Wage Responsiveness and Labor Market Disequilibrium

Ramon E. Lopez
and
Luis A. Riveros

Core unemployment may not affect market wages; transient
unemployment does. Policymaking should reflect the distinc-
tion.

Core unemployment corresponds to the structural and natural components of open unemployment, while transient unemployment is associated with the labor market impact of cyclical fluctuations.

Core unemployment may not significantly change market wages because it is associated with distortions in the labor market, a mismatch between jobs and workers, and normal turnover.

Core unemployment has persisted in Colombia, which has one the highest unemployment rates in Latin America.

Argentina, which has the lowest unemployment rate in Latin America, experiences relatively higher cyclical employment fluctuations.

Wage policies would be less effective in improving the labor market in Colombia than microeconomic policies — including measures to deregulate the labor market, reduce the wage gap between the formal (protected) and informal (unprotected) sectors, increase labor mobility, and provide more training or job information.

Stabilization and other policies to induce wage flexibility are more appropriate for dealing with cyclical unemployment.

This paper is a product of the Debt and Macroeconomic Adjustment Division, Country Economics Department. Copies are available free from the World Bank, 1818 H Street NW, Washington, DC 20433. Please contact Luis A. Riveros, room N11-061, extension 61762.

WAGE RESPONSIVENESS AND LABOR MARKET DISEQUILIBRIUM

by

Ramon E. Lopez

University of Maryland
Country Economics Department - The World Bank

and

Luis A. Riveros

University of Chile
Country Economics Department - The World Bank

I. Introduction

Studies on the recent performance of Latin American labor markets,
[PREALC (1987) and Riveros (1988)] highlight two prominent stylized facts.
First, an apparent lack of correlation between observed wage changes and
unemployment. Second, a remarkable diversity of unemployment across otherwise
similar countries. These facts offer some complexities in the context of
analyses carried out within a neoclassical framework and raise doubts about the
effectiveness of traditional policies seeking adjustment and equity stance. For
instance, if wages are relatively insensitive to labor market conditions, demand
management stabilization policies emphasizing fiscal discipline and monetary
austerity are likely to be effective in controlling inflation and improving
international competitiveness only after a prolonged period of high
unemployment. Similarly, the existence of a large diversity in the rate of
unemployment across countries in Latin America may be attributed to inherent
differences in wage dynamics or to substantial discrepancies in labor market and
macro policies.

The objectives of the paper are: (1) to empirically probe on the
validity of the hypothesis that wages are relatively unresponsive to labor
market disequilibrium, and (2) to investigate whether the dramatically diverse
rates of unemployment observed across certain Latin American countries obey to
fundamentally different wage dynamics or are the product of diversity in labor
market distortions and other labor market policies. In doing this we have
chosen to analyze the experiences of Argentina and Colombia for the period
1960-1985. These countries, being at relatively similar stage of development,
have exhibited the most contrasting features in levels of open unemployment
during the period. Argentina has had the lowest rate in Latin America while
Colombia has shown one of the highest rates in the region.

Explanations of the first stylized fact mentioned above may rely upon
labor market inefficiencies (Friedman, 1977) or the role played by rational

expectations (Lucas,1973; Sargent, 1973]1/, whereas the second one is usually
explained on the basis of differences in implementing statistical concepts, the
importance of the urban informal sector and the role played by the government in
the labor market [PREALC, (1987); Lopez & Riveros, (1988)]. However, little
work has been done on the relationship between the components of open
unemployment and actual labor market disequilibrium. In particular, a
conceptual breakdown of total observed unemployment, depending upon its actual
effect on aggregate wages has not been developed. This is a relevant issue in
several LDCs given the importance of structural factors underlying the existence
of high unemployment, thus positing questions with regard to poli   tions.

In this paper we explore an economic interpretation of the _.o above
mentioned stylized facts based on the distinction between core and transient
unemployment. Core unemployment corresponds to the structural and the natura]
components of observed open unemployment, while transient unemployment is
associated with the labor market impact of cyclical fluctuations. The
importance of this distinction is that structural unemployment may not
significantly affect market wages, because it is primarily associated with labor
market distortions. That is, structural unemployment would be similar to
natural unemployment which is related to qualifications mismatch and normal
turnover, but with the important difference that structural unemployment may
substantially fluctuate over time as distortions change. On the contrary,
transient unemployment affects market wages basically because it reflects
effective disequilibrium in the labor market.

Distortions in the labor market induced by either government
regulations or union activity generate both open unemployment and a form of
equilibrium quasi-voluntary unemployment 2/ analogous to that analyzed by
Harberger (1971) in a model considering a "protected" or regulated sector and a
competitive sector.3/ Quasi-voluntary unemployment does not generate pressures

on wages in the competitive sector because the supply price of the unemployed is closer to the wage prevailing in the protected sector than to the lower wage existing in the non-regulated sector. Open unemployment caused by distortions in the labor market, does not lead to actual disequilibrium in the labor market and, hence, is not likely to exert downward pressures on effective wages.

Previous studies in both countries have investigated the trade off between unemployment and wage changes [Broderson (1975), Reyes (1984)], but no attempt has been made to distinguish the various components of open unemployment. In analyzing the experience of developed countries, most studies have introduced a distinction between "natural" and cyclical unemployment, where the former is assumed to be constant in time.4/ A potential problem of this methodology, however, is that if quasi-voluntary unemployment is not constant through time its changes would be lumped together with cyclical fluctuations, thus obtaining an inadequate separation between natural and cyclical unemployment. Since core unemployment is related to distortions in the labor market5/, and since the real effects of these distortions tend to widely fluctuate in time without necessarily responding to market disequilibrium, it is likely that this unemployment component also changes throughout time.6/ In this study we allow for variations in core unemployment throughout time, thus permitting a more satisfactory separation between core and transient unemployment and a more clear identification of the actual labor market disequilibrium.

There are three basic questions we address empirically in this paper. Is the effect of transient unemployment on wage changes significantly different from that observed with regard to core and total unemployment?; Can the unemployment rate differentials between Argentina and Colombia be explained by differences in core unemployment or they simply reflect differences in transient unemployment? More fundamentally, is the higher observed unemployment in

Colombia associated with a slower wage responsiveness to labor market disequilibriums than in Argentina?

The structure of the paper is the following. In the second section we review the evidence and the main policy issues in discussion. In the third section we discuss the conceptual framework and the econometric model. In the fourth section we present the econometric results and in the last section we summarize the main results.

II. The Evidence and Policy Issues

Colombia is one of the Latin American countries with the highest unemployment rate (Table 1). It has been hypothesized that heavy unemployment developed during the 1960s and 1970s was a result of labor market inefficiencies, particularly the role played by segmentation and of certain labor market policies emphasizing protection of formal sector workers (Lopez, 1987). During the 1980s, the economic recession has further increased unemployment at the same time as real wages rose through 1985. Although the role played by frequent shocks affecting the structure of production has been important --thus generating shifts in the nature of the skill composition of labor demand and inducing some qualification mismatches--explicit government policies to absorb unemployment and to substantially reduce frictional unemployment have not been implemented. In fact, most employment is generated by the private sector, which in Colombia is less stable than government employment (Lopez, 1987). Moreover, the existing evidence suggests that a large proportion of the unemployed are highly educated, young and dependent. This evidence, together with the indicated high degree of distortions in the protected labor market, would suggest that a sizable proportion of the unemployed corresponds to quasi-voluntary or structural unemployment.

In contrast to the case of Colombia, unemployment in Argentina has been historically among the lowest in the region. As can be seen in Table 1,

TABLE 1

Labor Market Trends in Argentina and Colombia

	ARGENTINA		COLOMBIA	
	U	W	U	W
1970	5.0	80.6	9.9	108.7
1975	3.6	100.0	11.2	100.0
1976	4.8	64.5	10.4	90.2
1977	2.3	61.3	9.6	88.0
1978	3.3	62.1	8.1	101.1
1979	2.5	69.4	9.1	105.4
1980	2.5	80.6	10.0	109.8
1981	4.8	73.4	8.7	117.4
1982	5.3	63.7	9.3	121.7
1983	4.7	77.4	11.0	123.9
1984	4.6	90.3	13.2	127.2
1985	4.7	79.0	14.0	129.3
1986	4.3	79.8	13.8	134.8
1987	4.6	73.4	11.8	137.0
Average	4.1	75.4	10.7	113.9

Notes: U = Urban Unemployment Rate
        W = Average manufacturing wages

Source: ECLA (1987), Paldam and Riveros (1986), IMF,
        ILO (1986): Yearbook of Labor Statistics.

the average rate of unemployment in Argentina for the period 1970-87 has been less than half that of Colombia. Interestingly, low unemployment levels have prevailed in the presence significant real wage fluctuations which have been, in turn, associated with major macroeconomic shifts. Also, in sharp contrast with Colombia, the government has followed active job absorption policies. This may have resulted not only in lower total unemployment but also in relatively higher cyclical employment fluctuations due to errors made by the government in forecasting the level of employment in the private sector. Although sluggish growth over the long run and large fluctuations are two clear characteristics of the evolution of real wages, previous studies have not shown an obvious correlation with the performance of open unemployment (Sanchez, 1987).

Policy questions regarding the performance of wages and unemployment have become crucial in the context of adjustment in both countries. Diagnosis on the type and relative magnitude of the various components of total unemployment in the economy is important in analyzing the policy options to affect unemployment. If unemployment is essentially the natural-core component, there will be very little relationship between prevailing unemployment levels and the wage dynamics. In this case, wage policies would not be effective and rather will call for microeconomic policies, like those aiming at increasing labor mobility and at implementing training schemes and improving labor market information. If unemployment is essentially non-natural (structural) core unemployment, the main policy prescriptions would deal with deregulation of the labor market, particularly oriented to reduce labor market segmentation and other forms of labor market distortions. Finally, transient (cyclical) unemployment may imply a more prominent role for stabilization policies and other policies to induce wage flexibility.

III. The Model

The basic idea is to estimate an unemployment equation based on both structural and cyclical factors, which will be used to separate the transient and core components of total unemployment. Subsequently, these estimated unemployment rates will be used in another equation relating nominal wage changes on the one hand, and the various types of unemployment and the inflationary rates on the other. We explore two variables associated with unexpected demand shocks in order to account for cyclical effects on total unemployment: unexpected monetary shocks and unexpected fiscal shocks. With regard to the former, we follow Barro's approach, in which the rate of change in M1 are fitted against certain macroeconomic variables whereas the residuals are used as the unexpected monetary shocks (DMR) in the unemployment equation.7/ With regard to the second, we include the deviation of the actual fiscal exp.nditures from its long run trend (DVT).8/ The effect of increases in both DMR and DVTR on total unemployment is expected to be negative.

Apart from unexpected demand shocks we also consider unexpected supply shocks in the determination of cyclical or transient unemployment. In order to account for unexpected supply shocks, we consider the variation of terms of trade, which may be associated to a real impact in the economic activity. We distinguish two components with regard to the effect of terms of trade (TOT) on total unemployment: a structural trend (TOTS) and unexpected shocks (TOTU). The former one was estimated as the fitted value against a time trend, while the latter is the difference between the actual and the fitted values.

In order to estimate core unemployment, we follow the model by Lopez & Riveros (1987, 1988), in which labor market segmentation is related to the coexistence of protected and unprotected sectors. This model distinguishes the markets for skilled and unskilled labor, and defines the informal sector as that formed only by unskilled workers producing mostly non-tradable goods, i.e.,

services.9/ The formal sector, on the contrary, uses skilled and unskilled
workers to produce both tradable and non-tradable goods; the minimum wage is
assumed binding only for unskilled workers in the formal sector and determines
the total labor supply of unskilled and the proportion of them actually absorbed
in the formal sector.10/

Although the Lopez & Riveros' model focuses on analyzing effectiveness
of macroeconomic policies in the presence of labor market segmentation, some
its features are of relevance to consider the trade off between wage changes and
unemployment. In particular, the existence of a wage gap between the formal
(protected) and the informal (unprotected) sectors is associated to the degree
of labor market distortion and thus, it should be highly correlated with core
unemployment. By the same token, the distortionary gap existing between
effective and notional (equilibrium) formal-sector wages, is also associated
with the presence of structural unemployment in the economy. However, it is
important to recognize that both wage gaps have an endogenous component linked
to short run macroeconomic fluctuations. The main implication is that variables
associated with prevailing wage gaps may be used as a proxy to estimate the core
unemployment in the economy.

In the unemployment equation we use the ratio between minimum wages
and wages of unskilled workers (MINWU) as a proxy for the formal/informal wage
gap. We also control by the ratio of non-wage costs of labor (fringe benefits
and social security payments) to total manufacturing wages (QOWM), as a proxy
for regulations in the formal labor market. Finally, we consider the effect of
lagged unemployment to measure the degree of "stickiness" or unemployment
persistence. Thus, the following general form of the unemployment (TU) equation
was estimated:

$$TU_t = a_0 + a_1 DMR_{t-1} + a_2 DVT_{t-1} + a_3 TOT_t + a_4 MINWU_t +$$

$$a_5 QOWM_t + a_6 UN_{t-1} + V_t \qquad\qquad [1]$$

where a_i ($i = 0..6$) are parameters, t is time and V_t is a random term.

The variables MINWU and QOWM have both endogenous components given that their denominators are likely to be dependent on unemployment. Thus, we estimated [1] by instrumental variables to correct for the possible correlation of theses variables and the error term.[11]

Core unemployment is calculated as

$$CORU_t = [\hat{a}_0 + \hat{a}_3 TOTS_t + \hat{a}_4 MINWU_t + \hat{a}_5 QOWM_t] \ (\frac{1}{1-\hat{a}_6}) \qquad [2]$$

where ^ above the parameters means the corresponding econometric estimate. [12] The transitional unemployment component (TRUN) is calculated as the difference $TU_t - CORU_t$. In (2) $\hat{a}_0/1-\hat{a}_6$ would correspond to the "natural" rate of unemployment which is assumed constant throughout time. The structural unemployment correspond to $(\hat{a}_3 TOTS + \hat{a}_4 MtNWU_t + \hat{a}_5 QOWM_t) \frac{1}{1-\hat{a}_6}$ which of course varies throughout time as the effective labor market distortions change.

Following Lipsey (1960) we assume a wage adjustment equation of the form: $\Delta W/W = g[(D-S)/N]$, where $\Delta W/W$ is the rate of change in wages, D-S is the excess of demand for labor (i.e., transient unemployment), and N is total labor force. Separating the negative excess demand, which is assumed to correspond to transient unemployment, and positive ones (cyclical vacancies) and expressing vacancies as a function of unemployment, one gets a negative relationship between wage changes and cyclical unemployment.

Workers are concerned about real wages, thus implying that the rate of change in real wages --as obtained deducting the inflation rate-- is related to transient unemployment. Since $d[W/P]/dt(1/W/P)$, where P is the price level, is

equal to $\Delta W/W + \Delta P/P$, one obtains the well known inflation augmented relationship. We also consider a variable reflecting changes in average labor productivity $\Delta(Q/N)$ in order to capture the effect of other factors of production (energy, capital, etc.) on the demand for labor and, hence, on wage changes (Grubb, (1985), Layard and Nickell (1987)). Thus, the estimated wage equation is:

$$(\Delta W/W)_t = b_0 + b_1 \ (\Delta P/P)_t + b_2 \ TRUN_t + b_3 \ \Delta(Q/N)_t + e_t \qquad [3]$$

where b_0, $b_1 > 0$, $b_2 < 0$ and $b_3 > 0$ are fixed parameters and e is a random term. Further, under the assumption of absence of money illusion $b_1 = 1$. Equations (1) and (3) are estimated recursively.

IV. The Results

The regression results for the two countries for the period 1960-85 appear in Tables 2 and 3. Table 2 presents the parameters obtained from estimation of the unemployment equation [1]. The results show that for each country there is one distortionary factor statistically significant in explaining observed unemployment. In Argentina, the most significant factor is the wage differential between minimum wages and wages of unskilled workers, which exerts a positive effect in total unemployment, thus partly determining structural unemployment. In the case of Colombia, the most relevant factor is the ratio between non-wage costs of labor and real manufacturing wages.13/ The effect of unexpected monetary shocks was negligible in both countries and, consequently, this variable was eliminated from the regression. The deviation of fiscal expenditures over the (long-term) trend (DVT) does affect negatively unemployment in Colombia, but not in Argentina. The effect of terms of trade is,

TABLE 2

Unemployment Equations
(OLSQ Estimates)

	Constant	DVTR(-1)	TOT(-1)	WMINWU	QOWM	UN_{t-1}	R^2	D.W.
ARGENTINA	5.27	-3.06	-0.037	3.27	0.26	0.22	0.65	1.62
	(1.07)	(-0.76)	(-1.52)	(1.94)	(0.18)	(0.85)	(6.34)	(na)
COLOMBIA	12.46	-10.03	-0.018	-0.87	2.56	0.46	0.64	1.60
	(2.98)	(-1.60)	(-1.55)	(-0.54)	(2.21)	(2.29)	(5.92)	(3.39)

Notes
1. ( ) under coefficients are t-statistics and
( ) under R^2 are F-statistics,
( ) under DW are h-statistics

2. These regressions were estimated by instrumental variables, given the endogeneity of WMINWU and QOWM. The instruments used were GDP growth, inflation rate, nominal exchange rate and money growth.

Computed elasticities between unemployment (U) and independent variables:

	LWMINWU	LQOWM
ARGENTINA	0.6812	.0541
COLOMBIA	-.0824	.2426

however, statistically significant with the expected sign in both countries. In comparing the two estimates it is interesting to note that both the lagged unemployment variable and the constant term are highly significant for Colombia but not so for Argentina, thus possibly indicating more unemployment persistence in the former country.

Figure 2 presents the estimated values of transient and core unemployment based on the coefficients included in Table 2. Core unemployment fluctuates substantially in time, but less than transient unemployment, as expected. Transient unemployment is negative in some periods, which basically represents the existence of excess vacancies over unemployment, and in general, appears more closely correlated with total unemployment than core unemployment. This correlation between transient and total unemployment may explain why a (spurious) relation between total unemployment and wage changes has been detected in certain cases. This is not, in any case, supported on theoretical grounds.

In Table 3 we present the results for the wage equation [3] for the two countries. We have also included the variable A_i which accounts for acceleration or deceleration of inflation to capture possible indexation adjustment within the year.14/ This may be an important factor in countries with high and volatile inflation. We have used alternatively the total unemployment (TU), core unemployment (CORU) and Transient unemployment (TRUN) rates, calculated on the basis of the fitted unemployment equation.15/   In general, we have obtained very good fits, particularly in the case of the equation with transient unemployment.

We observe that the effect of transient unemployment on wages is significant and with the right sign in both countries. On the contrary, in the case of Argentina both core unemployment and total unemployment are clearly not significant. In the case of Colombia, the results show that total unemployment does significantly explain the dynamics of nominal wages, but we consider that

Table 3

Wage Equations: Dependent Variable: Nominal Wage Changes

1. With of Transitional Unemployment (TRUN)

	TRUN	$(\Delta p/p)_t$	Ai	$\dot{L}(Q/N)_t$	R^2	D.W.
ARGENTINA (C)	-36.92	0.89	0.09	7.47	0.92	1.73
	(3.34)	(14.17)	(0.01)	(1.07)	(72.0)	
COLOMBIA (O)	-1.18	0.97	(0.003)	0.86	0.83	1.76
	(-2.06)	(13.7)	(1.00)	(2.12)	(30.3)	

2. With Core Unemployment (CORU)

	constant	CORU	$(\Delta P/p)_t$	Ai	$\Delta(Q/N)_t$	R^2	D.W.
ARGENTINA (O)	-35.50	7.27	0.97	-1.61	1.86	0.90	1.85
	(-0.40)	(0.47)	(12.64)	(0.17)	(0.18)	(44.7)	
COLOMBIA (C)	36.36	-1.75	0.48	0.006	-2.53	0.89	1.84
	(-0.18)	(-1.23)	(3.30)	(1.84)	(-2.80)	(33.6)	

3. With Total Unemployment (TU)

	constant	TU	$(\Delta P/p)_t$	Ai	$\Delta(Q/N)_t$	R^2	D.W.
ARGENTINA (O)	76.76	-14.29	0.94	-1.99	11.21	0.91	1.67
	(1.43)	(-1.39)	(13.39)	(-0.21)	(1.14)	(49.0)	
COLOMBIA (C)	27.56	-1.06	0.48	0.0062	-2.13	0.89	1.79
	(3.62)	(-1.78)	(3.33)	(2.26)	(-2.43)	(35.5)	

Notes :   1. ( ) under coefficients are t-statistics and
( ) under R^2 are F-statistics.

2. All equations are estimated by ordinary least squares and

Computed Elasticities between nominal wage changes and unemployment rates:

	TU	TRUN
ARGENTINA	0.54	0.15
COLOMBIA	0.55	0.06

this result is due to the correlation between total and transient forms of unemployment. Furthermore, although the fitting of the wage equation including total unemployment is also very good, we obtain that the sign and magnitude of the coefficients associated with the labor productivity and inflation variables respectively, are not consistent with economic theory. In fact, the coefficient of the productivity variable is negative and the coefficient of the inflation variable is only 0.48, significantly different from 1, thus indicating that workers suff^ of money illusion. This is in sharp contrast with the coefficients obtained when transient unemployment was used as an explanatory variable where the coefficient of the labor productivity variable is significant and positive as expected and the coefficient of the inflation variable is 0.97, not significantly different from 1.

In general, the results obtained do provide empirical support to our theoretical contention that the distinction of different forms of unemployment is important in explaining the observed wage dynamics. In particular, the elasticity of wage changes with respect to unemployment, is substantially lower in terms of transient unemployment than in terms of total unemployment (see bottom part of Table 3)16/. The main implication is that the degree of wage rigidity is much higher when the relevant unemployment component is taken into account. Our estimates also report that both countries have a similar wage changes/unemployment elasticity but that the actual responsiveness of wages to transitional unemployment is much higher in Argentina, a result concordant with the observed bigger relative importance of this unemployment component. The fact that wage responsiveness to transient unemployment in Colombia is less than 40% the responsiveness in Argentina, suggests that the observed persistently higher unemployment in Colombia is not only due to greater labor market distortions but also to greater inertia in the wage dynamics itself.

In both countries, the results show a strong explanatory power of the inflation variable on nominal wage changes, which we could not investigate further because we used only yearly information. In Colombia, the hypothesis that the corresponding parameter is equal to 1 cannot be rejected at 95% confidence interval, whereas in Argentina, the same hypothesis is not rejected at 90% confidence interval. This evidence seems to indicate absence of money illusion in both countries. Finally, the role of productivity changes appears significant in Colombia, where the parameter has the right sign in the equation incorporating TRUN. In the equations including CORU and TU the parameter associated to productivity changes is negative, a result that does not have any interpretation and seems to indicate that only the equation considering TRUN is the proper one to analyze the wage dynamics in the economy. In summary, it appears that there exists significant gains in explaining wage changes by using transitional unemployment as the appropriate indicator of labor market disequilibrium.

V. Concluding Remarks

The results obtained substantially support our main contention that the distinction between core and transient unemployment is important to explain the labor market dynamics of wage determination. Moreover, the empirical estimates clearly show that labor market distortions play an important role in explaining structural unemployment and that the latter has changed quite significantly throughout the period. This suggests that the traditional separation between "natural" unemployment as represented by a constant, and "cyclical" unemployment (usually associated with cyclical factors) is not sufficient. Under conditions of varying degrees of labor market distortions as in the countries considered, the so called "cyclical"

unemployment would include a large component of structural unemployment, and thus would also be inappropriate to explain wage fluctuations.

A major conclusion of the paper is that aggregate real wages in both countries are indeed responsive to effective labor market disequilibrium, i.e. real wage changes as the rate of transient unemployment changes. However, real wages are not significantly affected by changes in the rate of quasi-voluntary unemployment or by normal turnover and mismatch unemployment.

Another interesting finding is that throughout the period and as a proportion of total unemployment, structural unemployment has been substantially higher in Colombia than in Argentina. This would suggest that measures oriented to reduce labor market distortions would be more effective in reducing unemployment in Colombia than in Argentina.

Finally, the results suggest that the higher observed unemployment in Colombia is also associated with a slower wage responsiveness to effective labor market disequilibrium. In fact, as shown in Table 3 the elasticity of wage fluctuations with respect to transient unemployment is about 2.5 times larger in Argentina than in Colombia. This result is consistent with the finding that in Colombia the persistency of unemployment, as reflected by the significant positive coefficient of the lagged dependent variable in the unemployment equation, is important while in Argentina persistency appears to be negligible. Interestingly enough, this diverse wage dynamics is not reflected by the wage responsiveness with respect to total unemployment (both about 0.5). That is, a model that does not distinguish core and transitional unemployment would provide misleading results in this respect.

FOOTNOTES

1. For a review of the debate on the Phillips curve, see Wulwick (1987). An application of the expectations-augmented Phillips curve for OECD countries is found in Summer & Ward (1983). More recently, Alogoskoufis (1987) has examined the informational implications of the Phillips curve for a small open economy

2. As discussed below, equilibrium quasi-voluntary unemployment corresponds to a certain notional or "statistical" disequilibrium that does not affect market wages. We use this concept in contrast with the concept of "effective" or actual labor market disequilibrium associated to transient unemployment.

3. The protected sector includes mainly large private firms subject to government regulation and union activity, and the public sector itself.

4. For an excellent survey about labor market disequilibrium in the context of stagflation, see Helliwell (1988).

5. The type of distortions we are referring here are existing wage gaps resulting from regulations, as for instance between formal and informal sector, or minimum wages and competitive wages, as well as to job security laws.

6. For example, there is tendency to set minimum wages according to equity criteria or to preserve their real purchasing power without reference to labor market conditions. Thus, even if real minimum wages are more or less constant, the effective distortion will vary significantly if market conditions change throughout time.

7. Unexpected demand shocks are modelled on the basis of a money growth equation in which the rate of change in M1 (DM) is explained by some lags, the deviation of actual government expenditures from a normal trend (G-G*), and the rate of GDP growth (Y), i.e.,

    $$DM_t = a_i M_{t-i} + bi (G-G*_{t-i}) + CY_t + E_t$$

    where ai, bt and c are parameters and E(t) is a random term. The inclusion of both monetary and fiscal shocks is justified by the fact that in several years throughout the period analyzed fiscal deficits have been financed with external borrowing rather than money creation as has been the norm in most Latin American countries.

8. We fitted total government expenditures against time, and we calculated the deviation of actual values from these fitted values.

9. This idea keeps the central features of the tradition of labor market segmentation, characterized by a low productivity informal sector largely concentrated in urban services.

10. Lopez & Riveros (1988) demonstrates that this is, however, not a crucial assumption for the main results of the model.

11. The instrumental variables used were GDP growth, inflation rates and the lagged values of MINWU and QOWM.

12. $CORU_t$ is really long-run unemployment and hence, to calculate it we assume that $\hat{UN}_t = UN_{t-1}$. This is why the expression in brackets in (2) is divided by $1-a_6$.

13. Interestingly, this ratio has been increasing rapidly throughout time. A World Bank-ILO report of 1982 concluded in that this increasing trend was basically associated to the financial cost of job security regulations.

14. This is a dummy variable with value 1 when the expected inflation is higher than the actual inflation rate.

15. The wage equation [3] was estimated with instrumental variables to account for the endogeneity of the rate of change in average labor productivity.

16. To calculate this elasticity, we used the average (positive) values of UTRAN, U, the nominal wage changes and the estimated coefficients appearing in Table 3.

REFERENCES

Alogoskoufis, G.: "Monetary Policy and the Informational Implications of the Phillips Curve in an Open Economy", Discussion Paper Series No 183, Centre for Economic Policy Research, London, 1987.

Andersen, P.S.: "Real Wages, Inflation and Unemployment", BIS Working Papers No. 9, Bank for International Settlements, July 1984.

Broderson, M.: "La curva de Phillips y el conflicto entre el pleno empleo y la estabilidad de precios en la economia Argentina 1964/74," Documento de Trabajo no. 75, Di Tella, November 1975.

Coen, R. M. and Hickman, B. G.: "Is European Unemployment Classical or Keynesian?" American Economic Review, vol. 78(2), 1988.

Friedman M.: Nobel Lecture: Inflation and Unemployment, Journal of Political Economy, 85, 1977

Grubb, D.: "Topics in the OECD Phillips Curve", Centre for Labour Economics, LSE, Discussion Paper No 231, October 1985.

Harberger, A. "On Measuring the Social Opportunity Cost of Labor," International Labor Review, 130, 1971.

Helliwell, J. F.: "Comparative Macroeconomics of Stagflation," Journal of Economic Literature 25(1), 1988.

Layard, R. and Nickell, S.: "The Performance of the British Labour Market," Discussion Paper, Centre for Labour Economics, London, School of Economics, 1987.

Lipsey, R. G. "The Relation Between Unemployment and the Rate of Change of Money Wage Rates in the United Kingdom, 1862-1957: A Further Analysis," Economia, February (1-41).

Lopez, R.:"Unemployment and the Structure of the Labor Markets in Colombia", ("Desempleo, la Estructura del Mercado del Trabajo en Colombia"), Estudias de Economia, 15 (1), 1988.

Lopez,R. & Riveros, L.: "Unemployment, the Structure of Wages and Aggregate Expenditures in a Small Open Economy", mimeo, CECDA, The World Bank, 1988

_____: "Exchange Rate Policies and the Structure of the Labor Market in Three Latin American Countries: A Research Proposal" DRDLM, The World Bank, April 1987.

Lucas, R.E. Jr.:"Some International Evidence on output-inflation Tradeoffs" American Economic Review", 68, 1973

Musalem, A.: "Colombia: A Dynamic Open Economy Macroeconomic Policy Framework and Resource Mobilization", Mimeo, 1987.

Paldam, M. and Riveros, L.: "Minimum Wages and Average Wages: Analyzing the Causality. The Case of Six Latin American Countries," Discussion Paper DDD , The World Bank, 1986.

Reyes, A.: Tendencies del Empleo y la Distribucion del Ingreso, June 1986.

Riveros, L :"Recession and the Role of the Labor Market in Latin America", Discussion Series Paper, Dept. of Economics, University of Warrick, UK, May 1988.

Sanchez, C.: "Characteristics and Operation of Labor Markets in Argentina", DRD Discussion Series Paper DRD 272, The World Bank, Washington, May 1987.

Sargent, T.J.: "Rational Expectations, the Real Interest of Interest", Brooking Papers on Economic Activity, 2, 1973

Sumner, M.T. & Ward R.: "The Reappearing Phillips Curve", Salford Papers in Economics, Salford University, 1983

Quandt, R.E. & Rosen, H.S.: "Unemployment, Disequilibrium and the Short Run Phillips Curve: An Econometric Approach", NBER Working Paper Series No 1648, 1985.

Wulwick, N.J.: "The Phillips Curve" Which? Whose?, To Do What? How?", Southern Economic Journal 53, April 1987.

Figure 1

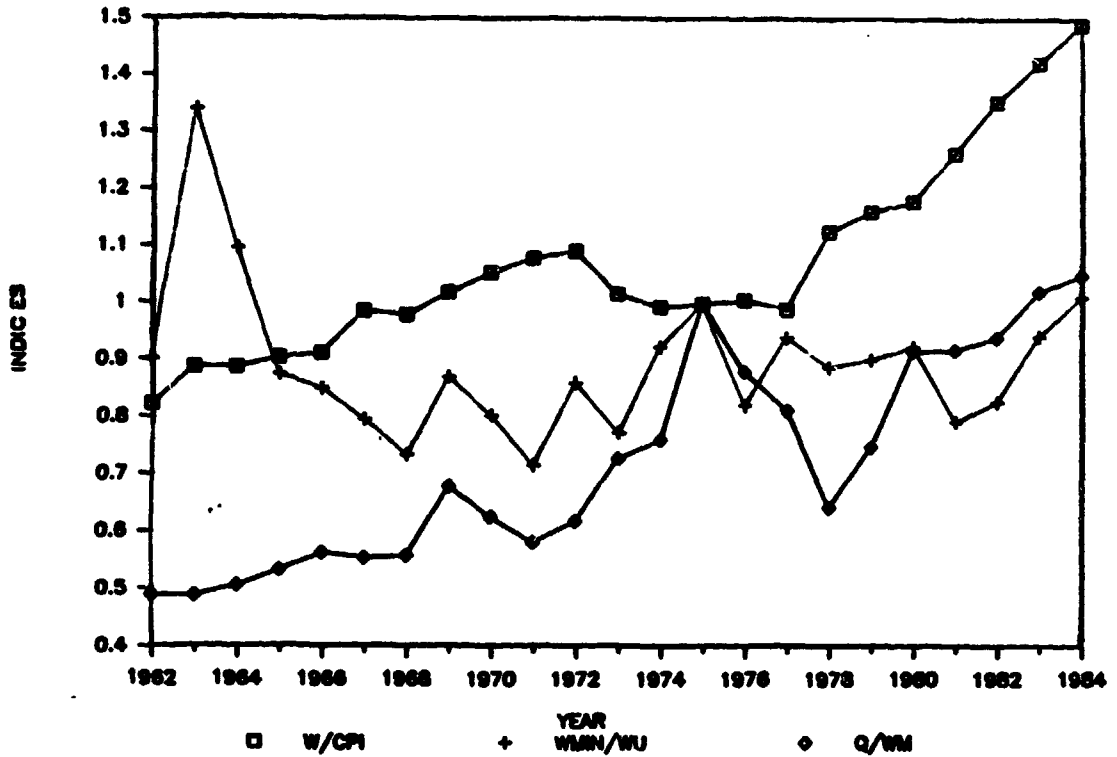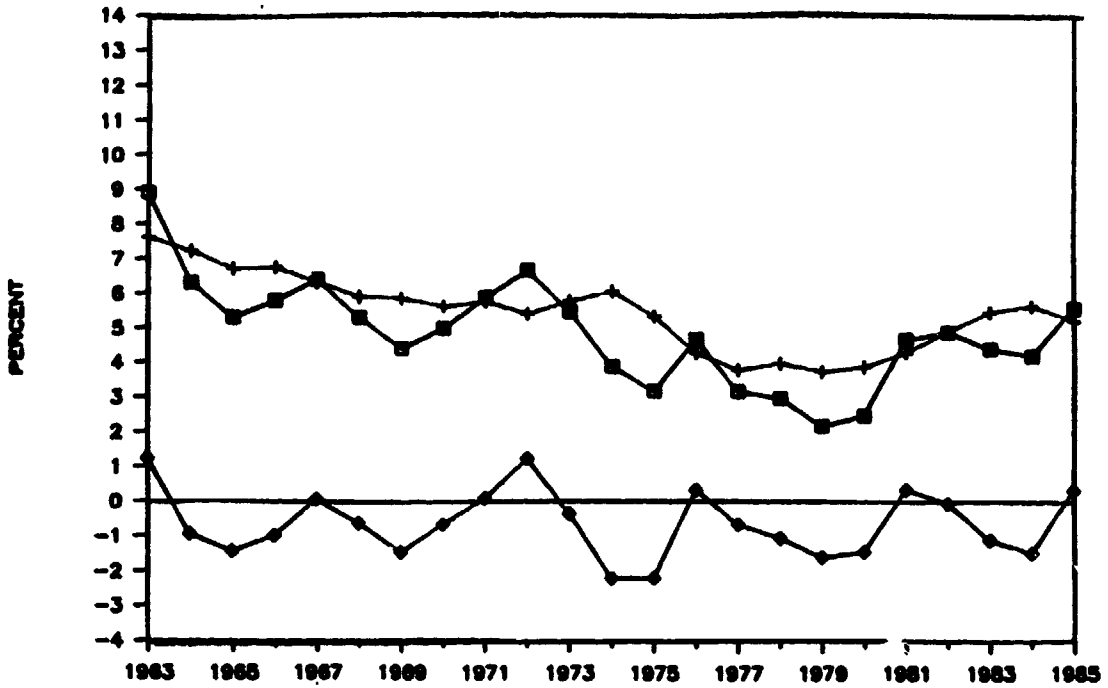## ARGENTINA: WAGE VARIABLES
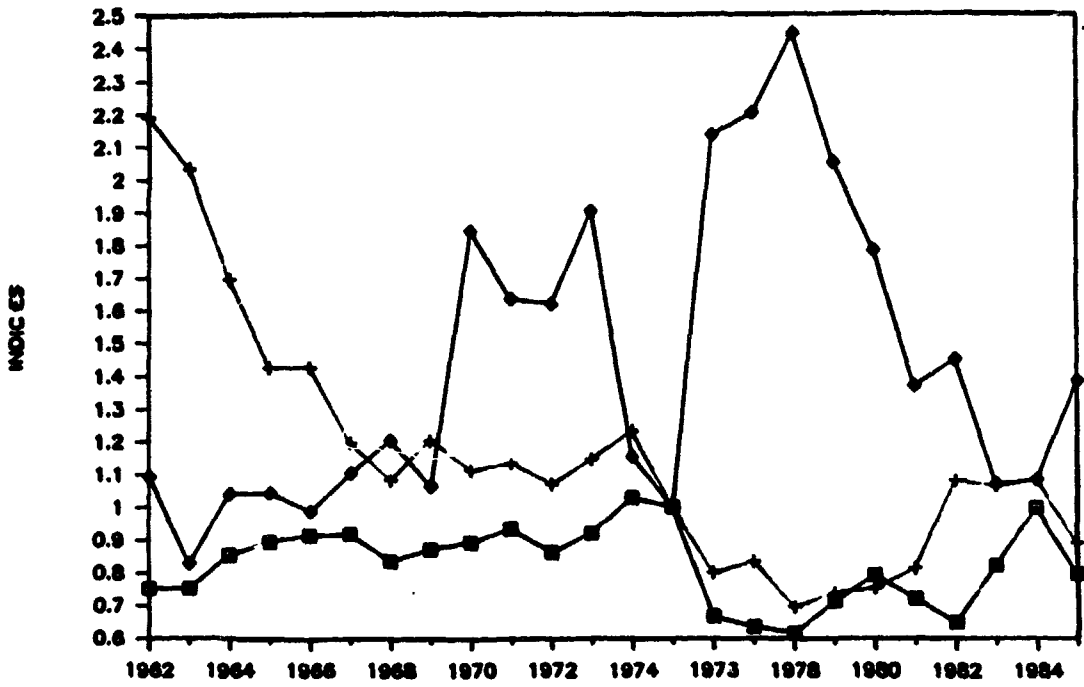
COLOMBIA: WAGE VARIABLES

Figure 2

ARGENTINA: UNEMPLOYMENT RATES

COLOMBIA: UNEMPLOYMENT RATES
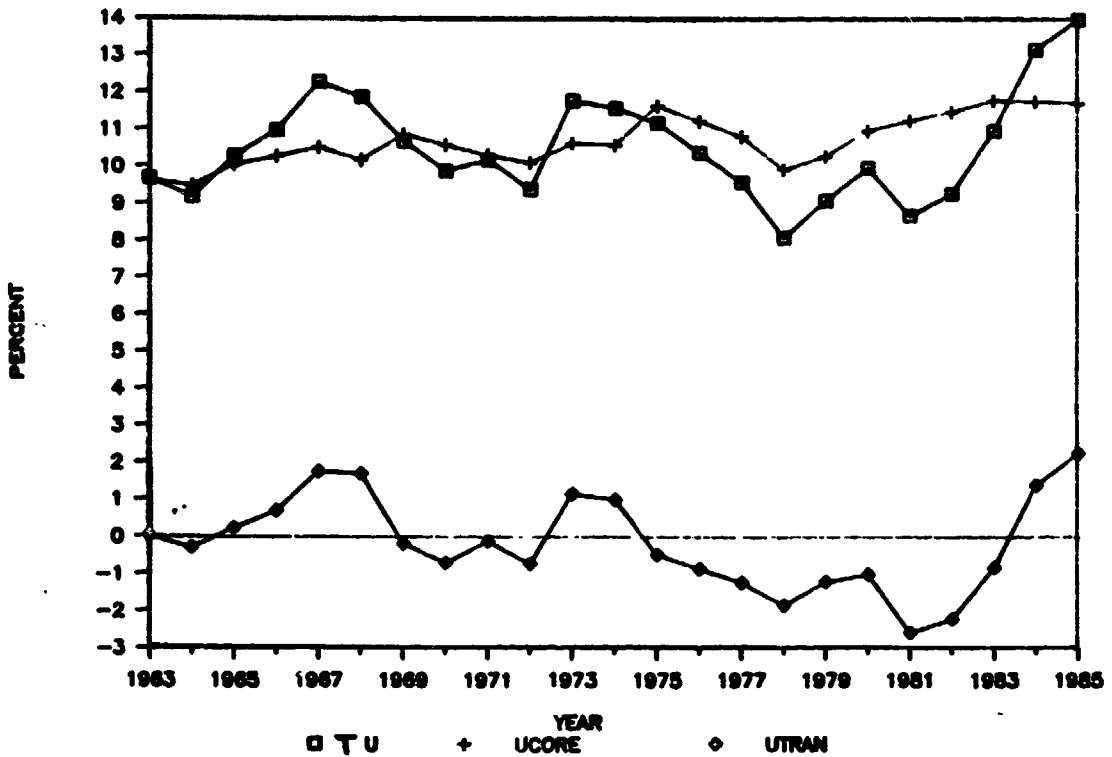
□ T U   +   UCORE   ◇   UTRAN

| | ARGENTINA | | | | COLOMBIA | | |
	TU	UCORE	UTRAN	U	UCORE	UTRAN
1963	8.9	7.6	1.3	9.7	9.7	0.0
1964	6.3	7.2	-0.9	9.2	9.5	-0.3
1965	5.3	6.7	-1.4	10.3	10.1	0.2
1966	5.8	6.8	-1.0	11.0	10.3	0.7
1967	6.4	6.3	0.1	12.3	10.5	1.8
1968	5.3	5.9	-0.6	11.9	10.:	1.7
1969	4.4	5.9	-1.5	10.7	10.9	-0.2
1970	5.0	5.6	-0.6	9.9	10.6	-0.7
1971	5.9	5.8	0.1	10.2	10.3	-0.1
1972	6.7	5.4	1.3	9.4	10.1	-0.7
1973	5.5	5.8	-0.3	11.8	10.6	1.2
1974	3.9	6.1	-2.2	11.6	10.6	1.0
1975	3.2	5.4	-2.2	11.2	11.7	-0.5
1976	4.7	4.3	0.4	10.4	11.3	-0.9
1977	3.2	3.8	-0.6	9.6	10.8	-1.2
1978	3.0	4.0	-1.0	8.1	9.9	-1.8
1979	2.2	3.8	-1.6	9.1	10.3	-1.2
1980	2.5	3.9	-1.4	10.0	11.0	-1.0
1981	4.7	4.3	0.4	8.7	11.3	-2.6
1982	4.9	4.9	-0.0	9.3	11.5	-2.2
1983	4.4	5.5	-1.1	11.0	11.8	-0.8
1984	4.2	5.7	-1.5	13.2	11.8	1.4
1985	5.6	5.2	0.4	14.0	11.7	2.3

NOTE: Figures are percentages of the labor force
U = UNEMPLOYMENT RATE
UCORE = CORE UNEMPLOYMENT
UTRAN = TRANSIENT UNEMPLOYMENT

SOURCE: Calculated with the estimated parameters presented in Table 2

ARGENTINA
(IN THOUSANDS OF AUSTRALES)

	GDP (1)	G (2)	M1 (3)	CPI (4)	O (5)
1960	16.4	0.10	0.18	0.006	n.a.
1961	18.1	0.11	0.21	0.006	22
1962	18.1	0.14	0.22	0.008	22
1963	16.4	0.17	0.28	0.01	23
1964	16.0	0.22	0.40	0.012	24
1965	17.9	0.27	0.50	0.016	25
1966	19.7	0.43	0.67	0.021	24
1967	19.9	0.56	0.87	0.027	27
1968	20.5	0.62	1.11	0.032	27
1969	21.5	0.67	1.22	0.034	25
1970	22.1	0.74	1.47	0.039	25
1971	22.8	1.11	2.03	0.052	25
1972	23.3	1.86	2.92	0.083	24
1973	24.1	3.97	5.73	0.133	30
1974	25.3	5.93	9.10	0.165	32
1975	25.3	23.05	26.76	0.465	27
1976	25.3	108.8	95.14	2.524	38
1977	26.8	194.5	214	6.967	37
1978	26.1	487.9	576	19.194	40
1979	27.8	1255.4	1383	49.811	39
1980	28.3	2676.1	2735	100	38
1981	26.3	6251	4610	204.476	27
1982	25.3	15336	14864	541.404	25
1983	25.8	141302	69953	2402.86	24
1984	26.6	682431	434804	17462.03	29
1985	25.3	8623519	2878143	134832.8	30

NOTE: GDP = REAL GROSS DOMESTIC PRODUCT (CONSTANT 1980 PRICE)
      G = NOMINAL GOVERNMENT EXPENDITURE
     M1 = NOMINAL MONEY SUPPLY (M1)
   CPI = CONSUMER PRICE INDEX (1980=100)
     O = NON WAGE COST OF LABOR AS A PERCENTAGE OF TOTAL WAGE COST

SOURCE: COLUMN (1) AND (4): INTERNATIONAL FINANCIAL STATISTICS
       COLUMN (2): "EL GASTO PUBLICO EN LA ARGENTINA"
       COLUMN (3): CENTRAL BANK
       COLUMN (5): SANCHEZ (1987)

COLOMBIA
(IN BILLIONS OF COLOMBIA PESOS)

	GDP (1)	G (2)	M1 (3)	CPI (4)	O (5)
1960	542.0	2.3	4.1	5.1	n.a.
1961	569.6	3.5	5.1	5.54	22
1962	600.4	3.4	6.2	5.68	25
1963	620.2	4.2	6.9	7.5	27
1964	658.4	4.1	8.4	8.82	28
1965	682.1	5.8	9.7	9.13	30
1966	718.6	7.7	11.0	10.94	32
1967	748.8	8.1	13.5	11.83	34
1968	794.6	11.0	15.4	12.52	34
1969	845.0	14.7	18.4	13.79	43
1970	923.6	18.2	21.6	14.74	41
1971	978.6	22.3	24.0	16.07	39
1972	1053.6	24.1	29.8	18.23	42
1973	1124.5	29.8	38.6	22.01	46
1974	1189.1	36.0	46.0	27.36	47
1975	1216.7	49.8	59.6	33.63	62
1976	1274.3	52.8	80.9	40.44	55
1977	1327.3	72.8	103.5	53.8	50
1978	1439.7	101.1	134.9	63.37	45
1979	1517.1	151.5	167.6	79.03	54
1980	1579.1	195.1	216.7	100	67
1981	1615.1	263.9	259.7	127.48	72
1982	1630.4	331.5	325.7	158.78	79
1983	1656.1	401.8	406.2	190.16	90
1984	1711.6	541.0	501.1	220.84	102
1985	1753.2	682.0	642.2	273.94	

NOTE: GDP = REAL GROSS DOMESTIC PRODUCT (CONSTANT 1980 PRICE)
      G = NOMINAL GOVERNMENT EXPENDITURE
     M1 = NOMINAL MONEY SUPPLY (M1)
    CPI = CONSUMER PRICE INDEX (1980=100)
      O = NON WAGE COST OF LABOR AS A PERCENTAGE OF TOTAL WAGE COST

SOURCE: COLUMN (1) AND (4): INTERNATIONAL FINANCIAL STATISTICS
       COLUMN (2): BANCO DE LA REPUBLICA
       COLUMN (3): 1960-1969 THE WORLD BANK (REPORT NO 138-CO)
                1970-1985 MUSALEM (1987)
       COLUMN (5): THE WORLD BANK (REPORT NO.5845)

Appendix

A: Definitions and Sources of Variables

1. TU = Annual average unemployment rate of total labor force.

   Sources : Argentina : Sanchez (1987)

   Colombia : Reyes (1986)

2. DMR = Unanticipated monetary growth which is defined as $DM_t - DM_t*$

   where DM_t = the rate of change in M_t between time (t-1) and (t)

   $DM_t* = f(DM_{t-1}, DM_{t-2}, FEDV_t, UN_{t-1})$

   = fitted OLSQ equation

   M_t = annual average growth rate of money supply M_1

   Sources : Argentina : Central Bank.

   Colombia : 1960-69 Report no. 138-CO The World Bank

   1970-85 Musalem (1987)

3. DVT = Deviation of the real government expenditures (RG) from its trend (RG^*)

   Sources : Argentina : El Gasto Publico en la Argentina 1960-83, FIEL, May 1985

   Colombia : Banco de la Republica.

4. LWMINWU = log (WMIN/WU)

   where WMIN = minimum wage rate

   WU = unskilled wage

   Sources : Argentina : Sanchez & Giordano (1987)

   Colombia : Reyes (1986)

5. QOWM   = log (Q/WM)

         where   Q = non-wage cost ratio (percent of non-wage costs of

                 labor)

            WM = average manufacturing wage

         Sources : Argentina : Sanchez & Giordano (1987)

                 Colombia   : The World Bank Report no. 5845-CO.

6. Pt   = yearly inflation rate (CPI).

         Sources : Argentina & Colombia : IFS

7. NWDOTT   = Rate of change in aggregate average nominal wages.

         Sources : Argentina : 1960-82 Llach & Sanchez (1984)

                               1983-85 is based in data provided by

                               (FIEL) Evolucion Real Remuneraciones

                               Medias Brutas Industria Manufactura).

         Colombia :   Reyes (1985)

8. Q/N   = Average productivity in manufacturing (value added divided

     by total employment).

	Title	Author	Date	Contact
WPS63	Does Japan Import Less Than It Should?	Kenji Takeuchi	July 1988	J. Epps 33710
WPS64	Cocoa and Coffee Pricing Policies in Cote d'Ivoire	Takamasa Akiyama	August 1988	D. Gustafson 33714
WPS65	Interaction of Infant Mortality and Fertility and the Effectiveness of Health and Family Planning Programs	Howard Barnum	July 1988	S. Ainsworth 31091
WPS66	Slowing the Stork: Better Health for Women through Family Planning	Anthony R. Measham Roger W. Rochat	July 1988	A. Manciano 33226
WPS67	Price and Tax Policy for Semi-Subsistence Agriculture in Ethiopia	Robert D. Weaver Saad Ali Shire	August 1988	D. Gustafson 33714
WPS68	A Comparison of Lamps for Domestic Lighting in Developing Countries	Robert van der Plas		
WPS69	Does Local Financing Make Public Primary Schools More Efficient? The Philippine Case	Emmanual Jimenez Vicente Paqueo Ma. Lourdes de Vera	August 1988	T. Hawkins 33678
WPS70	Vocational Education and Economic Environments: Conflict or Convergence?	Arvil V. Adams Antoine Schwartz	August 1988	T. Hawkins 33678
WPS71	School Effects on Student Achievement in Nigeria and Swaziland	Marlaine Lockheed Andre Komenan	August 1988	T. Hawkins 33678
WPS72	The Relative Efficiency of Public Schools in Developing Countries	Emmanuel Jimenez Marlaine Lockheed Vicente Paqueo	August 1988	T. Hawkins 33678
WPS73	Taxation and Output Growth in Africa	Jonathan Skinner	August 1988	A. Bhalla 60359
WPS74	Fiscal Stabilization and Exchange Rate Instability: A Theoretical Approach and Some Policy Conclusions Using Mexican Data	Andrew Feltenstein Stephen Morris	August 1988	A. Bhalla 60359

	Title	Author	Date	Contact
WPS75	Welfare Dominance and the Design of Excise Taxation in the Cote d'Ivoire	Shlomo Yitzhaki Wayne Thirsk	August 1988	A. Bhalla 60359
WPS76	On the Shadow Price of a Tax Inspector	Shlomo Yitzhaki Yitzhak Vakneen		
WPS77	Incentive Policies and Agricultural Performance in Sub-Saharan Africa	Bela Balassa	August 1988	N. Campbell 33769
WPS78	Economists, Institutions and Trade Restrictions: A Review Article	J. Michael Finger	September 1988	N. Artis 33731
WPS79	Quantitative Appraisal of Adjustment Lending	Bela Balassa	August 1988	N. Campbell 33769
WPS80	Emerging Issues of Privatization and the Public Sector	Samuel Paul	September 1988	E. Madrona 61711
WPS81	Reaching People at the Periphery: Can the World Bank's Population, Health, and Nutrition Operations Do Better?	Richard Heaver	September 1988	S. Ainsworth 31091
WPS82	Microeconomic Theory of the Household and Nutrition Program:	Dov Chernichovsky Linda Zangwill	September 1988	S. Ainsworth 31091
WPS83	Welfare Costs of U.S. Quotas in Textiles, Steel, and Autos	Jaime de Melo David Tarr	September 1988	C. Cabana 61539
WPS84	Black Markets for Foreign Exchange, Real Exchange Rates and Inflation: Overnight vs. Gradual Reform in Sub-Saharan Africa	Brian Pinto	September 1988	S. Fallon 61680
WPS85	Wage Responsiveness and Labor Market Disequilibrium	Ramon E. Lopez Luis A. Riveros	September 1988	L. Riveros 61762