Inflation and Wage Indexation in Italy*

Throughout the fifties and sixties the rate of inflation in Italy remained very much in line with the average for the main industrial countries.

The outbreak of inflation that all countries have experienced during the seventies, and especially since 1974 in connection with the oil crisis, in Italy has given rise to rates of price increase much higher than elsewhere. At the root of this divergence lie a series of " structural " factors,[1] among which the automatic indexation of wages to consumer prices (sliding scale or *scala mobile*) is undoubtedly of key importance.

The present paper traces the development of inflation in Italy throughout the period following World War II, with particular emphasis on its relation to labour costs, productivity and import prices. Since the sliding scale mechanism has been operating at full power during the whole of the seventies, and especially in the second half of the decade, owing to the increased frequency of both domestic and imported destabilizing pressures, this period is analyzed in greater detail. The conclusions indicate that the sliding scale has played an important role in aggravating inflationary pressures during that period.

[1] See the Governor's Concluding Remarks to the *Report of the Banca d'Italia* for 1979. See also the Concluding Remarks for 1978.

1. Growth, Income Distribution and Inflation in the Fifties

In the decade 1951-61 Italy's gross national income, at constant prices, increased by an average 5.8 per cent per year. The annual rate of inflation was 2.5 per cent calculated from the implicit price deflator for income (Table 1) and almost as low (2.8

TABLE 1

REAL INCREASES IN GDP AND IMPLICIT PRICE DEFLATORS FOR GDP, EXPORTS AND IMPORTS (a)
(percentage changes)

Year	GDP at constant prices		GDP deflator		Exports deflator		Imports deflator	
1952	4.5		3.2		−6.3		−2.1	
53	7.5		2.8		−5.2		−6.9	
54	3.6		2.8		−0.5		−3.7	
55	6.7		3.4		1.3		1.7	
56	4.7		3.9		−0.4		2.9	
57	5.4		2.0		−0.5		5.2	
58	4.9		2.3		−9.1		−2.1	
59	6.6		−0.2		−6.3		−6.0	
60	6.3		2.0		2.6		−0.2	
61	8.3	8.2	2.7	2.8	−1.5	−1.8	−2.1	−2.3
62		6.2		5.7		0.2		0.2
63		5.6		8.4		2.8		1.7
64		2.8		6.5		3.2		3.5
65		3.3		4.2		−0.9		0.5
66		6.0		2.3		—		1.7
67		7.2		2.8		1.2		0.6
68		6.5		1.7		0.1		0.5
69		6.1		4.1		2.7		1.3
70		5.3		6.8		6.2		3.5
71		1.6		7.2		4.1		5.2
72		3.2		6.3		2.3		3.7
73		7.0		11.6		15.6		26.2
74		4.1		18.5		36.6		57.2
75		−3.6		17.5		10.9		6.0
76		5.9		18.0		20.5		24.0
77		1.9		19.1		19.2		16.9
78		2.6		14.0		7.7		4.5
79		5.0		15.2		16.4		17.5
80		3.5		20.6		19.1		24.5
Average annual rates of increase								
51-61	5.8		2.5		−2.7		−2.4	
61-69	5.5		3.5		0.9		1.0	
69-79	3.3		13,3		13.5		15.4	

(a) Figures for the years prior to 1960 have been taken from the old National Accounts series.

per cent) in terms of the cost of living index. Wholesale prices were also almost absolutely stable (Table 4).

The growth in national income can be largely attributed to the increase in industrial value added, which averaged over 8 per cent per annum in industry excluding construction. In construction the average yearly increase was 9 per cent, in the services sector little under 5 per cent, and in agriculture 2.7 per cent (Tables 2 and 3). In 1961 industry (including construction) accounted for 37 per cent of aggregate value added, the services sector for 36 per cent, agriculture for 15 per cent and general government for 12 per cent.

In industry the cost of labour per unit of output remained more or less stable during the decade in question, as did the implicit price deflator for value added (Table 2). On the other hand, in agriculture the unit cost of labour went up by 2.4 per cent annually and the deflator by 1.2 per cent, while a more inflationary trend was displayed by unit labour costs in the services sector (with an average increase of 2.4 per cent) as well as by the implicit deflator for the sector's value added (4.8 per cent per annum). Finally, in construction the rise in prices was considerably higher than both the average and that in the rest of industry (3.2 per cent per year).

The 2-3 per cent yearly increase in consumer prices recorded during the fifties is the result of a zero rate of growth in the prices of industrial products and annual increases of 1.2, 4.8 and 3.2 per cent, respectively, in the implicit prices of value added in agriculture, services and construction (Table 3).

The large gains in productivity in industry enabled wages and salaries to be adjusted to the rise in the cost of living without bringing inflationary pressures to bear on output prices. Indeed, wages increased at a much faster pace than prices, but slower than industrial value added (Table 2).

The ample purchasing power afforded by the increase in industrial value added goes some way to explaining the rise in wages and salaries in the agricultural and services sectors, being in part due to rises in the prices of the products of these sectors since the growth in productivity and in supply was poor. In the construction industry, the rapid increase in output, as well as in prices and wages, points to a process of growth and inflation fostered by strongly expanding demand.

TABLE 2

INDUSTRY EXCLUDING CONSTRUCTION (a)
(percentage changes)

Year	Value added at constant prices	Per capita productivity	Per capita wages and salaries	Cost of labour per unit of output	Implicit price deflator for value added
1952	4.3	3.6	7.7	3.9	—1.7
53	7.5	5.3	7.9	2.4	—0.9
54	9.5	6.6	5.7	—0.8	—2.6
55	8.7	8.3	7.9	—0.3	—
56	7.9	5.3	7.4	1.8	—0.5
57	6.9	4.3	5.4	1.1	1.1
58	2.9	3.2	5.7	2.5	2.6
59	10.9	9.3	4.6	—4.4	—2.0
60	13.0	8.4	7.6	—0.6	—
61	10.3 / 11.3	5.3 / 8.8	6.8 / 9.8	1.3 / 0.9	1.8 / —0.6
62	9.5	8.3	13.9	5.1	1.9
63	6.9	5.1	20.5	14.7	6.8
64	2.0	2.4	7.3	4.8	5.7
65	5.4	7.4	3.7	—3.5	1.5
66	9.6	10.2	7.3	—2.6	—0.3
67	10.2	7.7	11.5	3.4	1.8
68	9.7	7.9	6.6	—1.1	—1.4
69	7.3	5.5	8.9	3.1	2.5
70	8.2	5.3	18.9	13.0	7.5
71	0.9	0.9	10.9	10.0	6.6
72	4.4	5.6	11.3	5.5	4.7
73	10.4	8.7	21.8	12.0	10.5
74	5.2	2.7	22.5	19.3	20.3
75	—9.3	—9.2	22.3	34.7	21.0
76	12.3	11.9	23.6	10.4	16.6
77	1.6	1.5	19.8	18.0	18.2
78	2.7	3.1	14.4	11.0	13.1
79	6.3	6.5	17.9	10.8	14.4
		Average annual rates of increase			
51-61	8.1	5.9	6.6	0.6	—0.2
61-69	5.5	6.8	9.9	2.8	2.3
69-79	4.1	3.6	17.9	14.2	13.2

(a) Figures for the years prior to 1960 have been taken from the old National Accounts series.

The virtuous circle of growth in Italy in the fifties, judging by that of industry, is closed by the rapid increase in gross investments; at constant prices they rose by 9.5 per cent per year during the decade, and employment grew by 1.8 per cent. Exports increased by an average 15.1 per cent per year, while export prices declined continuously throughout the decade.

The stability of prices during the period was due not only to the substantial improvement in productivity in industry, which

TABLE 3

AGRICULTURE, CONSTRUCTION AND SERVICES (a)
(percentage changes)

Year	AGRICULTURE			CONSTRUCTION			SERVICES (b)		
	Value added at constant prices	Per capita wages and salaries	Implicit price deflator of value added	Value added at constant prices	Per capita wages and salaries	Implicit price deflator of value added	Value added at constant prices	Per capita wages and salaries	Implicit price deflator of value added
1952	—1.6	5.0	2.6	17.0	5.8	3.8	4.4	9.7	7.7
53	11.0	7.8	3.4	14.9	7.2	3.0	4.3	6.5	5.1
54	—5.4	5.2	2.9	10.7	6.9	3.4	2.9	6.5	4.7
55	5.2	6.2	2.5	11.6	9.3	4.4	5.5	8.5	6.2
56	0.2	5.7	2.7	3.0	6.0	4.5	4.2	8.0	7.0
57	1.5	3.1	—1.1	9.4	6.5	3.7	4.9	7.2	4.2
58	11.2	2.9	—	7.7	8.3	1.7	3.4	6.7	3.9
59	3.4	3.2	—6.8	6.9	3.9	0.1	5.4	6.2	2.7
60	—4.8	—1.7	0.1	5.0	8.3	3.8	6.0	5.5	3.5
61	8.4	4.0 / 4.9	6.5 / 6.3	7.0 / 7.4	8.4 / 7.6	3.7 / 3.6	6.4 / 7.2	6.3 / 7.1	2.4 / 3.3
62	—0.6	16.6	11.0	8.4	16.8	9.7	5.0	12.8	7.1
63	2.3	15.0	4.3	6.0	18.8	10.9	5.4	19.0	10.7
64	5.1	23.8	1.5	0.5	19.8	14.8	3.9	9.7	7.2
65	1.8	9.5	4.1	—5.3	2.5	7.0	4.0	12.2	5.6
66	2.8	10.1	—1.0	0.4	8.3	3.2	5.0	6.6	4.4
67	7.8	9.9	—2.5	6.0	9.9	5.2	5.2	5.4	4.1
68	—2.9	6.7	—0.8	8.8	9.5	2.9	6.2	6.8	4.3
69	1.6	12.7	8.6	8.2	5.5	7.9	5.5	6.2	4.3
70	—0.3	21.0	3.2	—1.4	18.1	14.7	5.3	10.1	6.2
71	0.5	12.7	2.9	—4.5	11.5	7.2	3.6	14.6	8.9
72	—7.4	17.0	10.1	1.1	9.7	5.1	4.3	9.5	7.4
73	7.0	20.4	20.7	3.1	25.5	14.7	5.0	15.8	9.7
74	1.9	33.6	13.9	2.0	26.7	28.0	4.3	18.6	16.5
75	3.3	32.0	15.3	—7.5	23.4	22.5	0.6	17.6	17.7
76	—4.1	23.2	21.3	—0.7	20.9	19.4	3.7	18.6	16.6
77	—0.5	28.8	20.1	0.1	26.7	21.1	2.8	21.2	18.3
78	3.5	18.6	13.1	0.8	17.5	13.8	2.7	17.5	15.6
79	4.8	19.4	12.0	2.0	19.8	18.9	3.8	16.5	16.2
					Average annual rates of increase				
51-61	2.7	4.1	1.2	9.2	7.0	3.2	4.7	7.1	4.8
61-69	2.2	12.9	3.0	4.0	11.2	7.6	5.0	9.7	5.9
69-79	0.8	22.3	13.1	—0.6	19.7	16.3	—3.6	16.0	13.2

(a) Figures for the years prior to 1960 have been taken from the old National Accounts series.
(b) Includes general government.

TABLE 4

PRICE INDEX
(percentage changes)

Year	Wholesale prices	Consumer prices	Cost of living	Trade union index
1951	14.0		9.7	
52	−5.6		4.2	
53	−0.4		1.9	
54	−0.9	2.8	2.7	
55	0.9	2.3	2.8	
56	1.7	3.4	5.0	
57	1.0	1.3	1.9	
58	−1.7	2.8	4.8	3.8
59	−3.0	−0.4	−0.4	−0.4
60	0.9	2.3	2.6	2.5
61	0.2	2.1	3.0	0.3
62	3.0	4.7	5.1	5.7
63	5.2	7.5	7.5	8.7
64	3.3	5.9	5.9	7.1
65	1.6	4.5	4.3	4.7
66	1.5	2.3	2.0	2.5
67	−0.2	3.7	2.0	2.3
68	0.4	1.4	1.3	1.6
69	3.9	2.7	2.8	3.3
70	7.3	4.9	5.1	5.0
71	3.4	4.8	5.0	5.1
72	4.1	5.7	5.6	6.5
73	17.8	10.8	10.4	12.0
74	40.8	19.1	19.5	17.2
75	8.6	17.0	17.2	16.7
76	12.3	16.8	16.5	16.7
77	16.6	17.0	18.1	17.7
78	8.4	12.1	12.4	12.7
79	15.5	14.8	15.7	15.3
Average annual rates of increase				
51-61	−0.7		2.8	4.5
61-69	2.3	3.1	3.8	
69-79	14.1	12.2	12.4	12.4

TABLE 5

EXTERNAL VALUE OF THE LIRA
(index numbers 9.2.73 = 100)

Year	Index number	Percentage change
1973	90.8	− 9.2
74	82.5	− 9.1
75	78.8	− 4.5
76	64.9	−17.6
77	59.9	− 7.7
78	57.4	− 4.2
79	55.8	− 2.8
80	53.8	− 3.6

absorbed the effects of wage increases, but also to the stability of the lira exchange rate, in an international context of stable or even declining prices. During the decade, in fact, the prices of Italy's imports fell by an average annual 2.4 per cent.

2. Inflation and Growth from 1961 to 1969

In the eight years running from 1961 to 1969 Italy's gross domestic product increased on average by 5.8 per cent, a faster rate than that of the EEC (4.8 per cent) or the OECD as a whole (5.1 per cent).

At 3.5 per cent per annum calculated from implicit prices, the rate of inflation was higher, however, than the average for the EEC and OECD and also than the rate observed during the fifties (2.5 per cent). The difference between these averages is not very great, a view, however, that is influenced by the very high rates and much larger divergences and fluctuations of recent years. The main reason for the rise in the average inflation rate was developments during the period 1962-65, when the implicit price deflator for consumption went up by an average 5.6 per cent per annum, with a peak of 7.5 per cent in 1963.

Per capita wages and salaries in industry increased by 14 per cent in 1962 and then rose by a further 20 per cent the following year, while in agriculture the increases were 17 and 15 per cent respectively, with a subsequent rise of 24 per cent in 1964. In the construction sector the average increase for the three years 1962-64 was 18 per cent. Lastly, in the services sector the increase was smaller on average in the three years, but was still large in 1965.

The Italian economy — and especially the industrial sector — whose rapid growth during the fifties had rested on an abundant supply of unemployed labour, or of labour coming from low productivity sectors, in 1962 for the first time came up against a particularly low unemployment rate.

The earlier upsurge in demand and in economic activity had been due in part to an expansion of credit, the ratio between total financing (to the public and private sectors of the economy) and GDP having doubled between 1958 and 1962 (from 7.6 to 16.5

per cent) and the ratio of public deficit to national income having declined. The amount of lira-denominated financial assets (notes and coin, deposits and securities) rose from 1.14 times GDP at the end of 1957 to 1.76 times at the end of 1963.

Although productivity per worker increased steadily — over 8 per cent in industry in 1962 and over 5 per cent in 1963 — costs rose by an even greater amount, with marked effects on product prices. This bout of inflation, however, was rapidly checked during 1966-68 by an extremely large growth in productivity (averaging, in industry, almost 8 per cent annually in the three years), by the nearly absolute stability of import prices and, lastly, by the moderate degree of price indexation of wages and salaries. The considerable increase in wages and in real income that had occurred since 1957, when the value of the sliding scale point was raised (see Section 4), had reduced the degree of coverage that the sliding scale afforded against price increases.[2]

The wage push and redistributive pressures of 1962-64 brought about important changes in the organization of productive activity. In industry in particular, investment was increasingly channelled towards less labour intensive areas or into projects to rationalize productive processes. Hence, despite the substantial increase in productive activity, at the end of the sixties the number of employed workers was still well below the figure recorded at the peak of the cycle between 1963 and 1964.

3. The Seventies

The new cycle of wage negotiations that began in autumn 1969 led in 1970 and 1971 to increases in the money wages of employed workers far in excess of the potential growth of productivity. On top of this, some of the claims granted restricted plant use, thereby slowing the rise in productivity.

[2] For the effect of productivity on the degree of coverage, see E. TARANTELLI, "Mercato del lavoro, rinnovi contrattuali e politica economica", paper presented at the CESPE (Economic Policy Research Centre) meeting on "Economic crisis and influence of the international situation in Italy" held in Rome on 15th-17th March, 1976.

In industry the cost of labour per unit of output rose by 13 per cent in 1970 and 10 per cent in 1971 (Table 2), figures by no means exceptional in the light of subsequent experience, but extremely high when compared to those of fifties and sixties. However, it must not be forgotten that already in the mid-sixties the United States — whose currency had been the main means of settlement in world trade and whose monetary stability had been generally better than the other major industrial countries — had known a phase of rapid price rises in connection with the military involvement in Vietnam. Moreover, towards the end of the sixties many European countries were suffering inflationary pressures, mainly caused by the rise in labour costs.

On the whole, the jump in labour costs at the beginning of the seventies had only limited effects on prices. The rise in consumer prices only went over the 5 per cent level in 1972, and firms accepted a large drop in their profit margins and self-financing capacity. That the inflationary push was moderate was in part due to a decline in the propensity to consume, a phenomenon which became more pronounced in later crises marked by a faster rate of price increase and followed by monetary and fiscal measures to restrain internal demand.

In 1973 there emerged a new phenomenon, of which only small signs had been evident in earlier years: a considerable acceleration of the rate of increase in raw material prices on world markets, fostered by a simultaneous cyclical upswing in many of the industrial countries, as well as by heavy purchases on the part of certain major countries as a form of investment for excess foreign currency reserves.

Italy's particular economic situation, which in the three years 1970-72 featured poor levels of productive activity and investment and high unemployment, prompted the authorities at the beginning of 1973, when unrest on world foreign exchange markets was causing major movements of exchange rates, to keep interest rates low and to abandon the intra-EEC fluctuation bands. Spring 1973 brought a new phase of labour negotiations and substantial losses in output. The float of the lira led during the year to an average devaluation of 9 per cent compared with 1972.

The devaluation of the lira came on top of the increase in world goods prices, causing Italy's unit import values to soar in

1973 by 26 per cent. The effect on domestic prices, and especially on consumer prices, was immediate: the latter rose by almost 11 per cent per year, marking the onset of an inflation which still persists at exceptionally high rates, alternately accelerating and decelerating.

The oil crisis of the end of 1973, combined with a further 9 per cent depreciation of the lira, pushed up Italy's import prices again the following year, this time by 57 per cent. The average rate of increase in consumer prices for the year was nearly 20 per cent, but at times during the year was even faster: in the early months the rate of inflation hovered around 60 per cent on an annual basis for wholesale prices and 30 per cent for consumer prices.

Per capita wages and salaries rose in 1973 by between 20 and 25 per cent in all sectors except services. In 1974 the rates of increase in construction and agriculture were between 25 and 35 per cent and in industry over 20 per cent. Yet notwithstanding the rise in prices, real earnings remained high. Moreover, although there was a sustained improvement in productivity, labour costs per unit of output rose considerably (Tables 2 and 3). There was a further, large decline in profit margins, now affected not only by the increased cost of labour but also by the higher prices of raw materials and energy.

Readjustment of the balance of payments was sought through a severe fiscal and monetary deflation, and the monetary policy adopted in 1974 is without exception the tightest since 1947. A contributory factor in restoring the external accounts to a balanced situation was a further large drop in the propensity to consume and a rise in relative prices of manufactures.

Against this background of strongly increasing costs, falling profit margins and hence of repressed inflation and rapid cyclical downswing, an agreement was reached in January 1975 between the Confindustria (Confederation of Italian Industry) and the trade unions concerning wages: the " once only " wage increases granted caused a 6 per cent jump at the beginning of the year in the cost of labour in industry; in addition, changes were made in the system of automatic indexation of wages that brought their price elasticity close to unity.

In 1975, for the first year since the war, there was a decline in gross national product in real terms. The unit cost of labour in industry rose by 35 per cent; in the climate of rapidly rising

inflation of the time, the new indexation mechanism was to a great extent responsible for the increase in nominal wages. Labour costs soared by close to 30 per cent in agriculture and the construction sector and by about 15 per cent in services, where the average wage is higher (Tables 2 and 3).

The unsustainable increase in labour costs, together with the policy to boost domestic demand, adopted in response to the unsatisfactory trend of employment, but without the backing of sufficient foreign currency reserves, led to the foreign exchange crises and devaluations of 1976 (17 per cent on average during the year).

Import prices, which had risen by only 6 per cent in 1975 thus placing a strong brake on inflation, went up by 24 per cent in 1976, with immediate repercussions on consumer prices. These increased by 25 per cent in the course of the year.

As a result of the indexation system, the increase in wages and salaries was over 20 per cent. During the period, the operation of the inflation mechanism was a rapid chain of rise in costs, devaluation, rise in prices, further rise in costs.

Again, from autumn 1976 through most of 1977, a halt to inflation was sought by means of a tight fiscal policy (based to a large extent on the raising of indirect taxes and public utility charges) and a cut down on credit (at that time only credit in lire, in order to encourage inflows of foreign currency loans). This strategy produced appreciable results in terms of readjustment of the current account balance and foreign exchange position, although at the cost of a marked slowdown in productive activity.

Nonetheless, per capita wages and salaries in industry went up by 20 per cent, mainly through the indexation mechanism which had also been affected by the raising of direct taxes, public utility charges and administered prices (an essential part of the stabilization policy); the unit cost of labour rose by 18 per cent. In agriculture and construction the rates of increase for wages and unit labour costs were between 25 and 30 per cent, and in the services sector, too, the rises went beyond the level of 20 per cent.

When the depreciation of the external value of the lira came to a halt in 1977 it helped to curb the rise in domestic prices, although the inflation rate during the year remained around 13-14 per cent. The following year, indexation transmitted to wages rates of increase of the same magnitude, which were reflected back on

domestic prices, until a new acceleration was caused in mid-1979 by the rise in oil prices.

In the two years 1979-80 consumer prices went up by almost 40 per cent; 5 and 15 per cent less, respectively, were the increases in wages and salaries and in unit labour costs in industry, which rose less sharply owing to the satisfactory productive cycle between mid-1978 and the first quarter of 1980.

From the middle of 1979, inflation was aggravated principally by factors of external origin. In fact, since wage increases granted by labour contract agreements were on the whole moderate and the degree of coverage afforded by automatic wage indexation slightly less than three or four years earlier, the rise in the cost of labour remained below the rate of inflation.

The external value of the lira from 1977 on was sustained by the improvement in the current account balance and increase in foreign currency reserves. Nonetheless the losses were continuous, Italy's inflation rate being higher than that of the other industrial countries.

In autumn 1979, concurrently with a new jump in the rate of inflation and a worsening of the external accounts, monetary policy was again given a restrictive turn, after the mild expansion under way since the end of 1977. Tight credit conditions made it possible to finance the external imbalance via imports of short-term capital without tapping foreign currency reserves.

The slowdown in economic activity since the second quarter of 1980 will help to achieve at least a partial readjustment of the current balance of payments. However, if the increases in labour costs caused by automatic indexation to prices continue, that slow-down, with its related fall in productivity, will actually worsen production costs. So, even without other inflationary pressures, bringing the inflation rate down is bound to be a very slow process.

4. Wage Indexation [3]

From what has been set out above it can be deduced that the increase in labour costs played a decisive role in the inflationary process in 1962-63, at the beginning of the seventies and in 1975-76.

The persistently high rate of increase in prices since 1976 also seems to have been due mainly to the rise in labour costs and, in particular, to the automatic wage indexation mechanism, which has amplified and prolonged inflationary pressures originating abroad (increases in the prices of raw materials and oil), deriving from devaluation of the exchange rate, or of domestic origin (the latter stemming partly from cyclical stabilization measures consisting of increases in indirect taxes and public utility charges).

A wage indexation agreement between the trade unions in industry and the Confederation of Italian Industry was first put into effect in northern Italy at the end of 1945 and subsequently extended, during 1946, to central and southern Italy. The implementation of the agreement was accompanied by a *de facto* wage truce so that the increase in wages was virtually due only to that in prices.

In the highly inflationary conditions of 1946 and 1947 the agreement on indexation made it possible to avoid frequent conflicts in connection with the renegotiation of wages, and in this way contributed to the regular performance of productive activity and increased productivity.

The 1946 agreement provided for equal sliding scale increases for all the categories of workers covered, independently of their rank and wage level. There were, however, territorial differences.

The agreement was modified in 1950 with the introduction of different values of the sliding scale point for different wage levels.

The values of the sliding scale point were raised in 1957 and again in 1963.

[3] For more detailed analysis of the subject matter of this section, see: I.F. MARIANI, " Promemoria sulla scala mobile," *Rivista di Politica Economica*, 1979; C. D'APICE, " Scala mobile: tra storia e scelte politiche," *Politica ed Economia*, 1980; R. FILOSA and I. VISCO, " Costo del lavoro, indicizzazione e perequazione delle retribuzioni negli anni '70," in *I difficili anni '70*, edited by G. Nardozzi, Milan, 1980.

In 1969 the territorial differences were eliminated with the values of the sliding scale point being unified at the highest previously existing levels.

In 1975 there was a return to a single value of the sliding scale point for all categories of workers and levels of wages. The sliding scale payments for blue-collar workers were switched from an hourly basis to a monthly basis, as had always been the case for white collars; the highest level was implemented gradually over the two subsequent years and gave rise to a corresponding increase in the degree of cover provided.

The agreement was subsequently extended to workers in agriculture, services and general government, thus increasing the proportion of wages covered by automatic indexation. In 1977 the so-called " anomalous sliding scales " were abolished by law, while negotiations led to the de-indexation of severance pay and changes in the basket used to calculate the index (unchanged since 1946).

For hourly wages it is possible to divide the rate of their increase into the part due to the sliding scale mechanism, i.e. automatic, and that due to other causes. In the second half of the sixties the contribution of the sliding scale to the increase in wages was very small (about 1.5 per cent per year). In industry excluding construction the increase was, moreover, in line with or less than that in productivity. From the middle of 1969 to the end of 1974, during which time wages rose at rates sometimes higher than 25 per cent per annum and on average by 20 per cent per annum, the sliding scale component of the increase averaged around 3 per cent up to 1972 and around 6.5 per cent in the subsequent years.

In the wake of the new labour contracts and the January 1975 changes in the indexation mechanism, the rate of increase in hourly wages in industry continued at a high level (around 24 per per cent). Between 1975 and the first quarter of 1978 the increase due to the indexation mechanism was equal on average to 13 per cent (Chart 1).

Compared with the same periods one year earlier, from the second quarter of 1978 to the first quarter of 1979 the average rate of increase in hourly wages rose by a little less than 15 per cent, with the increase due to the sliding scale mechanism amounting to 10 per cent. Even though the increase in the prices of imports was very small in this period, domestic inflation remained at a rate of around 13 per cent, thus allowing firms to make good the reduction in their margins caused by the continuous rise in labour costs.

HOURLY REAL AND MONEY WAGES IN INDUSTRY EXCLUDING CONSTRUCTION
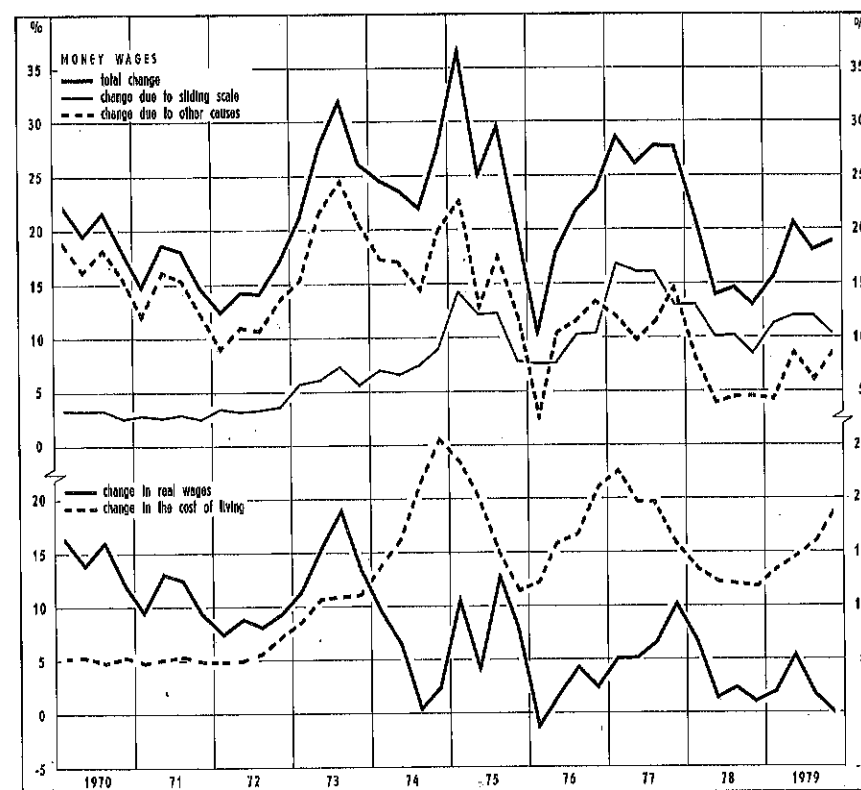
Source: BANCA D'ITALIA, Relazione annuale 1979.

Since the middle of 1979, mainly as a result of labour contract renewals, labour costs have once again risen at rates close to 20 per cent. The share of these increases attributable to the sliding scale rose with a lag and amounted to approximately 60 per cent of the total.

From 1975 onwards the degree of cover provided by the sliding scale against increases in the cost of living averaged around 75 per cent and since 1977 has been close to 80 per cent. During this period, zero or very low rates of inflation and a rate of increase in wages 13-14 percentage points below the actual one would have ensured the same rise in real wages.

5. The Sliding Scale and Inflation

The effect of prolonging and amplifying inflationary pressures of both domestic and foreign origin,[4] which can be deduced by examining the paths followed, especially since 1975, by costs and prices, can be highlighted better by means of a simplified model of the relationships between prices and labour costs. A complete empirical test of this model would require a series of considerations and theoretical analyses that are beyond the scope of this paper. The phenomena will be analyzed, instead, only on the basis of the results of research into the subject carried out in connection with the econometric model of the Research Department of the Banca d'Italia.[5]

The relationships between prices and labour costs can be described, disregarding periodic connotations, by the following three-equation model of cost inflation:

A) *Rate of change in labour costs (wages) in nominal terms*

$$(1) \quad \dot{w} = a \, \dot{p} \, c + \dot{w}^A$$

where: $\dot{w}$ = rate of change in money wages

$\dot{p} \, c$ = rate of change in the cost of living (as measured by the trade union index)

$\dot{w}^A$ = rate of change in wages independent of prices (primarily labour contract increases).

As a general rule, for the coefficient of indexation, *a*, we have

$$0 \leq a \leq 1$$

with $a = 0$ in the case of zero indexation and $a = 1$ when labour costs are fully indexed to prices.

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[4] Cf. the interview with the Governor of the Banca d'Italia, Dr. Carlo Ciampi, published in the *International Currency Review* of 16 July 1980 and the further remarks on the theme of inflation made by the Governor in the 19 September 1980 issue of the same review.

[5] I am grateful to C.M. Pierucci and I. Visco for the preparation of the model. For further details, the following works should be consulted: C.M. PIERUCCI, C. TRESOLDI, "Il settore dei prezzi interni: aspetti istituzionali, schemi di riferimento e verifica empirica," *Modello econometrico M2BI*, December 1976; C. CHIESA, G. GOMEL, B. SITZIA, R. VALCAMONICI and S. VONA, "Un modello di analisi e previsione del settore bilancia dei pagamenti correnti," *Modello econo-*

B) *Relationship between output prices and costs*

$$(2) \quad p \, q = \mu \, \frac{C}{q}$$

where: $p \, q$ = output prices

C = total costs

q = quantity of output

μ = mark-up factor (> 1)

Output is to be taken here as referring primarily to the private sector of the economy and valued at factor cost.

Total costs, in turn, are defined as follows:

$$(3) \quad C = w \, L + e \, pm \, M$$

where: w = hourly cost of labour

L = hours worked

M = inputs, other than labour, imported from abroad

pm = import prices (in foreign currency)

e = exchange rate

For the sake of simplicity, an economy is assumed in which the cost elements other than labour costs are only those of imported materials and products (i.e. rents are excluded).

Substituting (3) into (2), we obtain:

$$(2 \text{ bis}) \quad pq = \mu \, \frac{1}{q} \left(wL + e \, pm \, M \right) = \mu \left(\frac{w}{\pi} + e \, pm \, M \right)$$

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metrico M2BI, March 1978. The formalization of the model is to be found in a more detailed and complete form in: BANCA D'ITALIA, *Modello econometrico dell'economia italiana M1BI, Settore reale e fiscale*, edited by G. Rey, M. Sarcinelli, P. Gnes, P. Miurin, R. Ruberti, E. Tarantelli and C. Tresoldi. See also: E. TARANTELLI, "Produttività del lavoro, salari e inflazione," Ente per gli studi monetari e bancari L. Einaudi, Research Papers No. 5, Rome 1970; F. MODIGLIANI and T. PADOA SCHIOPPA, "La politica economica in una economia con i salari indicizzati al 100 o più," in *Moneta e Credito*, March 1977. Conclusions similar to those reached in this paper are to be found in M. GOLDSTEIN, "Wage Indexation, Inflation and the Labor Market," *IMF Staff Papers*, November 1975; the main aim of Goldstein's study is to compare the effects of automatic and *de facto* indexation of wages and prices. For an application to Israel's economy, see: A. CUKIERMAN, "General Wage Escalator and the Inflation Unemployment Trade Off," *Economic Inquiry*, January 1977.

where π, equal to the ratio $\frac{q}{L}$, is the hourly productivity of labour and m, equal to $\frac{M}{q}$, is the ratio of imported inputs to output.

For a given, small, range of variation, we can also write:

(2 ter) $\dot{p}q = \dot{\mu} + \lambda (\dot{w} - \dot{\pi}) + (1 - \lambda)(\dot{e} + \dot{p}m + \dot{m})$

where λ and $(1 - \lambda)$ are suitable parameters defining the weight of the two components of total costs.

C) *Relationship between consumer and output prices*

(4) $\dot{p}c = b\,\dot{p}q + \dot{p}^A$

where $\dot{p}^A$ = changes in prices independent of the price of output. This variable incorporates, with suitable weights, both the changes due to increases in indirect taxes and public utility charges, and those due to increases in the prices of imported consumer goods.

The system consisting of the three equations (1), (2 ter) and (4) can be solved for the equilibrium values of the three unknowns or endogenous variables: the rate of change in consumer prices ($\dot{p}c$), the rate of change in output prices ($\dot{p}q$) and the rate of change in labour costs ($\dot{w}$). They are defined, amongst other things, in terms of: (1) the autonomous rate of change in labour costs ($\dot{w}^A$); (2) the rate of increase in productivity ($\dot{\pi}$); (3) the change in the exchange rate ($\dot{e}$) and/or in original import prices ($\dot{p}m$); and (4) the causes of change in consumer prices ($\dot{p}^A$) other than the cost of products.

Solving the system of three equations, we obtain the following values for the three endogenous variables:

$$\dot{p}c = \frac{1}{1-ab\lambda}\{\dot{p}^A + b\,[\lambda(\dot{w}^A - \dot{\pi}) + (1-\lambda)(\dot{e}+\dot{p}m+\dot{m}) + \dot{\mu}]\}$$

$$\dot{w} = \frac{1}{1-ab\lambda}\{\dot{w}^A + a\dot{p}^A + ab\,[\mu - \lambda\dot{\pi} + (1-\lambda)(\dot{e}+\dot{p}m+\dot{m})]\}$$

$$\dot{p}q = \frac{1}{1-ab\lambda}\{\mu + \lambda(a\dot{p}^A + \dot{w}^A - \dot{\pi}) + (1-\lambda)(\dot{e}+\dot{p}m+\dot{m})\}$$

The results show that the effects on the changes in labour costs and prices of inflationary, or stabilizing, pressures connected with autonomous changes in prices and wages, changes in the cost

of imports, variations in productivity and the mark-up, after scaling for the coefficients a, b and λ when implied, are amplified by the coefficient

$$\frac{1}{1 - ab\lambda}$$

In the case of Italy, the values of the three parameters a (indexation of wages to prices), b (elasticity of consumer prices vis-à-vis output prices) and λ (elasticity of output prices vis-à-vis unit labour costs) can be set as follows:

$$a = 0.8$$
$$b = 0.85$$
$$\lambda = 0.65$$

The factor $1/(1 - ab\lambda)$ is thus approximately equal to 1.8. Its value increases with the degree of indexation and approaches unity as the degree of indexation approaches zero.

From the above it follows, for example, that an increase in indirect taxation or public utility charges that has a 1 per cent impact effect on prices ($\dot{p}^A$) causes consumer prices to rise by 1.8 percentage points, labour costs by 1.4 points and output prices by 0.9 points.

An autonomous (contractual) change in labour costs ($\dot{w}^A$) of, for example, 3 percentage points leads, through the working of the multiplier mechanisms due to the sliding scale, to a final increase of more than 5 points in labour costs, of 3.5 points in output prices and of 3 points in consumer prices. A 3 point increase in productivity reduces output prices by 3.5 points, consumer prices by 3 points and labour costs by close to 2.5 points.

Exchange rate devaluation and increases in import prices produce effects through both the costs of imports of goods other than consumer goods and through $\dot{p}^A$. A 10 per cent rise in lira import prices, for example, generates a 6-7 percentage point rise in consumer prices, which is considerably larger than the initial impact effect of around 3 percentage points.

These phenomena do not appear immediately. The reaction of labour costs to changes in consumer prices is rapid, while those of consumer prices to changes in output prices and of the latter to changes in costs are slower.

In Italy in the seventies these reactions took a couple of years to work themselves out.[6] At all events, on the one hand, the effects on costs and prices of several inflationary impulses deriving from the same or different variables tend to be cumulative and, on the other, in a climate of continuous inflation all the movements of the dependent variables in equations (1), (2 ter) and (4) tend to be anticipated, which amounts to an immediate (or anticipated) multiplication of the inflationary pressures.

In particular, the movements of some variables, such as the exchange rate, through the announcement effect that they implicitly produce, can act as catalysts and accelerators of the reactions of those who control costs and prices.

Finally, it needs to be pointed out that the variables considered here to be exogenous, i.e. independent of changes in consumer prices, output prices and wages — such as the exchange rate, public utility charges and some components of labour costs other than sliding scale payments — are not actually exogenous. When costs and prices differ considerably from the initial values compatible with those of the variables considered here to be exogenous, these also react by adjusting to the new situation, thus giving rise to further inflationary pressures.

6. Conclusions

With the help of a simplified model of the relationships between the variables: labour costs, consumer prices and output prices, it can be shown that the indexation of labour costs to prices leads to an amplification of inflationary pressures originating, amongst other things, from: changes in prices on international markets, exchange rate variations, wage negotiations, tax increases and changes in public utility charges.

On the basis of coefficients obtained in empirical analyses of the Italian economy, the size of the amplification is found in some cases to be almost 2.

These analyses refer to Italy, where wage indexation is automatic, but similar results would nonetheless be found if indexation

[6] Cf. C.M. PIERUCCI and C. TRESOLDI, "Il settore dei prezzi interni: aspetti istituzionali, schemi di riferimento e verifica empirica," *op. cit.*

were *de facto* arising from the behaviour of the contractual parties in the face of inflationary disturbances.

It remains to be shown that the degree of indexation would be the same in this case as with automatic indexation.[7] It is likely, however, that there would be an increase in the costs connected with the need for more frequent negotiations. In fact, the sliding scale was introduced in Italy at a time of high inflation, at the end of World War II, precisely with the aim of avoiding over-frequent negotiations and promoting labour productivity.

It can also be deduced from the model that productivity and the very factors that in recent years have given rise to destabilizing pressures on prices can contribute to the stability of prices and costs.

In the fifties, with a relatively high degree of indexation of industrial wages to prices, the increases in productivity and the continual decline in the prices of imported products ensured a period of exceptional price and wage stability, despite inflationary disturbances (of a domestic origin) that were by no means negligible.

The sixties were a period of transition, with a number of inflationary peaks that were rapidly absorbed, once more as a result of the improvement in productivity and of the stability of prices on international markets and of the exchange rate.

Developments in the seventies, with large increases in the prices of Italy's imports, exchange rate instability and strong upward pressures on costs deriving from wage negotiations coupled with a lower rate of growth, provided repeated impulses to the multiplier mechanism affecting prices and wages. The outcome was an average rate of inflation of 14 per cent over the decade and an even higher rate after 1973. This is the same as saying that the purchasing power of money in terms of goods fell between 1972 and 1980 to a quarter of its initial value, the average fall in the purchasing power of other countries over the same period was a half, so that the purchasing power of the lira in terms of other currencies was correspondingly halved.

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[7] Cf. in this connection M. GOLDSTEIN, "Wage Indexation, Inflation and the Labor Market," *op. cit.*

APPENDIX

The Sliding Scale and Income Distribution

Under the system of wage indexation adopted in 1975 the value of the sliding scale point is the same for all levels of wages. At Lit. 2,389, it initially provided full indexation for a monthly wage equal in the base period (August-October 1974) to Lit. 238,900.

The system continues to provide full indexation of this initial wage and of the intervening increases deriving from the rise in prices (as measured by the special trade union index). The degree of indexation falls when there are real increases in wages (i.e. when they rise faster than prices) and rises when real wages fall.[1]

It is also easy to infer that the degree of indexation is below the average for higher-than-average wages, and viceversa; and also that the sliding scale mechanism leads to a narrowing of wage differentials. As inflation gradually causes the ratio of sliding scale increases to initial wages to rise, wages tend, in the absence of other reactions, to become equal.

The increases in prices recorded in Italy over the last five years have caused a considerable reduction in wage differentials, which, according to expert opinion, leads higher paid workers to make wage demands designed to restore them.[2] These larger demands are an additional inflationary pressure, which can be considered in the model described in the text through the term $\dot{w}^A$ in the first equation. Empirical estimates of the size of this effect are not available however.

On the other hand, the narrowing of wage differentials caused by the working of the sliding scale mechanism can be documented on the basis of surveys analyzing income distribution. In this connection, reference should be made to a study by G. Caligiuri, where the reduction

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[1] Cf. E. TARANTELLI, " Mercato del lavoro, rinnovi contrattuali e politica economica," op. cit.

[2] On this point, see, amongst others, the intervention of G. Faustini at the previously mentioned meeting organized by the Centre of Economic Information for Journalists.

TABLE 1

INDICES OF INEQUALITY OF PERSONAL INCOMES

	1973	1974	1975	1976	1977	1978	1979
THEIL							
Total inequality between recipients of income of which:	0.462	0.399	0.341	0.303	0.319	0.308	0.286
between the various economic and professional categories	0.155	0.103	0.111	0.085	0.092	0.074	0.075
within the various economic and professional categories	0.307	0.296	0.230	0.218	0.227	0.234	0.210
GINI							
Total inequality between recipients of income	0.491	0.455	0.432	0.413	0.425	0.417	0.407
Total inequality between recipients of employee income	0.335	0.316	0.291	0.290	0.269	0.284	0.267

in the dispersion of incomes is documented[3] on the basis of the data collected for the Banca d'Italia's survey of households' income and saving.

The same survey shows that in the period 1973-79 Gini's index of inequality fell from 0.491 in 1973 to 0.432 in 1975 and to 0.407 in 1979 (Table 1). Theil's index declined from 0.462 in 1973 to 0.341 in 1975 and to 0.286 in 1979. These figures refer to individual after-tax incomes of all kinds. For employee incomes alone, Gini's index declined from 0.335 in 1973 to 0.291 in 1975 and to 0.267 in 1979. The, somewhat surprising, indication is that there was a very marked narrowing of wage differentials up to 1975, while subsequently it continued fairly slowly with Theil's index showing that it was attributable more to the narrowing of differentials between the various different economic and professional categories than to those within them.

The values of the indices can be influenced by changes in the sampling methodology, but, after the sharp falls of the early years, behaviour designed to prevent further marked narrowing of wage differentials cannot be ruled out.

A. F.

[3] G. CALIGIURI, " Evoluzione dei redditi da lavoro dipendente e da pensioni nel quinquennio 1973-79," in *Bollettino* of the Research Department of the Banca d'Italia, 1978. On the same problem, see also, R. FILOSA and I. VISCO, " Costo del lavoro, indicizzazione e perequazione delle retribuzioni negli anni '70," in *I difficili anni '70*, G. Nardozzi (ed.), Milan, 1980.