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A NOTE ON THE PORTUGUESE WAGE - GAP: 1954 - 1983

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I - Introduction

In this paper we will present a series of the wage gap, calculated for Portugal, and we will make a few comments on the determinants and consequences of the obtained values.

Conceptually, the wage gap is not a very usefull measure of disequilibrium in the labour market since it is a poor substitute for the knowledge of the labour demand and supply functions. Nevertheless its comparative simplicity may recomend its use, especially in a country where statistis are generally of poor quality.

Being aware of the theoretical shortcomings of this measure, when drawing conclusions from it we will be particularly carefull and use "outside" information.

When constructing a series of the wage gap we want to build a measure of the fluctuation of wages around what could be called the "equilibrium wage rate". In the simplest of the settings, this, for a small open economy, is the wage rate compatible with full employment or, more precisely, the natural rate of unemployment and with the equilibrium in the external account.

Conceptually we should, therefore, look simultaneously for the equilibrium conditions of the labour market and for the equilibrium of a measure of the external account, as a proxy for a full general equilibrium model.

As this sort of calculations turns out to be particularly difficult for a country with poor statistics, the simple methodology of the calculation of an index of the wage gap becomes atractive.

The main, and most restrictive, idea is that this sort of equilibrium can be proxied by a given value or series of values of the share of labour in aggregate value-added. To keep matters as simple as possible we will consider that the share of labour compatible with macroeconomic equilibrium is constant.

The problem, then, becomes one of choosing a base year for the index of the wage gap. The values of the index, for the years other then the base, will obtain by the aplication of a rate of change that is the difference between the effective rate of change in remunerations (inclusive of payroll and other social security taxes) and what we could call a "warranted growth rate of remunerations" that is the rate of change in remunerations that is compatible with the natural rate of unemployment and with the constant share of labour in national income.

In the next section we will see how we can arrive to a practical formula for calculating an index of the wage gap and note the restrictive assumptions that are made in that calculation. We will also present the values obtained for Portugal.

In the third section that series will be used to appreciate the recent macroeconomic performance of Portugal with an emphasis placed in the evolution of labour market conditions. The need for "outside" information and, therefore the insufficiency of the wage gap measure will, then, be highlighted.

II - The wage gap

We start considering the share of labour in national income as $\frac{L.w}{p_y.Y}$, where

L is employment.

w is the anual rate of compensation, per employee.

p_y is the GDP deflator.

Y is real value added or real GDP.

A constant share of labour, implies, in rate form, that $\hat{w} = (\hat{Y} - \hat{L}) + \hat{p}_y$

Of course this means that for a constant labour share product wages must have a rate of change equal to the rate of growth of productivity.

But, as attention is usually placed in real wages, that is wages deflated by the consumer price index, we can add and subtract to the above expression the rate of inflation

$$\hat{W}= \hat{P} + (\hat{y}- \hat{L}) + \hat{p}_y - \hat{P}$$

Or, considering that for a small open economy, divided in two sectors, a traded goods sector and a montraded goods sector.

$$\hat{P} \simeq \alpha\hat{p}_y + (1-\alpha)\hat{p}_m$$

where α is the share of nontraded goods in output and $\hat{p}_m$ is the rate of change of import prices we get

$$\hat{W} = \hat{P} + (\hat{Y} - \hat{L}) + (1 - \alpha)(\hat{p}_y - \hat{p}_m)$$

Now, recalling that we want a measure of the rate of change in wages that are consistent not only with a constant share of labour, as a proxy for external equilibrium, but also with a constant natural rate of unemployment we must add to the last expression another term that reflects the growth of the labour force and its impact in the warranted rate of wage growth as defined above.

To keep unemployment at the natural rate and assuming that employment is demand determined, wages must grow according to

$$\hat{W} = -\ (1-\gamma)\left(\frac{1}{\sigma}\right)\ \hat{F}$$

where γ is the labour share in value added and $\hat{F}$ is the growth rate of the labour force.

The warranted rate of wage growth is, therefore obtained as

$$\hat{W}^* = \hat{P} + (\hat{Y} - \hat{L}) + (1-\alpha)\ (\hat{P}_y - \hat{P}_m) - (1-\gamma)\ \left(\frac{1}{\sigma}\right)\ \hat{F}$$

To calculate the index of the wage gap all we have to do is to choose a base year, where the index will take the value 100 and which provides the labour share γ, and then to change the value of the index for each year according to the difference between the change in effective remunerations and the warranted rate of growth of remunerations as indicated above.

With reference to Portugal we choosed as the base year 1973. In this year we had a situation that could be characterized by full employment and a substantial decrease in the emigratory flow that allows us to think that the labour market was in equilibrium or somewhere close to it and also a situation of near equilibrium in the foreign current account.

The choice of the equilibrium in the current account as an indicator of external equilibrium, as oposed to the balance of trade, is a result of a particularity of the portuguese economy. In fact the large contingent of emigrants finance, through remittances an always present deficit in the trade balance.

The calculations will be presented under two different sets of assumptions. That, we feel, provide upper and lower bounds on the index of the wage gap. Both will share a common assumption of the share of tradables in output. This is generally considered of the order of 50 percent for the most recent years (1).

In the set of assumptions A we consider an equilibrium share of labour in value - added of 50 percent and an elasticity of substitution between labour and capital, assumed constant, equal to unity.

This is a "rounded numbers" set of assumptions and constitutes a lower bound on the index for the 70's and 80's.

In the set of assumptions B we consider the share of labour in value-added to equal 51.6 percent as indicated in the official National Income Accounts for 1973. Here we will use an elasticity of substitution between capital and labour of 0.4.

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(1) This figure came to my knowledge through conversations with various portuguese economists. I do not know of any written estimation of the share of tradeables in portuguése output.

The empirical evidence on elasticities of substitution, available for the portuguese economy is repported in Sousa (1977), Barbosa (1977) and Beleza (1980).

The estimates vary widely especially between Sousa (1977) and Barbosa (1988) on one hand and Beleza (1980) on the other hand. The former authors present estimates of, respectively 0.6 and 0.8 while Beleza's estimates range from 0.1 for non-manual workers to 0.4 for manual workers.

It is important to note, if we want to apraise the difference in the estimates, that Sousa's (1977) and Barbosa's (1977) estimates were obtained using time-series data. The former author considers only data on manufacturing while the latter uses more aggregated data.

Beleza's (1980) estimates result from a cross-section model using data or manufacturing.

INDEXES OF WAGE GAP

Year	$\hat{W}$	$\hat{P}$	$\hat{Y}-\hat{L}$	$\hat{P}_y-\hat{P}_m$	$\hat{F}$	$\hat{W}^*_A$	$\hat{W}^*_B$	I_A	I_B
1954								87.3	85.5
1955	2.7	0.0	3.9	-2.7	0.8	2,1	1.5	87.8	86.5
1956	5.0	3.1	3.5	-2.8	0.6	4.9	4.4	87.9	87.0
1957	5.4	1.7	4.1	-3.4	0.7	3.8	3,2	89.3	88.9
1958	3.6	1.3	1,3	12,2	0.9	8,2	7.5	85,2	85.5
1959	7.9	1.3	4,7	3,1	0.8	7.1	6.5	85.9	86.6
1960	-1.6	3,8	4.0	2.6	0.9	8,6	7.9	77.2	78.4
1961	9.8	-0.6	6.8	-1,0	1.5	5.0	3,6	80,9	83,3
1962	8.4	2,8	5.6	-3.2	0.9	6,4	5.6	82.5	85.6
1963	8.2	2,3	4.7	1.4	0,7	7.4	6.8	83.1	86.6
1964	12.5	1.8	6.3	-0.1	0.1	8.1	7.9	86.8	90.8
1965	10.2	4.6	7.9	1,9	-0.2	13.4	13,7	84.0	87.6
1966	10.7	3,9	3.2	1.3	-0.2	7.9	8.0	86.3	90.0
1967	12.8	4.7	7.4	1.8	0.7	12.7	12,1	86.4	90.6
1968	8.5	2.7	6.7	-3.6	0.6	7.3	6.8	87.4	92,2
1969	8.7	5.1	2,9	7,6	0.1	11.8	11.7	84.7	89.4
1970	16.8	2.2	3.7	5,7	3.2	7,2	4.6	98.9	100,3
1971	15.8	3.0	7,0	3.3	-0.6	12,0	12,4	102.7	103,7
1972	17.9	6.0	8.7	4.4	-0.6	17.2	17,7	103.5	104.0
1973	18,8	12.9	12,2	-7,2	-0.7	22,2	22,4	100,0	100,0
1974	36,1	27,2	3,1	-11.5	8.7	20.2	14.0	115.9	122.1
1975	34.0	20.4	-3.5	5,0	2,7	18.1	16.1	134.3	144.0
1976	20,9	21.1	4,7	-2,7	1.4	23.8	22.8	130.4	141.3
1977	17.8	27,4	5.5	-12.4	1.1	26.2	25.4	119.4	130.6
1978	19,1	22,5	3,7	1,2	0.3	26,7	26.4	110.3	121.1
1979	21.0	24,2	4,3	0.2	2.3	27,5	25.8	103.1	115.3
1980	25.9	16.6	2,2	-2.1	1.5	17.0	15.9	112.3	126.8
1981	23.1	20.0	-0,6	-1,5	1,6	17,9	16.7	118.1	134.9
1982	19.2	22,4	3.1	5,8	-1,1	29.0	29.7	106.5	120.7
1983		25,5	1,7						

Notes on the table:

a) Set of assumptions A:

$\sigma = 1$

$\gamma = 0.5$

$\alpha = 0.5$

b) Set of assumptions B:

$\sigma = 0.4$

$\gamma = 0.516$

$\alpha = 0.5$

c) $\hat{W}$ is the percentage growth rate in remunerations.

$\hat{P}$ is the rate of consumer prices inflation.

$\hat{Y}-\hat{L}$ is the rate of productivity growth in percentage.

$\hat{p}_y-\hat{p}_m$ is the difference betwen the percentage growths in the prices of domestic production and of imports.

$\hat{F}$ is the percentage growth rate in labour force.

$\hat{W}^*_i$ is the percentage growth rate of warranted wages, as defined, under the set of assumptions i.

III - Macroeconomic performance and the wage - gap.

In order to comment on the obtained values of the index of the wage-gap it will be usefull to have a short survey of the portuguese macroeconomic experience.

During the period from the late 50's to the early 70's the general pattern of the dynamics of the portuguese economy was one of a strong output growth, especially so during the 60's and early 70's. This growth was felt mainly in industry and was quite pro-trade biased. In fact exports increased from 17 to 26 percent of GDP from 1960 to 1972 while imports, also as a percentage of GDP, increased from 23 to 31, in the same period.

Two other charachteristics of the years before the Revolution, that is before 1974, were a generally tight labour market and a surplus in the external accounts.

These three "facts" about the portuguese economy are consistent with, and could even he inferred from, the index of the wage gaps that until the 70's indicates a negative wage gap. Of course, growth was led by exports and remittances and should be partially attributed to the growth in world trade and in the particular patern of European growth after the war.

In this setting the obvious question is what prevented the wage gap from closing much before the 70's, given the acknowledged tightness of the labour market.

In the late 50's and especially during the 60's the portuguese population experienced very strong migratory flows. On the internal edge the flows were from agriculture and countryside to the towns and to industry and services. Industry was indeed the fastest growing sector during the period. On the external edge there was a strong emigratory flow for Europe and especially for France and Germany.

Also, it should be noted, the beginning of the colonial war in 1961 had important effects on the labour market given the marked increase in armed forces enrollement. The abnormal figure for labour force growth in that year is probably rooted in this new situation.

An hypothesis that is currently put forward to explain this situation is that wages were kept "artificially low" due to a degree of monopsony power in the labour markets. This hypothesis was studied in Beleza (1980) that tests the equality between wages and marginal products in industry for nanual and non - manual workers.

His conclusions do not reject the hypothesis in the above mentioned argument.

In this context it is also interesting to note that the monopsony power of firms could be rooted in the institutional arrangements then prevailing. If this was the case the political changes of 1969/1970 that led to a substantial increase in union's bargaining power can contribute - together with the build up of pressure in the labour markets due to the colonial war and the growing importance of the emigration - to explain the closing of the wage gap that the data shows in 1970.

An implicit assumption of the analysis is, even, that the positive but decreasing wage gaps of 1971 and 1972 contributed to the charachterization of 1973 as an year of equilibrium in the labour market.

In late 1973 and in 1974 and 1975 the portuguese economy suffered the impact of strong external and internal shocks. The external shocks resulted from the first oil shock and the ensuing deterioration in the terms of trade and the international recession that followed. All these had important effects for a small open economy that imports all the oil it uses.

The internal shocks were a consequence of the Revolution in 1974 and 1975 that meanet the loss of the colonies, an important imigratory flow of former settlers, the disruption of production and an important measure of political instability.

At the same time the new political ambience allowed a marked increase in the bargaining power of unions that were able to get large increases in both real and product wages. Unions and the labour movement in general were also able to make the government imposse legally the forbidance of firings and dismissals but for the extreme cases.

In terms of the labour market, all this can be seen as a rightward shift in a labour supply schedule due to the increase in the potentially active population and, symmultaneously, a leftward shift in the labour demand schedule given the increases in uncertainty and risk, the deterioration of the terms of trade and the productivity shocks.

Given the already mentioned increase in union's bargaining power the conomic experience of the revolutionary years could hardly fail to show the opening of large wage gaps.

In the following years and especially in 1978 and 1979 as the economic policy was dominated by the external constraint, the wage gap decreased and was almost closed in 1979, only to be reopened due to the expansionary policies followed in 1980 and 1981.

It can only be emphasized the extreme sensitivity of the wage gaps to the economic policies being pursued.

As to the other determinants of the positive wage gaps that prevailed during the post - revolutionary years, only in 1974/ /1975 and 1980/1981 did real remunerations per worker increased. The gap, then, can be attributed, to some extent, to demographic and productivity shocks.

As we wrote before, we are perfectly aware of the limitations of a wage gap series to analyse macroeconomic performance and particularly to apprciate the path of unemployment. Nevertheless we feel that the obtained values of the index of the wage gap can provide some information, if only of qualitative nature.

An important aspect that the index can contribute to explain is the trend growth in unemployment. Of course, if we accept the assumptions that sustain a measure like an index of wage gap then, due to constantly positive wage gaps, we should have constantly growing unemployment.

Also, there are reasons to believe that not all unemployment, due to the gaps, has already materialized since labour legislation, as we mentioned before, made firings virtually impossible. Yet, in October 1976 individual labour contracts of fixed (short) term duration were introduced thereby reintroducing some flexibility in employment decisions. This type of contracts covers, in October 1983, an estimated 11.3 percent of employment.

Under these circumstances the closing of the gap in 1983 and even the appearance of a negative wage gap that is easy to forecast for 1984 may not be enough to reverse the trend of growing unemployment since there will be, temporarily, an inertia in this trend due to the cummulated effects of the past wage gaps, as Krugman (1982) clearly pointed out.

DATA APPENDIX

The constrution of the indexes of the wage gap required data series on real GDP, employment, GDP deflactors, consumer price indexes, remunerations and labour force.

The series on real GDP and GDP deflators were drawn from the IMF, International Financial Statistics and various issues of the Anual Repport of the Bank of Portugal.

The consumer price indexes from 1976 onwards are from the Repports of the Bank of Portugal. Before that year, when a "national" consumer price index was inexistent, the figures were constructed as weighted averages of the existent regional indexes. The weights were each region share in population according to the 1960 census. Of course the weights were made to sum one.

Employment and labour force statistics are from Mateus (1979), Schmitt (1981), and Repports of the Bank of Portugal. It should be noted that data on this variables differ substantially according to the source. We tried to build a series that could make sense, especially in the 1974/1975 years.

Finally, the series on remunerations was constructed from official National Income Statistics for the period 1965 to 1976, Mateus (1979) for the previous years and Repports of the Bank of Portugal for the more recent years. The series presented is the anual growth rate of labour income (including social security taxes on employers) less the growth rate in employment.

REFERENCES

Barbosa, M. (1977): "Growth, Migration and the Balance of Payments in a Small Open Economy", Unpublished Ph.D. Dissertation, Yale University.

Beleza, L.: (1980): "Wages and marginal productivity in Portuguese manufacturing", in Economia, Maio, 1980.

Krugman, P. (1982): "The real wage gap and employment", in Annales de l'INSEE, 1982.

Krugman, P. and Macedo, J. (1979): "The economic consequences of the April 25 th Revolution, in Economia, Outubro 1979.

Mateus, A. (1979): "Modelo de conjuntura para a economia portuguesa", Banco Portugal, 1979.

Sousa, A. (1977): "Funções de produção com elasticidade de substi tuíção constante na indústria transformadora portuguesa", in Economia, Janeiro, 1977.