COMMISSION OF THE EUROPEAN COMMUNITIES

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ON THE POSSIBLE PART PLAYED BY CERTAIN PRIMARY NON-EMPLOYMENT INCOMES IN THE INFLATIONARY PROCESS IN IRELAND

prepared for the
Commission of the European Communities
by

Dr. R.C. GEARY
Former Director of
the Economic and Social Research Institute,
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Responsibility for the views expressed, and for any errors, is entirely the authors .

Abbreviations

AAPS : Allowance for adjustment for price of stocks.

AFF : Agriculture, forestry, fishing (major sector).

c. c. : Coefficient of correlation.

CD : Census of Distribution.

CAP : Common Agricultural Policy.

CIP : Census of Industrial Production.

CPI : Consumer Price Index (Ireland).

CSO : Central Statistics Office.

c. v. : Coefficient of variation.

DPT : Department of Posts and Telegraphs.

ESR : Economic and Social Review (Dublin).

ESRI : Economic and Social Research Institute.

FTC : Fair Trade Commission.

GDFCF : Gross domestic fixed capital formation.

GDP : Gross domestic product.

GO : Gross output (industry).

ISB : Irish Statistical Bulletin (CSO).

NHP : Null hypothesis probability.

NIE : National Income and Expenditure (annual reports CSO).

NIEC : (former) National Industrial and Economic Council.

NO : Net output (industry).

NPC : National Prices Commission.

PAD : Public administration and defence.

QEC : Quarterly Economic Commentary (ESRI).

RPO : Review and Present Outlook (Dept. of Finance).

RNO : Remainder of net output (industry) = net output less employee remuneration.

RPI : Retail price index (UK).

TG : Transportable goods (industries).

TGER : Transportable goods (industries) employee remuneration.

UB : Unemployment Benefit.

UA : Unemployment Assistance.

Contents

Appendices

Chapter 1. Non-employee Unit Cost

As a background to this study of non-employee* income we direct attention to Appendix 1 and Chart 1, designed as a succinct description of the trend of inflation in Ireland in recent years.

As to Appendix 1, of major importance for the present study is the contrast in trend between unit costs of employee remuneration and of Other income: in both periods 1958-1968 and 1968-1974 the rise in the former has been much greater than in the latter. (The distinction between Other income concepts (1) and (2) will be dealt with later.) It will also be seen that in both periods unit cost of employee remuneration increased more and of Other income less than retail prices (CPI) in Ireland.

Very noteworthy is the fact that (to base 1968) the terms of foreign trade have been substantially in Ireland's favour: (economically a phenomenon as valuable as a rise in productivity), though unfortunately with a reversal in 1974. We discuss Irish and British price trends presently, in our comment on Chart 1, remarking here only that, despite admonition,[+] since 1968 the Irish index has systematically risen more than the UK index[++] (see Appendix 1).

After generally lagging behind retail prices in the period 1958-1971, agricultural prices forged ahead in 1971-1973 with, of course, enhanced inflationary effect: note the great rises in retail prices and employee remuneration in 1973-1974.

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* For brevity, in the text we usually term this "non-wage" or "Other".

\+ R. C. Geary and J. L. Pratschke: "Some Aspects of Price Inflation in Ireland" ESRI, Paper No. 40, 1968, advising that meticulous attention be given to keeping the Irish price trend at or below the UK trend, in the interest of our exports thereto.

++ It is possible that the faster rise in the Irish CPI compared to the British RPI may have been due to differences in the weighting patterns between the two countries, or to differences in the rates of increase of indirect taxes less subsidies. A recent NESC report has examined these questions and concludes in respect of the former that "during the period 1968-73, ... a time of very rapid inflation, ... differences in weighting have imparted no specific bias in either direction ... Any doubts as to the comparability of the two index numbers can, therefore, be safely ignored". In regard to the effects of indirect taxation, the report found that changes in taxes could, at most, explain only a small proportion of the difference between the UK and Irish indexes between 1968 and 1973, though due to problems with the comparability of data, the evidence is not conclusive:
E. V. Morgan: "Causes and Effects of Inflation in Ireland", NESC Report No. 10, 1975; (see especially the Appendix by S. Scott).

In Appendix 1 there is first mention of unit cost, a well-known concept considerably exploited in this paper. It is the quotient of the current value of any entity (GDP, employee remuneration, Other income etc.) divided by the corresponding volume of output, i.e. the value of the entity at constant prices, usually expressed in index number form. It is the best economic indicator of the "price" of an entity. If in year t, number of labour hours is N_t, total current labour cost L_t, volume of GDP Y_t, all in index number form with same base year (say, 1968 as unity), then -

Current cost of labour = $C_t = L_t/N_t$

Productivity of labour = $\pi_t = Y_t/N_t$

so that -

Unit cost of labour = $L_t/Y_t = C_t/\pi_t$

or, in words, unit cost of labour is the quotient of current money wages per hour by labour productivity. Other entities can be treated in an analogous way.

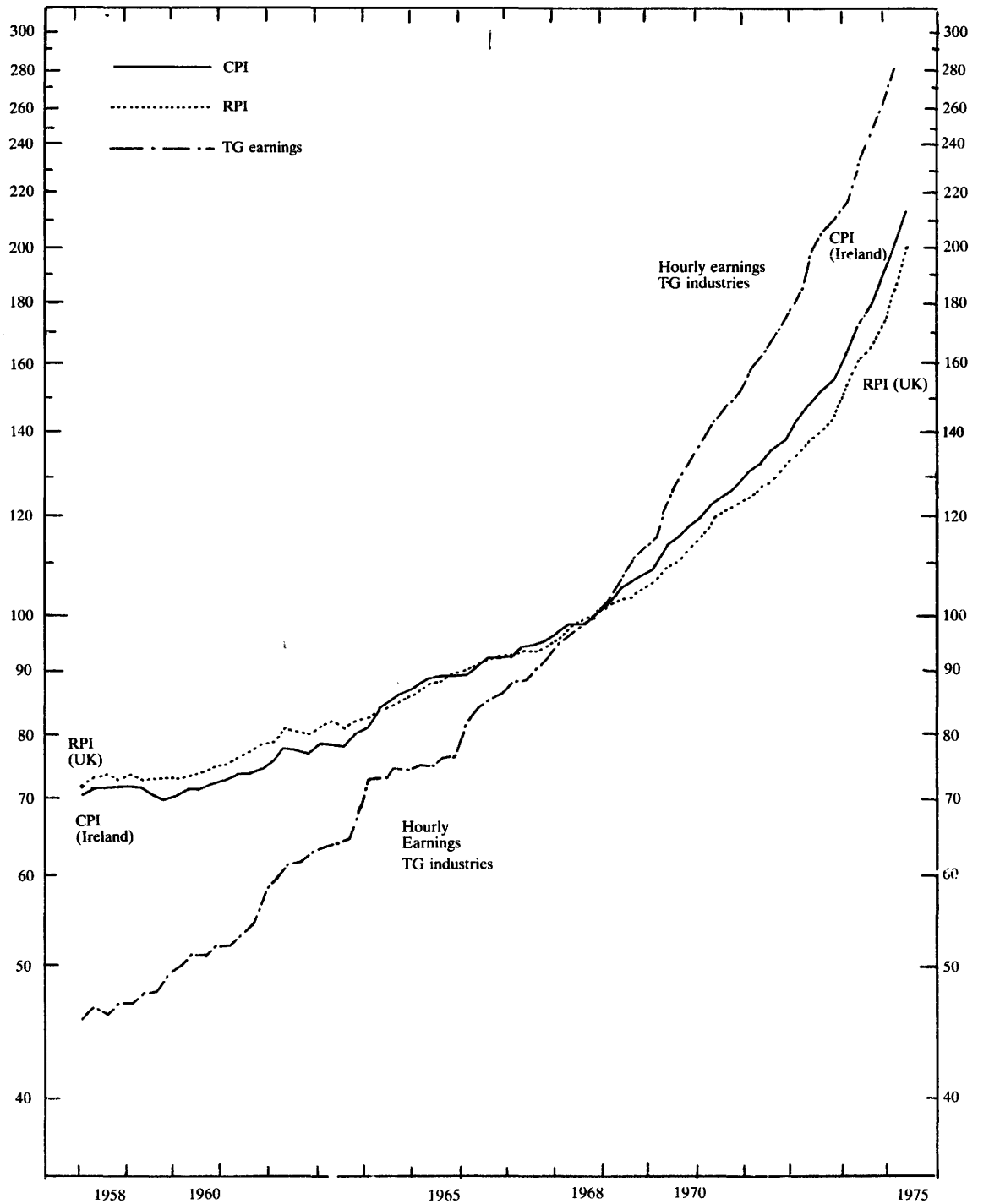
Of course the graph for TGER in Chart 1 as in current money terms gives a grossly exaggerated notion of the true situation as it affected employees: here it is designed merely to give an idea of the magnitude of inflation. In real terms (using CPI as a deflator) TGER rose by 37 per cent between the fourth quarter of 1968 and the first quarter of 1975 and by 4.3 per cent in the latest year (i.e. to first quarter 1975), compared with an annual average rate of 5.4 per cent in the period from fourth quarter 1968 to first quarter 1974. The sharply increased rate of inflation in 1974 has slowed down somewhat labour's rate of improvement in standard of living.

[Chart 1]

Chart 1 shows on a logarithmic scale quarterly indexes of UK and Irish retail prices and hourly TG employee remuneration from 1958. It has been shown* that in the period 1947-1965 there was a marked similarity between the trend in UK and Irish retail prices, if in general conformity rather than simultaneity. This is confirmed to the eye, by Chart 1, for the period 1958-1974 though, as remarked above, since 1968 the Irish

* Geary and Pratschke, op. cit., where it is shown that the "disparity index" between the prices is low though, of course, the internal Irish effect is considerable, tending to push the Irish figure in advance of that of the UK.

Chart 1 : **Average hourly earnings in TG industries, CPI (Ireland), RPI (UK); quarterly 1958-1975. November 1968 as 100. (Logarithmic scale).**



index has tended to rise more than the UK index. It seems to us that Ireland's intimate economic and social involvement with the immensely larger UK (i.e. UK cause, Ireland effect) must be a major consideration for our findings and recommendations.

To make another important point, we subjected the data for the two periods 1958-1968, 1968-1974 for the two Irish graphs on Chart 1, i.e. four sets of data in all, to orthopol* analysis. Applied to each of the two time periods, this was equivalent to fitting a linear trend and a curve of the second degree orthogonal to it in time t (in quarters). Orthogonality means that the quadratic trend in each case can be superposed on the linear.

The eye does not deceive in showing that the gradient of increase in both graphs, (i.e. the coefficients of the linear terms) is statistically highly significant ($P < .001$). As regards the curvature (i.e. the quadratic coefficient), for log (CPI), it is highly significant in both periods ($P < .001$) and significant but much less so as regards log (TGER) ($.05 > P > .01$).+

While the quadratic (i.e. the curvature upwards) coefficient of log (CPI) is larger in magnitude in 1958-1968 than in 1968-1974, the difference is not statistically significant ($P > .05$). The important point is that the propensity of the log (CPI) graph to curl upwards around the linear trend was inherently as emphatic in 1958-1968 as in 1969-1974.

The truth is that the seeds of the present critical inflationary situation were present long before they became a matter of concern some two years ago. Indeed the signs were unmistakable long before 1968.++

The appearance of inevitability of Chart 1 is no reason for despair. Governments in other European countries have been successful in diminishing inflation in recent years.

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* R. A. Fisher and F. Yates: Statistical Tables for Biological, Agricultural and Medical Research, Oliver and Boyd, 1957.

\+ See Appendix 7 for actual analysis.

++ R. C. Geary and J. L. Pratschke, op. cit. The Central Bank and the NIEC also, have for long been issuing warnings.

Macro Aspects of Non-Employee Income

Our major source here is the Central Statistics Office (CSO) annual series National Income and Expenditure (NIE). In these reports values of certain macro series are estimated in current and constant prices. Series so shown comprise (i) GDP at factor cost by 5 sectors of origin, (ii) GDP at market prices in 7 categories. Our main interest in these statistics is the implicit price indexes derived as the quotient of the current value by the constant value.

We must, therefore, form some idea of what values at constant prices mean. Conceptually the values of the items at current prices are unique and well-defined, though there are, of course, margins of errors in their estimation. Conceptual and practical difficulties are rife in the estimation of the constant price series. Sometimes more than one value is conceivable; sometimes none at all, though here it may be a case of the practical difficulties being insurmountable, rendering necessary recourse to arbitrary price deflators. Even as regards aggregates: in NIE, GDP at constant market prices as derived from the sectoral factor cost side is different from that from the expenditure side. This conflict could not arise if all elements of added value were estimated by the double deflation method. This has proved practicable only in the case of the agricultural sector. Services of public authorities were in general found by valuing number of employees at base year remuneration: this means that labour productivity in this sector is assumed constant, surely dubious in the light of increase in government activity. Generally speaking, volume estimates in the two sectors Agriculture, forestry, fishing and Industry are of better statistical quality than in the other three sectors which are practically all producing services (as distinct from goods). Having entered this caveat (and in full sympathy with CSO), in what follows we accept, without further comment on this aspect, the official estimates. In principle we therefore assume that every current value flow is factorisable into price and quantity, i.e. $V = PQ$, even if this can be done in more than one way and if the estimates of P and Q vary greatly in reliability*.

[Table 1.1]

* The unsatisfactory situation as regards statistical estimation of the volume of public and other services is a world phenomenon. It has been proposed as a project for investigation by ESRI.

Table 1.1: Unit costs of employee and Other income and consumer price index 1968-1974, with year 1968 as 100

Year	Consumer price index	Employee remuneration	Other income			
			AFF	Non - AFF		Total
			(2)	(1)	(2)	(2)
1968	100	100	100	100	100	100
1969	107.4	110.4	104.4	111.2	113.9	107.2
1970	116.2	125.2	107.7	110.6	114.2	108.9
1971	126.7	137.3	111.8	116.7	118.6	113.3
1972	137.5	151.5	145.7	137.5	135.4	137.8
1973	153.3	170.2	190.2	160.9	142.5	157.2
1974	179.3	198.7	165.5	183.7	152.4	153.7

Basic sources: 1968-1973 NIE 1973

1974 - Review of 1974 and Present Outlook - June 1975

Notes

(1) Gross of stock appreciation; (2) net of stock appreciation - see text. 1974 figure for AFF is based on current and constant net output values of agriculture (alone), including stock changes.

The NIE Table A.2 distinguishing remuneration of employees and Other income in five major sectors of origin at current market prices forms the basis of our macro approach. In aggregate these are the main constituents of gross domestic product (GDP) at factor cost; the only other constituents are the adjustment for stock appreciation, (i.e. alteration of change in value of stock included in Other income to the national accounting definition value of volume change in stocks), and provision for depreciation. With the recent huge increase in wholesale prices this (negative) adjustment figure has become large and must be taken into account. In the years 1972-74 this increase largely explains the poor showing of cash flow compared with profits according to the accountancy definition. To show the importance of the adjustment: in 1973 Other income in industry was £195m., adjustment for stock appreciation was £65m. or one-third of unadjusted Other income; the corresponding percentage for the sector Distribution, transport and communication was about one-sixth. Unadjusted and adjusted concepts are used in Table 1.2 and Chart 2 partly based on it.

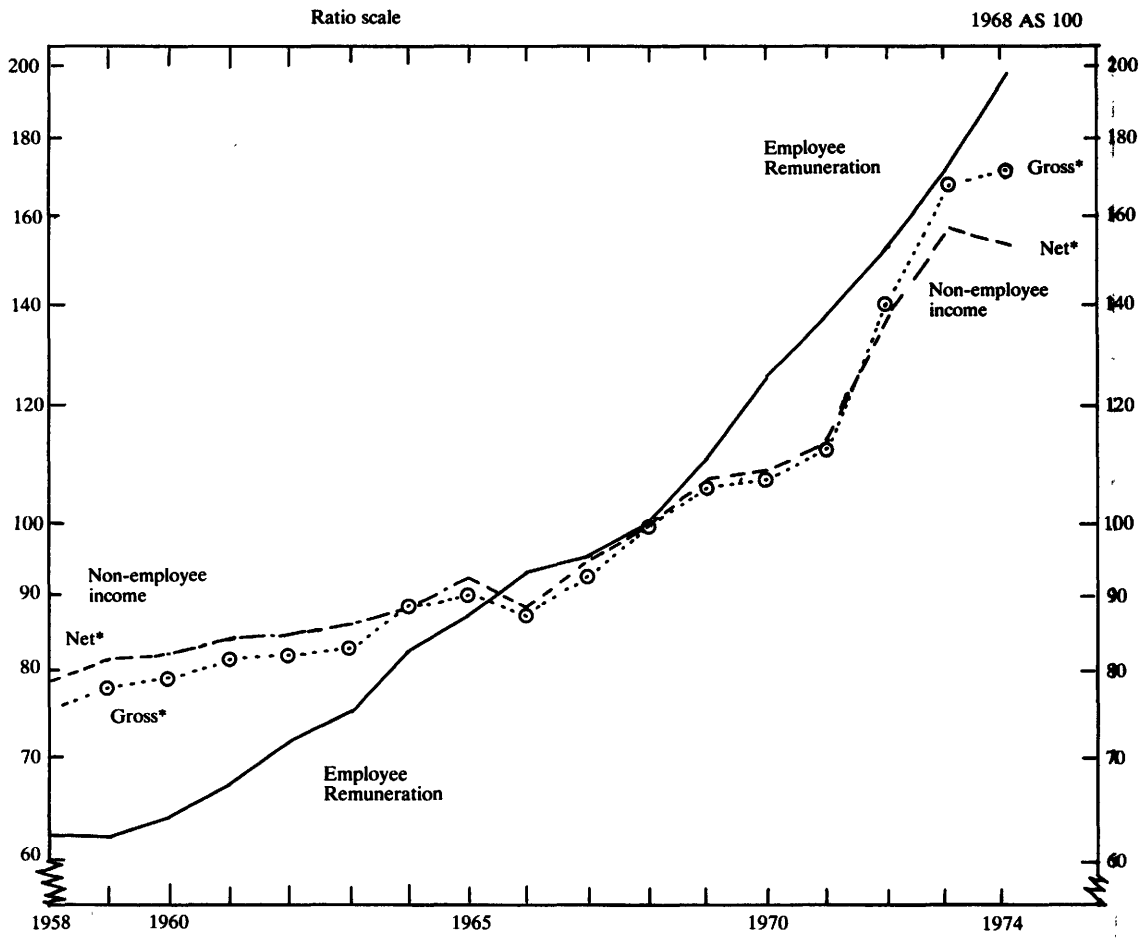
[Chart 2]

All three graphs on Chart 2 are expressed per unit of real GDP at factor cost in index number form. The two graphs for Other income show that the adjustment was not important during the period 1958-1972 but assumed much significance in 1973 and 1974.

Chart 2 shows that up to 1971 the gradient of increase of unit cost of Other income was far less steep than the unit cost of employee remuneration. There was a sharp change in trend in the Other income graph in 1972-1973, so that in 1973 the index had practically reached the level of that of employee remuneration. In 1974 there was clearly a falling away especially evident in the net graph. This is probably one source of the depression of 1974-1975, with its huge increase in unemployment. Decisions to change industrial output are made mainly by recipients of Other income, who are, of course, influenced by factors other than trend in Other income.

As it was well known that income experience in agriculture was very different from that in other sectors during the last three years it seemed desirable to distinguish AFF from the rest of Other income in this study of unit costs. Table 1.1 shows that AFF after being lower in unit cost (to base 1968) during the years 1969-1971, unmistakably "took off" in 1972, to reach a peak in 1973 far ahead of the index for Other income elsewhere in the economy. The severe fall in 1974 still left AFF well above the net figure (2) for unit cost of the rest of Other income.

Chart 2 : **Unit cost of employee remuneration and non-employee income 1958-1975**



* of stock appreciation

Sources : Tables 1.1, 1.2 and NIE.

In a later chapter we shall show that prices of Irish agricultural products and materials are in the main outside the control of Irish farmers. Irish farmers are "not to blame" for the trend in prices on which their incomes so largely depend. Nonetheless we must surmise that the great rise in the unit cost of Other income in AFF that began in 1972, meaning for consumers a marked rise in the price of foodstuffs was a major contributory cause to the great rise in CPI and in the unit cost of employee remuneration - the latter two related, of course - in 1973 and 1974.

So far our function has been simply to describe, not to analyse or to demonstrate cause-effect. We certainly cannot infer, at this stage, that because the unit cost of labour is rising more rapidly than that of other incomes labour, is "more to blame" for inflation than the self-employed and profit earners. It could happen that in two periods being compared with the same volume of output there was a change-over towards labour intensity, i.e. more labour and less tangible capital, or fewer employed but working harder and more skilfully (i.e. improved labour productivity), or change in structure which certainly occurred.

We are beginning to discern one of the major problems in this research: what are the quantity units of measurement in the context of the definition of price, "price is the value of a unit of product", the product being deemed to be reasonably homogeneous?

[Table 1.2 and Chart 3]

Unit Costs in Five Broad Sectors

In Table A.2 of NIE net national product at current prices is displayed in five broad sectors each sub-classified into (a) remuneration of employees and (b) other income. In Table A.4 output at constant (1968) prices is shown for the five sectors. Consequently we are enabled to produce for each sector the two unit cost indexes on exactly the lines already discussed for GDP as a whole. The results are shown in Table 2, graphed on Chart 3. Unfortunately, figures for later than 1973 are not estimable for non-agricultural sectors.*

* Revised and updated unit cost indexes for the period 1969-1974 are presented in Appendix 9; the material for this appendix became available at a late stage of the research.

Table 1.2: Unit cost indices for remuneration of employees and other income, and implicit price indices for gross domestic product (factor cost), 1958-1973.

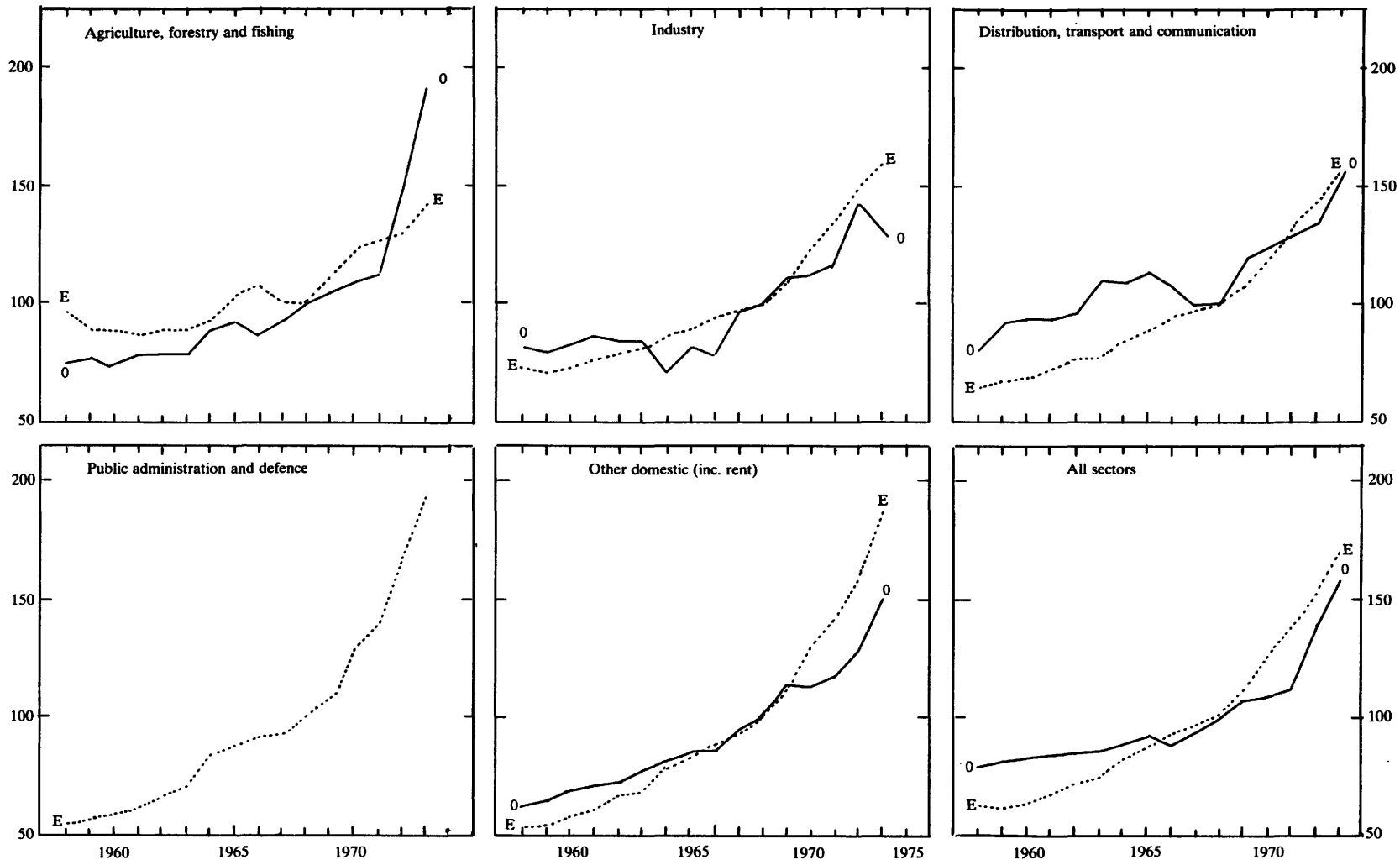
1968 as 100

Year	Agriculture, forestry and fishing	Industry	Distribution transport and communication	Public administration and defence	Other domestic (inc. rent)	All Sectors
			Remuneration of employees			
1958	95.9	72.4	64.9	54.2	52.9	62.1
1959	89.5	71.1	66.5	55.9	54.6	61.8
1960	88.0	72.7	68.3	58.9	57.5	63.8
1961	86.2	75.3	72.0	61.8	60.4	67.0
1962	87.9	79.4	75.7	65.9	65.5	71.6
1963	88.4	81.8	77.0	70.0	68.7	74.9
1964	92.9	86.7	84.8	83.9	78.1	82.4
1965	103.7	88.7	88.2	87.9	82.6	86.8
1966	107.4	94.9	94.3	91.5	88.5	92.8
1967	100.1	96.4	97.5	92.7	92.8	95.4
1968	100	100	100	100	100	100
1969	110.3	109.7	106.5	109.5	110.6	110.4
1970	121.3	123.0	117.6	120.2	129.1	125.2
1971	125.4	135.1	131.1	141.1	141.4	137.3
1972	129.2	147.5	142.2	167.8	158.7	151.5
1973	141.1	158.5	156.4	196.1	185.2	170.2
			Other Income			
1958	74.7	80.3	80.0		62.2	78.7
1959	75.2	78.1	92.1		62.6	81.4
1960	73.3	82.9	94.5		68.6	82.3
1961	76.6	86.0	94.5		70.7	84.2
1962	78.4	84.4	96.4	not	72.6	84.6
1963	78.5	84.1	109.8	applicable	76.5	85.6
1964	88.3	70.6	109.7		80.8	88.8
1965	91.5	82.9	113.9		83.8	92.2
1966	86.8	77.8	107.1		87.1	88.3
1967	92.4	95.8	99.6		94.0	94.5
1968	100	100	100		100	100
1969	104.4	110.6	117.7		114.7	107.2
1970	107.7	111.9	123.3		112.2	108.9
1971	111.8	115.6	127.3		116.8	113.3
1972	145.7	142.7	134.1		128.2	137.8
1973	190.2	129.4	153.3		149.9	157.2
			Gross domestic product (factor cost)			
1958	76.0	71.8	66.5	54.2	55.4	66.6
1959	75.4	71.0	70.7	55.7	57.3	67.6
1960	73.6	73.3	72.5	58.9	60.4	69.1
1961	76.5	75.9	75.9	61.8	63.2	72.0
1962	76.5	79.5	79.4	65.9	67.1	75.4
1963	78.9	82.1	83.5	70.1	70.9	78.2
1964	87.8	83.1	89.0	84.0	78.2	83.9
1965	92.3	87.3	93.2	87.9	82.7	88.2
1966	89.2	91.5	95.6	91.5	87.5	90.7
1967	93.4	96.2	97.1	92.7	93.0	94.8
1968	100	100	100	100	100	100
1969	105.0	109.9	109.3	109.5	112.0	109.2
1970	109.2	120.6	119.0	129.2	123.2	119.2
1971	113.3	130.7	130.2	141.1	132.8	128.3
1972	143.9	146.5	140.2	167.8	148.1	146.4
1973	184.8	152.0	155.6	196.1	172.9	165.4

Basic Source: 1958-1964: National Income and Expenditure, 1971. 1965-1967: National Income and Expenditure, 1972. 1968-1973: National Income and Expenditure, 1973.

Notes: Figures for Other Income are net of stock appreciation. At the time of writing the latest NIE available was that for 1973.

Chart 3 : **Unit cost indices (base 1968 as 100) for remuneration of employees (E) and Other income (O) in five major sectors and all sectors, 1958-1973**



Source : Table 1.2

In the three non-AFF sectors for which comparison is possible, in the period 1958-1973 the rise in wage cost has been much greater than is the case with Other income.

All four non-agricultural wage unit costs have the same characteristics - they always rise first slowly and much more steeply after 1968. To the eye the employee remuneration (E) graphs for Public administration and defence and Other domestic are even more alike than any other pair. This is borne out by the correlation coefficient between the 14 year-to-year changes in wage unit costs which is as high as .96 compared with, e.g., .86 for the c.c. between Public administration and defence and Industry wage unit cost changes. The Other domestic sector, nearly a quarter of GDP at factor cost, obviously includes income of all services other than those in Transport etc. and Public administration.

The apparently excessive rise in Unit costs in Public administration and defence is subject to the qualification that in this sector volume output is measured for the most part by numbers engaged, hence it is assumed that there has been little or no rise in productivity. We can offer no opinion as to the plausibility or otherwise of this assumption hence we do not know to what extent or direction true unit costs differ from those shown for this sector in Chart 2. We can only recommend that CSO develops statistics of volume output for Public administration and defence and other service sectors which (with some knowledge of the methodology) we add is easier said than done. See also remarks and footnote on page 5.*

The Concept of Price of Other Income

The difficult problem of pricing Other income may be approached from a somewhat different angle. So far we have been content to derive unit cost indexes for employee compensation and other income by dividing current values of each by constant price values of GDP, thus preserving the current value proportionately of each. Here we try to regard employee compensation as businessmen regard it, a cost like any other.

An Example. A cabinet-maker with an employee makes a single product - say, tables, always to exactly the same design. In quantum, materials required are always the same;

* Precise definitions of the sectors shown in Table 1.2 will be found in NIE 1973, pp. 40-41.

for simplicity we assume a single material, timber. The following illustration shows how price of Other income is calculated in period 2 compared to period 1. The actual price of a table (over which the cabinet-maker has no control) is £6.5 in period 1 and £7.15 in period 2.

	Period 1	Price Index	Period 2
	£		£
1. Timber	2.600	1.12	2.91200
2. Emp. remun.	1.625	1.09	1.77125
3. Other income	2.275	P	2.46675
4. Total	6.500	1.10	7.15000

The prices of items 1 and 4 are unambiguous. As regards 2, the hourly rate has increased in the ratio 1: 1.1227 but because of an increase of labour productivity of 3 per cent the employee cost embodied in a table increased by the 9 per cent shown (1.09 = 1.1227/1.03).

The price index required is then

$$P = 2.46675/2.275 = 1.084$$

To link the example with what follows we should point out that this exemplifies only the Laspeyres (earlier weighting) approach. Actually Laspeyers and Paasche give identical figures here.

The Algebra of Double Deflation*

Price, as commonly understood, is a gross concept. Thus, the products (goods or services) of a firm each have a unique price per conventional unit; so have the various non-factor inputs. The difference between the values of products and of non-factor inputs is the added value, i.e. a net value. The price and quantum of added value are realisable concepts (i.e. $V = PQ$, as always), apart from statistical difficulties, but they cannot be validly derived without the intermediacy of prices of products and materials, i.e. gross prices. In fact let V_i and v_i be the current value of output and value of input respectively

* We hope that this algebraic interlude will not seem intrusive. It is very simple; one of the authors was involved in its development; and it is the easiest way of introducing a subtle economic argument.

in period i and V_{ij} and v_{ij} the values of quantities in period i at period j prices. Let a_i be added value so that, at current prices, $a_i = V_i - v_i$. Let there be two periods 1 and 2. Then -

$$a_1 = V_1 - v_1; \; a_2 = V_2 - v_2.$$

But also define a_{ij} as follows -

$$a_{12} = V_{12} - v_{12}; \; a_{21} = V_{21} - v_{21}$$

Then

$$P' = a_{12}/a_1; \; P'' = a_2/a_{21}$$

where P' is the Laspeyres and P'' the Paasche price index. Similarly for the quantum indexes -

$$Q' = a_{21}/a_1; \; Q'' = a_2/a_{12}$$

Granted the logic of the classical Laspeyres and Paasche formulae, one can scarcely conceive of any other approach to the factorisation of added value than that indicated, which is termed the double deflation method. This necessarily involves gross prices. Note that the various indexes behave statistically as they should: for instance the classical result that the product of Laspeyres price by Paasche - quantum and vice versa is the value index. Thus

$$P' Q'' = P'' Q' = a_2/a_1.$$

Actual Calculation of Price of Other Income

We now use the GDP accounting identity -

GDP = Domestic demand + exports - imports
= Employee remuneration + Other income (after adjustment for stock appreciation) + provision for depreciation + taxes on expenditure - subsidies.

GDP is at market prices; domestic demand includes government as well as personal expenditure and capital expenditure. All flows except the two income flows on the right are gross and hence uniquely priceable; in fact in NIE constant (1968) price series are given for all so that their average annual prices in index form are derivable as the quotient of current by constant price value.

We propose to find the price index between consecutive years for Other income by regarding the identity as an equation for determining the only unknown, namely, the price

of Other income.

In index number making we price an identical "basket" of goods and services (i.e. identical in quantities) at the prices ruling in the periods of comparison 1 and 2, the Laspeyres or Paasche indexes being the quotients of the two figures. Treating employee compensation as a cost raises the thorny question of the unit to be used in pricing paid labour. In the cabinet making example we priced labour as per unit of output. While we prefer this concept, we admit that a case could be made for pricing as per hour, in the interest of "no change" in quanta in the periods of comparison. In Tables 1.3 and 1.4 we calculate year-to-year price indexes of Other income using the per unit of output concepts only for the price of employee remuneration.

[Table 1.3]

In Table 1.3 we give the actual working of the unit cost (price) of Other income according to the ideas in this paragraph, for 1968 to base 1967 as unity.

From the Note to Table 1.3 it is obvious that P' is the Laspeyres, and P'' the Paasche, price index, P the Fisher Ideal. Actually the values of P' and P'' are almost identical here and between every pair of years - see Table 1.4.

In appearing to deflate GDP (flagrantly a new flow) by a single index we may be thought to have infringed the rule that only gross values are conceptually priceable. This is not so. As we have carefully checked, the CSO implicit deflator of GDP is an exact synthesis of five gross flows: personal expenditure, government expenditure, GDFCF, exports and minus imports.

Year-to-Year Changes in Price of Other Income

We give all these year-to-year price (unit cost) indexes in column 1 of Table 1.4 in which two other versions of non-employee income prices are given as well.

[Table 1.4]

Table 1.4 shows that, while the three Other income price series are perceptibly different they all sustain the proposition that the non-employee cost increases were generally less than the employee remuneration increases. Indeed, as the cumulative indexes show,

Table 1.3: Illustrative working of index of unit cost of Other Income in 1971 to base 1970 as 100. (£ million.)

	Item	Actual Value		Price Index (1970 as 1)	Q 1970 at P 1971	Q 1971 at P 1970
		1970	1971			
		1	2	3	4	5
1.	Gross domestic product at market prices	1,641.3	1,869.7	1.1004	1,806.09	1,699.11
2.	Employee remuneration	829.8	961.9	1.0957	909.21	877.89
3.	Other income (net of stock appreciation)	431.6	474.9	P', P", P	479.48	427.26
4.	Provision for depreciation	132.6	148.4	1.1019	146.11	134.68
5.	Taxes on expenditure	326.3	371.4	1.0819	353.02	343.28
6.	Less subsidies	-79.0	-86.9	1.0345	-81.73	-84.00

Basic Source: National Income and Expenditure 1973, Tables A.2 - A.6.

Notes: Column 3: Quotients of estimates of values at current by values at constant (1970) prices.
2. Employee remuneration - see Table 1.2
3. For P', P", P, see below.
4. Provision for depreciation - price index applicable to gross domestic fixed capital formation.

Column 4: Column 1 x Column 3.

Column 5: Column 2 ÷ Column 3.

P', P" and P are derived as follows: $431.6P' = 479.48$ (The right hand side of each equation being the difference between $474.9/P'' = 427.26$ Item 1 and Items 2 - 5 in columns 4 and 5 respectively).

$P' = 1.1109$; $P'' = 1.1115$; $P \equiv (P'P'')^{\frac{1}{2}} = 1.1112$.

Table 1.4: Three estimates of unit cost of Other Income; unit cost of employee remuneration; consumer price index. Previous year as 100.

Year	Other Income			Employee remuneration	Consumer Price Index
	1	2	3	4	5
1959	107.9	103.4	103.7	99.6	100.0
1960	97.4	101.0	101.7	103.1	100.4
1961	102.5	102.3	103.0	105.0	102.7
1962	100.4	100.5	100.9	106.9	104.2
1963	99.6	101.3	101.1	104.6	102.0
1964	110.2	103.7	106.0	110.0	106.7
1965	102.9	103.8	101.8	105.4	105.0
1966	96.6	95.9	97.4	106.9	103.0
1967	105.7	106.9	106.2	102.8	103.2
1968	102.0	105.9	107.8	104.8	104.7
1969	101.9	107.3	106.1	110.4	107.4
1970	99.9	101.6	101.1	113.5	108.2
1971	111.1	104.0	105.0	109.6	109.0
1972	122.3	121.6	123.4	110.3	108.6
1973	120.1	114.1	120.3	112.4	111.4
1958-1968*	127.3	127.0	133.3	161.1	137.4
1968-1973+	166.1	157.2	167.2	170.2	153.3
1958-1973*	211.5	199.7	222.9	274.2	210.6

* 1958 as 100. + 1968 as 100

Basic Sources: National Income and Expenditure 1973 Tables A. 2-A. 6 Irish Statistical Bulletin. December 1974.

Notes

Column 1: Using the method illustrated in Table 1.3.
Column 2: based on Table 1.2. (the numerator is Other Income net of stock appreciation, the denominator GDP at constant factor cost.
Column 3: Similar to Column 2, but with Other Income gross of stock appreciation as numerator.
Column 4: based on Table 1.2
Column 5: the figure for each year is based on an average of quarterly observations.

they were quite close to the CPI, at the later period 1968-1973. Other income price seems to have strengthened its position vis - à - vis employee income price in 1968-1972 compared with the earlier 1958-1968.

The outstanding feature of Table 1.4 is perhaps the upsurge in the price of Other income in 1972. From Table 1.2 this rise is obviously due to Agriculture, forestry, fishing for which we find that unit cost of Other income rose by 30 per cent, compared with 23 per cent for industry, 5 per cent for distribution etc. and 10 per cent for other domestic.

Ceteris paribus we might have expected a negative relationship between year-to-year rises in costs of employee remuneration and costs of Other income, i.e. that a rise in one was at the expense of the other. This does not seem to be the case. In fact the correlation between columns 2 and 4 of Table 1.4 is r = .37, not significantly different from zero with 12 d.f. but giving no indication of negative relationship.

Conclusion from Chapter 1

The main indicator of inflation, the CPI, has been increasing at an accelerating rate since 1968 (Chart 1). The tendency of the quarterly CPI graph to curl upwards was much the same in the later period 1969-1974 as in 1958-1968. Inflationary pressure has been latent for a long term of years.

While unit cost of Other income (gross) was closer to that of employee remuneration during the period 1969-1974 than in the earlier period 1958-1968, over the whole period 1958-1974 the general picture is emphatically of a greater advance of the unit cost of employee remuneration (Chart 1). Table 1.1 shows that in the period 1958-1974 unit cost of employee remuneration increased considerably more, and unit cost of Other income (net of stock appreciation) considerably less, than the CPI.

We think that much significance attaches to the change in unit costs in AFF and non-AFF (Table 1.1) in the single year 1973-1974 as an explanation of the onset of depression. While the CPI and employee remuneration unit cost both rose by 17 per cent, Other income unit cost (net of stock appreciation) in AFF fell by 13 per cent (though from a high level in 1973) and in non-AFF rose by only 7 per cent. As to what followed in 1975-1976 we need only remark that the level of activity (hence of employment) in the non-AFF private sector depends largely on the decision of recipients of Other income.

Chart 3, based on Table 1.2, shows that in major non-AFF sectors over the whole period 1958-1973, unit cost of Other income lagged far behind that of employee compensation. This was also true of the period 1968-1973 except in the case of Distribution etc.

Attention is directed to the new approach for pricing of Other income the results of which are given in column 1 of Table 1.4. We would like to have the comments of our colleagues on this approach.

Chapter 2. The Agricultural Sector as a Source of Inflation

While, as will have been seen from the last column of Appendix 1, gross agricultural prices rose considerably in 1973 (and such increase contributed to the acceleration of inflation in Ireland), this price rise was a world phenomenon. More than half of Ireland's agricultural output in 1973 was exported. Now, as always, home agricultural prices are dominated by export prices. Commodities of which Irish farmers can "make" prices are, we believe, few and their value comparatively small. Fresh vegetables may be a case in point - see Chapter 3, but even here there can be no question of monopoly: price collusion is untypical of agricultural markets. Anyway, any vestiges of internal price control are sure to vanish under the CAP of the EEC.

We made the point earlier that more than half of Other income arises in agriculture, which accordingly merits separate consideration. We first deal with the price aspect; after that, in very general terms, with income formation in recent years. We have also insisted that in all sectors the level of Other income depends largely on prices (as distinct from quanta) of products and materials. This is specially true of agriculture for which the volume of net output has increased very slowly both in the long and short term. Thus the volume of net output increased by only 13 per cent in the period 1968-1974 compared with 38 per cent in gross output manufacturing industry.

[Table 2.1 and Chart 4]

The outstanding feature of Chart 4 is the vast increase in price of materials (as defined in Notes to Table 2.1) in 1974. This is specially significant in view of the proportionately greater increase over the years in quantum of materials purchased than in quantum of gross output: 25 per cent and 15 per cent respectively between 1968 and 1974; over the longer term 1953-1974, the percentages were 189 and 58. This phenomenon marks the transition of Irish agriculture more towards a cash, and away from a subsistence, economy, a phenomenon which will usually make farmers more vulnerable in an inflationary situation.

The new index of price of net output (defined in Notes to Table 2.1) gives a more meaningful view of the agricultural price situation than does that of gross output. In effect it nets out the vast increase in the price of materials between 1973 and 1974 when the Consumer Price Index was increasing by 17 per cent. Little to wonder at the agitation of the farming community and their representatives in 1974 !

Table 2.1: Agricultural price indexes and Consumer Price Index, 1969-74

1968 as 100

Year	Agricultural prices			Consumer prices
	Gross output	Materials	Net Output	
1969	104.7	101.8	105.6	107.4
1970	109.9	106.3	110.8	116.2
1971	116.3	114.9	116.7	126.7
1972	138.8	121.5	144.4	137.5
1973	176.2	155.8	182.9	153.3
1974	180.7	208.7	171.0	179.3

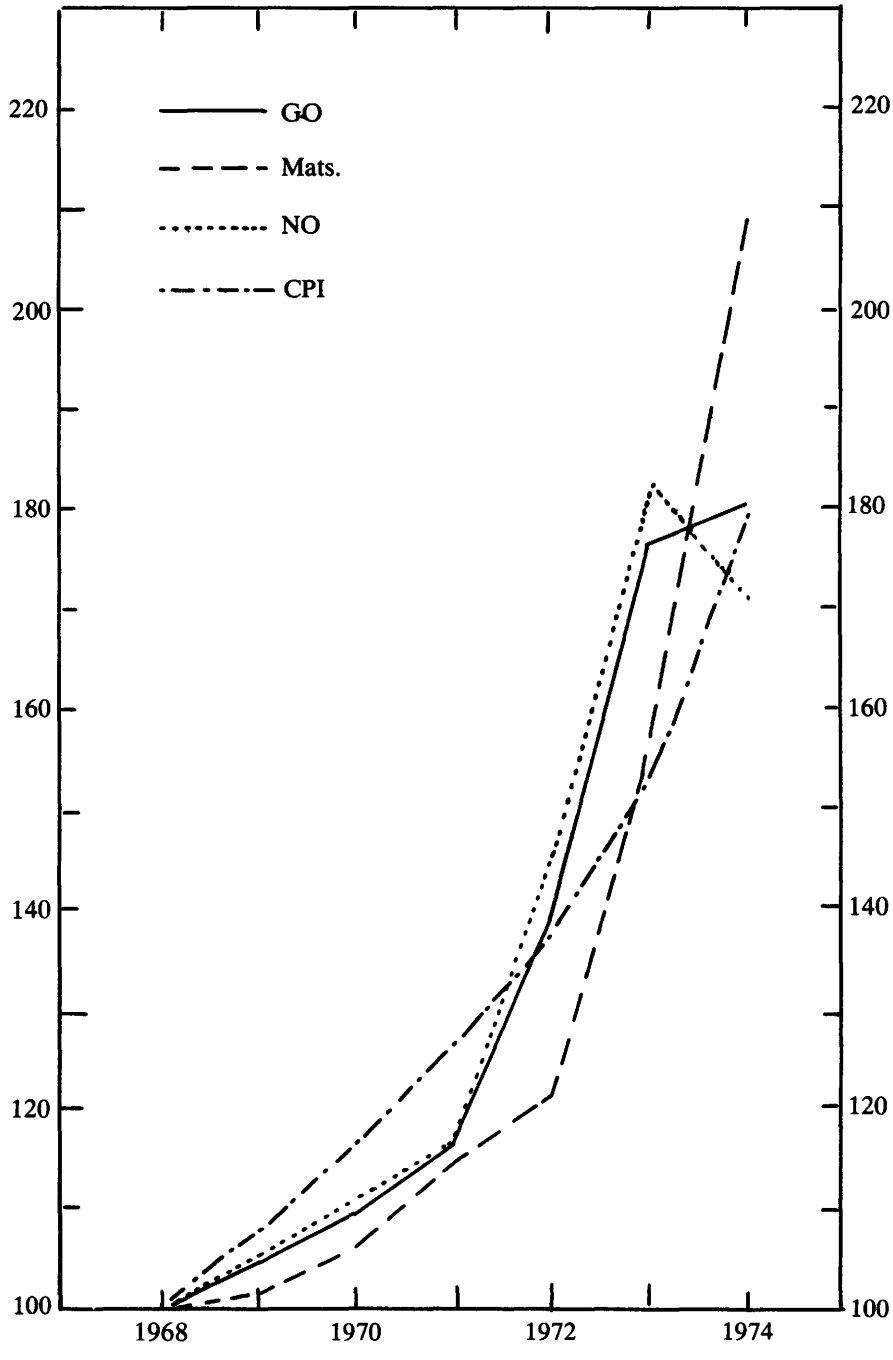
Basic sources: ISB (June issues): "Review of 1974 and Present Outlook"

Notes

All agricultural price indexes have been derived from the identity $P = V/Q$, indexes V (value) and Q (quantum) being given. Accordingly, price indexes for gross output (i.e. of sales off farms and consumption in farm households, hence ignoring inter-farm transactions) and materials (only feeding stuffs, fertilisers and seeds purchased) differ slightly from official indexes. The net output price index is new. It is derived as the quotient of value of net output (i.e. gross output less materials as defined above) by quantum of net output (i.e. gross output less materials, each at constant prices). See text and Chart 4. Gross and net output include changes in livestock numbers.

"Materials", as defined, does not explicitly include petrol, oil etc. though the enormous increase in prices thereof probably was partly responsible for the price rise in "materials". If petrol, oil etc. were included in materials, we calculate that the price index of materials would have been 213.1 (compared with 208.7 in Table 2.1) in 1974 and the price index of net output 168.7 (instead of 171.0).

Chart 4 : **Agricultural price indexes 1969-1974, 1968 as 100**



Source : Table 2.1.

We conclude this brief study of prices by the generality that, contrary to the popular opinion outside agriculture up to 1974, prices have not particularly favoured Irish farmers.

The last column of Table 2.2 (p. 25) shows that the marked expansion first recorded in 1972 was short-lived; the fall in 1974 in average real income amounted to one-fifth. As happened so often in the past in Ireland, the improvement in average real income (i.e. in purchasing power) during 1968-1974 was mainly due to fall in manpower. In fact, at 1968 prices the real value of farmers' income arising in 1974 (£358 million at current prices - see Table 2.2 - deflated by CPI) was £200 million, an advance of merely 7 per cent on the actual 1968 value (£187 million), compared with a decline in manpower in agriculture of 18 per cent.

From another angle: it has been noted that in advanced economies there is a marked tendency towards equality in broad sectors of the economy in the statistic average income per person engaged, in particular in those two broadest sectors (1) agriculture and (2) rest of the economy, though it is relevant to remark that these have a far lower proportion of their labour force in agriculture than Ireland has. This is, of course, what one would expect, granted long-term mobility in the working population, i.e. away from poor sectors and towards better sectors. It is known that, by this test, the Irish economy falls well short of "advanced" - see columns 8 and 9 Table 12 of ERI Paper No. 16.* Have agriculturalists improved their relative position in recent years?

The ratios of earned income per head of persons at work in (1) AFF and (2) rest of the economy in the years specified were as follows:-

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* E.A. Attwood and R.C. Geary: "Irish County Incomes in 1960", ERI Paper No. 16, 1963 shows that the discrepancy between average farm and non-farm employee income is due to the situation in the west and north-west of the country.

Year	Ratio
1958	57
1968	59
1972	65
1973	74
1974	61

These figures are probably too low because (1) farmers pay little direct taxation so that, on this account alone, the ratios for disposable income should be larger, (2) consumption of own produce without process of sale, valued in NIE at farm prices, should be values at retail prices. Obviously, other corrections (e.g. for subsidies) should be made to obtain "true" ratios. Such correction would be onerous and, we think, unnecessary for the present purpose, which is merely to establish trend.

While there was a real improvement in the relative position of agriculturists up to 1973, there was a severe setback in 1974, leaving them but little better than they were in 1958. Indications are that there has been an improvement in 1975. Even so, the "advanced economy" ratio of unity still seems remote.

Conclusion as to Agriculture

The great rise in agricultural prices in recent years has been a major component of inflation, directly in food prices, indirectly in the effect on incomes of the rise in the CPI. However, we can find no evidence that Irish agriculture, in general, was in a position in recent years to influence its income level through price adjustment. In the year 1974 when inflation in Ireland can really be said to have got out of hand, farmers were more the victims of inflation than the creators thereof.

This conclusion is about agriculture in general. Had we time, we would try to analyse the data by farm size, region, product etc. As is well known, average incomes vary greatly in such separate "cells". These analyses could not be sufficiently up-to-date, as we have insisted above - the year 1974 was crucial - but, with a good deal of knowledge of these aspects in the past, we surmise, with confidence, that groups in anything like a quasi-monopolistic position would be insignificant.

In our final chapter we resume discussion of the problem of inflation in agriculture.

Table 2.2: Transition from output to income of agriculture, 1968-1974

Year	Gross output	Specified materials	Other expenses	Subsidies	Income arising			Total per person at work (£)	
					Total	Employee	Other	Actual	Real
1	2	3	4	5	6	7	8	9	10
	£ million, current								
1968	304	67	52	2	187	19	168	603	603
1969	319	73	59	4	191	20	171	641	597
1970	344	82	66	7	203	21	182	717	617
1971	388	95	77	9	225	25	200	824	650
1972	480	102	87	12	303	27	276	1,135	825
1973	625	145	100	14	394	29	365	1,515	989
1974	634	175	101		358	35	323	1,409	786

Basic sources: Same as Table 1.1

Note

Our presentation differs slightly from the official one in that we have included the small amount of land annuities (about £3 million throughout) in column 4, instead of in column 6. (Data for 1974 are preliminary and contain a few speculative elements of our own) Other expenses (column 4) included rates, repairs, petrol etc., depreciation, transport and marketing, land annuities etc. Deflator for column 10 is CPI, assumed therefore to apply to agricultural income, and only approximately true.

Chapter 3. Retail Trade

Census of Distribution Data

An important source of non-wage income is retail trade, and the Census of Distribution (CD) is the most important source of data in relation thereto. The last two complete CD's were for the years 1956 and 1966. While these are remote in date they are by no means irrelevant for our study, for it will be recalled that in the postwar period inflation was always in evidence; if not at the present galloping rate at least at a smart trot. In fact, between 1956 and 1966 the Consumer Price Index increased by 38 per cent, equivalent to a compound rate of 3.3 per annum.

The 1966 Situation

We begin with an examination of the data for 1966 alone. These data consist of (1) sales, (2) gross margin, (3) employee compensation, (4) net margin = (2) less (3), and (5) number of persons engaged in the categories (a) employees, (b) family workers. Gross margin is sales minus purchases plus changes in stock between end and beginning of year. While net margin is the most relevant of these statistics for our purposes it should be pointed out that these totals contain many supplementary costs as well as income of family members. One must also recall that this income includes much that is of a similar nature to income from employment; it is therefore much more than a return to capital. The supplementary costs include turnover tax and wholesale tax in 1966, rent, rates, advertising, wrapping material etc, which together are substantial. Our main object will be to compare derived data for 1956 and 1966 and such comparisons between net margin ratios may be valid as approximating to what would be found by using non-wage incomes if these were available. Of course a constant net margin on turnover does not imply that there has been no change in the rate of return on the retailer's capital unless we assume that the ratio between the value of his sales and that of his capital has remained unchanged.

CD provides at the national level a twofold classification (1) by description of business and (2) size (number of persons engaged). As to (2), we have reduced the classes to three, 1-4, 5-9, 10+.

[Table 3.1]

Table 3.1. Major statistics for retail trade in Ireland in 1966, in three sizes of business classes, (1) actual values, (2) corrected for different type of business structure.

Size	100GM/S	100W/S	100NM/S	100W/GM	GM/P (£)	W/N (£)
1	2	3	4	5	6	7
			(1) Actual			
1-4	19.5	4.8	14.7	24.6	549	374
5-9	20.8	8.6	12.2	41.3	893	472
10+	22.5	10.3	12.2	45.7	1,248	581
All sizes	21.1	8.1	13.0	38.3	846	501
			(2) Corrected for structure			
1-4	20.5	5.3	15.2	26.1	605	394
5-9	21.0	8.8	12.2	41.6	890	476
10+	22.1	10.3	11.8	46.2	1,041	558
All sizes	21.1	8.1	13.0	38.3	846	501

Basic source: CD 1966

Notes

Notation:-

S = Sales

GM = Gross margin = Sales minus purchases plus increases in stock.

W = Employee compensation.

NM = Net margin = GM - W.

P = Number of persons engaged = number of employees plus number of family workers.

N = Number of employees.

Size in column (1) relates to number of persons engaged (P)

Corrected series (2) are found by reweighting size functions for each description of business by totals for all sizes, i.e. each size is similarly weighted. The weights are the denominators of the functions, i.e. S for columns 2 - 4, CM for column, 5 P for column 6, N for column 7.

Column 4 = Column 2 less Column 3.

The only comparisons that can be made in Table 3.1 are those between different sizes of retail outlets. But here comparison may be affected by the different sizes of different descriptions of business; for instance on average clothing firms are larger than groceries. Series (2) are accordingly provided to show what the functions would have been if all sizes were weighted alike, i.e. each given the weight pertaining to all sizes of firm of a given description. The table shows that these corrections are significant, generally in the direction of lessening the contrast between different sizes. The following comment is based on series (2).

As size increases so does the gross margin ratio (column 2). The wage ratio (column 3) increases steeply mainly because the proportionate number of employees to total engaged increases with size; in 1966 uncorrected percentages for family workers in relation to all engaged were 63.9 for size 1-4, 21.9 for 5-9, 1.7 for 10+, reflecting the tendency for shops to become limited companies with increasing size, whereby nearly all persons engaged become employees, net margin providing interest and profit for shareholders, not normally working in the business.

Of most importance from the present point of view is to note (column 4 (2)) that the net margin function decreases with increasing size. Still, column 5 suggests that even when firms are large, employee compensation tends towards about one-half of gross margin, a conclusion borne out by the more refined classification by size and description of business.

Column 6 indicates the great increase in efficiency with increasing size, which probably results in much improved pay rates. The conclusions of this section are not materially affected by the absence of a collection for purchase taxes (see below).

This study of Table 3.1 makes it important to have regard to the trend in size of retail outlets.

Comparison of 1956 and 1966

A difficulty arises in that the 1966 retail sales and hence gross and net margins included turnover tax and wholesale tax, the 1956 data being free of such impositions. For reasons given in Appendix 2 the effect of the wholesale tax was ignored and the

1966 data corrected for the effect of the $2\frac{1}{2}$ per cent turnover tax assumed to apply equally to all descriptions of business and levied on retail value inclusive of turnover tax. No correction was made for "old" indirect taxes on drink, tobacco, petrol, rates etc. levied in both 1956 and 1966 which were not remitted by the retailer, and hence not included in gross or net margins, though it is recognised that different incidence in the two years might affect comparisons of functions like 100 GM/S. Data are not available for making corrections for "old" taxes.

[Table 3.2]

The only correction made was to subtract $2\frac{1}{2}$ per cent of sales in 1966 from sales, gross and net margins and recalculate the functions involving these data, for comparison with the actual functions for 1956.

One of the most significant showings of Table 3.2 is that (comparing columns 3 and 4 for the S percentage) outlets are becoming larger, though the smallest are holding their own. An examination of descriptions of business shows that this tendency is most marked for Groceries (percentage in size 10+ increasing from 16.6 to 32.1) and is practically confined thereto. We find in fact that, on elimination of Groceries, the corresponding corrected percentage for size 10+ increased only from 47.6 to 50.1. This increase in size must lead to greater efficiency if not, unfortunately, to a lowering of the 100 GM/S statistic - again see columns 3 and 4.

At this point we must remind ourselves that this section is not an analysis of the level and trend of retail trade. The analysis was undertaken to ascertain to what extent non-employee income in this sector was responsible for inflation.

To turn to inflation, one of its major evils is said to be that it weakens the opposition of customers to price rises. If this were so, one would expect to find, during a period of inflation (in our case 1956 to 1966), a significant increase in relative mark-up in net margin (i.e. NM) our proxy for non-employee income or - a possibility we are unable to examine - a failure to pass on to consumers improvements in the value-capital to sales ratio.

Nothing of the kind can be inferred from Table 3.2. The column 3 and column 4 "all sizes" figures 100 NM/S and 100 NM/GM are practically identical, if with small decreases for the two smaller sizes and increases for the largest size.

Table 3.2: Major statistics for retail trade in Ireland in 1956 and 1966 in three size of business classes, (1) actual values, (2) 1956 separate description of business functions reweighted by 1966 weights.

Size	1956	1956 data with 1966 weights	1966	Change		
				Total	Structure	Internal
1	2	3	4	5	6	7
			S percentage			
1 - 4	35.5	34.5	33.9	-1.6	-1.0	-0.6
5 - 9	25.9	25.3	19.9	-6.0	-0.6	-5.4
10 +	38.5	40.2	46.1	+7.6	+1.7	+5.9
All sizes	100	100	100	-	-	-
			100 GM/S			
1 - 4	17.4	18.0	17.4	0.0	+0.6	-0.6
5 - 9	17.4	18.6	18.8	+1.4	+1.2	+0.2
10 +	19.8	19.8	20.5	+0.7	0.0	+0.7
All sizes	18.2	19.0	19.1	+0.9	+0.8	+0.1
			100 NM/S			
1 - 4	13.0	13.4	12.5	-0.5	+0.4	-0.9
5 - 9	9.8	10.4	9.9	+0.1	+0.6	-0.5
10 +	9.1	9.2	9.9	+0.8	+0.1	+0.7
All sizes	10.7	10.9	10.8	+0.1	+0.2	-0.1
			100 NM/GM			
1 - 4	74.8	74.3	71.8	-3.0	-0.5	-2.5
5 - 9	56.2	55.9	53.1	-3.1	-0.3	-2.8
10 +	46.8	46.4	48.5	+1.7	-0.4	-2.1
All sizes	58.7	56.9	56.6	-2.1	-1.8	-0.3
			GM/P (£)			
1 - 4	265	268	479	+214	+3	+211
5 - 9	450	457	786	+336	+7	+329
10 +	633	641	1,109	+476	+8	+468
All sizes	402	427	745	+343	+25	+318
			W/N (£)			
1 - 4	201	206	374	+173	+5	+168
5 - 9	254	266	472	+218	+12	+206
10 +	346	355	581	+235	+9	+226
All sizes	278	295	501	+223	+17	+206

Basic Source: CD 1956 and 1966.

Notes: (See over)

Notes to Table 3.2

For notation (S GM etc) see Table 3.1

Most of the column 4 figures differ from the similarly described figures in Table 3.1 because the Table 3.2 figures have been corrected for the effects of the $2\frac{1}{2}\%$ turnover tax of 1966. This correction reduced the original S and hence GM and NM by .025S, leaving W, P and N unchanged.

The column 3 figures show what the 1956 functions would be if the absolute values of S, GM, P and N were those of 1966. They are the most useful data for comparison with those of column 4

Col. 5 = Col. 4 - Col. 2

Col. 6 = Col. 3 - Col. 2

Col. 7 = Col. 4 - Col. 3

The reweighting undertaken in Table 3.2 has a different object to that in Table 3.1. For the classes 1-4, 5-9, 10+, the adjusted figures are obtained by reweighting the observations in 1956 for a given class size over all business descriptions, using the weight appropriate to the description and class in 1966.

The adjusted All sizes figure is obtained by reweighting (using the appropriate 1966 "all sizes" weights) the three revised figures of the previous paragraph.

In fact, in general the table gives a strong impression of regularity. Again comparing columns 3 and 4, the percentage increases in the efficiency ratios for GM/P are very similar in the three size groups. As regards W/N, there was a tendency for average employee compensation to increase percentage-wise more for small shops than large, a natural tendency towards equalization in view of the low pay in small shops in 1956.

For all sizes the adjusted or 'internal' increase in GM/P was 74 per cent, very close to the 70 per cent 'internal' increase for average employee compensation W/N. But, as indicated earlier, the Consumer Price Index advanced by only 38 per cent. Is there evidence of undue inflationary pressure here?

Let sales (S) in 1956 and 1966 be S_1 and S_2 respectively with numbers engaged respectively P_1 and P_2. Let the unitary retail price index (to base 1956 as 1) be p. Then one measure of (persons engaged) productivity π is:-

$$\frac{S_2 \cdot P_1 \cdot 1}{P_2 \quad S_1 \quad p}$$

By this criterion if $\pi = 1$, then output per person must have remained unchanged; if $\pi > 1$, it must have increased, and vice versa if $\pi < 1$. Using uncorrected figures for S_2 (i.e. inclusive of 2½ per cent turnover tax) we find $\pi = 1.31$.

If we assume that the unitary index of gross margin per person engaged of 1.74 is price-deflatable by the unitary Consumer Price Index of 1.38 (incorrect strictly speaking but probably near enough to the truth for the present purpose), the real increase in unitary gross margin per person was 26 per cent (1.26 = 1.74/1.38), hence less than π. The answer to the question posed at the end of the second last paragraph is in the negative. During the interval 1956 to 1966 compensation of either employees or family workers in the retail sector was not inflationary.

It is true that the foregoing calculation, based on productivity, has in it elements of tautology, the two sides of the calculation simply repeating the regularities of comparison in Table 3.2. But, even without the productivity calculation, one could rely on the regularity alone to argue that retailers were concerned only to maintain these regularities (percentage marks-up and the like) during a period of price and wage increase, though of course less than in more recent years.

The Annual Inquiry into Retail Trade by the Central Statistics Office provides estimates on a sample basis of the sales, and of the ratio of gross margin to sales, of retailers. These estimates are available for the period 1967-1970 only. After a draft of this chapter had been prepared, summary results of the 1971 Census of Distribution were published. Table 3.3 is based on these two sources.

Table 3.3. Sales and Ratio of Gross Margin to Sales 1966-1971.

	Sales (£ million) (1)	Increase in Sales (%) (2)	Gross Margin:Sales (%) (3)
1966	473.76	-	19.1
1967	510.24	7.7	19.3
1968	564.32	10.6	19.0
1969	624.71	10.7	19.6
1970	682.81	9.3	18.7
1971	758.51	11.1	20.0
1966-1971 Average	-	9.9	19.3

Basic Sources: 1966, 1971 CD

1967-1970 ISB December 1972.

Notes

The estimates of sales in the years 1967-1970 are obtained by applying the percentage change in sales of sample respondents to the 1966 CD figure for sales (including sales of CD non-respondents). The ratio of gross margin to sales is adjusted for the turnover tax, included in reported gross margins in 1971 only, allows for the effect of CD non-respondents.

In interpreting the figures in column (3) it should be remembered that the absence of a correction for wholesale tax receipts included in gross margins is more serious in the years 1967-1971 than in 1966 (the tax was introduced at 5% on 1st October 1966), and particularly so in 1970 and 1971 (the tax was doubled to 10% on 1st May 1970). (See Appendix 2).

It appears that there has been little change between 1966 and 1971 in the ratio of gross margin to sales, and that the trend of the period 1956-1966 has continued.

Conclusion as to Retail Trade

The period we deal with is rather remote, even though an effort has been made cursorily to bring it up to the latest CD year, 1971.

The strongest impression this section of the research has left on us is that retailers have acted to preserve their more-or-less traditional percentage marks-up which would imply that little attempt, if any, was made to take advantage of inflation, in particular to use the lowering of consumer resistance to increase these percentage margins. Of course, the period was one of comparatively mild inflation and it may be argued that it is only when prices increase frequently is consumer resistance lowered appreciably.

A point we have not mad is that, to the benefit of the consumer, retailing is a very competitive sector, with many outlets for most descriptions of business.

Chapter 4. Group and Individual Retail Prices

There is some relation between price and Other income. At any rate a comparatively large advance in selling price of product constitutes a prima facie case for investigation of undue profit obtained. Detailed information on Other income is woefully deficient, as will by now be clear, and statistics with even only tenuous connection with our main topic must be examined for any glimmer of light they may afford. It is in this spirit that we present the following short analysis of retail prices.

Group Prices

The idea in Table 4.1 is to identify the commodity groups (if any) which, from time to time, pushed the CPI upwards. We should emphasize that absolute figures depend on the base period chosen, here the official CSO base November 1968. However, the figures in each column show the periods in which each group exercised most inflationary pressure, without regard to the importance of the group. A remarkable feature of each group series is that (with few exceptions) its period of effect (i.e. with percentages significantly different from 100) tends to be continuous and not dispersed, e.g. when the Tobacco percentage reached the seventies in IV 1972, it stayed there ever since.

[Table 4.1]

In point of weighting and psychological effect, the showing of the Food group is by far the most significant. In recent years its important inflationary effect began in I 1973 and has continued ever since - if with varying force. The last figure shown, 106 for mid-May 1975 must cause trepidation if something is not done about it. We surmise, with confidence, that this relative rise in price of Food was the major element of the acceleration in the rate of increase in incomes in the last two years.

It may come as a surprise that, relatively speaking, those old tax-gathering warhorses, Drink and Tobacco are not to the inflationary forefront in recent years. Clothing had a pressure period from IV 1973 to IV 1974 but has receded. The Fuel and light effect since 1974 needs no comment. The Housing effect (mainly due to rates) was most pronounced in 1972, Transport in 1971 and again very recently. The very emphatic ratio of 115 for Other goods in I 1975 was due entirely to Newspapers and periodicals for which alone the ratio was 155 and which omitted, yielded a group index of

Table 4.1: Commodity group CPIs as percentages of total CPI, quarterly 1969-1975. Base: Mid-November 1968 as 100

Date, mid-month		Consumer price index	As percentage of All Items consumer price index; index for:-									
			Food	Alcoholic drink	Tobacco	Clothing, footwear	Fuel, light	Housing	Durable goods	Other goods	Transport	Services etc.
1969	February	103.3	100.6	101.1	97.0	97.8	98.6	98.3	100.6	102.8	102.2	99.6
	May	105.1	101.0	102.2	97.1	97.2	97.1	97.1	100.2	104.0	101.5	99.0
	August	106.8	100.4	105.8	97.0	96.5	96.4	99.5	99.7	102.9	101.7	98.0
	November	107.6	99.4	105.3	97.8	97.1	97.2	102.6	100.7	103.7	101.3	98.0
1970	February	109.4	100.3	103.6	96.3	97.0	99.2	101.6	100.7	103.2	100.5	98.5
	May	113.9	102.1	103.3	95.3	97.2	97.8	98.5	100.2	101.8	98.5	98.8
	August	115.8	99.4	104.0	94.0	97.5	98.3	100.2	99.7	113.0	100.0	99.0
	November	118.4	97.7	101.9	92.1	98.0	97.1	101.5	99.9	112.1	106.8	100.4
1971	February	120.3	98.3	100.5	90.7	98.0	100.8	100.0	99.2	111.0	106.2	101.3
	May	123.6	98.3	104.5	88.7	97.8	99.2	98.1	99.3	111.1	106.1	101.9
	August	126.0	98.3	103.0	87.6	97.7	101.0	102.5	99.2	109.8	104.6	101.8
	November	128.6	98.4	101.2	85.1	98.1	101.1	106.0	99.0	109.0	105.8	101.0
1972	February	131.5	100.1	99.2	83.3	98.4	101.7	104.0	98.9	112.3	103.6	100.5
	May	133.5	100.8	98.0	82.1	98.7	100.4	103.1	99.0	112.2	103.1	101.4
	August	137.2	102.7	95.6	80.0	98.5	102.5	104.4	98.3	110.3	101.4	100.4
	November	139.2	101.6	96.3	78.6	100.3	102.7	106.5	99.6	109.7	101.6	100.6
1973	February	144.7	106.0	93.8	75.7	101.0	99.4	103.0	98.9	106.9	97.4	99.9
	May	149.1	108.2	91.8	73.4	102.1	97.7	101.3	98.9	104.7	96.6	99.5
	August	152.6	104.7	95.9	79.1	103.3	97.5	99.4	99.1	103.4	96.5	100.9
	November	156.8	104.7	94.0	77.2	105.4	97.1	97.4	101.4	103.1	101.7	100.8
1974	February	164.2	103.8	90.4	73.7	106.2	120.3	95.7	102.1	102.8	99.5	99.5
	May	173.3	103.3	90.4	72.1	105.6	126.0	93.2	102.5	108.4	100.9	97.2
	August	179.9	103.2	87.4	69.6	105.7	131.2	92.3	102.0	107.3	103.6	97.6
	November	188.2	104.9	84.8	66.6	106.5	127.4	92.3	101.8	112.8	100.7	97.9
1975	February	203.3	102.9	94.2	74.8	102.5	124.9	88.1	98.2	115.4	104.1	95.9
	May	215.7	106.3	91.1	70.6	100.7	123.7	84.1	96.0	112.9	107.6	93.9
Index weights		100	32.4	8.7	7.0	8.8	5.5	6.9	4.0	4.9	10.2	11.6

Basic Source: ISB and CSO Bulletins

Note: In text Quarters are indicated by Roman Numbers e. g., IV 1973

merely 91. Neither Durables nor Services had any marked effect.

[Table 4.2]

The upper part of Table 4.2 (as in Table 4.1) takes no account of group weightings. In the first half of 1975 (in fact the percentage increases mid-November 1974 to mid-May 1975) in order, with percentage increase, were: Transport 22, Food 16, Other goods 15, Fuel and light 11, Services etc. 10, Clothing etc. 8, Durables 8, Housing 4. We omit Drink 23 and Tobacco 21, as these large increases are due almost entirely to budgetary policy. Mere citation of these group figures, indicating the commodity-wise pervasiveness of inflation, is an indication of the magnitude of the task of curbing it. That middle-term objective of single digit inflation would mean less than 5 per cent in the half-year.

The magnitudes in the lower part of Table 4.2 depends on both weights and the group percentages of the upper part. Hence Food looms largest. Of special moment is that the 6.5 points in the latest period (II 1975) is by far the worst in the Food row, a grave harbinger of what is likely to happen to incomes in the near future always, of course, with the qualification that nothing is done about it*. In addition to Food (reading row-wise) Transport is about the only other group which shows a marked worsening in 1975 so far, compared with past quarters, again without reference to Drink and Tobacco.

Individual Commodity and Service Prices

CSO has kindly made available to us a fully detailed schedule of retail price percentage changes in mid-February 1975 with mid-November 1968 as 100, with year-to-vear percentage changes for certain intervening pairs of years. The tables contain particulars for no fewer than 364 descriptions of commodities, precious treasure-trove for a study of inflation in its commodity aspect. In what follows on this aspect we find it more convenient to deal with indexes instead of percentage changes.

Naturally, we start with a citation of the commodities that increased most in the 6 and-a-half years, in order of demerit.

[Table 4.3]

* See previous footnote.

Table 4.2: Changes in group CPIs, quarterly 1973-1975

Group	Percentage quarterly change to mid-									
	1973				1974				1975	
	I	II	III	IV	I	II	III	IV	I	II
Food	8.5	5.2	-1.0	2.8	3.8	5.0	3.7	6.4	5.9	9.6
Alcoholic drink	1.2	0.8	7.0	0.7	0.7	5.5	0.4	1.4	20.1	2.5
Tobacco	0.1	-	10.2	0.2	-	3.3	0.2	0.1	21.3	0.1
Clothing etc.	4.7	4.2	3.5	4.8	5.6	4.9	3.9	5.5	3.9	4.3
Fuel etc.	0.7	1.2	2.2	2.4	29.7	10.5	8.1	1.6	5.9	5.1
Housing	0.6	1.3	0.4	0.7	2.9	2.8	2.8	4.6	3.1	1.2
Durables	3.2	3.0	2.6	5.2	5.5	6.0	3.3	4.4	4.2	3.8
Other goods	1.3	0.9	1.1	2.4	4.5	11.3	2.8	10.0	10.5	3.8
Transport	-0.4	2.2	5.4	5.1	2.4	7.1	6.6	1.7	11.6	9.7
Services etc.	3.2	2.6	3.7	2.7	3.1	3.4	4.2	5.0	5.8	4.0
Total	4.0	3.0	2.3	2.8	4.7	5.5	3.8	4.6	8.0	6.1
	Points change									
Food	3.9	2.6	-0.5	1.4	2.0	2.8	2.1	3.8	3.8	6.5
Alcoholic drink	0.1	-	0.8	-	-	0.7	-	0.2	2.8	0.4
Tobacco	-	-	0.8	-	-	0.3	-	-	1.9	-
Clothing etc.	0.6	0.5	0.5	0.7	0.8	0.8	0.6	0.9	0.7	0.8
Fuel etc.	-	-	0.2	0.2	2.5	1.1	1.0	0.2	0.8	0.7
Housing	-	0.1	-	-	0.3	0.3	0.3	0.5	0.4	0.2
Durables	0.2	0.2	0.2	0.3	0.3	0.4	0.2	0.3	0.3	0.3
Other goods	-	-	-	0.2	0.4	0.9	0.3	0.9	1.1	0.4
Transport	-	0.3	0.8	0.8	0.4	1.2	1.2	0.3	2.2	2.1
Services etc.	0.5	0.4	0.6	0.5	0.6	0.6	0.8	1.0	1.2	0.9
Total	5.5	4.4	3.5	4.2	7.4	9.1	6.6	8.3	15.1	12.4

Source: ISB and CSO bulletins

Note

In the lower ("Points change") part of the table, dashes mean "small", not identically zero. For this reason and also because of rounding group figures do not necessarily add to total.

Table 4.3: Commodities which increased most in retail price in mid-February 1975 since mid-November 1968, with indexes to base mid-November 1968 as 100.

Commodity	Index	Commodity (continued)	Index
Cabbage	323	Linoleum	269
Postage	317	Towels, Turkish	265
Cooking apples	317	Carpeting	263
Newspapers, periodicals	314	Tomatoes	263
Onions	308	Cream crackers	258
Carrots	301	Cups and saucers	256
Gas	287	Scrubbing brushes	254
Potatoes	280	Shirts, collar attached	253
Turnips	279	Housing repairs	252
Laundry - charges for sheets	277	Whiting, fillets	251
Fuel oil	272		

Table 4.4: Number of items increasing most in price in two periods and null-hypothesis appraisal of their interperiod concordance.

Group and period	Increase more than	Numbers of Items		Value of t	Probability appraisal
		Total	In common		
1	2	3	4	5	6
	%				
Food items					
1973-74	20	12	2	-1.48	n.s.
1974-75	25	19			
Other items -					
1973-74	20	56	14	0.35	n.s.
1974-75	25	46			

Notes

Col. 2: Percentages arbitrary.

Col. 5: Ratios of deviation from null-hypotheses mean to s.d. corresponding respectively to 2 and 14 corrected for continuity. (See Geary-Pratschke for formulae.)

Col. 6: n.s. = not significant at .05 probability level.

Table 4.3 contains the 21 commodities (out of the 364 descriptions) with indexes exceeding 250 (the general index being 203). Its most remarkable feature is that it contains six of the seven descriptions of fresh vegetables: one wonders why cauliflowers (208) have not advanced with the rest ! Anyone who recalls the indecisive results of inquiries in the past into retail margins for these commodities will not be surprised at their achieving the notoriety of Table 4.3 in a serious inflationary situation.

It is mildly satisfactory that only 21 out of 364 descriptions (or 6 per cent) appear on this Table 4.3 list. Seven years ago Geary and Pratschke* studied this problem of individual price changes from the viewpoints of (1) frequency distribution and (2) persistence of price increase leaders, two periods being selected for investigation, 1953-1965 and 1963-65. These, of course, were periods of inflation (if far less grave than nowadays) so that the results may have some interest and relevance.

Frequency distributions for both plain and log versions of the individual indexes were established, plain being found to be heavily skewed in both periods. The longer term (1953-1965) frequency of log indexes was also significantly skewed, but not the shorter (1963-65). In fact, generally the shorter term log distribution was by far the most interesting of all four studied. Though symmetrical it was not normally distributed its a value indicating a high concentration near the mean (i. e. in K. Pearson's term "leptokurtic"), indicative of a high proportion of prices which have not changed much about the general mean. Another conclusion is that the diversity in the changes in the prices of individual consumer goods increased markedly in the later (i. e. 1963-1965 period).

As to persistency, four short price change intervals (in fact of two years), yielding three periods of comparison, 1954-1956 with 1956-1958 etc. were studied in the whole period 1953-1965. As regards all items (then numbering 197), "we concluded that there is a strong tendency for rising prices item-wise to persist".

Geary and Pratschke also used the rudimentary methods above, enabling comparison with the showing of Table 4.3. The results are curious. These authors listed ten commodities that rose significantly in price in all their four periods. Not a single one of the earlier ten appears in our later twenty-one (Table 4.3). Furthermore, the earlier authors list the commodities with largest price increases in periods 1953-1965

* Op. cit.

and 1963-1965. Four commodities* (out of 13) are common to the 1953-1965 and Table 4.3 lists two+ (out of 11) in the 1963-1965 and Table 4.3 lists. The discordance is less when it is pointed out that items (3 or 4 in fact) of Drink and Tobacco figure prominently in all the earlier lists but are absent from the Table 4.3 list. Still, we are of the opinion that the more serious latter-day inflation was accompanied by a marked change in commodities of steepest increase.

We do not consider it necessary (in view of the more specialized character of the present inquiry) to bring the Geary-Pratschke work on price frequency distributions up-to-date. We have, however, investigated the two latest annual price change periods, i.e. 1973-1974 and 1974-1975 (mid-February in all cases) to try to discover any commodity-persistency, i.e. is there any evidence that commodities that increased most in price in the earlier period did so in the later?

The CSO list contained 364 descriptions of goods. Examination showed that in the separate intervals in the whole period 1968-1975 certain descriptions tended always to increase in price by closely similar percentages, e.g. the six descriptions of beef etc. We decided that such commodities should be reduced to one, e.g. one description only of beef, its percentage price change being the simple average of the six changes. We also decided to omit drink, tobacco and all oils because of their artificial circumstances. Of the 364 original descriptions, there remained 257 commodities of which 52 were Food and 205 Other. The Geary-Pratschke analysis is given in Table 4.4. There is no evidence for particular items to persist in price rise in these two years of greatest inflation. If the negative value for $\underline{t}$ for Food were significant it would mean a tendency for items which rose, in one year refrained the next and vice versa; as the actual value of $\underline{t}$ is not significant this inference cannot be made on this evidence alone.

[Table 4.4]

The Table 4.4 analysis pertained to the commodities with largest price increases in the two latest years. When all commodities are taken into account simple correlations between price changes in the years 1973- 1974 and 1974-1975 in the groups Food, Other All items, yielded the following results:-

* Cooking apples, Papers and magazines, Potatoes, Carrots.
+ Potatoes, Papers and magazines.

Group	Number	c.c.	Significance
Food	52	-.34	.01 < NHP < .02
Other	205	+.08	.10 < NHP
All Items	257	-.10	.05 < NHP

In the Food group there is evidence of negative relationship, i.e. there was a tendency for high - low in 1973-1974 to be followed by low-high. This was absent from Other and All items.

Prices of Services

The full title of the section in the CPI system is "Services and Related Expenditure". Direct information of the trend of incomes in the service industries is so meagre as to justify a small study of price trends in this section for such clues as they may afford about non-wage incomes. Table 4.5 goes beyond this requirement: it has some interest perhaps in showing what happens to prices in the almost entirely sheltered service sector.

[Table 4.5]

The usual theory pertaining to service industries is that average incomes therein tend to rise similarly to those in other industry; capacity for productivity improvement is less in service industries; hence, with inflation, prices of services are liable to rise more than other prices. Clearly such theory requires qualification in its application to Ireland.

The column 4 figure of 95.9, i.e. well under 100, tends to show that service prices were not a prime cause of inflation in Ireland. A curious phenomenon is that the column 5 figures, averaging what happened in the whole period 1968-1975, are nearly always in excess of those of 1975 (column 3). This might be interpreted as these services having had their major effect before 1974-1975, the year of worst inflation, and therefore contributing to this condition.

Of more direct (if of very limited) interest in Table 4.5 is the showing of items numbered 2, 3, 7 which probably reflect to a degree what is happening to non-employee income. Doctors' etc. fees seemed to be ahead of the general average, throughout the whole period, if not during 1974-1975.

Table 4.5: Service-type commodity price indexes as percentages of All Items indexes

Service-type commodity	Previous year (mid-February) as 100		Mid-November 1968 as 100	
	1974	1975	1974	1975
1	2	3	4	5
1. Entertainment	96.5	93.3	91.5	98.6
2. Hairdressing	98.9	98.6	101.3	102.3
3. Shoe repairs	102.7	98.2	106.3	101.0
4. Laundry, cleaning	98.6	105.3	104.4	100.7
5. Proprietory medicines	92.3	93.6	80.3	96.5
6. Other medicines, drugs	85.6	87.6	55.6	91.0
7. Doctors', dentists'fees	102.1	95.2	113.4	102.0
8. Hospital charges	109.4	93.7	118.5	102.8
9. Education	95.8	94.7	84.4	97.3
10. Domestic service	102.6	93.6	112.1	101.8
11. Television rentals	91.3	93.6	72.8	95.0
12. Hotel accommodation	103.5	103.0	106.1	101.0
13. Expenditure abroad	99.4	93.7	96.4	99.4
14. Postage	105.5	114.9	156.0	107.4
15. Telephone, telegraph	108.1	98.4	91.2	98.5
16. Sports' clubs subs.	98.7	102.2	119.8	102.9
17. Trade union subs.	96.9	93.2	74.8	95.5
18. Licences	128.0	99.8	101.3	100.2
Total above	99.3	96.6	95.9	99.3

Basic source: ISB and CSO records.

Note

Figures for first five commodities are condensations of our own from more detailed CPI individual indexes.

Conclusion as to Individual Commodity Prices

Our brief examination has left us with the very strong impression of the pervasiveness of inflation. Even if at a high level of aggregation, one must not exaggerate the differences in the ratios in Table 4.1. Having regard to the magnitude of the rise in the All Items CPI index since 1968, the differences between the ratios is generally small. Pervasiveness means that each individual rise in price contributed to general inflation causing income rises which, in turn contributed to the further rise of the individual commodity. Cause and effect are indistinguishable. It does not mean that, in general, certain price and certain income rises are the cause of inflation; rather that inflation is the malady contributing some mean M per cent to all prices and incomes, the individual (commodity, income, group) effect being m_i, so that the actual rise for indivudual i is $M \pm m_i$ with M generally dominating m_i. There is, of course, some surmise in the foregoing paragraph. We shall be content to regard it as something of a hypothesis, to be examined further.

Chapter 5. An Input-Output Approach

The methodology of this section has been used by the Central Bank of Ireland* and the Department of Finance+ and the use to which it was put has encountered vigorous criticism by economists.++ This criticism, it would appear, bore less on the actual method than on the inferences which were drawn from the statistics.

In fact, several writers have animadverted on the use of I-O analysis to estimate the precise contribution to price increases of different categories of primary inputs. There are four major criticisms, according to Morgan, whose argument is outlined here. First, the I-O model assumes that all primary input prices are exogenously determined, and hence in the case of wages and profits at any rate, are incorrectly specified; furthermore it assumes that purchases do not substitute cheaper for dearer inputs. Second, the assumption of exogenously determined unit cost of non-employee income is particularly dubious. Third, the model takes a very limited view of the role of international influences, which are assumed to operate only through import prices (and perhaps also export prices). It is this point which has been most emphasised by P. T. Geary and by Moore McDowell. Geary argues that the model ignores the macroeconomic channels whereby the external rate of inflation is transmitted to a small open economy with a fixed rate of exchange: these channels include the impact of changes in the balance of trade on aggregate demand via the foreign trade multiplier, and of these changes and of changes in the inflow of capital on the domestic money supply. Morgan's fourth criticism is that since the model takes primary input price increases as exogenously determined, it can describe only the proximate reasons for movements in the prices of final products, and can say little about the fundamental causes of inflation. We refrain from comment on these arguments being content to place them on record for the benefit of readers.

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* Quarterly Bulletin of the Central Bank of Ireland, Spring 1974.

\+ Government White Paper "A National Partnership" Prl. 4141, 1974.

++ P. T. Geary: "The Causes of Inflation", JSSISI 1974-75, Vol. 23, Part 2: E. Victor Morgan: "Causes and Effects of Inflation in Ireland" NESC. Report No. 10 Moore Mac Dowell: "The Control of Inflation in a Small Economy", Studies, Spring 1975.

As R. C. Geary* was associated with first applications of the I-O method to Irish price data, it may be useful if we now give a brief appraisal of the method, attempting to state clearly what it does and what it does not do, from a purely statistical point of view.

The retail price of any commodity or service at any time can be broken down into the cost of home-produced ingredients, fuel and light, at farm or factory prices, imports (valued c.i.f.), indirect taxes less subsidies, transport and distribution costs (all stages), wages and salaries, profits, depreciation, financial charges and perhaps a few more. Costs deemed "primary" for I-O purposes are the seven shown in the first column of Table 5.1, all others "inter-industry".

To start with, this classification is direct, meaning that for any of the primary inputs no account is taken of the fact that so-called home-produced ingredients themselves contain imports and other primary inputs and so on ad infinitum. In its price aspect, the object of I-O is to derive the total price effect (primary + secondary + tertiary + ad. inf.) of price changes in each primary input. What is remarkable is that ultimate price changes in each inter-industry sector, and thence to household consumption as a whole, can be derived from initial changes, of course with rigorous simplifying conditions, as will appear.

Perhaps the most restrictive of these is that, not possessing an I-O table for Ireland for every year, we must assume a constant quantum structure (namely, that of the latest year of availability, 1969). This means that the base year structure (in both inter-industry and primary inputs) of each of the 33 sectors is deemed to apply quantity-wise throughout our period of reference 1968-1974, though in fact the product-mix, and the ingredient-mix for each product, must change from year to year because of price, technology etc. changes. This structure for each sector can be represented as totalling unity in 1969. Prices (really price indexes) in 1968 are all unity. The I-O price system is solved by writing down 33 linear equations stating that, in each year of reference, current price change (since 1969) equals change in total costs (including profit, also with its fixed quantum). We give an outline of the algebra in Appendix 3.

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* Lectures on Input-Output, ESRI L. Series, No. 1, 1966 (mimeographed); (with J. L. Pratschke) "Some Aspects of Price Inflation in Ireland", ESRI Paper No. 40, 1968; (with E.W. Henry and J. L. Pratschke) "The Recent Price Trend in Ireland", The Economic and Social Review, Vol. 1, No. 3, 1970.

In I-O in its price aspect the producer always "gets his price". Sector prices have essentially more the character of supply than of demand prices. Of course, we could add other variables and other equations and get different answers; and these answers might be more convincing for verifying a cause-effect hypothesis.

[Table 5.1]

Another restriction to the I-O price system is its assumption that sectors' selling price indexes to each other purchasing sector are the same, which is manifestly not the case, since selling sectors' product-mix to other sectors may be different. Yet another restriction applicable here is that for each primary input, price change was the same for all sectors a procedure necessary because of unavailability of sectoral data.

Despite all these breaches with reality we might hope that as we require but a single figure for each primary input and each year, errors would tend to cancel out. As an overall check we have therefore juxtaposed in Table 5.1 (last two rows) the actual national account price deflator for personal expenditure and the calculated I-O index.

The two series compare very well year-by-year. The fact that the I-O overall increase of 87 per cent exceeds the actual percentage of 77 is of no importance from the present point of view. Some excess is to be expected for much the same reason that the base-weighted Laspeyres always exceeds the true rise in price. The assumed constancy of the I-O table quantity-wise ruled out adjustments which must have taken place in response to differential price changes in the general direction of mitigating the price increase.

We therefore take the view that the detailed figures in Table 5.1 are broadly acceptable. Their interpretation is more difficult as a guide for action. Obviously imports in 1974 and over the whole period were a major direct inflationary influence. Imports could also have indirect effects on incomes through consumer prices. We leave open any causal interpretation of this table.

Fortunately, we are concerned only with non-employee incomes, items 5 and 6 in Table 5.1. Whether the table can be given a causal interpretation or not, if the contributions to total changes are small, or negative, we argue that this effect is small. We would also consider this argument reinforced by the fact that, in a period of constantly rising prices, the contributions were very variable - actually negative (for Agriculture)

in 1974 when prices rise so sharply.

Conclusion as to Input-Output Pricing

We regard Table 5.1 as about the most important we have devised for this research. But also, as we stated above, its interpretation is difficult. We absolve ourselves of this task here (except as regards Other income) in the sense that here and elsewhere we have made it our main concern to set down and to analyse statistically all the relevant statistics, drawing what seem to us only obvious conclusions therefrom, leaving purely economic discussion to others, but with the humble expectation that our statistics will be found useful in such discussion.

Here we claim that, despite the stated deficiencies of the I-O approach, a comparison of the last two rows of the table shows that the method used is soundly based. In 1974, when inflation approached the catastrophic, import prices, as allowed for by I-O (and, as stated above, there are additional effects), accounted for about two-thirds of the total rise in prices. As emphasised in Chapter 1, there is a specific Anglo-Irish dimension in the price trend expressing itself in incomes, i.e. at least in the short run, income restraint is essential. As far as Ireland alone is concerned it is obvious (as strongly recommended by Geary and Pratschke* in less serious circumstances), that Irish price trends should be kept below those of UK, which has manifestly not been happening in the last few years.

Noting that in both agriculture and non-agriculture Other income contributions have always been far lower than the employee remuneration figure and having particular regard to the contrast in 1974 (with the non-agricultural Other income contribution negative) we hold that this I-O approach lends no support, at the macro level, to non-employee incomes' having an appreciable effect on inflation in recent years. This is the major conclusion of this research.

Unless profitability of Other incomes can be substantially improved, especially in non-agriculture, the future for economic development in Ireland is grim. It cannot be too often repeated that decisions in the private sector are the preserve of recipients of Other income. Improvement in Other income is merely a necessary condition. The general climate of opinion amongst Other income earners as to the future,

* Op. cit., Chapter 1.

influencing present action or inaction as to investment etc., is overwhelmingly important. Other income earners are not automata, and are generally in a stronger financial position to postpone decisions than are wage earners.

Table 5.1: Contributions of primary input prices to year-to-year changes in consumer prices 1969-1974.

Primary input	Percentage increase on previous year						Percentage increase 1974 on 1968	
	1969	1970	1971	1972	1973	1974	Actual	%
1. Imports	1.2	1.9	1.7	1.3	3.8	12.4	31.8	36.4
2. Indirect taxes	2.4	2.3	1.7	1.4	2.1	1.5	14.0	16.0
3. Subsidies	-0.5	-0.3	-0.1	0.0	-0.5	-1.4	-3.7	-4.2
4. Wages and salaries	2.8	3.7	2.8	3.0	3.6	4.9	26.7	30.6
Non-wage factor incomes -								
5. Agriculture	0.4	0.3	0.3	2.3	2.7	-1.1	5.8	6.6
6. Non-Agriculture	1.8	0.0	0.5	1.7	0.7	0.8	6.8	7.8
7. Depreciation	0.5	0.5	0.6	0.6	0.6	1.5	5.9	6.8
TOTAL I-O (above)	8.7	8.4	7.4	10.3	13.1	18.6	87.3	100.-
Consumption expenditure deflator	6.0	8.4	9.1	8.6	11.0	17.3	77.1	-

Notes

Calculations are based on the 1969 33-sector I-O table (CSO, unpublished). A sketch of the underlying algebra is given in Appendix 3.

Estimates were made for each primary input price index change (base unity) separately, i.e. the $\Delta\pi_i$, from which were derived the sectoral price index changes, i.e. the Δp_i, which, applied to the unitised (i.e. adding to unity) household consumption weights (and making allowance for the primary input part of household consumption) gave the change in the household budget price index (base unity) due to the price change for this single primary input. Due to the linear character of the I-O system, the effects due to separate primary input price changes are additive, to give the total price change due to the several primary input price changes.

These calculations were computed separately for the intervals 1968-69, 1969-70, 1969-71, ..., 1969-74, i.e. always with 1969, the year to which the I-O table relates, as base - for each primary input these were converted to the year-to-year figures shown. These were deemed to add exactly to estimated total change shown in the second last line.

Notes to Table 5.1 (cont'd)

The "Actual" figures 87.3 in the second last row is found as the product 1.873 = 1.087 x 1.084x ... x1.186. The detailed primary "Actual" figures are found similarly but proportionately adjusted to total 87.3.

See also NIEC Report No. 11 and Central Bank Quarterly Bulletin No. 1, 1974, in general relation to the interpretation of this table.

Chapter 6. Professional Incomes

No direct up-to-date information on higher professional incomes being available, we had to make an indirect approach. The general trend of earnings in the period 1968-1973 is also dealt with.

Fees paid by the State

This section is based mainly on information very kindly supplied by the Departments of Finance and the Public Service about professional fees current throughout the Irish public service in recent years.* Reference dates differ for the different professions so that it will be more convenient to consider each profession separately. The method is always to juxtapose actual ("nominal") fees in index form and these indexes deflated by CPI of closest date.

The data displayed in Table 6.1 are condensations from very voluminous official schedules. The indexes described as "nominal" are unweighted in all cases; in fact, they are the simple averages of ratios for sub-indexes within each description of profession. The fact of these estimates being unweighted is, in general, no disadvantage since, in most cases, the sub-indexes were very similar so that properly weighted estimates (if possible of calculation) would have yielded much the same results as those shown. In the case of dentistry, however, the sub-indexes were very different, so that a judicious selection had to be made for averaging; the values of the omitted sub-indexes were very much lower than those included, so that the figures shown are probably overestimates.

[Table 6.1]

The CPI deflators used were those deemed to apply at the exact dates of change when these were specified. They were usually found by linear interpolation from the official quarterly figures nearest that date. All deflated series have been brought to mid-May 1975, so that the nominal index at that date is the same as at the previous date of change, but the latest deflated index is lower.

The figures are subject to the following reservations:-

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* We are indebted to K. A. Kennedy for suggesting this approach.

1. The fees paid by the state would, of course, represent only a proportion of total income of professionals. Table 6.2 will show the complete picture.
2. They relate to only a few professions.
3. They reflect the gross situation. To obtain net income there should have been deducted the cost of employee remuneration and materials which no doubt increased here considerably, as everywhere else.

By reference to deflated series the evidence of Table 6.1 is conflicting: some professional activities got more than CPI would warrant, some less. In the two cases (last of No. 3 and No. 5) in which the last of the deflated series exceeds 100, reference to Chart 1 will show that, up to the end of 1974 the nominal indexes were less than those for hourly earnings in TG industries.

Professional Earnings 1968-1974

An earnings index for higher professional occupations has been compiled from data derived from a small example of incomes. The index is shown in column 2 of Table 6.2.

[Table 6.2]

It is clear from Table 6.2 that earnings of professional persons behaved quite similarly to TG employee earnings over the period 1968-1974, a substantial difference arising only in 1972. Moreover, these professional earnings agree roughly with those presented in Table 6.1 and based on fees paid in the public sector.

If, as used extensively elsewhere, we had been able to compare unit costs of the two groups, the contrast would, we suspect, be greater. Unit costs would be the indexes in columns 2 and 3 divided by labour productivity. We know that the increase in productivity was considerable in TG industry, in fact $3\frac{1}{2}$ per cent per annum in the period 1968-1974. We do not know anything about productivity increase of these non-employee professionals, but we surmise it to be less than in TG industry.

Conclusion as to Professional Other Income

By the tests used in this study these incomes seem not to be exceptionally inflationary. The impact of professional earnings on the general inflationary

situation must, however, be small. If, at a guess, we attribute a salary of £5,000 to each of the 8,200 technical and professional workers in the categories employers and own account, total professional income would be less than 2 per cent of the national income in 1974. Such a calculation discounts any possible "demonstration effect" of increases in professional earnings.

Table 6.1: Index numbers of fees charged by certain professions in the public zone at the dates indicated. Nominal estimates and these deflated by CPI.

1. Medicine

Doctors (medical certificates)			Medical Consultancy				
				Clinical		Paramedical	
Date	Nominal	Deflated by CPI	Date	Nominal	Deflated	Nominal	Deflated
1 V 67	100	100	1 I 68	100	100	100	100
1 IV 69	116	105	1 IX 69	100	90	112	100
1 II 71	134	105	1 IV 70	106	91	120	103
1 I 73	156	103	1 I 71	106	85	131	105
1 I 75	203	97	1 I 73	146	99	144	97
15 V 75	203	88	1 VII 73	154	98	170	108
			1 VI 74	166	91	170	93
			1 XII 74	176	88	197	99
			1 III 75	194	91	217	101
			15 V 75	194	86	217	96

2. Dentistry

	Extractions, fillings, dentures	
Date	Nominal	Deflated
X 68	100	100
XI 70	126	106
IX 71	127	98
IV 72	130	97
VII 74	171	96
V 75	171	79

Table 6.1 (continued)

3. Veterinary Medicine

	Bovine TB Eradication		Brucellosis			Meat Factory Attendance	
Date	Nominal	Deflated	Nominal	Deflated	Date	Nominal	Deflated
1 I 68	100	100	100	100	1 I 68	100	100
1 II 68	111	110	100	99	24 III 69	109	101
1 II 71	122	97	110	88	20 V 70	113	95
1 II 72	128	94	118	86	1 X 70	122	100
15 V 75	128	57	118	52	1 I 71	132	106
					1 I 72	139	102
					1 I 73	172	116
					1 VI 73	185	118
					1 VI 74	204	112
					1 XII 74	217	109
					1 III 75	239	112
					1 XI 75	261	116

4. Opthalmology

	Surgeons		Opticians	
Date	Nominal	Deflated	Nominal	Deflated
23 III 65	100	100	100	100
24 II 69	120	102	120	102
16 XI 70	140	104	127	94
12 V 72	180	128	170	121
1 XII 74	224	111	213	105
15 V 75	224	91	213	87

5. Solicitors

Date	Nominal	Deflated
1965	100	100
7 X 70	160	121
19 V 75	267	109

Table 6.2: Index numbers of earnings of professional persons per head, nominal and as deflated by CPI, 1968-1974 with comparative figures for TG employee earnings.

1968 as 100

Year	Nominal		Deflated by CPI	
	Professional earnings	TG employee earnings	Professional earnings	TG employee earnings
1	2	3	4	5
1968	100	100	100	100
1969	113	112	105	104
1970	122	128	105	110
1971	153	147	120	116
1972	184	169	134	123
1973	206	201	134	131
1974	237	237	132	132

Notes

Col. 2 figures, based on averages derived from a 5% sample of Revenue income data. The professional workers referred to in this table are broadly those employer and own account workers, in higher professional occupations in the industry Professional Services, as returned in the Census of Population. Col. 3 figures refer to weekly earnings.

Chapter 7. Profits of Irish Public Companies

A table in Trade Union Information (July-September 1975) shows that the year-to-year percentage increase in pre-tax profits in the one hundred or so public companies reporting in the year ended June was 39% in 1973, 33% in 1974 and only 7% in 1975. Rather similar percentages are obtained for post-tax profits and dividends. As the changes in the CPI for year ended June were respectively (in %) 10, 14 and 22, it is evident that in the recent pre-depression period Irish public companies were doing very well.

Scrutiny of the individual accounts, also published by TUI, however, showed a great variation in the period to which the account related, raising a doubt as to inferences to be drawn from statistics based on period of report, as the foregoing. Accordingly we decided to try to reproduce the percentages as closely as we could according to the former concept. This proved difficult, and the figures in Table 7.1 are to be regarded as approximations for reasons which will be clear from the Notes. At least we are certain that they give a truer picture than that from the reporting period concept, in the abrupt transition from prosperity to depression, accompanied by sharply increasing inflation.

Table 7.1. Percentage year-to-year changes in profits and dividends of Irish public companies 1972-1973 and 1973-1974.

Year	No. of companies	Percentage change on previous year			
		Profits		Dividends	CPI
		Pre-tax	Post-tax		
1973	91	+38.2	+40.9	+33.6	+11.4
1974	86	-18.5	-18.9	- 8.9	+17.0

Basic source: Trade Union Information issues to that of November-December 1975

Notes

The 1974 data are based on accounts of public companies reporting up to end June 1975 but which related to trading in year ending within the twelve months July 1974 - June 1975, with corresponding figures for previous year. Similarly for the year 1973. These are deemed to show calendar year changes.

The number of companies in Table 7.1 included in the 1974 calculation falls short of exactly the 100 companies reporting in the period July 1974 - June 1975. Nevertheless there can be little doubt that for the aggregate of all public companies a substantial profit increase in the years 1972 and 1973 was converted into a decrease in profit in 1974. The loss of 19 per cent for the 86 companies shown in Table 7.1 for 1974 compares with the TUI figure for profit of 7 per cent for the 100 reporting companies. The percentage changes for public companies shown in Table 7.1 are before adjustment for stock appreciation, so formidable in recent years. Realistically (i.e. after such adjustment) the 1974 percentage profit changes would be worse than as shown.

We must try to compare the experience of public companies with that of all companies and all other income. On the same basis as Table 7.1, the profits of the 86 public companies for the year 1973 were £59.9m; according to NIE 1973 the estimated non-AFF "trading profits of companies (including all corporate bodies) before tax" was £248m. Profits of public companies are accordingly only one-quarter of the profits of all companies. We infer that the profit experience of all companies could be very different percentage-wise from that of public companies.

Table 7.2 with all its different non-availabilities and basic sources, is an attempt to bring the public company profit change situation up-to-date. It goes without saying that the figures increase in uncertainty as time goes on: none-the-less are based on published figures from reliable sources.

Table 7.2: Percentage year-to-year changes in non-AFF profits and Other income before and after allowance for adjustment for price of stocks (AAPS), 1972-1976.

	1972	1973	1974	1975	1976
Trading profits:-					
All companies:-					
Before AAPS	+28.5	+33.5	n.a.	n.a.	n.a.
After AAPS	+24.0	+17.8	n.a.	n.a.	n.a.
Public companies (before AAPS)	+39.3	+38.2	-18.5	n.a.	n.a.
Other income:-					
Before AAPS	+22.6	+26.4	+14.5	+5.5	+20.9
After AAPS	+18.8	+13.7	+ 7.4	+12.2	+26.8

n.a.: not available. Basic sources: NIE 1973, TUI to November-December 1975, QEC January 1976, RPO June '75.

First it is to be remarked that trading profits of all non-AFF companies before tax form most of Other income - in fact 56 per cent of it before tax and before AAPS in 1973. We may surmise therefore that company profit experience in 1975 and 1976 may be like that of all Other income. This may not be the case with public companies with (as we have shown) profits only a fourth of those of all companies. In interpreting the table it may help to note that QEC sets percentage rises of implicit personal consumer expenditure prices at 17, 21 and 11½ in 1974, 1975 and 1976.

Main inferences from Table 7.2 appear to be:-

(1) As early as 1973 the after AAPS effect (i.e. cash shortage) on company profits was very drastic.

(2) The AAPS effect may become favourable in 1975 and 1976.

(3) No improvement is to be expected in all or public companies in 1975 compared with 1974. There may be improvement in 1976.

(4) In 1972 and 1973 public companies were doing better than all companies.

Conclusion as to Public Companies

Public companies are, of course, the larger companies. One assumes that these are the bell-wethers of the non-agricultural part of the economy. That they were so successful before the present recession augurs well for the economy as a whole, for these results were achieved in the rigours of substantial rises in prices of materials and in wage rates over which managements had little control. Managements must have been taking an optimistic view of economic prospects in Ireland in these years, i.e. that investment was likely to be profitable.

Still, Table 7.1 shows that the transition from profit to loss can be very severe and sudden, so much more so than in the case of prices and wages. The showing is the more serious for the whole economy in that, as so often repeated in this paper, decision as to level of activity in the private sector rests largely with managements of big concerns and such decisions are based on long-term profitability. We can only hope that these decisions are not too much influenced by short-term experience, in which the world wide depression played its part.

Chapter 8. Manufacturing Industry

The latest year for which the results of a complete CIP are available is 1972. It is unfortunate that this date is so remote. However, the data are not irrelevant to a general study of inflation which, as will have been amply clear from previous chapters, has been happening all the time, if with acceleration in the last two years.

Our principal instrument in this chapter is Appendix Table A6.1. There we show for 40 manufacturing industries index numbers (to base 1958 as unity) of all statistics that seemed relevant to our main topic, non-employee income, for which No. 6, unit cost of remainder of net output, (i.e. net output less employee remuneration) is the proxy. Nos. 4, 5, 6, 7 and 12 are "prices" in the wider sense; the other variables are deemed to be related to these. It will be noted that No. 1, index of fixed capital stock at constant prices, relates to the year 1968 the latest for which these data are available. The classification of industries used is that of CIP. Five industries were omitted because some of their indexes were bizarre which may have been due to appreciable changes in product type.

The base year selected is 1958 as marking the beginning of the industrial upsurge. General increases in certain variables 1958-1972 were as follows:-

Percentage increases per year for total manufacturing 1958-1972 (except as otherwise indicated)

	Per cent per year
Fixed capital stock at constant prices*	8.1
Volume of output	6.4
Net output price (unit value)	5.8
Unit costs:-	
Employee remuneration	5.1
Remainder net output	6.4
Materials	3.1

* 1958-1968

Continued

Percentage increases per year for total manufacturing 1958-1972 (except as otherwise indicated)

	Per cent per year
Employment	2.4 (2.6)*
Productivity:-	
Labour	3.9
Fixed capital stock*	-1.1
Factor+	1.4
Share of remainder of net output in total net output	0.6
Employee remuneration per employee	9.2
Consumer price index	4.7

* 1958-1968

+ Factor productivity: let x_1 be expected NO in 1968 on basis of number of employees and constant price fixed capital in 1968 applied to 1958 rates of employee remuneration per employee and RNO per £ capital. Let x_0 be value of NO 1958 - and v_1 index 1968 of volume of output (base 1958 as unity). Then index of factor productivity 1968=$v_1 x_0 x_1$.

The great increase in capital stock is a reminder of the character of Other income: it must be rewarded and it is a very important source (through business saving) of new capital investment. In regard to this increase in capital stock the increase in output was disappointing. In fact, confining attention to the period 1958-1968 (i.e. of fixed capital volume statistics availability) we find:-

	Increase per cent per year
Value remainder net output per unit of volume of fixed capital	4.4
Employee remuneration per employee	7.3

In Chapter 1 comparison between employee remuneration and Other income in trends of unit costs is subject to the qualification that changes in the unit cost index could have come about, in whole or in part, by changes in quanta of labour and of physical capital applied. The last two figures may be deemed correct for these different quanta. This is clear for the labour rate of 7.3 per cent: note "per employee". The first figure means that in manufacturing industry in the ten years 1958-1968 quasi-profit per quantum unit of fixed capital applied increased by 4.4 per cent per annum. In more simple terms: the reward for labour increased at nearly twice the rate as for capital.

While the increase in labour productivity has been substantial there has actually been a decline in capital productivity, i.e. the quotient of volume output by the volume of fixed capital stock. It is pretty obvious that the impressive improvement in labour productivity in the ten years 1958-1968 was largely due to labour having more and better plant, equipment and building at its disposal. In 1958 fixed capital per worker in manufacturing industry was £1,100; in 1968 it was £1,900, capital being valued at constant prices.

Naturally, factor productivity (i.e. quantum output in relation to both labour and capital combined) has risen far less than labour productivity, in fact by 1.4 per cent per year.

Individual Industries

Appendix Table A6.1 contains material which may not be directly relevant to the present study. Researchers in other topics in the field of manufacture may however find them interesting. It may be observed that should any relationships between the factors seem likely on these data, involving comparison only between 1958 and 1972, they can be strengthened by single step data between consecutive years, thus with multiplication of data. If, however, investigation of the present data does not yield significant results, there does not seem much point in extending inquiry to year-to-year material.

Variability between the 40 industries for each of the 12 statistics can best be compared by using the coefficient of variation (c.v.) i.e. the ratio of the standard deviation to the mean coefficient of variation for data of the Appendix 6: Table A6.1:-

1.	Fixed capital stock at constant prices	.48
2.	Value of gross output	.60
3.	Volume of gross output	.49
4.	Gross output price (unit value)	.21
	Unit cost:-	
5.	Employee remuneration	.30
6.	Remainder of net output	.33
7.	Materials	.27
8.	Employment	.40
9.	Labour productivity	.34
10.	Value of net output	.50
11.	Share of remainder of net output in total net output	.17
12.	Employee remuneration per employee	.11

The three with lowest c.v.s. those numbered in order 12, 11, and 4, are perhaps of the greatest interest. The lowness of No. 12 indicates the propensity of wages to have the same rise throughout industry. The variable No. 11 figure shows that within each industry the change in the "share" of net output was comparatively low. The figure for variable No. 4 shows that price changes were fairly uniform in the different manufacturing industries, another illustration of the pervasiveness of inflation, a point to which we attach great importance. The fairly large figure for change in labour productivity (No. 9) is indicative of a disappointingly sizable variation throughout industry, though this may have been partly due to variation in size of firm and other causes, including variation in volume of output.

The c.v. for our main variable No. 6, while much greater than that for gross output price is much the same as for employee remuneration and, indeed, for price of materials.

The Correlation System

In a purely exploratory spirit, unhampered by hypotheses, we produced

the full correlation matrix for the thirteen variables in Table A6.1 - see Table A6.2 and the Note thereto. With 40 pairs of variables the conventional null-hypothesis critical probability points are:-

Probability	c.c. value	Significance symbol
.001	.50	xxxx
.01	.40	xxx
.02	.37	xx
.05	.31	x

These are described as "conventional" in the sense that they apply only to pairs that are random to one another which is manifestly not the case with many pairs in Table A5.2, having regard to the way they were calculated. There is also the point that if all 13 variables were entirely random to one another a few c.c. would be found to be conventionally "significant" (in fact about 8 at .05 probability) of course an untenable inference. Generally speaking the foregoing critical c.c. values would have to be much higher - we do not know by how much - to be associated with the probabilities indicated.

Our prime interest is with No 6,* unit cost index of remainder of NO index. This is positively related to unit cost of employee remuneration (No. 5). The partial c.c. between the two variables 5 and 6 with No. 11 constant (symbolically $r_{56.11}$) was as high as .91, an interesting result.

Of perhaps greater interest is that No. 6 seems negatively related to No. 9 - labour productivity $r_{69} = -.40$ (xxx), i.e. the greater the increase in labour productivity the lower the increase in unit cost of Other income and vice versa.

Probably non-trivial conventionally significant results derived from Table A5.2 are the following:

* Variable numbers are as in Notes to Table A6.1.

Variable numbers	Sign	Significance	Nature of relationship, in words, in brief*
1, 8	+	xxxx	Employment increases with capital
1, 12	+	x	Pay increases with capital
1, 13	+	xxx	Capital increase % largest in labour-intensive industry.
3, 5	-	xx	Greater increase in GO volume lower increase in unit cost of labour
3, 9	+	x	Greater increase in GO volume greater increase in lab. prod.
4, 8	+	xxx	Greater increase in GO price, greater increase in employment
4, 9	-	xxx	Greater increase in GO price, lesser increase in lab. prod.
5, 6	+	xxx	Greater increase unit cost labour, greater increase remainder NO.
5, 9	-	xxxx	Greater increase unit cost labour, lesser increase lab. prod.
6, 9	-	xxx	Greater increase unit cost remainder NO lesser increase in lab. prod.
9, 11	+	xx	Greater lab. prod. greater increase in share of RNO in NO.

While the relationships we deem non-trivial are few, it is statistically satisfying that, in general, the results in Table A6. 2 are consistent. It should be noted that the foregoing results and indeed all in Table A6. 2 are associative, not causative, in character.

It would lead us too far afield to attempt further examination of the data in Tables A6. 1 and A6. 2: analysis by partial correlation or econometric equations might be rewarding. We suggest that Table A6. 1 is worthy of scrutiny, for instance to note facts, as that the 1972 index of unit cost of remainder of NO for sugar refining is 481, by far the largest figure in the column, and to note that this industry is about the nearest in practice

* For full description see Notes to Appendix Table A6. 1.

to a monopoly in the Irish Republic. We freely admit that we may have fallen for the theoretical appeal of this comment; the truth may be more simple, e.g. a change in the content of RNO, our proxy for Other income, or the world price of sugar etc.

Some of the relations in Table A6.2, even though conventionally insignificant are interesting. This remark applies especially to variable No. 13, capital per person engaged in 1968, an absolute figure, be it noted, and not an index. We introduce this variable, we confess, not in relation to the present study, but for our interest in the labour-intensive v. capital-intensive industry issue. This is of crucial importance for Ireland, with endemically high unemployment and underemployment problems. In such a situation we should favour labour-intensive industry, unless there were such telling arguments against it as that, as a method, it is obsolescent, e.g. that over a period its output was proportionately less than for capital-intensive industry.

Low values of variable No. 13 indicate labour-intensive industry. From Table A6.1 we note that, in 1968, the most labour intensive industries were (in order) shirtmaking, miscellaneous clothing, women's clothing, men's clothing, boots and shoes, i.e. simpliciter clothing (with less than £1,000 per employee), labour intensive in most countries, especially the Third World. Highest values (i.e. most capital-intensive) are fertilisers (at £8,000 by far the largest) and brewing. Ireland is a country with one of the largest proportions of exports in relation to GDP in the world. It is a little unfortunate that labour intensity in Ireland should be greater for clothing industries, in which prospects for substantial increase in exports seem bleak. The No. 13 column nevertheless may afford guidance in policy formation away from undue capital intensity.

Variable No. 13 is insignificantly related to the production indexes value and volume of GO (Nos. 2, 3) employment (No. 8), value of NO (No. 10). If capital intensity were related to growth we would expect significantly positive c.c.s. We infer that there is no significant relationship between labour or capital intensity and growth.

Conclusion as to Manufacturing Industry

We have ranged so widely that we find it difficult to comment in relation to our main topic, Other income. The proxy therefore, No. 6, appears only once in our c.c. schema, to the effect that its index is positively related to that of unit cost of labour.

We are again impressed by the pervasiveness of inflation.

Some of the insignificant relationships are as interesting as the non-trivial significant ones; for instance, between variables No. 3 (volume growth) and No. 6 unit cost RNO. Surely one would have expected a pronounced negative relationship; we find a negative c. c. but it is not significant. Also we find a lack of association between this growth variable No. 3 and capital intensity (No. 13).

Chapter 9. Concluding Remarks

So far our treatment has been austerely statistical. In this last chapter we allow ourselves more speculative freedom. We start with our first thought, namely, that in a small country with a relatively huge export trade, rise in Other income in the private sector must be very much more an effect than a cause of inflation. We regard this hypothesis as not disproved after the fairly thorough analysis of this paper.

Ex ante Thinking*

Before serious analysis of the data our first thoughts were that any controllable effects of Other income on inflation were negligible compared with imports and other external effects, employee remuneration and government expenditure. The important word here is "controllable". Such an hypothesis is not falsified by the fact that income earners of all kinds are equally "responsible" for inflation, in the sense that a willing or forced reduction of income of a given amount would have more or less the same effect in all categories in lessening inflation. The point is that (in our initial view) recipients of Other income have collectively little autonomous power to increase it, in Irish conditions. This is a macro viewpoint; we would of course, try to isolate groups, if any, in a quasi-monopolistic situation, including self-employed professionals and the groups they possibly influence income-wise. It is essential to bear in mind that it is change in this latter situation that matters.

Our thinking is largely based on the genesis of Other income, i.e. the way it is derived, fundamentally different from that of employee remuneration. Other income in the private sectors consists of (1) income earned by working proprietors and members of their families and (2) rents, dividends, interest, etc; the distinction between (1) and (2) is mainly between small and non-small concerns. Other income is, from one point of view, essentially a residue as the difference between selling value and all costs. Employee remuneration is a prior charge, often regarded nowadays as exogenous in analysis; Other income depends on price of product or service. Herein lies the fundamental distinction between the two main constituents of added value. But, will the enterpriser get his price? His success is assured only if he is a monopolist, in whole or in part.

* See Appendix 8, for which the authors are very much indebted to Mr. J.J. Walsh, Chairman, National Prices Commission.

To a considerable degree throughout the economy the offering price is cost plus, i.e. the cost of all inputs plus a fixed percentage. While the topic has been much debated in Ireland, and we have not avoided its resumption in this paper, we may state that, having regard to the vast changes in prices and other economic variables during the past half-century, businessmen in Ireland have been successful in maintaining the proportion (i.e. in getting the offered price) borne by Other income in added value, if with some lessening in recent years. Controversy on "the proportion" has centred on whether there has been a significant change at all? The short answer is: there has, but it is small in relation to other magnitudes involved.*

Other income, therefore, depends largely on price of product or service. With imports equivalent in 1973 to 45 per cent of GNP, one of the highest figures in the world, and protective duties rapidly on the decline - ultimately to zero within the EEC - it is hard to conceive of monopolistic prices on a wide scale within Ireland. There are official bodies whose activities are probably effective in keeping prices lower than they otherwise would be and in curbing any monopolistic tendencies, namely, the National Prices Commission,+ the Restrictive Practices Commission++ and the Prices Division of the Department of Industry and Commerce. The National Prices Commission advises the Minister for Industry and Commerce in fixing maximum prices, and the Restrictive Practices Commission has the primary function of holding public inquiries into the conditions which obtain in regard to the supply and distribution of goods or the provision of services; it drafts Fair Practice Rules. The Prices Division is the recipient of complaints against overcharging and has instituted hundreds of prosecutions.

It is difficult to decide how effective these bodies are, faced, as we are in Ireland at the moment of writing with the largest rate of inflation in the EEC. In view of the vast numbers of individual goods, the astronomical number of transactions and the fact that there has been a very wide range of percentage price increases during the past few years as we have seen, it must be assumed that controls are not completely effective. Because of their relation to Other income, we have looked at the trend in retail prices of individual commodities.

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* J.G. Hughes: "The Functional Distribution of Incomes in Ireland 1938-1970", ESRI Paper No. 65, 1973.

\+ See Appendix 5.

++ See Appendix 8.

Agriculture

Agriculture requires special treatment (supplemental to Chapter 2), because of the magnitude of the sector's Other income - 1973 it amounted to £374m. or more than half of total Other income, namely, £736m. There can be no doubt but that the vast increase in agricultural prices (unit cost) of 90 per cent in the period 1968-1973 - see Table 1.2 - far greater than in the case of any other main sector - made a major contribution to inflation in Ireland. But this increase was largely due to world prices and prices within EEC, in particular. In fact, it was the principal reason for our adhesion to EEC; it was national policy to release the Irish farmer from the age-old British régime of cheap food prices. The point is that most of the vast inflationary rise in agricultural prices was due to external causes.

There was a school that believed that the price mechanism, a most wonderful automatic regulator of the distribution of goods and services, should not be interfered with, i.e. that re-distribution of income was a separate affair, to be dealt with by social security, negative taxation, etc. Farmers everywhere, and Arab oilmen recently, ordained otherwise.

The fact that farm price increases are largely imposed from outside the economy is no reason for accepting them helplessly, still less that researchers should not study their effects. To revive an adage last fashionable in Ireland before World War I, agricultural redemption is to be sought through quantum, not price; price increases are always bad for others, if not for farmers. And, as to the second point, we study the repercussions of agricultural price increases on the economy.

In a paper of the mid-1950s Geary,* from a time series study of agricultural prices and incomes, tentatively suggested that there might be an inverse relationship in the short term between prices and aggregate quantum output in agriculture, i.e., a tendency towards achievement of a steady income. This, it was surmised, was a global result, farmers being sensitive to price rises in individual products, increasing production in such products but lowering production in others. A little later this tentative view was supported though for England, by the results of a cross-section survey from which the

* "Variability in Agricultural Statistics on Small and Medium Sized Farming in an Irish County." JSSISI November 1956.

author concluded that a practical way for increasing the aggregate volume of agricultural output in the UK was to reduce prices of agricultural products.

This tendency towards inverse relationship between quantum and price in Irish agriculture was interpreted by Geary as a widespread satisfaction with a more-or-less predetermined low cash income deemed, in turn, to be a marked weakness on the side of demand by agriculturists. Any tendency to reduce output with increased agricultural prices would have deplorable effects on the economy. It is another argument in favour of curbing these prices.

Certain it is that in Ireland and England agitation for improved agricultural incomes concentrated on prices of product and, in so far as there were claims for reduction of prices of materials, the object, one surmises, was more to enhance margins than to increase volume output.

Whatever enthusiasm Irish farmers ever had for the quantum approach to prosperity vanished under the impact of two World Wars, the only periods during this century (save for the last few years) that farmers acquired substantial money incomes. It is also relevant that, so far as home markets are concerned, the price elasticity for Irish farm products is generally low, i.e. a reduction (absolute or relative) in price will not necessarily result in a substantial increase in home sales; of course, this is not true of exports.

To repeat, we regard agricultural prices as a major threat to inflation, at least in the near future. This "income redemption through price" attitude is by no means confined to Ireland. It seems to be largely that of CAP.

One wonders if it is suited to Ireland, even apart from its harmful effect on inflation. It has often being stated that in parts of Ireland there is the finest agricultural land on earth and that quantum output potential (physical if not economic) is something like twice what it is now. We (and CAP) seem to have accepted that the only way towards equality of income, farm with non-farm, is reduction of numbers on farms.

In our view it seems doubtful if full employment can ever be attained in Ireland if non - AFF sectors are to cope with this agricultural surplus of manpower. At least in Ireland if not elsewhere in EEC there is a strong case for maintaining, if not

increasing, numbers engaged in AFF, of course through increased production.

Of course, existing surplus production in EEC is no answer, those "mountains" of beef, butter, milk powder etc, deemed due to errors in pricing policy. To accept this argument is to ignore that two-thirds of the world is stated to be near starvation. To revive the cliché: "the problem is one of distribution not of production". Europe, North America and the Antipodes have more of their world share of developable land, hence also responsibilities towards the hungry world.

We recommend that AFT and ESRI combine on a comprehensive study for a policy for agriculture, forestry and fishing in Ireland. Recommendations therefrom might have their effect on CAP of EEC.

But to end this section we feel we should call attention to the very recent expert opinion of S.J. Sheehy enshrined in the following quotations:-*

> "Our Irish representatives have fought single mindedly for the highest possible prices for farm produce ..." The CAP provides an excellent framework for Irish agriculture. We must, however, take a more positive approach to the rationalisation of the CAP, lest in exploiting the CAP for short-term gain we kill the goose that is laying the golden egg".

We agree - as applicable to the very recent period and the future.

Non-agricultural Policy

One wonders whether something of the kind (i.e. a preference for a price to a quantum route to better income), in conditions of rampant inflation obtains in non-agriculture. The theoretical assumption is that all managements try to maximise profit. Do they, in fact? It is virtuous to obtain profit through large output and low prices. Is this always what happens? Clearly industrial pricing policy and experience require examination.

Within their firms, managements (as distinct from employees and shareholders) have absolute power of decision as to prices at which goods and services are offered, which decision will, of course, be influenced by competitive prices and other considerations.

* Irish Times, 11 May 1976.

Ordinary observation goes to show that, contrary to the usual theoretical assumption, a wide range of prices can obtain at any given time for a given description of good, not explicable by transport costs etc. Also, a small difference in product price may mean a large difference in profit; and, as degree of inflation increases, purchaser resistance to price increase lowers. In all these circumstances, many managements must seek solace in marginal price increases rather than in enhanced sale volume, with all the trouble associated therewith. There are fewer coronaries in the price approach.

Geary and Pratschke* suggested also that inflation may be necessary for economic development under modern conditions; their only supporting argument was the negative one (or perhaps the "zero" one) that a price standstill would spell widespread ruin. In the early post-Keynesian days some expressed a liking for "a small price rise" (carefully avoiding assessment of the magnitude of "small") to which the more percipient were wont to reply: "The notion of a small price rise is about as sensible as that of a small pregnancy". How right the latter were !

The point of the foregoing remarks is that the widespread idea of "redemption through price" may be a leading cause of inflation resulting, ultimately, in disaster (i. e. of the currency unit). Until disaster, there seems to be no strong countervailing force operating.

Prices not Incomes

We here state our firm conviction that, as between price and income control, the better way to curb inflation is direct action on prices, involving, of course, indirect action on incomes. So, more or less existing levels of money income will improve in real value. Direct action on money incomes must lead to political and social trouble.

In the creation of NPC and other bodies designed to control prices, this is obviously the official attitude. Have their actions been effective in the sense that prices would have been higher without them? They clearly have not been sufficient.

The State and Non-employee Income

The State, regarded as an entity, is the major monopolist in Ireland as

* op. cit.

everwhere else. It is capable of earning Other income, as the difference between its receipts from taxation, fees and marketing services less costs of labour and of goods and services. At the start, we decided that the State came within our terms of reference but felt that the task of analysis was beyond our resources of time, money and talent. We must be content to recommend that an independent, full scale, research inquiry be made into the extent of the contribution of State activity to inflation, and how this might be mitigated in future.

Who are to Blame for Inflation?

We had no intention of converting this study into a search for guilty men, whether these be deemed to be workpeople ("greed"), managements ("profiteers") or governments ("profligate spendthrifts"). We took this negative attitude not from pusillanimity but from the conviction that all of us are to blame, which may be another way of saying that none of us are to blame. What seems clear is that sacrifices must be made by all if inflation is to be curbed.

Workpeople and their unions are usually cast in the blameworthy role, for more or less the showing of Chart 1. Their gains are well ahead of those of Other income earners, our main interest. Yet, if this advantageous situation obtains, may it not be inherent as the outcome of free collective bargaining, equitable as a progress towards less social inequality? In an inflationary situation there are few safeguards; there is one here. If earnings go beyond a certain level, production must fall and unemployment transpire. One can easily envisage a situation in which average earnings of employees at work and out of work have declined because of inordinate demands for increased earnings; NIEC was strongly of this opinion in the 1960s when inflation was far less serious than it is now. Something like this may be happening in Ireland at the moment.

EEC Prices and Inflation

There are newspapers reports (as well as reports by tourists) that retail prices in Britain and Ireland are generally lower than in other EEC countries and, as we know, British and Irish prices are increasing faster than elsewhere in the Community. These facts are consistent with British and Irish prices tending towards equality with the others, to be expected with increasing trade and other links between EEC countries. This is surmise, but, to the extent that it is true, it offers but a gloomy prospect for an early

substantial mitigation of inflation in Britain and Ireland. In the long run it may be different: the success of the rest of EEC in levelling off prices must have a corresponding effect on British-Irish prices unless, of course, the sterling exchange rate continues its present downward trend.

The Present Inquiry

Our initial thinking therefore produced (i) a strong negative hypothesis which we regard as sustained, (ii) suggestions for inquiry into agriculture and the public service mainly with a view to mitigation of the impact of these great sectors on inflation. We have provided data and a train of argument about both.

In the event our approach was statistical, involving analyses of all available statistics on the different sectors of the economy, some of these statistics admittedly with but slim relationship to our subject of inquiry, namely,the effect on inflation of Other income. At the end of each chapter we state our conclusions on what we believe to be the clear showing of the statistics.*

Our opening hypothesis might be paraphrased: in the main,earners of Other income are affected by inflation but are not the cause of it. In our analyses we have found nothing to disprove this thesis at the macro level.

We base this conclusion on the relative trends in unit costs of employee remuneration and of Other income, especially in 1974. Amongst macro sectors, it is only in the case of agriculture that the latter exceeded the former in recent years, and here this effect is partly due to decline in number of employees, but mainly to relative trends in cost of prices of products and materials, over which Irish farmers have little or no control.

The foregoing finding, even without appeal to statistics, should be impregnable for a small country with relatively large export and import trades, assuming perfect competition. But to what extent is the latter the case? Have Irish producers special markets or special products which give them some control over the prices at which they sell? Have exporters different prices for home sales and exports? We may state that ESRI has under active consideration a proposal to investigate on a sample basis Irish

* All our findings are not in these very brief "conclusions". We hope that readers will find some value in our results in themselves, even if but dimly relevant to our theme.

industrialists reaction to economic change, of which the degree, if any, of imperfect competition, would be very much a part. In the meantime, our conclusion stands.

Econometrics

Our main finding i. e. that by and large Other income in Ireland is not a cause of inflation is so essentially simple that we hesitate to submit it to sophisticated investigation. However, in Appendix 3 we have begun investigation on a simple and elegant behaviouristic system of simultaneous equations due to G. Tintner. All that we claim for it in application is that the showing is reasonably close to what has happened recently in Ireland.

We recognise that the Cobb-Douglas postulated as a production function is not suitable for the present inquiry because of its implication of a constant ratio in time of employee remuneration to Other income.* In fact our approach, on the contrary, has shown that there have been differences in trend, especially when the data are examined in different sectors. Another production function allowing for variation in the ratio might be substituted for the Cobb-Douglas. Perhaps also some of the functions now regarded as exos might be converted into current endos with a corresponding number of equations added. All we can claim now is that the system may merit some further elaboration.

We confess to some doubt about the value of this approach for helping with the present problem. For example, if we decide to regard employee income as endogenous and furnish it with a causal equation, as caused, say, by CPI and other variables we beg a large question at the start.

Concluding Reflections

The main conclusion of the study is that few earners of non-employee income have any control over their level of income, (in so far as this depends on the prices of labour products and materials) except as regards level of activity. This is a corollary of the fact that Other income is essentially a residue, the difference between selling value and costs, including cost of labour, over the level of which, price-wise, the enterpriser has little influence, unless he be a monopolist in whole or in part. Such cases must be rare in Ireland with its relatively vast foreign trade and the reasonably effective and wide-ranging activities of the NPC.+ As price control must be more effective at factory level, one

* See Appendix 4.

\+ See Appendix 4.

must be doubtful about the efficiency of control of costs of distribution (even though these come with the ambit of NPC), our investigation of retail trade shows no tendency towards an increase in percentage mark-up, if admittedly the period of reference of our data is somewhat remote - see Chapter 3.

Our general approach in this study has been to compare price or unit cost trends associated with non-employee income with CPI and/or employee unit costs trends, in so far as this was possible. If the trend of Other income in a particular occupational or industrial group was lower than either or both the other series, we would decide that it would not be necessary to try to find out if conditions conducive to over-pricing had changed for the worse under the conditions obtaining in the group. Obviously it would be extremely difficult to obtain information on the latter aspect on anything like a comprehensive scale. We consider that unfair pricing, in the aggregate, is on a small scale.

Our residue theory, as applying to Other income in the private sector implies that if inflation be curbed generally, i.e. if the rate of increase in prices of goods and services and unit costs of employee incomes be reduced, the trend in unit cost of Other income will take care of itself: any tendency in the latter to increase unduly in general or in particular will be fortuitous. To repeat: the rise in Other income is an effect, not a cause, of inflation.

Hence any suggestion we might make would bear on general inflation. As every government is actively engaged in the task of curbing inflation, and every economist thinking about it, it may seem temerarious on our part to enter the fight against inflation. We do not think so because our proposal is so obvious and unoriginal.

It is: strive to attain a substantial increase in exports, mainly by making export prices "more competitive", i.e. lower. Ireland has relatively one of the largest export trades in the world, so that way is already lighted for us. Probably the basis of the marked rise of trend in the country's prosperity that began in the late 1950s and early 1960s was the rise in exports. Still, our income per head is the lowest amongst our EEC partners, less than half that of the most prosperous.

The price elasticity of demand for exports from this small country is very large. This means that a small reduction in price may result in a large increase in volume of exports thus with a lowering in unemployment. Of course, price reduction of goods and ser-

vices exported is not enough; fortunately we possess a large volume of talent in the arts of marketing abroad no doubt capable of expansion.

We suggest that price reduction absolutely or relatively can best be realized by people's working harder and more skilfully, not only those directly engaged in export industries but all workers. Such an end can be achieved only by a national campaign against inflation, showing what an evil it is, cheating most of the people most of the time. We admit that we are not optimistic about this suggestion being adopted.

There is a difficulty to be faced here. If wages are curbed it seems that, in equity, so must Other incomes. But decision as to increased economic activity in the private sector, as we have so often stated, remains absolutely with recipients of Other income, impelled mainly by the profit motive.

Of course there are ways of coping. We suggest this only. Nothing is more likely to convince Other income earners of better times to come (i.e. better rewards in future) than a disposition on the part of employees to make sacrifices in the present hard times.

Many times we have had to insist on the extent to which our small country must accept world prices for what we buy and sell. If we accept this position absolutely, i.e. to produce and consume goods to a world pattern, surely our economic future is dubious, in competition with low cost and large scale producers. Why should we not produce, on a far larger scale than at present, goods recognised internationally as specifically Irish, even luxury goods for a world becoming wealthier?

Appendix 1

Selected index numbers 1958-1974

Year	Unit cost indices			Implicit price indices			Retail prices		Agricultural Prices
	Employee remuneration	Other income (1)	Other income (2)	GDP	Exports	Imports	Ireland	UK	
1958	62.1	73.1	78.7	66.6	81.5	86.9	72.8	74.2	78.6
1959	61.8	75.8	81.4	67.6	83.7	85.1	72.8	74.5	78.5
1960	63.8	77.1	82.3	69.1	82.9	86.5	73.1	75.4	76.4
1961	67.0	79.4	84.2	72.0	82.8	87.3	75.1	78.0	76.7
1962	71.6	80.1	84.6	75.4	84.1	87.7	78.3	81.3	78.0
1963	74.9	81.0	85.6	78.2	85.7	89.3	80.2	82.9	78.4
1964	82.4	85.9	88.8	83.9	89.9	90.5	85.6	85.6	86.7
1965	86.8	87.4	92.2	88.2	91.6	92.7	89.9	89.7	90.3
1966	92.8	85.2	88.3	90.7	93.3	92.7	92.6	93.2	88.9
1967	95.4	90.4	94.5	94.8	93.9	92.7	95.5	95.5	96.7
1968	100	100	100	100	100	100	100	100	100
1969	110.4	103.4	107.2	109.2	106.1	104.2	107.4	105.4	102.8
1970	125.2	107.1	108.9	119.2	113.4	111.4	116.2	112.2	107.6
1971	137.3	116.1	113.3	128.2	121.8	118.1	126.7	122.7	115.1
1972	151.5	141.4	137.8	146.4	136.4	123.8	137.5	131.4	139.8
1973	170.2	174.2	157.2	165.4	164.2	142.2	153.3	143.5	182.7
1974	198.7	167.7	153.7	180.7	200.8	188.1	179.3	166.6	185.3

Basic Sources: NIE 1971-1973; ISB June 1975; Review of 1974 and Present Outlook.
Statistical Abstract 1969; Department of Employment Gazette, August 1974.

(1) Gross stock appreciation; (2) net of stock appreciation.

Appendix 2

Correction of 1966 CD Data for Taxation

In the case of those ratios involving gross margin, a problem of comparability arises. According to the Census of Distribution definition, gross margin equals "Total Sales less Purchases plus increases in Stocks"; moreover, respondents are instructed to "include any payments to suppliers in respect of turnover tax and wholesale tax" in the value of their purchases, and to "include receipts from customers for turnover tax and wholesale tax" in the value of their sales. Hence "gross margin" includes any sums in respect of turnover tax and wholesale tax which the retailer is required to remit to the Revenue Commissioners. Whether a retailer is liable to remit such sums depends on whether he is registered with the Revenue Commissioners for the purposes of the sales taxes; if he is, he can make all purchases for his stock in trade (in so far as they are not already gross of sales taxes) free of tax, and will be liable to remit the tax on sale.

Turnover tax was levied at a rate of 2½% in 1966 on almost all sales of goods and services; wholesale tax was levied, on a narrower range of goods and services from 1 October 1966, at a rate of 5%. Both taxes were levied on the selling price inclusive of tax. If we are aiming, with gross margin, at a measure of value added by the retailer (in fact, it includes, in addition to certain sales taxes, rather more than value added), it will be necessary to deduct any amounts included in respect of sales taxes. These amounts were estimated as follows: (i) it was assumed that turnover tax applied to the entire turnover of Census respondents, though this turnover includes a small amount of sales by wholesale; and that the full amount of this tax was included in their reported gross margins; the latter part of this assumption implies that all sales were made to persons who were not registered for turnover tax by retailers who were, supplied entirely by suppliers who in their turn were registered; this assumption is justified by the number of registered outlets in 1966/67 compared with the number of Census respondents. (ii) In view of the narrower range of goods covered by wholesale tax, the small number of registrations in 1966/67 the small sum collected from its operation in the period 1 October 1966 to 31 March 1967 wholesale tax was ignored. Thus the burden of turnover tax is overestimated, and that of wholesale tax neglected; the errors tend to cancel, leaving a probable net overestimate of the tax burden, and a consequent small underestimation of margins in 1966.

Gross margin net of turnover and wholesale taxes is, in the text proper, implied by the term "gross margin".

In calculating those ratios involving sales, it has been decided to use sales net of turnover tax. No such correction has been or can be made for other indirect taxes, which are, with some exceptions (e.g. rates) not included in reported GM. Accordingly the value of those ratios involving sales will differ according as Government increases its revenue from indirect taxes by means of the turnover tax or otherwise.

The figures for the ratio of gross margin to sales in Table 4.3 are corrected in a similar fashion to those in Table 4.2 involving retailers' margins. It should be noted that from May 1 1970 the turnover tax was doubled to 5 per cent, and consequently a weighted average of the two rates was used in correcting 1970 figures. A more serious reservation in regard to the figures for 1967-1970 is that no correction for wholesale tax is made. While this procedure is acceptable in relation to 1966, during which the wholesale tax applied for a short time only, the fact of a downward trend in gross margins as a proportion of sales may be disguised in Table 3. It seems likely, however, that Table 3.3 establishes a point, while further refinement of it would, owing to the restricted scope of the wholesale tax, and ignorance of the proportion of retailers' purchases free of wholesale tax, be conjectural.

Appendix 3

The Algebra of Input-Output Price Changes

The basic method of analysis is as follows: If there are n industrial sectors, m primary input factors, then the basic pricing equations are

$$\sum_{i=1}^{n} p_i a_{ij} + \sum_{k=1}^{m} \tilde{\pi}_k b_{kj} = p ; \qquad j = 1, \ldots\ldots\ldots n$$

or in matrix form.

$$\underset{\sim}{p}'\underset{\sim}{A} + \underset{\sim}{\tilde{\pi}}'\underset{\sim}{B} = \underset{\sim}{p}'$$

where p_i is the price of the product in each industrial sector; $\underset{\sim}{A}$ the matrix of inter-industry input coefficients; $\tilde{\pi}_k$ the price of a primary input, and $\underset{\sim}{B}$ the matrix of industry primary input coefficients. Note that we may always include the primary inputs themselves as outputs of industrial sectors, e.g. if all primary inputs are to be viewed as outputs, we have $a_{ij} = o$, all i, $j \leq m$, $b_{ij} = \delta_{ij}$; i, $j \leq m$, where the first m outputs are the "primary" goods. This of course implies $p_i = \tilde{\pi}_i$ $i \leq m$.

Solving for $\underset{\sim}{p}'$, we have

$$\underset{\sim}{p}' = \underset{\sim}{\tilde{\pi}}'\underset{\sim}{B}(\underset{\sim}{I} - \underset{\sim}{A})^{-1}$$

A price index, e.g. the CPI., is then viewed as simply a weighted sum of the price vector $\underset{\sim}{p}'$, say $P = \underset{\sim}{p}'\underset{\sim}{h}$, a scalar, where $\underset{\sim}{h}$ is the column vector of household weights, hence we have,

$$P = \underset{\sim}{p}'\underset{\sim}{h} = \underset{\sim}{\tilde{\pi}}'\underset{\sim}{B}(\underset{\sim}{I} - \underset{\sim}{A})^{-1}\underset{\sim}{h}$$

It is convenient to deal with price changes (indicated by the prefix Δ), prices being regarded in each time interval as index numbers to base unity in the year of I-O (here 1969). We also allow in what follows for primary input in households.

In fact, assume that price changes (with 1969 as 1) for each primary input are the same for all 33 sectors, namely, $\Delta\tilde{\pi}_i$ (hence a scalar) for primary input i. Let $\underset{\sim}{b}'_i$ be the row vector of coefficients for primary input i, $\underset{\sim}{h}$ the unitized (i.e. column sum to 1) I-O household consumption vector, $\underset{\sim}{h}_1$ the interindustry part of $\underset{\sim}{h}$ and $\underset{\sim}{h}_{2i}$ (a scalar) the element of $\underset{\sim}{h}$ for primary input i. Then if ΔP_i a scalar, be the change (1969 as 1) in price of household consumption between 1969 and any other year,

$$\Delta P_i = \Delta \tilde{\pi}_i \left[\underset{\sim}{b'}_i \, (\underset{\sim}{I} - \underset{\sim}{A})^{-1} \underset{\sim}{h}_1 + h_{2i} \right]$$

Changes shown were readily calculated from this formula, the scalar values

$\underset{\sim}{b'}_i (\underset{\sim}{I} - \underset{\sim}{A})^{-1} \underset{\sim}{h}_1 + h_{2i}$ (which, over i, sum to unity),* being given. Percentages do not always exactly add because of rounding. If ΔP is the resulting change in the price of household consumption, it is evident that

$$\Delta P = \sum_{i=1}^{k} \Delta P_i$$

as used in the table. For application, see Notes to Table 5.1.

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* See E.W. Henry,"Irish Input-Output Structures 1964 and 1968", (ESRI Paper No. 66, 1972), Appendix 1.

Appendix 4

A Macro Behaviouristic System

Our model is simple and elegant, due to G. Tintner, which he describes as a "highly aggregated Keynesian model".*

Endogenous Variables (endovars):

C = Private consumption (current)

Y = GNP (current)

P = Implicit GNP price index

X = GNP (constant price)

D = Employment +

Exogenous variables (exovars):

N = Population

G = Public consumption (current)

I = Gross investment (current)

L = Change in stocks (current)

E = Exports (current)

M = Imports (current)

K = Capital stock (constant price)

W = Annual income per employee (current)

An interesting feature of this model is its regarding average employee compensation (W) as exogenous. Taking a strict view, scarcely any economic variables are entirely exogenous but we agree with Tintner that under modern conditions the wage rate has more the character of an exovar. For reasons which will presently appear, our main interest, namely, non-employee income, does not appear explicitly in this model. Following Tintner, we do not regard the model as stochastic. Data are annual. In what follows we omit the subscript t, i.e. "C_t" etc. will be written "C". The five equations are -

* G. Tintner: "A Simple Aggregate Model for Austria". Mimeograph memorandum of the Institut for Okonometrie, Techniche Hochschule Wien.

+ Contrary to our practice elsewhere, we here include in "employment" independent and family workers. "Employee" income DW is correspondingly changed.

(1) A consumption function: $\frac{C}{NP} = a + b \frac{Y}{NP}$

(2) Definition of GNP: $Y = C + Q$

with $Q = G + I + L + E - M$. All on the right are exovars, Q therefore being regarded as a single variable, greatly simplifying the algebra.

(3) GNP at constant prices: $X = \frac{Y}{P}$

(4) Demand for labour: $\frac{\delta X}{\delta D} = \frac{W}{P}$

A Cobb-Douglas production function:

(5) $\log X = d + f \log D + g \log K$

From (1) and (2), C/NP and Y/NP may be expressed in terms of Q/NP, i.e. in reduced form. Each equation is solved by least squares and by reverse substitution a and b are found. Tintner uses the following neat device to estimate f in (5). From (5), by partial differentiation,

$$\frac{D}{X} \cdot \frac{\delta X}{\delta D} = f.$$

Then using (4), $f = DW/PX$. Log f is estimated as the arithmetic mean of ($\log D + \log W - \log P - \log X$) over all the observations. Such an estimate of log f may be regarded as consistent, under general conditions. For scale reasons g is estimated as (1 - f). We shall not be concerned with the constant d.

The system as a whole is non-linear so cannot conveniently be expressed in reduced form, i.e. each endovar in terms of the exovars. This, however, is quite easy if we linearize the system by postulating "small changes" whereby all the variables become $\delta (\log C) = \delta C/C$ etc, δC being small, including the exovars.

Table A4.1: Linearized reduced form of Gerhard Tintner's aggregate model for Austria.

	δ N/N	δ W/W	δ Q/Q	δ K/K
δ P/P	a (1 - f) N/F	(1 - b) fX/F	(1 - f) Q/PF	-(1 - b) gX/F
δ Y/Y	aN/F	afN/F	Q/PF	-afN/F
δ X/X	afN/F	$(aN - \overline{1 - b}X)f/F$	fQ/PE	$a(aN - \overline{1 - b}X)g/F$
δ C/C	aNPX/CF	afNPX/CF	$(a\overline{1 - f}n + bX)Q/CF$	-afNPX/CF
δ R/R	aN/F	afN/L	Q/PF	-afN/F
δ D/D	aN/F	$(aN - \overline{1 - b}X)/F$	Q/PF	-agN/F

Notes to Table A4.1

$$F = - a (1 - f) N + (1 - b) X$$

$$R = Y - DW = (1 - f) Y = gY$$

The coefficients for dR/R are identical with those for dY/Y for obvious reasons.

Adopting a slightly different, but easily reconcilable, approach from Tintner's we show in Table A4.1 the reduced form of the "small change" linearized model. The presence of endovars in the coefficients may seem strange, at first sight; less so, if we reflect that the model purports to show what the values of the small changes in the δ (log endovars) would be, given the δ (log exovars), the system having initially the values of the variables shown in the tables. In application, values of each of the five exovars involved will be substituted for Q in the fourth column of Table A4.1.

An intriguing feature of the model is the absence of capital stock K in the formulae for the coefficients in Table A4.1. a fortunate circumstance in view of the dubious statistical quality of our estimates therefore. The reason: K is not required for the calculation of f and g in the Cobb-Douglas and the δ -treatment eliminated the constant d.

In this sytem, non-employee income R would be Y-DW = gY, i.e. proportionality of employee and non-employee income in added value is strictly preserved. This means that the reduced form coefficients appropriate to R are identical with those of Y.

While this assumption of constancy is oversimplifed in its application to Ireland (in fact the hypothesis is discussed elsewhere in the paper), it is not so implausible as to vitiate the results we present in Table A4.2.

Table A4.2: Tintner's elasticities for Ireland, for mean of years 1958-1974.

Exovar log change	Endovar log change				
	$\delta C/C$	$\delta Y/Y$	$\delta P/P$	$\delta X/X$	$\delta D/D$
$\delta N/N$	0.55	0.41	0.14	0.27	0.41
$\delta G/G$	0.29	0.37	0.12	0.24	0.37
$\delta I/I$	0.43	0.54	0.18	0.36	0.54
$\delta L/L$	0.04	0.05	0.02	0.03	0.05
$\delta E/E$	0.81	1.00	0.34	0.67	1.00
$\delta M/M$	-0.93	-1.16	-0.39	-0.77	-1.16
$\delta K/K$	-0.19	-0.14	-0.38	0.25	-0.14
$\delta W/W$	0.37	0.27	0.75	-0.48	-0.73

Notes

This table was constructed from the formulae in Table A4.1 with variables given their mean values for the seventeen years 1958-1974. Data was therefore as follows:-

Parameters

a = 81.0773

b = 0.540405

f = 0.66324

Means

Endovars

$\bar{C}$ = £923.9 million

$\bar{Y}$ = £1,322.8

$\bar{P}$ = 0.8735 (1970 as 1)

$\bar{X}$ = £1,424.1 million

$\bar{D}$ = 1.060 million

Exovars

$\bar{N}$ = 2.910 million

$\bar{G}$ = £183.5 "

$\bar{I}$ = £269.8 "

$\bar{L}$ = £24.8 "

$\bar{E}$ = £504.3 "

$\bar{M}$ = £583.4 "

$\bar{K}$ = £2,305.1 million

$\bar{W}$ = £839.5 "

The table means that, e.g. -

$$\delta\frac{C}{C} = 0.55\ \delta\frac{N}{N} + 0.29\ \delta\frac{G}{G} + \ldots + 0.37\ \delta\frac{W}{W}$$

so that the columns represent the linear reduced forms of the five endovars when changes in the exovars are small.

All the basic variables, except K and N for 1958-1973 are from issues of CSO's National Income and Expenditure; 1974 values are from the March 1975 issue of the ESRI Quarterly Economic Commentary by J. Durkan and F. Kirwan. Estimates of N were supplied by CSO (End of Notes to Table A4.2).

Table A4.2 shows all the elasticities of the system, e.g. the first value 0.55 means that ceteris paribus a rise of one per cent in population results in a rise of 0.55 per cent in private consumption at current prices. There are, of course, many regularities in Table A4.2 (obvious from the formulae in Table A4.1): e.g. the $\delta X/X$ column equals the $\delta Y/Y$ column minus the $\delta P/P$ column and all column entries for the Q-set are in proportion, except for rounding.

Without too much stress on the results of so simple a model and mentioning only general tendencies rather than actual values, we find -

(i) Increases of one per cent in members of the Q-set (except imports) have positive percentage effects on the endovars.

(ii) As expected from their magnitudes exports and imports have the largest elasticities.

(iii) Increase in capital stock lowers prices and increases volume of GNP.

(iv) Increase in money wages substantially increases prices and volume of GNP and reduces (in greater proportion) employment.

In light of recent Irish experience, there is little to cavil at in these inferences from the model. Still, we must be on our guard, mindful of the econometric warning: one is liable to get from a model what one puts into it.

We have not provided a column of Other income $R = gY$ in Table A4.2 because, as is evident from Table A4.1 the values would be identical with those in the $\delta Y/Y$ column.

In Table A4.3 we compare actual with predictions from the model for all five endovar unity increases, $\delta P/P$ etc. for 1971-72, 1972-73 and 1973-74. For prediction Table A4.1 formulae were used, variables P etc. being taken as means $(P_0 + P_1)/2$ etc. and unitary changes as $2(P_1 - P_0)/(P_0 + P_1)$.

Table A4.3: Unitary Changes in Endovars (i) Actual and (ii) Predicted from Table A4.1 1971-72, 1972-73 and 1973-74

	1971-72		1972-73		1973-74	
	A	P	A	P	A	P
$\delta\frac{P}{P}$	.122	.171	.129	.168	.081	.059
$\delta\frac{Y}{Y}$	.167	.219	.179	.184	.083	.040
$\delta\frac{X}{X}$	.046	.048	.050	.017	.002	-.015
$\delta\frac{D}{D}$	-.008	.038	+.005	-.003	.007	.096
$\delta\frac{C}{C}$	.137	.095	.179	.172	.136	.044
$\delta\frac{R}{R}$	.144	.219	.209	.184	.071	.040

A : Actual

P : Predicted from model using Table A4.1

Note:

For method of calculation see text.

Except for 1972-73 the model cannot be regarded as very successful, perhaps because of its simplicity and of the estimates taken for δ P/P etc. The predicted figures for δ R/R are the same as those for δ Y/Y. The exercise may prove useful for comparison with results from other models.

Appendix 5

The Work of the National Prices Commission*

Under the Prices Acts (1958-1972) the Minister for Industry and Commerce has powers (i) to investigate all prices and charges, including charges for professional services, and to fix maxima for, or freeze such prices; (ii) to investigate and control the margins of distributors of all sorts; (iii) various auxiliary powers in connection with these functions. Certain goods and services are excluded from the scope of the Prices Acts, the most important of which are

(a) activities carried on by or on behalf of a Minister of State (including the activities of state-sponsored bodies);

(b) primary agricultural products (including eggs, poultry, milk and milk products) and horticultural products;

(c) commodities for export;

(d) banking services;

(e) housing;

The National Prices Commission is an advisory body established by the Minister under the Prices Acts. In addition to the above exclusions, (which have not however, prevented the Commission from commenting on some of the excluded activities), the following are exempt from detailed price control:

(f) firms exporting 25% or more of their output of a product, if the average delivered cost excluding taxes on the British market is not less than the domestic price;

(g) firms producing transportable goods which employ not more than 20 people or the turnover of which is less than £150,000;

(h) all laundries and similar establishments;

(i) animal feedstuffs and fertilisers.

In addition it is stated in the Reports that there are some sectors where price controls are largely ineffective, e.g. personal and professional services, or where, due to continual

* The Commission has recently recommended a substantial modification of the structure of price control, which however involves no departure from its basic principle. The proposal is that price control concentrate on those firms which are considered to have a dominant position in an industry.

changes in products, inapplicable, e.g. footwear, clothing, textiles and furniture.

In deciding whether to allow a claim for a price increase, the Commission will exclude for the purposes of the claim any increase in wages and salaries in excess of Government guidelines (based on the National Wage Agreement), and will require a certain absorption of costs through productivity increases, the amount of this absorption varying with economic conditions.

The Commission summarizes its approach to price control in the following terms:

> "When enough firms are competing with each other or where there is growing competition from imports, market forces will generally put pressure on firms to improve their efficiency and so moderate the rise in prices following increases in costs. In this kind of situation we envisage that our role will be limited and our general aim would be to strengthen market forces. Our main interest will be in cases where there is one firm (whether in the public or private sector) or a few firms or a dominant firm in an industry, or where competition from imports is absent or limited or where competition seems for any reason to be restricted. Here, price surveillance is important, because firms so placed have a wider discretion in their pricing policies". (Report No. 1, 1971)

In the particular case of retail prices it states:

> "Whatever form of control over retail margins is applied, efforts must be maintained to make competition more effective. If this is to be achieved, the flows of information to both buyer and seller must be improved. The better the flow of information, the better the quality of competition and the more efficient the system". (Report No. 40, 1975).

The Commission sees its task as mitigating the detrimental symptoms of inflation rather than the basic causes, the control of which is a matter for Government and other agencies. In regard to those basic causes it rejects the view that more than a part of Irish inflation is imported, and continues:

> "Some argue that the main domestic contribution to inflation has come from excess demand for goods and services, generated by fiscal and/or monetary influences. Others argue that prices have been pushed up by the up-

> ward pressure on wages and salaries exerted by trade unions. The available evidence seems to favour the first explanation - that prices have risen faster in Ireland than in neighbouring countries as a result of a combination of excess demand and expectations of further price increases. Excess demand has been created (or has emerged) on a number of occasions by a rapid growth of Government expenditure and of Government borrowing from external sources or from the banking system. As a result of this excess demand, Irish wages and costs have risen faster than they would otherwise have done. And expectations of price increases have been created which have sustained the inflationary process during the (usually brief) periods when demand has not been excessive". (Report No. 36, 1975).

From its inception to May 1975, the Commission has dealt with 2,628 claims, of which 2.6% have been rejected, 48.4% accepted in part, and the balance accepted in full. In the two years to May 1975, of £266.5 million of increased annual costs claimed, £211.7 million was actually allowed. This leads to the conclusion that the prices of the products and services covered by these claims rose by about 21% less than they would have done in the absence of price control. Moreover, when one considers that most Commission recommendations relate to ex-factory prices, which bear a retailer's percentage markup, and that wage increases in excess of the Government guidelines may not have been claimed, the true saving may well have been greater. However it is quite possible that there has been a tendency for applicants to the Commission to submit claims in excess of an amount acceptable to themselves; the greater the extent of this practice, the less has been the saving to consumers as a result of the Commission's activities. Also, it is probable that the enforcement of a maximum permissible price will be at a level required to keep the less efficient producers in business, and that this price will come to be regarded as the minimum price which even the more efficient will observe. Indeed it was for these reasons that the Commission rejected the extension of the system of maximum price orders as a means of controlling retail prices.

Appendix 6

Table A6. 1: Index numbers (to base 1958 as 100) for Irish manufacturing industries 1972 and fixed capital stock statistics for 1968

Manufacturing industry		1	2	3	4	5	6	7	8	9	10	11	12	13
		Index number as base 1958 as 100												£
1.	Bacon	235	251	155	162	254	227	152	119	130	373	94	329	1,686
2.	Meat Slaughter	414	736	312	236	224	241	237	223	140	728	103	314	1,460
3.	Creameries	330	557	305	183	215	374	169	185	165	910	125	355	3,902
4.	Canning	336	456	288	158	229	145	144	187	155	541	78	354	1,830
5.	Grain Milling	187	240	155	154	200	246	142	91	170	349	110	338	3,427
6.	Bread, biscuit	155	234	127	184	244	264	148	98	139	321	105	318	1,864
7.	Sugar refining	167	223	140	159	249	481	123	103	137	471	143	340	3,497
8.	Sugar confectionery	167	282	191	148	184	183	131	106	180	350	100	331	2,233
9.	Margarine	180	275	172	160	245	277	129	146	118	457	104	288	2,443
10.	Distilling	189	334	214	156	140	264	165	57	372	362	156	255	3,873
11.	Malting	178	364	206	177	97	152	204	54	380	262	120	368	3,274
12.	Brewing	177	264	136	194	326	211	112	99	138	320	87	449	5,076
13.	Aerated waters	208	581	348	167	139	199	162	140	249	591	117	345	2,245
14.	Tobacco	210	213	112	191	302	251	176	97	115	297	94	348	2,653
15.	Woollen (ex. clothing	180	262	217	121	169	212	93	106	205	408	113	346	1,498
16	Linen	237	216	150	144	187	131	206	138	200	234	84	355	2,113
17.	Jute, canvas	276	526	342	154	164	230	136	135	253	653	121	417	1,928
18.	Hosiery	156	463	459	101	101	138	89	154	299	534	118	302	1,458
19.	Boot and shoe	210	245	146	168	187	208	148	97	150	282	107	281	650
20.	Men's clothing	149	281	147	191	223	291	157	101	145	355	121	324	453
21.	Shirtmaking	222	480	204	236	256	350	201	159	128	591	121	327	364
22.	Women's clothing	265	339	254	133	138	158	123	109	233	370	108	320	433
23.	Miscellaneous clothing	150	227	164	138	156	98	140	80	205	223	72	319	380
24.	Made-up textiles	204	496	311	160	196	163	152	149	208	561	90	407	1,254
25.	Wood (ex. furniture)	224	405	238	170	149	278	160	111	215	446	148	319	1,570

Continued

Table A 6. 1 continued

26.	Paper	206	376	273	138	152	161	127	123	223	428	103	338	2,297
27.	Printing	263	403	177	227	229	323	175	122	145	466	123	332	1,460
28.	Fellmongery	173	327	157	209	190	279	202	100	157	359	122	298	2,053
29.	Leather	105	363	186	195	229	203	174	111	167	406	93	384	1,008
30.	Fertilisers	697	531	335	159	224	337	123	183	183	942	120	409	8,017
31.	Oils, paints	157	313	224	140	165	222	120	107	208	439	113	343	2,610
32.	Chemicals, drugs	286	1,314	642	205	172	267	180	270	237	1,478	116	409	2,191
33.	Soap, detergents	147	303	176	173	215	319	124	109	161	463	121	346	2,297
34.	Glass	242	606	253	240	268	335	173	198	128	735	115	343	1,684
35.	Metals (ex. machinery)	315	610	386	158	177	161	150	210	184	658	94	326	1,810
36.	Machinery (ex. electric)	255	1,030	410	251	207	228	285	251	163	882	106	337	2,110
37.	Electrical machinery	329	885	489	181	191	229	163	279	175	1,022	110	335	1,053
38.	Road vehicles	164	390	184	213	297	176	203	172	106	451	72	316	1,402
39.	Other vehicles	394	429	173	247	418	405	141	179	97	721	97	403	1,434
40.	Miscellaneous	229	1,352	541	250	160	272	284	262	207	1,158	127	330	1,889
	Total Manufacturing	219	409	237	173	201	242	154	139	170	522	91	343	1,760

Basic Sources: Irish Statistical Bulletin, issues of September 1961 and March 1975. E. W. Henry, "Estimation of Capital Stock in Irish Industry 1953 to 1968", Journal of the Statistical and Social Inquiry Society of Ireland, 1971/72. E. W. Henry and S. Scott, "Estimated levels of Capital Stock in Irish Industry 1953-1968", The Economic and Social Research Institute, Memorandum Series, Dublin.

Notes: Titles of industries in first column are abridged. For full description see later basic source.

Column Heads:
1. Fixed capital stock at constant (1958) prices 1968.
2. Value of gross output.
3. Volume of gross output
4. Price (unit value) of gross output.

Unit costs:
5. Employee remuneration.
6. Remainder of net output.
7. Materials.
8. Employment
9. Labour productivity.
10. Value of net output.
11. Percentage share of remainder NO in total NO.
12. Employee remuneration per person engaged.
13. Fixed capital stock at constant (1958) prices per person engaged 1968.

Nos. 1 and 13 relate to year 1968; all others to 1972.

Table A 6. 2: Correlation coefficients between all pairs of variables in Table A 6. 1.

Variable	1	2	3	4	5	6	7	8	9	10	11	12	13
1	1												
2	.35	1											
3	.36	.90	1										
4	.17	.49	.10	1									
5	.18	-.15	-.39	.54	1								
6	.25	.08	-.11	.47	.50	1							
7	.07	.58	.26	.74	.01	.04	1						
8	.52	.87	.79	.47	.12	.12	.45	1					
9	-.11	.12	.35	-.45	-.80	-.40	-.06	-.22	1				
10	.54	.91	.86	.42	.02	.32	.35	.89	-.01	1			
11	.02	.16	.17	.04	-.34	.57	.02	-.10	.39	.21	1		
12	.31	.18	.18	.11	.31	.07	-.13	.18	-.06	.31	-.24	1	
13	.46	-.03	.00	-.11	.08	.28	-.16	-.06	.14	.14	.23	.36	1

Basic Source: Table A 6. 1.

Notes: Many of the high values are trivial, as between variables with a high common content, e. g., the .90 between value and volume of gross output. See also text.

Appendix 7

Orthopols Fitted to Log (CPI) and Log (TGER)

The curves are as follows:-

		No. of obs.
1958-1968:	$\log_{10}$ CPI = 1.9105 + $.0^2$1892 ζ'_1 + $.0^4$5099 ζ'_2 + e	44
1969-1974:	$\log_{10}$ CPI = 2.1222 + $.0^2$5381 ζ'_1 + $.0^4$7697 ζ'_2 + e	24
1958-1968:	$\log_{10}$ TGER = 1.8190 + $.0^2$3951 ζ'_1 + .02389 ζ'_2 + e	44
1969-1974:	$\log_{10}$ TGER = 2.1815 + $.0^2$8288 ζ'_1 + $.0^3$18662 ζ'_2 + e	22

In the notation of Fisher-Yates* ζ'_1 and ζ'_2 are the first and second orthopols, i.e. functions of the first and second degree in time t. The operations are equivalent to fitting OLS regressions in the linear and quadratic terms in time t. The time interval is one quarter, time being centred at the middle of the respective time periods.

Significance

As regards curvature (i.e. as determined by the coefficients of ζ'_2), which is the propensity to increase at an increasing rate, the fitted curves have the following characteristics:-

	Prob. significance in period -	
	1958-1968	1969-1974
log (CPI)	***	***
log (TGER)	*	*

Critical null-hypothesis probabilities P:-

***: P < .001; **: .001 < P < .01; *: .01 < P < .05.

Curvature, always positive, was much more marked in the case of prices, i.e., prices tended to increase at a more constant rate in each of the two periods envisaged than did earnings.

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* R. A. Fisher and F. Yates: Statistical Tables for Biological, Agricultural and Medical Research, 1957.

In all four comparisons, coefficients were larger in the later period than in the earlier. Probably in a non-statistical sense all four changes were significant. Statistically regarded, however, null-hypothesis significances for changes were as follows:-

	Linear term	Quadratic term
log (CPI)	***	not significant
log (TGER)	***	not significant

Appendix 8

by

J.J. Walsh

"Ex ante Thinking"

It may be of interest to mention an effect of inflation in a period of recession on prices and profits. If demand is falling and with it a firm's output, overheads per unit of output will rise with constant prices of inputs. If the prices of inputs are also rising the effect on unit overhead costs is, of course, all the greater. Manufacturers are usually reluctant to make workers - particularly skilled workers - redundant. There is likely to be a period when there is a reduction in overtime, or shift working, or even in normal working hours. The duration of the period before the work-force is reduced when output is falling will vary from one firm to another for a number of reasons. Over this period, however, labour costs per unit of output will tend to increase, adding to the effect of any increase in wages. You rightly say that to a considerable degree throughout the economy the offering price is cost plus. I am inclined to view that price-leaders, brand leaders, and indeed manufacturers of widely accepted brands (e.g. certain processed foods, drugs, cars and television sets) are each faced with a range of prices, which I think of as the competitive price band, within which a particular product is competitive with relatively slight effects on volume of sales. This situation reflects the existence of imperfect competition, influenced by advertising, brand goodwill, custom and reluctance to change (brands or possibly suppliers). In times of severe inflation the competitive price band tends to widen. This, I believe, is due to the buyer's expectation of frequent price increases coupled with the blurring of a framework of reference prices established in the minds of consumers in periods of relative price stability. Even in periods of stability I doubt if the manufacturer knows with any precision the width of the competitive price band in relation to a particular product. When overall costs are rising he will probably continue to increase his prices on a cost plus basis. During a period when demand is also falling and overhead costs are increasing with falling output this procedure is not only inflationary but is fraught with danger for the manufacturer. In a recession, more than at other times, manufacturers are under pres-

sure to depart substantially from cost plus pricing particularly in seeking to retain or enhance their export markets. Consequently the risk to the home manufacturer from the prices of imports is likely to increase. The home manufacturer may, therefore, find one day that he has announced a cost plus price increase which is simply unacceptable to a wide range of buyers and he is forced to withdraw it. He has risen right through his price band; indeed its location may have shifted through changes in pricing policies of his competitors. Unless he can adjust his costs - which may be difficult in the short-run - he could be facing a menacing situation. If his costs are, in fact, rising faster than those of his foreign competitors his position will become increasingly precarious; foreign manufacturers can undermine his position on the basis of simple cost-plus pricing. The prices of some imports, (in the absence of keen competition among importers), may then be higher than they otherwise would be.

Page 70 and Appendix 5

The analysis of price applications in Section 2 of each monthly report of the NPC indicated the moderating effect of control on price applications, which, when all reservations are made, I believe to be broadly valid in relation to actual prices. There is a second aspect of the work of the NPC which has received better attention but is, I think, of importance. This is the practice of the Commission of having studies in some depth made either by their own Consultancy Unit, or by outside consultants, on particular industries or services, or on particular firms. The object of these studies is to provide fuller information to the Commission, and to recommend steps to improve efficiency. While these studies have not always led to action by the parties concerned there is evidence that in some important cases they stimulated action to improve productivity. It is however virtually impossible to quantify what is in effect a patchy and medium-term result.

Appendix 9.

Unit Cost Indexes 1969-1974

Table A.9: Unit costs, in five sectors and in all sectors, of wages and salaries, other income, and total income, 1969-1974 (1968 as 100)

Year	Agriculture, forestry and fishing	Industry	Distribution transport and communication	Public administration	Other domestic (inc. rent)	All sectors
			Remuneration of employees			
1969	110.3	109.9	107.6	109.3	110.7	110.7
1970	121.3	123.2	119.1	129.1	130.1	125.9
1971	125.4	135.6	132.3	141.9	143.4	138.3
1972	129.3	150.2	144.2	165.3	160.0	153.3
1973	139.9	164.5	159.5	189.9	187.2	173.7
1974	152.4	195.6	187.9	224.7	216.4	203.5
			Other income			
1969	104.4	110.6	118.5	Not applicable	114.3	107.2
1970	107.7	111.9	131.4		110.6	109.6
1971	111.8	115.4	138.9		114.4	114.2
1972	146.0	146.7	147.9		125.4	139.6
1973	191.7	127.1	185.8		159.8	163.2
1974	161.7	92.8	163.4		173.3	144.6
			Gross domestic product (factor cost)			
1969	105.0	110.0	110.3	109.3	111.9	109.4
1970	109.2	120.7	122.2	129.1	123.5	119.8
1971	113.3	131.1	133.9	141.9	133.7	129.4
1972	144.2	149.4	145.1	165.3	148.4	148.2
1973	186.1	156.2	166.1	189.9	178.0	169.8
1974	160.7	172.8	181.7	224.7	201.9	181.7

Basic Source: NIE 1974.

Appendix 9.

Table A.9 (cont'd)

Notes

Figures for Other income are net of stock appreciation.

The data for Table A.9, which is revision and updating of Table 1.2, became available at a late stage of this research. It can be seen that during 1969-1973 revisions have been slight. Of particular interest are the statistics relating to 1974 which show sharp rises for each sector in the rate of increase of unit wage cost. Unit cost of Other income falls in every sector except Other domestic (incl. rent), the fall being particularly sharp in Agriculture and in Industry. These figures tend to confirm at an aggregate level the detailed analysis of Chapters 2-8.

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Study on the possible part played by certain primary non-employed incomes in the inflationary process in Ireland

by Dr R.C. Geary in collaboration with F.P. Murphy

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The present study tries to analyse the possible part played by certain primary non-employment incomes in the inflationary process in Ireland.

The study has been executed by Dr R.C. Geary with the assistance of F.P. Murphy. It is largely based on a statistical approach involving all available statistics on the different sectors of the economy such as non-employee unit costs (chapter 1), the agricultural sector (chapter 2), retail trade and prices (chap. 3 and 4), profesional earnings (chapter 6), profits of public companies (chapter 7) and manufacturing industry (chapter 8). A special analysis (chapter 5) puts forward the results of an input-output approach which indicates the contributions of primary input prices to changes in consumer prices (during the period 1969-1974). At the end of each chapter are stated the conclusions to which the statistics are believed to point. The last chapter (chapter 9) provides general interpretation and the conclusions drawn from the preceding analysis.

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