from that found by Shiller (1996), who concludes that elderly people in the United States and Germany have a larger dislike of inflation.[10] The explanation can be that in the Netherlands pensions and retirement benefits are as a rule protected against inflation, and that retirement benefits are financed through a pay-as-you-go system. The latter implies that high unemployment reduces the funds available for retirement benefits.

[9] In this respect it should be stressed, however, that in the Netherlands two parties that could be classified as center-left, namely the PvdA (socialdemocrats) and D66 (left-liberals) form part of the government and have fully agreed to make monetary and fiscal policy subject to the criteria formulated in the Maastricht Treaty.

[10] He ascribes this finding to the fact that this group has experienced considerable price instability in its younger years.

The group results presented in Section 5.1 (see Table 4) suggested that higher social classes are more aware of what monetary policy entails and about the role of the central bank. Our hypothesis is that especially a higher level of schooling accounts for this result. As Table 7 shows, this hypothesis is confirmed by a regression based on the individual γ^{cb} ratios. That education is a determining factor is not very surprising. It could be expected that higher educated people are more aware of the responsibilities of the central bank and better informed about what monetary policy entails. Regressions not shown here reveal that political orientation does not affect the preferences ascribed to the central banker. This is in itself not a surprising result, but it is a remarkable difference with the Italian situation, as will be shown below. The preferences ascribed to the central bank governor also depend significantly on the respondent's own preferences, which indicates in our view public consensus about policy institutions.

As far as the opinion about the government's relative preferences is concerned, we would expect that especially left-wing voters hold the opinion that the government cares too little about unemployment. Table 7 reveals that only the respondent's own preferences – represented by γ^{own} – have a significant effect on γ^{gov}. As we have seen above, these own preferences are significantly affected by income, class and political orientation. Regressions including these factors separately have shown that on their own they do not significantly explain the preferences ascribed to the government. Hence only the combination of these factors as reflected by γ^{own} is significant as explanatory variable. Again, this can be interpreted as a reflection of social cohesion.

It was stated above that the poll results reveal a significant difference between the public's perception of the objective function of the central bank and that of the government. As this difference is a crucial element underlying the pleas for central bank independence, it is worthwhile to investigate how it depends on the respondents individual characteristics. Regression of the difference between the perceived relative preferences of the central bank and those of the government shows a significant effect of social class. This effect is primarily due to education, although profession has a positive effect if a lower confidence level is accepted.

Table 8 shows the results for Italy. As far as γ^{own} is concerned, the coefficient of income level has a negative sign, though it is not significant. This is in contrast with our findings for the Netherlands,

TABLE 8

OWN RELATIVE PREFERENCES[a] AND PREFERENCES ASCRIBED TO POLICY MAKERS EXPLAINED (ITALY)

γ^{own}	= 0.52 − 0.01YL + 0.01LW + 0.01SOUTH + 0.01TOWN	R^2 = 0.02
	(67.00) (1.29) (2.26) (2.29) (2.56)	n = 951
γ^{gov}	= 0.53 − 0.01γ^{own} − 0.01REGION + 0.02NONE	R^2 = 0.02
	(20.15) (0.19) (3.43) (2.70)	n = 956
γ^{cb}	= 0.52 − 0.01CLASS − 0.01LW − 0.00REGION − 0.02MALE	R^2 = 0.01
	(43.97) (2.20) (1.55) (1.53) (3.06)	n = 936
$\gamma^{cb} - \gamma^{gov}$	= − 0.01CLASS − 0.03LW + 0.01SOUTH − 0.01MALE	R^2 = 0.03
	(3.37) (3.26) (2.02) (1.69)	n = 930

YL = income level.
LW = dummy for political orientation: left wing (Ulivo and closer to Ulivo) = 1, other = 0.
SOUTH = dummy for region: South and Islands = 1, other = 0.
TOWN = town size, ranging from 1 to 11 (1 = small, 11 = large).
CLASS = socio-economic class ranking from low to high (see Table 4b for details).
REGION = ranking according to region, north is low, south is high.
MALE = dummy for sex, male = 1, female = 0.
NONE = dummy for political orientation: does not feel close to Polo or Ulivo = 1, other = 0.
t-values in parentheses.

where a positive significant income effect was revealed. It is in line, however, with results reported in Fischer and Huizinga (1982) for the United States. The effect of political orientation on γ^{own}, LW (left-wing, indicating support for the center-left Ulivo coalition) is significant and positive, indicating the hypothesized lower inflation aversion of left-wing voters. Regressions of α^{own} and β^{own} separately (not shown here) indicate that especially differences in the weight of unemployment, β^{own}, account for these results. This contrasts with the findings for the Netherlands, where a difference in absolute inflation aversion accounted primarily for the significant effect on γ^{own}. For the Netherlands we found that a dummy for retirement was significant in explaining the own preferences. Unfortunately, the group of retired people in Italy was not isolated in the poll. It is not possible to use age to isolate this group, because in Italy until recently one could already go in retirement after 15 to 20 years of work. Therefore, from the age of about 35, one could be already retired.[11] In addition and in relation to this, in Italy people receiving a retirement benefit do very often have other sources of income, notably from paid labour. As

[11] In Italy the term 'baby-retired' was used. Often, women used this opportunity first to take care of their children and then take a part-time job. Men also choose to become retired and start their own business or take a job in a family business.

the possibility of early retirement has been abolished recently, there are still many people that benefit from the former arrangement. For Italy we have not found a significant effect of the age variable. Moreover, the sign of the coefficient was negative. This could be explained by the fact that Italy has no pay-as-you-go retirement benefit system like the Netherlands. A remarkable result from Table 8 is that both geographical region (reflected by the dummy SOUTH) and town size (TOWN) significantly influence the relative preferences: in Southern Italy and in the cities the concern with unemployment is higher. Presumably these effects interfere with that of income level and unemployment, as the per capita income in the South is lower than that in the North, and unemployment in the large cities can be assumed to be relatively high. This is confirmed by the fact that if the regional dummy SOUTH is removed, the income level becomes significant as explanatory variable. Apparently, the own preferences of the respondents reflect the division of Italy in the richer North and the poorer South.

In the Netherlands education level and own preferences were the most important explanatory variables of the relative preference ratio ascribed to the central banker, γ^{cb}. Education is also expected to play a role in Italy. The same applies to social class and profession. In addition, the hypothesis for Italy, given the results found for γ^{own}, is that in Southern Italy there is less confidence in government institutions. This would have to be reflected in a low perceived γ^{cb} and γ^{gov}. As Table 8 shows, these hypotheses are largely confirmed by the empirical evidence. Socio-economic class is a significant explanatory variable: the higher the class level, the more the central bank is thought to be inflation averse. As mentioned earlier, the social class ranking is based on education, income and consumption pattern. People from higher classes are perhaps better informed about the responsibilities of a central bank. Region affects the respondents' view of the central banker's preferences significantly if a lower confidence level is accepted: as predicted, people in Southern Italy believe in a lower γ^{cb}. The same applies for political orientation: left-wing respondents believe the central bank to care less about unemployment. A remarkable result is that male respondents ascribe a significantly lower relative unemployment concern to the central bank. This has perhaps to do with better information about economic policy institutions. As this result was not found for the Netherlands, the conclusion may be that Italian women are less emancipated than

those in the Netherlands. In Italy the respondents' own preference ratio is not found to be significant (t-values of about 0.56) in explaining the perceived preferences of the policy makers. This may reflect less social consensus and confidence in the policy-making institutions in Italy than in the Netherlands.

For the relative preferences ascribed to the government we expected the population in Southern Italy to have little confidence in government policy as far as employment policies are concerned. The regression results confirm this hypothesis. Additional regressions have shown that if the variable REGION is excluded from the regression, there is still no significant effect of income. This justifies the conclusion that the people living in Southern Italy, irrespective of their personal situation, do suspect the government of little concern with unemployment because they feel neglected as geographical area. Table 8 also shows that respondents who do not feel politically close to any of the possible coalitions (the right-wing Polo or the left-wing Ulivo coalition) believe that the government has relatively little concern for unemployment. This is a further confirmation of the hypothesis that in Italy some groups do not have any confidence in governmental institutions. As far as the difference between the perceived objective function of the central bank and that of the government is concerned, we would expect social class and education to play a role in Italy as well. This is confirmed by Table 8. That political orientation is significant is a remarkable difference with the situation in the Netherlands. Left-wing voters do have a significant higher estimate of the unemployment concern of the technical government. A possible explanation may be that the left supported the Dini government since its confidence vote and that during the month of February 1996, when the survey was held, Dini was publicly contemplating entrance into the center-left coalition in the election campaign, something which he afterwards indeed has done. Table 8 also shows that the perceived difference between the objectives of the two policy-making bodies is not larger for the population in the South. This indicates that these respondents have a relatively low estimate of both the government's and the central bank's concern with unemployment.

It was shown in Section 5.2 that the majority of the population in the Netherlands and a small majority in Italy holds the opinion that the government should have the final say in monetary policy matters (see Tables 5a and 5b). In order to ascribe the respondent's

opinion on this matter to various characteristics simultaneously, we apply a logit analysis. This approach is called for in situations where the dependent variable is of a qualitative type. It determines the probability that one of two (or more) qualitatively different possibilities occurs.[12] In our case, the dependent variable is the answer to the question: who do you believe should have the final say in matters of monetary policy, the government or the central bank governor? It can take on three qualitatively different values, namely the central bank governor, the government, or don't know. In the Netherlands, the latter category was quite small (5%, see Table 5a) and could therefore be neglected. Although in Italy the large percentage of 'don't know' answers (about 25%, see table 5b) implies that there are three qualitatively different answer categories, we feel that a multinomial logit analysis is perhaps less appropriate. The reason is that we are interested in two separate questions. The first is what determines a respondent's choice between the central banker and the government to have the final say over monetary policy. The second is what determines whether or not a respondent is indifferent to the balance of power between the government and the monetary policy-maker. As far as the first issue is concerned, multinomial logit analysis yields, thanks to the property of independence from irrelevant alternatives (IIA), the same results as binomial logit analysis (Cramer 1991). As far as the second issue is concerned, the IIA property could imply an underestimation of the explanatory variables on the probability of being indifferent. This is why we have chosen to examine the issues separately, each by binomial logit analysis.

Explanatory variables that come to mind in relation to the support for central bank independence are political orientation, own relative preferences and the difference between own preferences and those ascribed to the central bank. The hypothesis is that right-wing voters support independence and that the support for independence decreases with the difference between the own preferences or the perceived government preferences and the perceived preferences of the central bank. Thus, respondents with a higher γ^{own} ratio are expected to oppose central bank independence. Theories of delegation (e.g. Rogoff 1985, Lohmann 1992) have shown that delegation of monetary policy to an agent with conservative preferences may help reducing the inflationary bias and increase the expected

[12] See Cramer (1991) for a detailed explanation of logit analysis.

welfare of private agents. Still, if the central banker's objective function differs 'too much' from the social welfare function, delegation is sub-optimal. In addition, it can be expected that there is a correlation with what the respondent believes is the actual institutional setup. There does not seem to be a major dissatisfaction in the Netherlands with how monetary policy is conducted. If a respondent approves of actual monetary policy and if he believes that the central bank is independent, he can be expected to favour central bank independence.

The results of the analysis are shown in Tables 9a and 9b. The regression results relate the probability that the respondent is of the opinion that the central bank should be independent to the respondent's individual characteristics. The interpretation of the coefficients is similar to that in standard regression analysis. A positive coefficient for an explanatory variable indicates that the probability that the respondent favours central bank independence depends positively on that variable. Furthermore, the significance of the coefficients can be deduced from their t-values in the same way. When interpreting the magnitude of the coefficients account should be taken of the functional form of the logit model, of course.

Tables 9a and 9b reveal that in both countries political orientation is of significant influence. In the Netherlands, respondents that have voted for the socialist party (PvdA) do significantly more often oppose central bank independence.[13] Left-liberals (D66), on the other hand, do not have a significantly higher probability of favouring central bank independence. In Italy, right-wing respondents have a higher probability of favouring central bank independence if a lower confidence level is accepted. Another result is that in both countries the perceived difference between the central banker's and the government's inflation aversion, $\alpha^{cb} - \alpha^{gov}$, affects positively and significantly the probability that central bank independence is favoured. It is conceivable that the public does not perceive any trade-off between price stability and employment. Furthermore, the public generally assumes that the central bank governor is more concerned with not only inflation but also with unemployment (see Table 1). This may imply that in the eyes of the public there is no contradiction between being relatively unemployment-averse on the one hand and choosing central bank independence on the other. As the perceived difference between the government's and the central banker's inflation aversion has been shown to increase with social class and education, one is tempted to conclude that higher classes favour central bank independence. However, regressions on social class and education did not show significant effects. As Table 9a shows, in the Netherlands retired more often approve of central bank autonomy than other

[13] In this respect it should be noted that the central bank governor in the Netherlands is a former PvdA-politician.

TABLE 9A

SUPPORT FOR CENTRAL BANK INDEPENDENCE EXPLAINED BY INDIVIDUAL CHARACTERISTICS (THE NETHERLANDS)

Dependent variable	Constant	PvdA	D66	INDEP	EDUC	PENS	$\alpha^{cb} - \alpha^{gov}$
P(X = 1)	-1.06	-0.93	-0.19	0.87	-0.02	0.57	0.104
	(3.81)	(3.19)	(0.75)	(4.48)	(0.30)	(2.43)	(2.66)

Loglikelihood = -359.2696
Number of observations with X = 1: 196
Number of observations with X = 0: 415

X = answer to the question "Who should have the final say on monetary policy?": central bank = 1, government = 0.
PvdA = dummy for political orientation: PvdA = 1, other = 0.
D66 = dummy for political orientation: D66 = 1, other = 0.
INDEP = dummy for opinion about actual central bank independence: central bank governor has final say = 1, government has final say = 0.
t-values in parentheses.

TABLE 9B

SUPPORT FOR CENTRAL BANK INDEPENDENCE EXPLAINED BY INDIVIDUAL CHARACTERISTICS (ITALY)

Dependent variable	Constant	$\alpha^{cb} - \alpha^{gov}$	α^{own}	RW	INDEP	REGION
P(Z = 1)	-1.80	0.17	-0.02	0.35	2.22	0.01
	(3.89)	(4.66)	(0.51)	(1.76)	(11.37)	(1.06)

Loglikelihood = -357.90
Number of observations with Z = 1: 223
Number of observations with Z = 0: 494

Z = 1: Banca d'Italia should have final say over monetary policy.
Z = 0: Government should have final say over monetary policy.
RW = dummy for political orientation: Polo and closer to Polo = 1, other = 0.
INDEP = dummy for opinion about actual central bank independence: central bank governor has final say = 1, government has final say = 0.
t-values in parentheses.

groups. This is surprising, given the pensioners' low inflation aversion (see Table 7). In both countries the perception of the actual balance of power, INDEP, is significant. This suggests satisfaction with the way monetary policy is conducted, as respondents who believe that the central bank is independent do want to keep it that way. Note, finally, that in Italy region is not a significant explanatory variable. This may be due to the fact that, other things equal, people in Southern Italy do have little confidence in any policy-making body, hence they are indifferent about who has the final say on monetary policy.

This brings us to an analysis of the determinants of the probability of being indifferent as to whom should be given the final say over monetary policy. The poll results reveal that 24.7% of the Italian population is indifferent about the desirability of central bank independence. We expect that people in Southern Italy and people who do not feel close to any of the major political coalitions (Polo and Ulivo) are indifferent about who should dictate monetary policy. The results, shown in Table 10, indicate however that region does not have any direct effect on the probability of being indifferent about the institutional design of monetary policy. As far as political orientation is concerned, it is obvious that respondents who are not attracted to the major political groups are more likely to be indifferent about who has the power over monetary policy. This can be either because they are not interested in politics at all, or because they do feel attracted to political parties that are at the extreme left or right. Conform intuition is also the result that higher educated are less likely to be indifferent. An unexpected outcome is that female respondents are significantly more indifferent than man. This result was not found for the Netherlands and indicates that Italian women are less interested in politics and economics than Italian men. Finally, and somewhat surprisingly, town size has a significant effect. People living in big cities are less indifferent about who should have the final say over monetary policy. Our guess is that this perhaps is due to an informational disadvantage in rural areas.

We have seen that conform to the assumption made by theorists people believe that the central bank governor is more inflation averse than the government. A related theoretical conclusion is that inflation expectations are lower if, at least in the eyes of the public, the central bank is autonomous in its policy decisions. Therefore, we have investigated whether the inflation expectation is affected by whether

TABLE 10

INDIFFERENCE TOWARDS CENTRAL BANK INDEPENDENCE EXPLAINED BY INDIVIDUAL CHARACTERISTICS

Dependent variable[a]	Constant	EDUC	NONE	MALE	REGION	TOWN
P(I = 1)	–0.53	–0.22	0.93	–0.84	0.00	–0.05
	(1.78)	(2.75)	(5.57)	(5.11)	(0.10)	(1.90)
Log likelihood = –477.9305						
Observations with I = 1: 226						
Observations with I = 0: 736						

[a] P(I) = probability that the respondent is indifferent towards who should have the final say.
t-values in parentheses.
I = 1: no opinion about who should have final say.
I = 0: otherwise.

or not the respondent believes that the central bank is independent. It should be kept in mind that both the respondent's estimate of current and future inflation and his opinion as to whether or not the central bank is independent are significantly affected by a common factor, namely education level: the estimate of inflation is higher for people with lower education, while the probability of believing that the central bank is independent falls with education level. Table 11 gives the results of the regression of the rate of inflation expected by the respondents in the Netherlands and Italy.[14] There is no significant effect of the opinion about the actual balance of power between the central bank and the government on the one hand, and the expectation of inflation on the other. Besides, the coefficient of INDEP is positive, which is not conform to the theoretical prediction. The coefficient of the perceived preference ratio of the government has the expected positive sign, but is not significant. Table 11 also reveals that the preferences ascribed to the central bank governor do not affect inflationary expectations. This is a logical outcome given that the majority of the population – correctly – believes that the central bank is not truly independent. In the Netherlands education has a downward effect on inflation expectations. This is conform to intuition, given that the mean rate of inflation estimated by the public is too high, hence higher educated respondents have given an estimate that is closer to the true inflation rate. As was mentioned in Sect-

[14] When reading Table 11 it must be kept in mind that in both countries many respondents did not have any idea about current or future inflation.

ion 5, almost half of the respondents (43.7%) had not any idea about the current or future rate of inflation. When interpreting the results of Table 11 this must be taken into account: the number of observations for Italy is only 419. Furthermore, as was observed earlier, it was by no means clear at the time of the survey whether the elections would result in a stable coalition government, and if so whether this would be a right-wing or a center-left coalition. For Italy the perceived objective function of the government – that is, its relative concern for unemployment relative to inflation – does not play a significant role. In fact, the sign of its coefficient is negative, which is contrary to intuition. No effect of the dummy for central bank independence is found and in this case, too, the positive sign of the coefficient is unexpected. However, the perceived central bank's absolute inflation aversion, α^{cb}, does have a significant downward effect on the inflationary expectation. This is an important result, as it suggests that if the public regards the central banker as an inflation-hater this may reduce inflationary expectations irrespective of the (public's view of the) degree of independence of the central bank.

TABLE 11

INFLATIONARY EXPECTATIONS EXPLAINED BY RESPONDENT'S CHARACTERISTICS

The Netherlands	π^e = 3.50 + 0.36INDEP	– 0.32EDUC	+ 3.79γ^{gov}		R^2 = 0.02
	(2.77) (0.72)	(2.63)	(1.82)		n = 453
Italy	π^e = 6.26 – 0.08α^{cb}	– 0.036γ^{gov}	+ 0.10INDEP		R^2 = 0.019
	(14.27) (2.69)	(0.47)	(0.63)		n = 419

t-values in parentheses.

7. Conclusions

What do the findings in the previous Sections imply for the assumptions and predictions made in the theory? First, it is obvious that the public believes in what the theorists assume, namely that the central bank is more inflation averse than the government. This holds especially for higher social classes. On the other hand, the public is of the opinion that the central bank is more concerned about unemployment than the government. Moreover, the public opinion is that the government is too much concerned relatively with inflation. This is not in line with the picture sketched in the theoretical literature of a government or a central banker, respectively.

Another result in line with the conclusions from the game-theoretical analysis of the interaction between policy and policy expectations is that a higher perceived relative weight of unemployment in the government's objective function results in higher inflationary expectations. In contradiction with the theory is the result that people who believe the central bank to be independent are not observed to have lower inflationary expectations. This might be due to a third factor effect, however, namely the level of education. The results reveal that inflation aversion is present especially among low income and right-wing groups. People with higher education or higher income believe that the central bank governor is too inflation averse, whereas lower social classes feel that there is no large discrepancy between their own preferences and those of the central bank governor.

A striking result is that the Italian central bank is considered to be more inflation averse relatively to unemployment than its Dutch counterpart. One is tempted to explain this by observing that this must be a result of the fact that in Italy inflation has long been and still is higher than in the Netherlands. This explanation, however, can hardly be based on rational behaviour on the part of the public. If higher inflation is observed, it would be more rational to believe that inflation has a lower priority for the policy makers.

Another important poll result is that there is no broad political support in Italy and the Netherlands for a more autonomous position of the central bank. Not only the supporters of left-wing political parties are against independence, the majority of all political parties or coalitions is opposed to central bank autonomy. This is a remarkable result in the light of the fact that in both countries politicians in general support participation in the European Economic and Monetary Union. Hence one may wonder whether independence, even if this implies lower inflation and inflation expectations, should be pursued. As far as the policy implications are concerned, the results from the survey raise some doubt as to whether the subordination of fiscal and monetary policy to the Maastricht criteria, and the institutional design and mandate for price stability for the future European central bank, are rooted in public consensus.

There are some striking differences between the results found for the Netherlands and Italy. In Italy there is much more divergence between the own concern for both inflation and unemployment on the one hand, and the perceived concern of the policy-makers on the other. In our view, this reflects the lower degree of social consensus in Italy relative to that in the Netherlands. As far as the individuals' own preferences are concerned, a remarkable difference was found for the effect of income level. In the Netherlands, the relative concern for unemployment rises signficantly with income level, whereas in Italy the coefficient of income level is negative (though not significant). This finding for the Netherlands is also remarkable in view of the earlier work by Fischer and Huizinga (1982), who found no effect of income level. Our result that a higher level of education increases the relative concern with unemployment over inflation is in sharp contrast with that by Fischer and Huizinga (1982), but is in line with the results found by Shiller (1996), insofar his result that economists are less inflation averse than the general public is to be ascribed partly to education.

The poll results also reveal that respondents who are much more concerned about unemployment than the central bank may still favour central bank independence. This could be viewed as a confirmation of Rogoff's (1985) analysis. However, the most plausible explanation is, in our view, that the public is not aware of the existence of a trade-off between inflation and unemployment. Thus, the central banks in the Netherlands and Italy seem to have succeeded in convincing the public that their focus on price stability is a result of concern with unemployment.

APPENDIX A

Questionnaire: the Netherlands (translated from Dutch)

Question 1.

How serious do you consider the following economic phenomena? Please assign a figure from 1 to 10, with 1 meaning very serious and 10 meaning not serious at all.
(N.B. You are not supposed to indicate whether you think inflation/unemployment is high or low, but how serious you consider these phenomena in general.)

a. Inflation; rising prices and income.
b. Unemployment.

Question 2.

How serious do you think the government considers these matters? Please assign a figure from 1 to 10, with 1 meaning very serious and 10 meaning not serious at all.
(N.B. You are not supposed to indicate whether you think inflation/unemployment is high or low, but how serious you think the government considers these phenomena in general.)

a. Inflation; rising prices and income.
b. Unemployment.

Question 3.

How serious do you think the governor of the Nederlandsche Bank, Mr Duisenberg, considers these phenomena? Please assign a figure from 1 to 10, with 1 meaning very serious and 10 meaning not serious at all.
(N.B. You are not supposed to indicate whether you think inflation/unemployment is high or low, but how serious you think the governor of the Nederlandsche Bank, Mr Duisenberg, considers these phenomena in general.)

a. Inflation; rising prices and income.
b. Unemployment.

Question 4a.

Suppose that the government and the governor of the Nederlandsche Bank have a difference of opinion on monetary policy, i.e. the policy aimed at inflation (rising prices and income), interest rates and exchange rates. Who do you think has the final say in the Netherlands, the government or the governor of the Nederlandsche Bank? The answer should be who actually has the final say, not who should have it!

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Question 2.

How serious do you think the government considers these matters? Please assign a figure from 1 to 10, with 1 meaning very serious and 10 meaning not serious at all.
(N.B. You are not supposed to indicate whether you think inflation/unemployment is high or low, but how serious you think the government considers these phenomena in general.)

a. Inflation; rising prices and income.
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(N.B. You are not supposed to indicate whether you think inflation/unemployment is high or low, but how serious you think the governor of the Nederlandsche Bank, Mr Duisenberg, considers these phenomena in general.)

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1. The government.
2. The governor of the Nederlandsche Bank.
3. Don't know/no answer.

Question 4b.

Who do you think should have the final say, the government or the governor of the Nederlandsche Bank?

1. The government.
2. The governor of the Nederlandsche Bank.
3. Don't know/no answer.

Question 5.

For some of your own financial and economic decisions it may be important to know to what extent prices are expected to rise in the future, such as buying a house or commercial property or investing your savings. Could you indicate to what extent you pay attention to anticipated price rises? Do you do this ...

1. Never.
2. Sometimes.
3. Regularly.
4. Often.
5. Don't know/no answer.

Question 6.

Various institutions and organizations in the Netherlands publish economic forecasts, such as forecasts of inflation. Which institutions publish these forecasts?

1. The government.
2. The governor of the Nederlandsche Bank.
3. The Central Planning Bureau.
4. Investment advisors.
5. Banks.
6. Universities.
7. Others, namely ...
8. Don't know/no answer.

Question 7.

Which institution or organization do you think publishes the most reliable economic forecasts?
For answers: see question 6.

Question 8a.

How high do you think the present level of inflation is? If you don't know, please give an estimate.

Question 8b.

How high do you think the level of inflation will be in 12 months' time? If you don't know, please give an estimate.

Question 9a.

For which political party[1] did you vote in the last parliamentary elections in May 1994?

1. CDA.
2. PvdA.
3. VVD.
4. D66.
5. Groen Links.
6. SGP.
7. GPV.
8. RPF.
9. SP.
10. AOV.
11. Unie 55+.
12. CD.
13. Other, namely ...
14. Abstained.
15. Don't know/no answer.

Question 9b.

If parliamentary elections would be held now, for which political party would you vote?
Answers: see question 9a.

[1] CDA = Christian-democrats; PvdA= Labour; VVD = Liberals (right-wing); D66 = Liberals (left-wing); Groen Links = Socialists; SGP, GPV, RPF = right-wing confessionals; SP = Extreme left; AOV, Unie 55+ = Parties of elderly people; CD = extreme right.

APPENDIX B

Questionnaire: Italy
(translated from Italian)

A. Questions about preferences for unemployment and inflation.

Question 1.

How serious do you consider the following economic phenomena? Please assign a figure from 10 to 1, with 10 indicating very serious and 1 indicating not serious at all.
(This is not to find out whether the respondent knows how high unemployment and inflation are, but how serious he considers these phenomena in general as problems to be faced by policy.)

a. Inflation.
b. Unemployment.

Question 2.

How serious do you think the government considers these matters? Please assign a figure from 10 to 1, with 10 indicating very serious at all and 1 indicating not serious at all.

a. Inflation.
b. Unemployment.

Question 3.

How serious do you think the governor of the Banca d'Italia, Dr. Fazio, considers these phenomena? Please assign a figure from 10 to 1, with 10 indicating very serious and 1 indicating not serious at all.

a. Inflation.
b. Unemployment.

B. Questions about the autonomy of the Banca d'Italia.

Question 4a.

Suppose that the government and the governor of the Banca d'Italia, Dr. Fazio, disagree on the monetary policy to be chosen, that is the policy aimed at controlling inflation, interest rates and the exchange rate of the lira. Who do you think has the final say in Italy, the government or the governor of Banca d'Italia?

1. The government.
2. The governor of the Banca d'Italia.
3. Don't know.

Question 4b.

And who do you think *should have the final say*, the government or the governor of the Banca d'Italia?

1. The government.
2. The governor of the Banca d'Italia.
3. Don't know.

C. Questions about the role of inflation expectations.

Question 5.

For some of your own financial and economic decisions it may be important to know to what extent prices will to rise in the future, such as buying a house or investing your savings. Could you indicate to what extent you pay attention to anticipated price rises? Do you do this ...

1. Never.
2. Sometimes.
3. Regularly.
4. Often.
5. Don't know.

Question 6.

Various institutions and organizations in Italy publish economic forecasts, such as forecasts of inflation. Which institution or organization do you think is the most reliable?

1. The government.
2. The governor of the Banca d'Italia.
3. Banks.
4. ISTAT.
5. Universities.
6. Others, namely ...
7. Don't know.

Question 7.

How high do you think the present level of inflation is? If you don't know, please give an estimate.

Question 8.

How high do you think the level of inflation will be in a year's time? If you don't know, please give an estimate.

Question 9.

Are your political ideas closer to the ideology of the Polo or of the Ulivo?

1. To that of the Polo.
2. More to that of the Polo than to that of the Ulivo.
3. More to that of the Ulivo than to that of the Polo.
4. To that of the Ulivo.
5. To none of these.

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