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Predictive value of firms' manpower expectations
and policy implications

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Internal Paper

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I   **INTRODUCTION**

Under the conventional econometric estimating procedures
fluctuations in manpower levels are explained and predicted in a two-stage
process. With given business expectations regarding the prospective trends
in production and real wages, the manpower levels aimed at by firms in the
long term are dependent on the marginal productivity of labour, which in
turn is determined by an appropriate production function. Because of the
costs of recruiting, training and dismissing labour, actual manpower levels
adjust to the desired medium-term levels with a time lag. Both in theory
and in econometric practice, this adjustment process is carried out on an
ad hoc basis using a separate adjustment function [1].

Attempts have been made to improve such short-term employment
functions by using models to capture the cyclically fluctuating relationship
between production and employment [2]. But, these too have failed to produce
any significant improvement in the predictive quality of such estimating
functions. It is clearly not possible to explain with models, let alone
forecast, short-term fluctuations in labour productivity (defined here as
output per person employed). The main reason probably is that firms are
largely autonomous in their employment behaviour, i.e. independent of the
trend in production. This finding has been established <u>inter alia</u> in special
studies which demonstrated that firms' willingness to hold on to their
employees at times of depressed economic activity is dependent to a quite
significant degree on their medium-term growth prospects. Even in the
event of a cyclical recovery of demand, these medium-term expectations

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[1] See, for example, A.J. Phipps, "The Relationship Between Output and
Employment in British Manufacturing Industry", <u>Oxford Bulletin of
Economics and Statistics</u>, vol. 37 (1975), and R.M. Solow, "Short-run
Adjustment of Employment to Output", in J.N. Wolfe (e.d.), <u>Value,
Capital and Growth</u>, Edinburgh, 1968.

[2] See, for example, F.P.R. Brechling and P. O'Brien "Short-Term
Employment Functions in Manufacturing Industries : An International
Comparison", <u>Review of Economics and Statistics</u>, vol. 49 (1967),
and R.N. Wand, "Man-Hour Behavior in U.S. Manufacturing : A Neoclas-
sical Interpretation", <u>Journal of Political Economy</u>, vol. 76 (1968).

are a crucial factor in firm's decisions whether or not to increase their workforce [3]. A whole range of exogenous variables are therefore at work and should be taken into account in any efficient forecasting model.

In the opinion of forecasters, the fundamental weakness of such conventional econometric estimating methods thus lies in the need to make a forward assessment of the exogenous variables. Spitznagel therefore draws the following conclusion from his extensive empirical investigations : "Since forecasts are generally conditional in nature, the purpose of future research must be to shift the level of conditionality backwards in order to reduce uncertainties in the 'if' components. This can be done by endogenizing exogenous variables and/or by incorporating predetermined variables or quantitative or qualitative leading indicators in econometric models" (translation) [4].

This paper sets out to examine whether predetermined exogenous variables such as those which are empirically obtained in the form of manpower plans [5] from the business surveys conducted among firms in most Community countries, can help improve forecasts of the demand for labour. It is confined to the employment trend in industry since this is the only sector in most Community countries in which surveys of manpower plans are carried out on a regular basis, in general three times a year (January/ February, June/July and October/November) and with a time horizon of three to four months [5]. Although in the Community an average of only around one third of the total employed labour force is now working in

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[3] G. Nerb, "Beschäftigungspolitische Verhaltensweisen der Unternehmen – Ergebnisse von Ifo-Umfragen", in Längerfristige Perspektiven für den Arbeitsmarkt in der Bundesrepublik Deutschland, Beihefte der Konjunkturpolitik, vol. 25, 1978, pp. 45 et seq., and id., Konjunkturverlauf und Arbeitsmarkt. Erkenntnisse aus Unternehmer- umfragen für die Arbeitsmarktpolitik, Ifo-Schnelldienst, November 1982

[4] E. Spitznagel, "Ansätze zur Prognose konjunktureller Schwankungen der Nachfrage nach Arbeitskräften" Allgemeines Statistisches Archiv, 2, 1976, p. 212.

[5] The expressions "manpower plans" and "manpower expectations" are used synonymously in this paper. The term "expectation" is therefore broadly defined.

industry, the decision to concentrate on this sector appears justified, at least for the purposes of short-term analysis : building and construction apart, it is here that cyclical fluctuations in employment have usually been sharpest.

The study embraced the following Community countries : Belgium, Germany, France, the Netherlands and the United Kingdom. No time series are available for manpower expectations in the other Community countries or those that are available do not cover a sufficiently long period.

Generally speaking, the period investigated covers the years 1969-81; however, as the necessary data were not always available, shorter periods had to be taken in some cases. In the case of Germany, for example, the study covers the period up to the autumn of 1979 only since, after that date, the surveys were conducted at quarterly intervals, and not every four months as previously. For methodological reasons, linkage of the two periods proved difficult and was not undertaken [6].

In Chapter II, a number of hypotheses are tested using empirical data. In line with the theory of rational expectations, the starting hypothesis is that firms make optimal use of all the information available when preparing their manpower plans. The best forecasting values would therefore be obtained by direct reliance on manpower plans. In order to test this hypothesis an alternative estimation was carried out using other determinants. Care was taken that only such values of the determinants were used as were available when the manpower plans were presented. The rational expectations hypothesis was also tested by incorporating in an estimating function both the manpower plans and the values of a number of employment-relevant determinants that were available at the time the plans were presented. The other hypotheses were concerned with the forecasting superiority of manpower plans in implementation functions and lastly - somewhat modestly - with the usefulness of manpower plans in employment functions.

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[6] On this point and on the period investigated, see details in Chapter II.

Generally speaking it was found that while firms' manpower plans do not meet the requirements of the rational expectations theory if "rational" is narrowly defined as, for example by Muth [7],manpower expectations do not seem to be auto-regressive either. They can best be described as "modestly-rational" or "semi-rational". This is to indicate that firms clearly do rely on the information available at the time when forming their expectations and drawing up their plans. Probably on cost-benefit grounds, however, they do not use all of it and what they do use does not appear to be processed in as optimum a way as the proponents of the rational expectations theory imagine. The adjustment process,too,is clearly slower and more erratic than is assumed in the strict version of the theory.

All in all, the investigation revealed that firms' manpower plans normally make an important contribution to improving forecasts of cyclical fluctuations in the number of persons employed. However, because of the semi-rational nature of manpower plans, it is advisable in an estimating function to use other factors along with empirically ascertained (survey) data.

Taking the example of Germany, Chapter III looks at the relation-s hip between manpower expectations and other business survey variables. It will be seen that although a relatively close link exists between production expectations and manpower expectations, this link does not seem to be stable over the cycle. The same is true of the relationship between manpower plans and views on the current business situation. This is a further argument in favour of eliciting information on manpower plans .through a direct question. Another interesting discovery is that, contrary to neoclassical theory, there seems to be no close link between manpower planning and the wage trend (change in real hourly wages).

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[7] J.F. Muth, "Rational Expectations and the Theory of Price Movements", Econometrica, vol. 39 (1961) pp. 315 et seq.. A useful review of the theory of rational expectations can be found in T.J. Sargent and N. Wallace, "Rational Expectations and the Theory of Economic Policy", Journal of Monetary Economics, vol. 2 (1976), pp. 169 et seq..

This must not, however, be taken to mean that the wage trend has no bearing on the manpower trend. Other investigations have in fact identified a significant relationship between wages and changes in employment in the medium term of two to three years. In the short term, however, any such relationship is clearly overshadowed by a number of other factors [8].

Lastly, an attempt is made in Chapter IV to fit the study's findings into the discussion of the theory of rational expectations. The conclusion reached in the study, namely that empirically ascertained plans and expectations are not rational in the strict sense of the term, means that we cannot forecast such plans and expectations but must rely on continuous, empirical collection of the relevant data [9]. The implication for economic policy is that empirically ascertained plans and expectations are as it were macroeconomic market research findings that should be carefully studied in order to determine whether the policy being pursued is tending to produce a stabilization of positive expectations in the economic sector concerned.

By way of conclusion, the study looks at the implications which the existence of "semi-rational" expectations has for the choice of economic policy strategies. One strategy - which can be described as Keynesian and demand-oriented - endeavours to make use of the limited

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[8] See, for example, H. Lehment, Der Einfluss der Lohnpolitik auf Produktion, Beschäftigung und Preise in der Bundesrepublik Deutschland seit 1973, Kieler Diskussionsbeiträge No 82, 1982.

[9] Similar inferences can be drawn from other empirical studies, especially : K. Aiginger, "Empirical Evidence On The Rational Expectations Hypothesis Using Reported Expectations", paper presented to the World Congress of Econometric Societies, Aix-en-Provence, 1980.

F. Papadia and V. Basano, EEC-DG II inflationary expectations - Survey based inflationary expectations for the EEC countries, Economic Paper No 1 (Internal paper), 1981.

P. Praet, A Comparative Approach to the Measurement of Price Expectations, Université Libre de Bruxelles, D.T. (80) 27, 1980 (Internal paper).

I. Wolters, Zum Zusammenhang zwischen Preiserwartungen des Ifo-Konjunkturtests und der tatsächlichen Preisentwicklung, Discussion Paper No 179-81, Institut für Volkswirtschaft und Statistik, Universität Mannheim, 1981.

trade-off that exists, at least in the short term [10], between the inflation rate and the unemployment rate.

The other strategy – advocated in particular by the proponents of the so-called new classical macro-theory – focuses exclusively on influencing the "natural" rate of unemployment, i.e. that degree of underemployment which occurs under given structural conditions (in particular, a given real wage level, a given capital stock and a given supply and demand structure) even when capital stock utilization is at a cyclically normal level. The waiver of discretionary monetary and fiscal policy measures, which is associated with this strategy, appears logical if, like the proponents of the new classical macro-theory, we deny that there is any trade-off between inflation and unemployment even in the short term. Yet the findings of this study and of other empirical work have demonstrated that the basis for an economic policy strategy of this kind, namely the assumption of strictly rational expectations, is unduly rigourous. However, even where expectations are "modestly rational" and point, at least in part, to a trade-off between inflation and unemployment, there are perfectly sound arguments in favour of pursuing an exclusively supply-oriented strategy of this kind. For a variety of reasons, it is considered appropriate in this study to combine both economic policy strategies in the situation of underemployment currently facing the Community countries. But pursuit of the first strategy should not be overdone as it often was in the past and is still being advocated by some Keynesians today. The policy of demand stimulation should be pursued only until the "natural" level of unemployment has been reached (in Germany this is equivalent to some 6.5 % at the moment [11]); it is not possible to force the actual level of unemployment below its "natural" level for any sustained period of time.

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[10] This follows from the semi-rational nature of empirical expectations. The Phillips curve would be vertical in the short term too only if expectations were strictly rational; there would then be no such trade-off in the short term.

[11] For a more detailed analysis of the "natural rate of unemployment" (NRU) see G. Nerb, Konjunkturverlauf und Arbeitsmarkt. Erkenntnisse aus Unternehmerumfragen für die Arbeitsmarktpolitik (Ifo-Schnelldienst, November 1982). The estimation of the present NRU is on line with other ones, e.g. Layard : 6,2 % for the period 1981-83 in Germany (R. Layard, G. Basevi, W. Buiter, O. Blanchard, R. Dornbusch, "The Case for Unsustainable Growth", Centre for European Policy Studies, Brussels, May 1984).

Because of the high level of hard-core unemployment in all Community countries, a policy of demand stabilization must be accompanied by a supply-side policy aimed at lowering the "natural" unemployment rate. It is also essential to take back-up labour market measures to reduce the labour force potential (in particular, cuts in the working week and in the length of working life, job-sharing schemes and other arrangements for part-time working) [12].

II   MANPOWER EXPECTATIONS : HYPOTHESES FORMULATED AND TESTS CARRIED OUT

According to the theory of rational expectations, business plans should provide the best possible forecast of the future trend of employment. Long before this new theory was propounded, Modigliani and Cohen, in a somewhat more cautious manner, pointed out that empirically collected planning data were normally superior to other forecasting procedures [13].

Empirical planning data can be used for forecasting purposes either direct or in the form of so-called implementation functions. Where no such data are available, forecasts are usually compiled by using regression analysis to determine the relationship between the target variable and the possible determinants during a particular base period

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[12] A useful analysis of the case for the various economic policy strategies, albeit one that comes to a different conclusion from that reached in this study, can be found in : L. Häberle, Wirtschaftspolitik bei rationalen Erwartungen - Konsequenzen einer kritischen Analyse der Theorie rationaler Erwartungen für die Wahl wirtschaftspolitischer Strategien, Untersuchungsreihe des Instituts für Wirtschaftspolitik, No. 49, Universität Köln, 1982.

[13] F. Modigliani and K.J. Cohen, The Role of Anticipations and Plans in Economic Behavior and their Use in Economic Analysis and Forecasting, University of Illinois, Urbana, 1961.

and then applying this to the forecasting period. The relationship observed need not, however, be stable over time. It will, in fact, be unstable whenever the structural approach does not take proper account of all the factors. The reason for any misspecification may be that the path of the target variable is influenced not only by the objective variables that have been explicitly taken into account but also by subjective factors such as assessments and other determinants. Such subjective factors cannot, however, be properly forecast using existing econometric methods.

By contrast, the use of empirically collected planning data should present distinct advantages. It is fair to assume that the determinants in question (assessments, sentiment) are already included in such data, properly weighted - this is particularly important - for each decision-maker. Even exotic determinants that are relevant for only a few firms and that cannot be taken into account using econometric methods are reflected in firms' planning data.

Leaving aside the costs of collecting and compiling data, the use of empirical planning data thus appears a priori as the clearly superior approach. However, this conclusion is subject to the qualification that it is conceivable, contrary to the assumptions made in the theory of rational expectations, that firms do not make optimal use of the information theoretically available when drawing up their plans. Although this can hardly be verified at macro level, there are many indications that non-optimal planning at company level is often responsible for ex post/ ex ante deviations at macro level. Moreover, data that are correct at micro level may yield a not altogether satisfactory result at macro level, either because the sample of the firms covered is not representative or because the micro planning data were not properly aggregated. In the case of trend surveys, there is the additional problem of quantifying qualitative data [14].

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[14] On the problem of transforming qualitative data into quantitative data, see, for example, J.A. Carlson and M. Parkin, "Inflation expectations", Economica 42, pp. 123-138, and G. Nerb, Konjunktur-prognose mit Hilfe von Urteilen und Erwartungen der Konsumenten und der Unternehmen, München - Berlin, 1975.

In the present econometric study of manpower plans at macro level the various causes of errors cannot be identified. The estimating results presented are rather to be used to test a series of hypotheses concerning the quality of planning data at macro level.

Hypothesis A

Firms' manpower plans yield the best forecasts for the target variable in question (change in numbers employed) that can be made at the time the plans are presented.

This hypothesis can be tested by comparing the estimation on planning data with estimations based on data other than manpower plans provided this information is available at the time the plans are presented.

The change in the numbers employed can be forecast directly from manpower plans using regression equation (I) :

$$(I) \quad \triangle B_t = a_{10} + a_{11} P_{t-1 \ (t)}$$

where $\triangle B_t$ is the percentage change in the numbers employed in period t as compared with period t-1. The expression $P_{t-1 \ (t)}$ denotes the manpower plans for period t presented at the end of period t-1. A constant term needs to be written into equation I and into equations II, IV, V and VII since the manpower plans and the change in the numbers employed are measured on different scales. However, in the other equations too, the constant term made for a better regression result.

Direct forecasting of the trend in the numbers employed using planning data is also possible where plans are implemented with a time lag. In the case in point, a change planned for the next period may conceivably occur only in the next-but-one period. But given the question put (expected change in the numbers employed in the coming three to four months), a time lag of more than one period (four months) appears unlikely. This leads to regression equation (II).

$$(II) \quad \Delta B_t = a_{20} + a_{21} P_{t-1 (t)} + a_{22} P_{t-2 (t-1)}$$

It is thus assumed that the planning data adequately describe the extent of the change in the numbers employed but do not correctly indicate the exact period when it is made. Equations I and II are compared with regression estimations in which not only the change in real hourly wages (W) but also the change in production (Q) and the production expectations for the coming three months derived from business surveys figure as determinants. To ensure that the values for these three determinants are indeed available at the time the manpower plans are presented, they are written into equation III with a time lag of at least one quarter.

$$(III) \quad \Delta B_t = a_{30} + a_{31} Q_{t-1 (t)} + a_{32} (L) Q_{t-1} +$$
$$+ a_{33} (L) W_{t-1}$$

The term (L) represents a polynomial of the lag operator L, with Q_{t-1} (t), Δ Q and Δ W denoting the production plans, as ascertained from business surveys, the change in the production index and the change in hourly wages adjusted for price changes. If regression equation III were to produce a better explanation or forecast than equations I and II, the initial hypothesis ("firms' manpower plans yield the best forecasts that can be made at the time they are presented") cannot be maintained. It must also be rejected where inclusion of variables Q_{t-1} (t), Δ Q or Δ W - each lagged by at least one quarter - in equation I or II makes for a significant improvement in the estimating results; : this would suggest that not all the information relevant to the trend in the numbers employed

was taken into account in firms' planning data P. This hypothesis can
be tested using equation IV :

$$(IV) \quad \triangle B_t = a_{40} + a_{41} (L) P_{t-1 (t)} + a_{42} Q_{t-1 (t)} +$$

$$+ a_{43} (L) \triangle Q_{t-1} + a_{44} (L) \triangle W_{t-1}$$

Hypothesis B

At macro level, firms' manpower plans yield the best possible
explanation of changes in the numbers employed when they are incorporated
in implementation functions.

An implementation function makes allowance for the fact that
plans are in part conditional. Plans are altered if determinants change
during the implementation period (i.e. the period to which the plans refer).
In order to test this hypothesis, real hourly wages and the actual and
expected change in production [15] - in each case during the implementation
period - appear in the function (V) together with manpower plans :

$$(V) \quad \triangle B_t = a_{50} + a_{51} P_{t-1 (t)} + a_{52} Q_{t-1 (t)} + a_{53} \triangle Q_t +$$

$$+ a_{54} \triangle W_t$$

However, function V cannot be used for compiling
up-to-date forecasts since it incorporates a number of unlagged determinants,
i.e. determinants not available at the time of forecasting. Hypothesis B
cannot be rejected if the estimating performance of function (V) is significantly

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[15] These are variables that theoretical considerations but also empirical
studies have shown to be significant for manpower plans (see Chapter
III).

better than one based on an estimating function in which such planning
data are not included :

$$(VI) \quad \triangle B_t = a_{60} + a_{61} \, Q_{t-1 \, (t)} + a_{62} \, (L) \triangle Q_t + a_{63} \, (L) \triangle W_t$$

Hypothesis C

Inclusion of manpower plans may enhance the estimating accuracy of an existing employment function.

Whereas hypotheses A and B are rigourous in the sense that the
empirical manpower expectations are seen as providing the - relatively -
best forecasting or explanatory variables, the planning data in hypothesis
C are deemed to be of only _relative_ use in the sense that their inclusion
makes for an improvement in an existing explanatory function :

$$(VII) \quad \triangle B_t = a_{70} + a_{71} \, P_{t-1 \, (t)} + a_{72} \, Q_{t-1 \, (t)} +$$

$$+ a_{73} \, (L) \triangle Q_t + a_{74} \, (L) \triangle W_t$$

Like equations V and VI, equation VII can be used solely for
providing an _a posteriori_ explanation of changes in the numbers employed.
It cannot be used for compiling up-to-date forecasts of such changes.

Comments on the regression estimations

Before the regression results are discussed, a number of points
need to be made regarding the data used, the period investigated and the
estimating equations applied. The question asked in Germany to obtain
information on manpower plans, our main concern in this study, is as
follows (in translation) :

Looking at the underlying trend, i.e. excluding purely
seasonal variations, the number of workers employed by our
firm will in the next three or four months :

- rise ;
- remain broadly unchanged ;
- decline.

The wording of the question is largely identical in all
Community countries. The question itself forms part of the so-called
harmonized programme of EEC business surveys in the countries of the
European Community.

As agreed with the EEC Commission, this question must be put
at least twice a year, in the spring and in the autumn. Most member
countries now, however, ask it at least three times or even four times
a year. Up to and including 1978, there were three annual surveys in
France (March, June and November) and a fourth has since been inserted
(January, March, June and November). In Germany, this question was put
twice a year in the period 1963-70 (May and October) and three times
a year in the period 1971-79 (January, May and September); since 1980, it
has been asked four times a year (January, April, July and October). In the
Netherlapds and Belgium, three surveys are conducted per year (February/
March, June and October). In the United Kingdom, three results per year
are available for this question in the period 1959-71 (February, June
and October); since then, four surveys have been conducted annually
(January, April, July and October).

The periods investigated were as follows : 1969-81 in France,
1971-79 in Germany, 1974-81 in the Netherlands, 1970-81 in Belgium and
1971-81 in the United Kingdom. Germany and the Netherlands apart, the
period in each case takes in the years 1971-81. It is shorter in Germany
(1971-78) because the survey method was changed and official employment
statistics modified with effect from 1980. The tentative estimates that
were none the less made for the period up to the end of 1981 yielded
results that differed only marginally from those for the estimating period

1971-79. In the Netherlands, appropriate survey results are available only from 1974 onwards. Italy was not included in the investigation since, generally speaking, appropriate survey results are available there only twice a year (June and October). In the other member countries not covered (Denmark, Luxembourg, Ireland and Greece), either no survey data on this question are available or what data are available do not cover a sufficiently long period.

The above question leaves doubts as to which values from official statistics should be compared with the business survey results. One main difficulty is that it is not known a priori how many months the manpower planning period comprises for the individual firms and to what extent firms do in fact eliminate from their planning data purely seasonal variations in the numbers employed. In order to test the predictive value of firms' ex ante reports, various time-series comparisons were therefore made in an earlier study - carried out on behalf of the Federal Labour Office of Germany [16] - between business survey results and ex post data from official statistics.

The main findings of that study can be summed up as follows : ex post values came closest to firms' expectations when the reference variable from official statistics was the average percentage change in the numbers employed in the next four months as compared with the average for the preceding four months. It would appear therefore that, in their ex ante data, firms are guided less by the numbers likely to be employed by them at the end of the planning period than by the average trend in the numbers employed over the next four months.

All the regression equations were based on a multiplicative approach. This was because the value pairs "survey balance of firms' manpower expectations" (taken from the business survey) and "actual rate of change" (taken from official statistics) point to the existence of

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[16] W. Gerstenberger, G. Nerb and S. Schittenhelm, "Unternehmerische Urteile und Antizipationen über den Bedarf an Arbeitskräften", in Mitteilungen, 9/1969, Institut für Arbeitsmarkt und Berufsforschung, Erlangen, pp. 671 et seq.

non-linear relationships. To judge by the scatter diagrams, the
relationships between the survey balance and the actual values should
correspond to a higher-order type of function. A possible explanation
is that the business survey is a cyclical barometer that is highly sensitive
to small quantitative changes. Even minor changes in economic variables
show up clearly in the business survey results. However, the greater the
quantitative changes, the smaller the relative increase in the corresponding
proportions in the reports. It was therefore assumed in the regression
equation that a multiplicative link existed between the determinants.

It is also to be noted that the qualitative variables used were
balances from the business surveys (i.e. differences between the weighted
positive and negative replies). Such balances can be compared with rates
of change but not with levels from quantitative index series. For this
reason, the actual number of persons employed, the level of production,
and real hourly wages as derived from official statistics were transformed
into first differences, i.e. into rates of change. All the data were
expressed in log terms to take account of the non-linear relationships
that clearly existed. They were not seasonally adjusted but seasonal
dummies were written into the regression equations to allow for possible
seasonal variations. The estimated seasonal coefficients are not given below
since they are of secondary importance to the subject matter of our study.

Short description of the symbols used in tables 1-5

P_{t-1} (t) : Manpower plans for the period t, about which firms are
questioned at the end of period t-1. Survey balances.

Q_{t-1} (t) : Production expectations for the coming three months. In the
United Kingdom, business expectations are used instead of
production expectations. In Belgium, the "courbe synthétique"
is used. Only those months in which the question regarding
manpower plans was put were taken. Survey balances.

B_t : Number of persons employed in manufacturing in period t. In Germany and in the United Kingdom, the rate of change $\triangle B_t$ is calculated by relating the average number of persons employed during the four months following the month in which the survey of manpower plans was conducted to the figure for the preceding four months. In the other countries, the planning data were used to forecast the numbers employed in the following quarter. Rate of change in %.

Q_t : Production index for manufacturing. The rate of change $\triangle Q_t$ was determined in the same way as $\triangle B_t$; rate of change in %.

W_t : As a rule, the index of hourly wages or the wage and salary bill in industry deflated by the index of industrial producer prices or by a proxy. In France and the Netherlands, the nominal wage trend was taken since neither country possesses a suitable deflator for industrial production. For the determination of $\triangle W_t$, see the comments on $\triangle B_t$. Rate of change in %.

R^2: Correlation coefficient (corrected by degrees of freedom)

TABLE 1 – REGRESSION RESULTS GERMANY .1971.1–1979.3

Equ.	c	$P_{t-1}(t)$	$P_{t-2}(t-1)$	$Q_{t-1}(t)$	ΔQ_{t-1}	ΔW_{t-1}	Mean Lag Q	Mean Lag W	SEE	R^2 (D.W.)
I D	−.008 (.001)	.051 (.004)							.0030	.929 (1.34)
II D	−.008 (.001)	.063 (.006)	−.014 (.006)						.0027	.945 (2.15)
IIID	−.016 (.002)			.041 (.010)	.199 (.053)	.117 (.105)	2.22	3.68	.0026	.967 (2.01)
IV D	−.012 (.003)	.018 (.013)		.029 (.013)	.101 (.089)	.089 (.106)	2.12		.0025	.972 (1.83)

(For equations V–VII the delta columns are ΔQ_t and ΔW_t.)

Equ.	c	$P_{t-1}(t)$	$P_{t-2}(t-1)$	$Q_{t-1}(t)$	ΔQ_t	ΔW_t	Mean Lag Q	Mean Lag W	SEE	R^2 (D.W.)
V D	−.008 (.001)	.051 (.007)	−.006 (.006)		.064 (.022)	.001 (.004)	0	c	.0023	.962 (1.96)
VI D	−.018 (.002)	.020 (.012)		.021 (.014)	.361 (.094)	.105 (.095)	1.62	3.04	.0023	.973 (2.10)
VIID	−.014 (.003)	.020 (.012)		.009 (.015)	.254 (.109)	.069 (.092)	1.33	2.24	.0022	.978 (2.04)

TABLE 2 — REGRESSION RESULTS GREAT BRITAIN   1971,3 — 1981,4

Equ.	c	$P_{t-1}(t)$	$P_{t-2}(t-1)$	$Q_{t-1}(t)$	$Q^\Delta_{t-1}(t)$	Q^Δ_{t-1}	W^Δ_{t-1}	Mean Lag Q	Mean Lag W	SEE	R^2 (DW)
I GB	-.004 (.001)	.032 (.002)								.0036	.906 (0.76)
II GB	-.004 (.001)	.040 (.004)	-.008 (.004)							.0035	.917 (1.36)
IIIGB	-.009 (.008)			.009 (.004)	.391 (.108)		-.067 (.135)	2.52	3.66	.0075	.689 (0.53)
IV GB	-.005 (.002)			.029 (.002)	.004 (.002)	.048 (.075)	-.058 (.052)	5.19		.0029	.952 (1.51)

Equ.	c	$P_{t-1}(t)$	$P_{t-2}(t-1)$	$Q_{t-1}(t)$	Q_t	W_t	Mean Lag Q	Mean Lag W	SEE	R^2 (DW)
V GB	-.006 (.001)	.032 (.004)	-.002 (.004)		.082 (.022)	-.015 (.014)	•	•	.0030	.941 (1.69)
VI GB	-.008 (.007)			.001 (.005)	.440 (.117)	-.118 (.131)	1.69	2.46	.0073	.699 (0.43)
VIIGB	-.008 (.003)	.029 (.002)		.002 (.002)	.116 (.047)	-.065 (.046)	0.71	4.01	.0026	.964 (1.54)

TABLE 3 –REGRESSION RESULTS FRANCE 1969.1 – 1981.4

Equ	Coefficient (stdd.error of) c	$P_{t-1}(t)$	$P_{t-2}(t-1)$	$Q_{t-1}(t)$	$Q^{\triangle}_{t-1}$	$w^{\triangle}_{t-1}$	Mean Lag of Q	Mean Lag of W	SEE	R^2 (DW)
I F	-.002 (.001)	.030 (.003)							.0025	.859 (1.03)
IIIF	-.005 (.008)			.006 (.002)	.168 (.062)	.179 (.121)	1.75		.0028	.862 (0.892)
IV F	-.001 (.006)	.019 (.004)		.003 (.001)	.099 (.045)	.152 (.086)	1.72	1.39	.0020	.934 (1.48)
V F	-.002 (.002)	.029 (.003)			.009 (.019)	.0003 (.050)	0	0	.0026	.859 (1.01)
VI F	-.004 (.005)			.006 (.002)	.159 (.082)	.176 (.120)	2.86		.0028	.862 (0.88)
VIIF	-.004 (.003)	.019 (.004)		.003 (.002)	.097 (.059)	.160 (.085)	2.76	1.22	.0020	.933 (1.54)

TABLE 4 —REGRESSION RESULTS BELGIUM 1970.3 — 1981.2

Equ.	Coefficient (stdd.error of)						Mean Lag of		SEE	R^2 (DW)
	c	$P_{t-1}(t)$	$P_{t-2}(t-1)$	$Q_{t-1} \cdot Q_{t-1}$	ΔQ_{t-1}	ΔW_{t-1}	Q	W		
I B	-.006 (.002)	.048 (.009)							.0056	.800 (1.24)
IIIB	-.086 (.023)		.060 (.017)	.132 (.096)	-.126 (.149)		2.78		.0046	.908 (0.73)
IV B	-.049 (.037)	.018 (.014)	.033 (.027)	.133 (.094)	-.141 (.146)		2.72		.0046	.918 (0.88)

Equ.	Coefficient (stdd.error of)						Mean Lag of		SEE	R^2 (DW)
	c	$P_{t-1}(t)$	$P_{t-2}(t-1)$	$Q_{t-1}(t)$	ΔQ_t	ΔW_t	Q	W		
V B	-.006 (.003)	.047 (.010)		.016 (.049)	.022 (.092)		0	0	.0058	.796 (1.30)
VI B	-.084 (.023)		.061 (.017)	.157 (.126)	-.140 (.151)		3.21		.0047	.906 (0.67)
VIIB	-.042 (.039)	.022 (.016)	.030 (.028)	.094 (.132)	-.142 (.146)		4.85		.0046	.917 (0.83)

TABLE 5 —REGRESSION RESULTS NETHERLANDS 1974.2 — 1981.3

Equ.	c	$P_{t-1}(t)$	$P_{t-2}(t-1)$	$Q_{t-1}(t)$ / Q_t	$Q_{t-1}(t)$ / Q_{t-1}	ΔW_{t-1} / ΔW_t	Mean Lag Q	Mean Lag W	SEE	R^2 (DW)
I NL	-.013 (.004)	.020 (.011)							.0079	.565 (1.78)
III NL	-.004 (.019)			.631 (.234)		-.144 (.176)	1.47	3.71	.0073	.786 (2.24)
IV NL	-.001 (.001)		-.011 (.012)	.710 (.286)		-.224 (.239)	1.49	6.58	.0075	.792 (2.06)
V NL	-.011 (.006)	.020 (.011)		-.026 (.082)	-.096 (.124)		o	o	.0082	.582 (1.72)
VI NL	-.023 (.014)			.528 (.295)	-.052 (.188)		2.78	1.83	.0077	.760 (2.27)
VII NL	-.023 (.015)	.003 (.022)		.511 (.343)	-.037 (.234)		2.79	2.91	.0080	.760 (2.30)

Regression results

Hypothesis A : (Forecasting superiority of manpower plans - Equations I, II, III and IV)

Manpower plans explain much of the variance in the trend of the numbers employed (equation I); this is true of all the five countries investigated, although a below-average result was recorded for the Netherlands (R^2 in estimating function I : 92.9 for Germany, 90.6 for the United Kingdom, 85.9 for France, 80.0 for Belgium and 56.5 for the Netherlands). Inclusion of manpower plans lagged by one period - this was done only for Germany and the United Kingdom - made for only a small improvement in the estimating results in each case (measured in terms of the SEE; R^2). In both cases, however, the Durbin-Watson measure for autocorrelation showed a significant improvement. The negative sign for the lagged manpower plans $P_{t-2\ (t-1)}$ refutes the assumption that errors occur in respect of the length of the planning period. It rather suggests some degree of regressivity in manpower plans, i.e. a lasting reversal of the direction of expectations that produces a negative correlation between the actual change in the target variable and the lagged planning data [17].

The estimation of the change in the numbers employed that was carried out for control purposes using variables other than empirically ascertained manpower plans yielded results that differed between the countries concerned (estimating function III). In the case of Germany, function type III comes out slightly better than function types I and II if we look at the standard deviation of the residuals, the coefficient of determination and the Durbin-Watson measure.

A similar result is obtained for France. In Belgium and the Netherlands, the superiority of estimations based on function III was not only gradual in kind but also very tangible. It was only in the case of the

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[17] On the matter of regressivity in plans and expectations, see also J. Bossons and F. Modigliani, On the Reasonableness of Regressive Expectations, paper presented at the Second CIRET Conference, Vienna 1963.

United Kingdom that an <u>ex post</u> forecast of the trend in the numbers
employed, compiled using empirically ascertained planning data,
yielded significantly better results than an alternative estimation based
on function III. Especially the decline in the number of persons employed
in the United Kingdom in 1980 and 1981 cannot be explained using regression
equation III; this yields a low value for the Durbin-Watson statistic for
that country.

The estimating results obtained using function type IV were
found to be superior to regression equations I, II and III in all the
countries investigated. It is evident, therefore, that the explanatory
and forecasting power of manpower plans can be enhanced by incorporating
additional explanatory variables in an implementation function. Like a
host of other empirical investigating results, this result refutes the
theory that the expectations of economic agents are rational in the
strict sense of the term. The assumption of modestly rational
expectations would seem to be more realistic (see Chapter IV). This study
has also demonstrated that, in their manpower expectations, firms do not
make use, or do not make optimal use, of all the information available
to them when plans are presented.

The predictive value of the additional determinants investigated,
viz. production expectations (or business expectations in the case of the
United Kingdom and the "courbe synthétique" in the case of Belgium, where
the time series of production expectations are not long enough), the actual
change in production and the trend in real hourly wages, is not the same in
all the countries. In Germany, but also in the United Kingdom and France,
the influence of production or business expectations in particular could be
clearly demonstrated statistically in function type III. By contrast, in the
Netherlands, the trend in the numbers employed is much more strongly
influenced by the past trend of production than by the other explanatory
variables. In the light of the present study, no clear-cut conclusion can
be drawn regarding the significance of real wages for the demand for labour.
The coefficient of real wages even has a positive sign in Germany and
France. This would be consonant with the purchasing power theory, which is
championed by the unions in particular and according to which the employment
effect is the greater the sharper the rise in real wages. Such a finding,

which is in absolute opposition to the new classical macro theory, must not, however, be exaggerated. Even convinced proponents of this new theory concede that the negative relationship which they claim exist between the real wage level and the trend in the numbers employed - i.e. the lower the level of real wages, the higher the numbers employed holds only in the medium term and is overshadowed in the short term by various other factors [18]. In the United Kingdom, Belgium and the Netherlands, we obtain for the influence of real wages at least the negative sign postulated by neo-classical theory. But even in these three countries the influence of wages could be only weakly demonstrated using the statistical test measures.

The conclusion concerning hypothesis A is that a forecast based solely on manpower plans does not, as the rational expectations theory would suggest, yield the best possible estimating values. In all the cases investigated, a better result is obtained by combining the planning data with other determinants (estimating function IV) than by using these data direct; in most cases, however, the improvement thus achieved was only limited since, with the exception of the Netherlands, the direct approach itself yielded good estimating results. Hypothesis A in the narrowly sense (manpower plans cannot be replaced by different, lagged variables, i.e. comparison of the estimating results of functions I and II, on the one hand, and those of function III, on the other) had to be rejected except in the case of the United Kingdom.

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[18] Roth and Lehment, for example, come to the conclusion that the strongest positive employment effects of wage restraint make themselves felt only two to three years later. This would be an argument among other things against a one-off wage freeze and in favour of a moderate wage policy covering a longer period. (See H. Lehment, Der Einfluss der Lohnpolitik auf Produktion, Beschäftigung und Preise in der Bundesrepublik Deutschland seit 1973, Kieler Diskussionsbeiträge No 82, February 1982, and J. Roth, Mehr Beschäftigung durch Reallohn-zurückhaltung, Kieler Diskussionsbeiträge No 85, March 1982).

Testing hypothesis B : (Forecasting superiority of manpower plans in
implementation functions)

        The results obtained using estimating function IV are an
indication of the empirical relevance of hypothesis B, according to which
the best possible results are obtained by incorporating data on manpower
planning in an implementation function. This is to be investigated by
comparing the estimating results obtained using functions V and VI.
It should be remembered that the only difference between function IV and
function V is that equation IV is a pure forecasting function into which
only values are written that were available before the beginning of the
forecasting period. In implementation function V, however, the values for
the variables production expectations or business expectations (the latter
in the case of the United Kingdom), actual change in production and actual
change in real wages extend into the forecasting period. Consequently, the
up-to-date values of these three variables are not known in a genuine
forecasting situation. The purpose of function V is to reveal the influence
of changes in the "general economic environment" that occured after
presentation of the manpower plans but during the implementation phase
(forecasting period). The estimations made using function type VI serve
to test hypothesis B in that they represent an attempt to provide an
alternative explanation for the trend in the numbers employed (i.e. no
use is made of manpower planning data). Both function V and function VI are
in the nature of explanatory models, not forecasting models.

        As the empirical regression results show, hypothesis B probably
holds only for the United Kingdom, where an explanation system based solely
on the trends in production and wages and on production expectations yields
a distinctly worse result than if manpower plans are used direct. In France,
too, though to a much lesser degree, implementation function V is found to
be superior to control function VI (assessment criterion : standard
deviation of the residuals). In Belgium and the Netherlands, implementation
function V is clearly inferior to function type VI in explaining
fluctuations in employment. It is worth noting that current production Q_t
influence implementation function V very significantly in Germany and in
the United Kingdom. The same is not true, however, of the real wage trend :

as was the case in functions III and IV, we even find a "false", i.e. positive, sign in Germany. This suggests that, unlike changes in the real wage trend, unexpected changes in production affect the implementation of manpower plans (at least in the short term).

Testing hypothesis C : (Improving the existing employment functions by
                        inclusion of manpower plans as an explanatory variable)

         According to this hypothesis, manpower plans enhance the quality of existing employment functions. The difference between function type IV and function type VII is simply that the former is a forecasting function and the latter an explanatory function. This is apparent from the fact that only values available before the beginning of the forecasting period were used on the right-hand side of the equation in function IV. In function VII, on the other hand, use is also made of current values of the explanatory factors, that is to say of values relating to the implementation stage of the manpower plans, i.e. the forecasting period. As the empirical results show, manpower plans in all the countries except the Netherlands make a significant explanatory contribution in function VII. This is particularly so in the United Kingdom but also in France.

         Comparison of the results for implementation function VII and those for forecasting function IV reveals that there are generally only small differences in the standard error and in the coefficient of correlation. As could be expected, these measures are usually somewhat better in the case of the explanatory function than in the case of the forecasting function (the only exception being the Netherlands). The contribution made by manpower plans to reducing the variance is broadly identical in both types of function; in the case of Germany and the United Kingdom, it is noticeable that if current production levels are taken into account, this indicator gains in significance relative to production expectations (estimating function VII).

         To sum up, it was only in the United Kingdom that manpower plans yielded a better estimation of the change in the numbers employed

than the other variables looked at, irrespective of whether the latter entered the estimation as lagged or unlagged variables (I and II as against III). In the case of the United Kingdom too, however, that part of hypothesis A according to which manpower plans already contain all the relevant information had to be rejected. Hypothesis B (manpower plans are superior to other variables in the trend in the numbers employed) had to be discarded in the cases of Belgium and the Netherlands. For Germany and France, the results yielded by both approaches were more or less equally good; only in the United Kingdom do the results once again point clearly to the superiority of manpower plans. Lastly, hypothesis C (employment plans make a significant but not a dominant contribution to explaining fluctuations in the numbers employed) had to be rejected only in the case of the Netherlands. The fact that, in all countries except the Netherlands, the manpower plans in forecasting function IV, i.e. combined with other determinants, make a statistically well-founded contribution is particularly important for up-to-date forecasting. Such an "indirect" estimation based on manpower plans is invariably superior to a direct forecast (where manpower plans are simply quantified without any other factors being taken into account). This suggests that manpower expectations are not rational in the strict sense of the theory but can best be described as semi-rational (see Chapter IV).

III   DETERMINANTS OF MANPOWER EXPECTATIONS

According to neo-classical macro-theory, the employment trend is crucially dependent on whether firms' price expectations are fulfilled, the argument being that concessions made by employers in wage negotiations are based on anticipated price levels that will guarantee them the rate of return they are seeking. If, as a result of a restrictive monetary policy or an unforeseen drop in sales, e.g. on export markets, only lower-than-planned price increases prove possible on the market, the level of real wages (wage costs deflated by the index of industrial producer prices) rises. Managements will then attempt to reduce their workforce to the extent necessary to bring wage costs expressed as a proportion of total

costs back to the level initially planned. Indeed, it is quite likely that they will attempt to compress the share of wage costs further through rationalization measures in order to come closer to their original profit target in spite of the deterioration in market conditions.

However, there is little in the results of this econometric study to suggest such a manpower policy, at least in the short term. Other empirical studies have also demonstrated that the real wage level does not significantly influence the level of employment, at least <u>in the short term</u>. With this time horizon, the employment-boosting effect of wage restraint is clearly overlaid by a number of other factors. Most of this effect makes itself felt only after some two to three years of an uninterrupted policy of wage restraint [19].

Even the implementation function presented in this paper produced very little, if any, statistical evidence that real wages were an additional determinant alongside manpower and production expectations. This may, however, be due to the fact that manpower expectations already take the influence of real wages fully into account. For this reason, the relationship between the planned manpower trend and the trend of real wages was looked at once again, but separately this time. Yet no statistical evidence of such a relationship was discovered. The same goes for the influence of price expectations on manpower planning. Differences between price expectations and prices actually fetched produced an even less satisfactory explanation than price expectations themselves. This probably has to do with the fact that price expectations are surveyed each month and, as a result, changes in price expectations show up very quickly in this series. Consequently, the remaining differences between price expectations prices actually fetched usually very small.

We also looked at the extent to which the manpower expectations reported were influenced by the data yielded by the business survey on :

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[19] For a similar finding, see, for example, H. Lehment, <u>Der Einfluss der Lohnpolitik auf Produktion, Beschäftigung und Preise in der Bundesrepublik Deutschland sit 1973</u>, (1982), loc. cit..

- trend of production compared with a month earlier (survey balances);
- production expectations for the next three months (survey balances);
- current business situation (survey balances);
- trend of business expected in the next six months (survey balances);
- assessment of current order-book situation (survey balances);
- plant capacity utilization (as % of normal operating limits).

It was found that manpower planning was consistently much more closely related to these indicators than to changes in real wages or to selling-price expectations. This suggests that the current order position and business expectations are the dominant factors behind short-term adjustments in the numbers employed. It is worth noting that in virtually all cases the correlation was closest whenever no lags were assumed in the relationship between manpower expectations and determinants. This is an indication that a large proportion of the information contained in the other variables immediately feeds into manpower expectations. None the less, as we saw when discussing the regression investigations, a significant improvement in the manpower forecast is obtained if other test variables, and in particular production expectations, are taken into account separately. It is evident therefore that prompt, though not full, account is taken of the determinants in question when manpower expectations are presented (see Table 6 and Fig. 1).

Fig. 1

Indicators of the employment situation in manufacturing
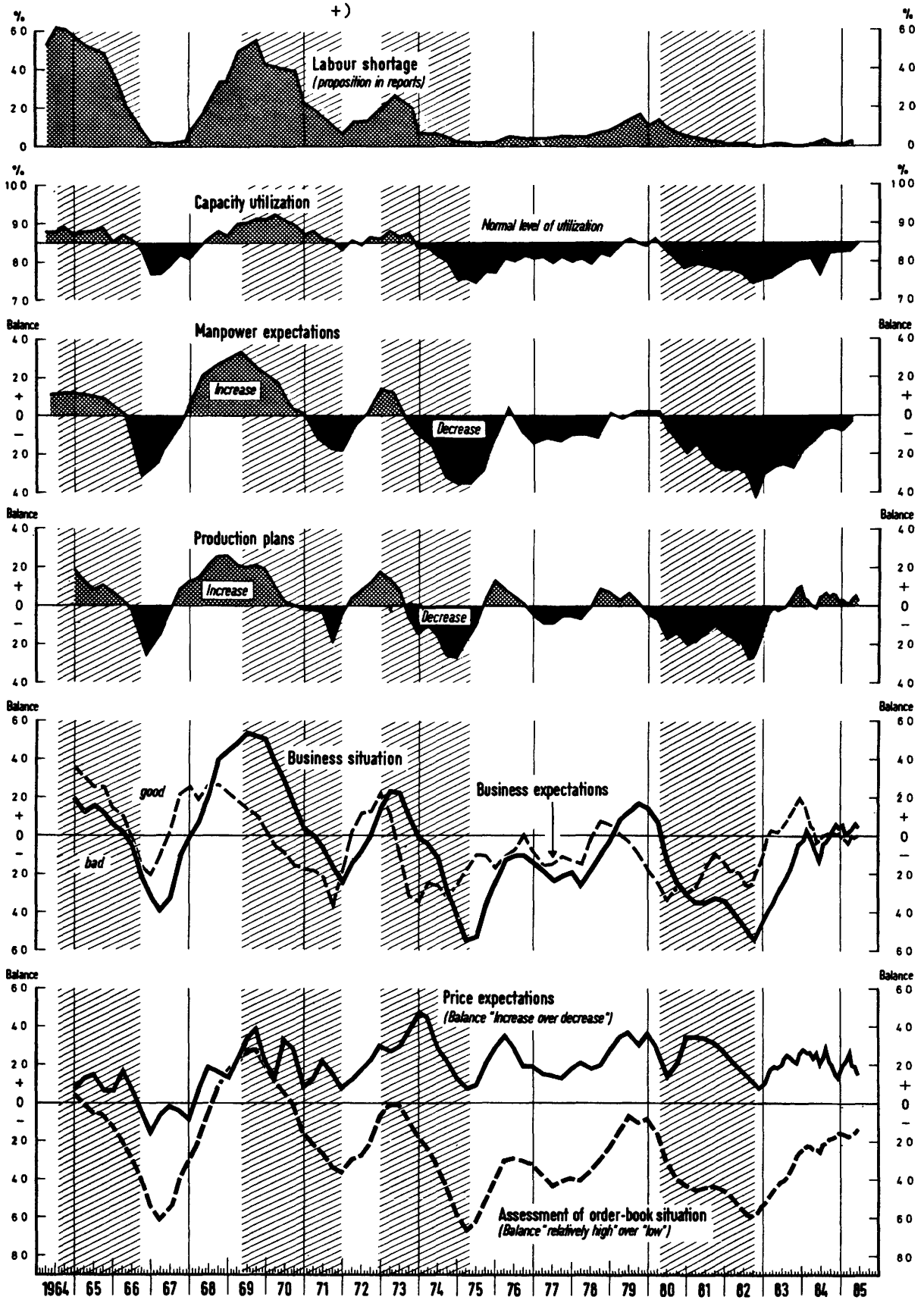
+)

The hatching indicates the period between the upper and lower turning-points in manpower expectations.

Source: Ifo business survey.

IFO-INSTITUT für Wirtschaftsforschung München

+) The hatching indicates the period between the upper and lower turning-points
   in manpower expectations.

Table 6

Relationship between manpower expectations and possible determinants — the case of Germany

Manpower expectations (survey balances, BS) correlated with :	Coefficient of correlation
Change in real hourly wages (%; official statistics)	
- unlagged	0,01
- lagged by four months	0,02
Selling-price expectations (survey balance, BS)	
- unlagged	0,11
- lagged by four months	0,02
Trend of production compared with preceding month (%; official statistics)	
- unlagged	0,54
- lagged by four months	0,51
Production expectations (survey balance, BS)	
- unlagged	0,60
- lagged by four months	0,78
Assessments of current business situation (survey balance, BS)	
- unlagged	0,73
- lagged by four months	0,23
Expectations of business trend in next six months (survey balance, BS)	
- unlagged	0,36
- lagged by four months	0,56
Assessment of current order-book situation (survey-balance, BS)	
- unlagged	0,73
- lagged by four months	0,23
Capacity utilization (%; BS)	
- unlagged	0,46
- lagged by four months	0,17

BS = Ifo business survey

IV   POSITION WITH REGARD TO THE RATIONAL EXPECTATIONS THEORY
AND ECONOMIC POLICY CONCLUSIONS

The expectations of economic agents play a central role in modern economic theory and in the economic policy recommendations based thereon. The rational expectations theory represents a very rigorous system for explaining the phenomenon of stagflation, that is to say the mixture of inflation, stagnation and unemployment, with which we have had to contend since the mid-1960s and, above all, in the 1970s. According to this theory, the failure of Keynesian employment policy in the period since the mid-1960s can be put down to the fact that economic agents,i.e. both managements and consumers, are no longer subject to money illusion. Expansionary monetary and fiscal policy measures, so this theory tells us, no longer trigger a rise in production and an increase in the number of persons employed but simply lead to higher prices.

In its "strict version", the rational expectations theory based on very restrictive assumptions. It is assumed, for example, that economic agents are in possession of all the information available, make the best possible use of that information and hence are aware of the "true" model of economic relationships. It is also assumed that firms and consumers do in fact act in line with these expectations. The Phillips curve would thus be vertical, not only in the long term but also in the short. In other words, there is no trade-off between the inflation rate and the unemployment rate, the consequence being that an expansionary monetary and fiscal policy simply generates higher inflation and does not reduce unemployment.

Just how realistic are these assumptions regarding the expectations of economic agents Numerous empirical studies have revealed that neither the expectations of firms nor those of consumers are rational in the sense postulated by the theory. To date, in addition to price expectations, which are the main focus of interest, empirically ascertained

investment and production expectations have been studied [20]. The
analysis of manpower expectations made in this study also refutes the
argument that expectations are rational in the sense postulated in the
strict version of the theory. Clearly, in forming their expectations,
economic agents do not take all information into consideration or are
unaware of the "real" model essential to the proper evaluation of
information. Although it is not possible to distinguish empirically
between these two influences, it is a fact that all the empirical
studies of which the author is aware contain systematic errors in the
expectations. This shows up in the fact that the deviations between
anticipated and actual values are not random but have a systematic
component.

However, this systematic error is usually not very great. For
example, provided the statistical base is sufficiently representative and
provided a suitable measuring scale is used, the correlation between
empirically ascertained expectations and outturns is, as a rule, surprisingly close.
However, as noted earlier, systematic divergences are discernible in most
cases, e.g. underestimations during a cyclical upswing and overestimations
during a cyclical downsing. This study has demonstrated that the relation-
ship between ex post and ex ante data can be improved appreciably by
including additional information in an implementation function.

There are a number of explanations for the lack of complete
agreement between expectations and outturns. In contrast to what the
rational expectations theory assumes, some of the costs involved in
obtaining and evaluating information and in making the adjustment deemed
necessary are fairly high. On cost-benefit grounds, therefore, some
information is not utilized or adjustment processes are not initiated
or are initiated with considerable delay. Yet, even if economic agents
were prepared to shoulder these costs, there would still be divergences
between ex post and ex ante values since, at least where economic theory

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[20] See, for example, K. Aiginger, Empirical Evidence on the Rational
Expectations Hypothesis using Reported Expectations, 1980, loc. cit.,
or P. Praet, A comparative Approach to the Measurement of Price
Expectations, Université Libre de Bruxelles, loc. cit..

stands at the moment, no one possesses the true forecasting model into which the information needs to be fed.

All in all, the findings of this study, like plenty of other empirical studies, are arguments in support of a "weak" version of the rational expectations theory. The relevant literature refers to "semi-rational" expectations [21]. It is assumed here that economic agents do not possess all the relevant information and that adjustments do not take place as promptly as is postulated in the "strict" version of the theory. Rather, cost-benefit considerations of economic agents determine the amount of information they possess and hence the duration of both the learning and adjustment processes.

The extent to which such cost-benefit considerations are taken into account fluctuates during the course of a business cycle. This is mainly because the learning processes of economic agents are not mechanical and because the readiness of both firms and consumers to take risks varies unpredictably over the cycle. Rational expectations (in the "strict" version of the theory) represent a theorical but in practice highly improbable borderline case of semi-rational expectations.

It is this cyclical flexibility in particular that also distinguishes semi-rational expectations from the autoregressive "expectations" frequently employed in econometrics (adaptive, regressive and extrapolative). These theoretical constructions of expectations are, of course, estimated in a purely mechanistic manner using past values of the same variable. For this reason, they usually contain a substantial systematic error. By contrast, empirically ascertained data on expectations, such as those collected in the context of the EEC business and consumer surveys, represent genuine expectations. As noted earlier, it cannot be assumed however that all respondents make use of all the.

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[21] See, for example, L. Häberle, Wirtschaftspolitik bei rationalen Erwartungen, Konsequenzen einer kritischen Analyse der Theorie rationaler Erwartungen für die Wahl wirtschaftspolitischer Strategien, loc. cit., pp. 193 et seq..

relevant information. On average, their level of information is much
lower than is assumed in the "strict" version of the rational expectations
theory. Whatever the level of information, there will also be significant
differences in the way economic agents handle information, ranging from
simple trend forecasts to highly complex forecasting systems.

What inferences for empirical economic research and for economic
policy are to be drawn from the conclusion reached in this study and in
various other studies, namely that, as a rule, expectations from
representative surveys represent data that can best be described as
"semi-rational" ?

The main implications for empirical economic research are that
a mechanistic expectation-forming process (autoregressive expectations)
cannot be assumed and that decisions and actions are not taken in such
a rational fashion as postulated in the rational expectations theory.
If the theory were right on the latter point, it would be sufficient,
given an effective price mechanism, to keep a close watch solely on price
movements in order to ascertain the expectations of economic agents.

For the above reasons, both the expectation-forming process
and the decision-making process are much more complex and cannot be
predicted using conventional econometric methods. There is therefore no
substitute for empirically ascertained data on expectations such as those
yielded by the EEC business and consumer surveys. However, as this study
has clearly demonstrated, making optimal use of the planning data does not
mean converting them directly into quantitative forecasts.

Instead, it is better to incorporate planning data into an
estimating model together with other information.

The main implication that the "semi-rational" nature of
empirically ascertained data on expectations has for economic policy is
that, contrary to what is asserted by proponents of the new classical
macro theory, there is at least some room for discretionary measures to
boost the level of employment. The short-term Phillips curve is not
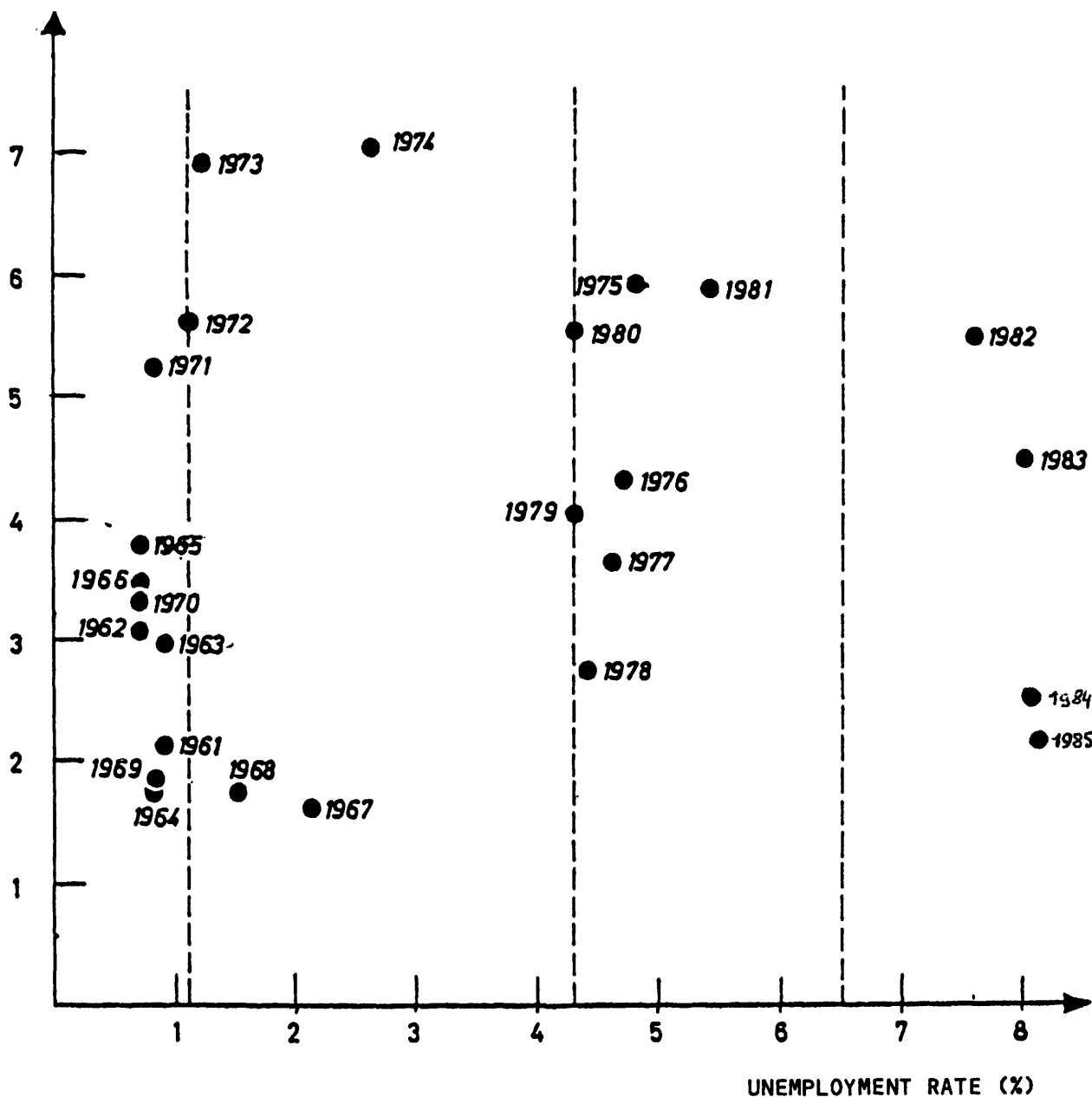
Fig. 2

THE PHILLIPS CURVE

Inflation rate (%)

Short-term
Phillips curve

NRU

Cyclical

Overemployment

Underemployment

A**

A

A*
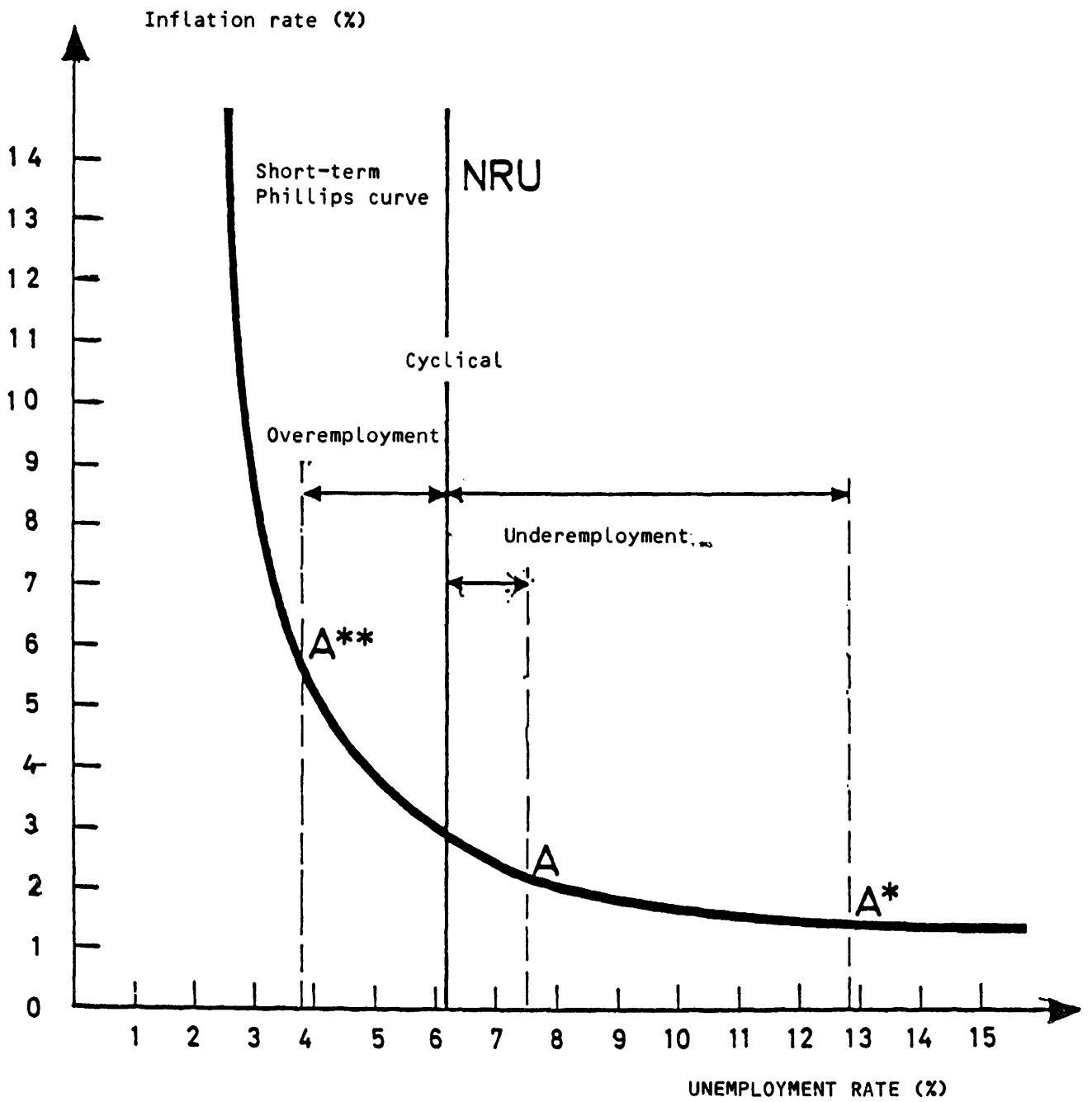
UNEMPLOYMENT RATE (%)

Germany

Fig. 3

RELATIONSHIP BETWEEN INFLATION RATE AND UNEMPLOYMENT RATE

Inflation rate (%)

(Cost-of-living
index for all private
households)

UNEMPLOYMENT RATE (%)

Legend : The dotted lines are to be seen as indicating the "natural" unemployment rate. It is necessary to imagine a series of Phillips curves around these vertical lines (see Fig. 2) which, in the short term at least, point to a modest trade-off between inflation and the unemployment rate.

therefore vertical but, as expected, slopes, downwards to the right (see
Fig. 2). The narrow room for discretionary measures to secure a trade-off
between the inflation rate and the unemployment rate is illustrated in Fig. 3,
which depicts the situation in Germany. The empirical results suggest that the
so-called natural rate of unemployment, i.e. the degree of underemployment
that is to be expected even when the stock of physical capital in the economy
is being utilized at a normal cyclical level, is around 6.5% in Germany. This
estimate is based on the unemployment rate during the cyclical peak in 1979
and takes into account the increase in the capital stock and the supply side
of the labor market since then.   This estimation is in line with other ones
e.g. Layard : 6,2% for the period 1981-83 in Germany [22]. Consequently, if the
economy returned to normal, the current unemployment rate in Germany of just
under 8% would fall by only around 1.5 percentage points. There is the danger
that, while an exclusively demand-stimulating policy of the traditional
Keynesian kind may temporarily succeed in forcing the unemployment rate below
its "natural" level, it, in the medium and long term, lead to an even higher
"natural" rate of underemployment. A better strategy would therefore probably
be to bring down unemployment to its "natural rate" through a relatively
moderate stimulus to demand and at the same time to take steps to lower the
natural rate of unemployment. This necessitates in the first place a consistent
growth strategy. As the problem of lowering the "natural" rate of unemployment
does not come within the ambit of this study, a reference to a few key elements
may suffice here : removal of obstacles to investment, primarily in the
construction of power plants, roadbuilding and telecommunications; improvements
in depreciation rules, above all for risky, long-term investments; and
introduction of tax incentives for job-creating product innovations. The last
move might among other things encourage the formation of innovation companies
that, helped by tax concessions, would attract risk capital in the same way as
companies set up specifically to take advantage of depreciation rules do at the
moment. Such capital, which should be raised especially from among those in the
higher income brackets who have no firm of their own to invest in, would need
to be channelled, as a matter of priority, to small and medium-sized firms that
have promising plans for new products but do not possess sufficient capital to
implement product innovations (manufacture and tapping of markets). As is demon-
strated by a host of depreciation-based projects some of which are of doubtful

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[22.] See footnote 11

value for the national economy, sufficient risk capital is forthcoming if its owners are offered appropriate tax incentives. The deficiency so far has been in the channelling of risk capital. It is high time that we created new forms of financing for innovation projects that involve risk. Otherwise, the necessary surge in innovation and the resulting creation of jobs with future potential will not materialize and the main emphasis of investment activity will continue to be on the rationalization and, at best, modernization of existing plant.

Yet even a successful growth policy of this kind, coupled with a moderate wage policy, will not by itself sufficiently alleviate labour-market problems over the next few years. It will need to be backed up by labour-market measures. Foremost among these should be more part-time working and new negotiated arrangements governing retirement (e.g. possibility of part-time work for those aged 55 or over) in such a way that the social security system is not unduly negatively influenced. Both unions and employers must be willing to seek new ways of combating unemployment, stopping at no taboos. In the case of Germany, a survey-based study by the Institut für Arbeitsmarkt- und Berufsforschung in Nuremberg revealed that employees are strongly attracted by the idea of part-time as opposed to full-time working even where this involves a significant reduction in pay. Polls showed that some 16% of those currently in full-time employment would be willing to work part-time [23]. However, in addition to job-sharing and a lowering of the flexible retirement age, unions and employers will need to reach wider agreement on other ways reducing working hours.

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[23] See C. Brinkmann, "Veränderung des Arbeitsvolumenangebots bei Realisierung der Arbeitszeitwünsche : Befragungsergebnisse und Modellrechnungen", in Probleme der Messung und Vorausschätzung des Frauenerwerbspotentials, Beitr. Arbeitsmarkt- und Berufsforschung 56, 1981, pp. 147 et seq..

This tendency is affirmed by a more recent survey conducted by the EC Commission in all member countries. According to this survey more than one quarter of German workers questioned would like to work shorter hours than they do today, provided that their hourly pay remain the same (see European Economy, Supplement B, N° 10, October 1985).

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