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PERSISTENCE IN REGIONAL
UNEMPLOYMENT. THE CASE OF
ARGENTINA**

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MACRO AND MICROECONOMIC PERSISTENCE IN REGIONAL UNEMPLOYMENT. THE CASE OF ARGENTINA

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Abstract

The aim of this paper is to develop a simple methodology for the study of regional unemployment persistence in Argentina. We use two complementary perspectives, combining a macroeconomic (aggregate) hysteresis approach with a microeconomic dynamic (individual-two-stage) evaluation. Macroeconomic results indicate that most shocks affecting the unemployment rate in different regions and population sub-groups are predominantly persistent (because of both participation and employment hysteresis). The microeconomic analysis allows us to detect a strong state-dependence effect (for most regions and mainly amongst youth and females), while duration-dependence is only significant for periods of high unemployment.

LA PERSISTENCE DU CHÔMAGE REGIONAL EN ARGENTINE. UNE APPROCHE MICRO ET MACROECONOMIQUE

Demian PANIGO, Mariano FELIZ et Pablo PEREZ

Résumé

L'objectif de cet article est de développer une méthodologie simple pour l'analyse de la persistance du chômage régional en Argentine. Nous combinons deux perspectives complémentaires avec des données individuelles et des données agrégées par région et par différents sous-groupes de la population. Les résultats de l'approche macroéconomique (agrégée) indiquent que la plupart des chocs qui peuvent affecter le taux de chômage ont des conséquences durables. Ces résultats proviennent du fait qu'aussi bien les chocs d'offre (sur le taux de participation) que les chocs de demande (sur le taux d'emploi) sont très persistants dans toutes les régions et tous les sous-groupes de la population. En outre, l'analyse microéconomique –sur données individuelles– nous permet de souligner l'existence d'une dépendance d'état particulièrement importante pour les femmes et les jeunes, alors que la dépendance à la durée ne s'avère significative que lorsque le taux de chômage est très élevé.

Keywords: Unemployment persistence, regional unemployment, duration-dependence and state-dependence.

Mots clés: Persistance du chômage, chômage régional, dépendance à la durée et dépendance d'état..

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1 Introduction

The behavior of Argentina’s labor market is paradigmatic, since, with regards to its particular historical trajectory and the size of the dis-equilibrium, it differs substantially from what is the norm in the rest of Latin America.

To obtain an adequate view of the current situation and the persistence of those dis-equilibriums it is first necessary to both situate these issues in their proper context and study them from a long-term perspective.

In the first place, the economically active population shows a tendency to increase. During the latest military regime the rate of labor market participation has grown in a sustained manner, reaching a maximum at the beginning of the 21st century. This increase can be explained by several factors. The most important reason relates to the rise of female participation in the labor market (mainly due to cultural changes, progress in educational attainment and changes in the structure of the productive system) together with the stabilization of the rate of population growth which had an impact on the population’s age structure, now showing signs of “aging”.

Depending on the phase of the business cycle, the economically active population suffers from the impact of several counterpoised tendencies. At times of expansion in the cycle, there is a “calling” effect that increases the rate of participation of people in the labor market, since many of those who are inactive are attracted by the increased probability of finding a job. By contrast, in recessions, when employment falls and it is harder to find an occupation, there is a “discouraged worker” effect, so people fall out of the active labor force, since they stop job-searching. Simultaneously, in periods of retraction of the economic activity, we can also detect the so-called “additional worker” effect, which is the result of the “forced” entry into the labor market by some of those who were part of the inactive labor force.

Up until the late eighties, the problem of unemployment did not present the dramatic characteristics of today, most probably due to relatively low labor productivity, the existence of labor protection legislation, a high unionization rate, the existing capital / labor forces correlation and the preeminence of the import-substitution model of capitalist development.

*We would like to thank the CEIL-PIETTE -MECOVI-Project participants for many useful comments on this paper. We are especially indebted to Julio César Neffa, Robert Boyer and Philippe Askenazy for their numerous helpful suggestions. The usual caveat applies.

The demand for labor force has suffered several unexpected changes since the beginning of the eighties, and its growth rate has fallen, particularly since 1989, when the process of “structural reforms” (inspired by the ‘Washington Consensus’) began. As a consequence of that process, the rates of unemployment and underemployment grew fast to reach record levels, fluctuating at a high plateau since then. This phenomenon is a common feature in most urban agglomerations in Argentina. During the nineties, the official argument highlights that the effect of shocks produced by structural reforms would not be permanent and that, with the recovery of economic growth, the labor market would return to a more ‘acceptable’ situation¹. The fact that these problems have not been resolved but seem to be permanently here, has led us to study the characteristics of the problem of unemployment persistence, or as it is called in the literature, ‘hysteresis’, in greater rigor and detail. This concept, originating from the natural sciences, applies to the fact that after the causes of an event have disappeared, the relevant variables (those which have changed due to that event) do not return to their previous state but remain out of their ‘long-term’ level; that is, the effect of the disruptive event ‘persists’.

For the case we are discussing in this article, we postulate the hypothesis which states that after the shock resulting from structural reforms, the increase in unemployment resulting from that event will not fade away in time but will tend to persist.

In this article we present a methodology for the study of unemployment persistence which we tested in the different regions of Argentina. We concentrate on the evaluation of the phenomenon from two complementary perspectives. Firstly, we analyze the aggregate characteristics of unemployment persistence. With that objective in mind, we apply several econometric techniques to the data reflecting unemployment, employment and labor force participation to determine the presence of hysteresis in those variables. Secondly, we perform an analysis with micro-data from the Permanent Household Survey User Base. We try to study the factors that determine unemployment persistence in several population sub-groups, attempting to find out whether

¹However, this ‘acceptable’ situation (as the previous decade –1980-1990– could be characterized), cannot be considered a desirable one, since the labor market showed an increasing level of underemployment, depressed real remunerations and dreadfully precarious working conditions. The new labor market functioning regime did not eradicate these hindrances, but exacerbated them instead.

a previous history of unemployment affects the probability of a person remaining unemployed. We examine the empirical results and present the policy implications of our methodology. Finally, the paper's main conclusions are presented.

2 The theoretical discussion

2.1 Unemployment persistence at a macroeconomic level

From an aggregate labor market perspective, the phenomenon of unemployment persistence can be intuitively understood as the slow dynamic adjustment of the economy to its quasi-equilibrium level of unemployment under the influence of its previous path of unemployment.

In both cases, the unemployment is seen as time-dependent or dependent on its previous evolution (Lindbeck, 1993).

The concept of persistence implies different things to different people. Arrufat, Díaz Cafferata and Figueras (1998) try to clarify the debate stating that a first common definition is used to speak of an unemployment level that reaches high and stable levels or that, that level, at any point in time, depends on its previous levels.

A second interpretation comes from the econometric literature and is associated with the existence of unit roots in time-series. This could be interpreted from the following expression:

$$u_t = a.u_{t-1} + e_t \quad (1)$$

where u_t is the current unemployment rate, u_{t-1} is the previous period unemployment rate and e_t is an error term with an expected value of zero and constant variance. The coefficient $a \geq 0$ expresses the persistence effect.

According to the hypothesis of hysteresis, the coefficient a would be equal to 1 (unit roots hypothesis), meaning that the future behavior of a variable would be equal to the previous value plus/minus a random variation. This would imply that the unemployment rate is a "random walk".

The concept of hysteresis, introduced in the labor economics literature by Phelps (1972) and later used by Blanchard and Summers (1986), refers to situations where shocks (or unexpected variations) in a variable have permanent or very persistent effects on its future behavior.

2.2 Unemployment persistence in particular population sub-groups

When we analyze the problem of persistence in unemployment amongst particular population sub-groups, it is usually believed that the periods of unemployment are interconnected implying that those who have been unemployed in the past have a higher probability of being unemployed in the future (Nickell, 1979). This is known as “state dependence” in unemployment.

However, it does not follow from this that the “history of unemployment” by itself is what causes future unemployment for a person. Other elements can cause present as well as future unemployment. Factors related to personal characteristics, learnt at home as well as acquired through experience in the labor market (or due to the lack of such experience) could reproduce unemployment². Apart from this there are also systemic characteristics, such as the circumstances of the local economy (for example, high levels of unemployment in a particular region) which in conditions of low geographical mobility, could generate unemployment persistence, independently of individual characteristics. It is also possible that unemployment persistence within certain population sub-groups is the result of the behavior of potential employers who use these people’s past unemployment history as a negative filtering factor, in which case the previous “history” is not the actual cause of unemployment but it acts only as a signal³.

Arulampalam, Booth and Taylor (2000) using the Household Survey in Great Britain for the male population found strong evidence of state dependence on unemployment. For them, this result could be due to the depreciation of human capital, since employers use the unemployment history of workers as a sign of their productivity or due to the fact that the unemployed are more prone to accept low quality jobs (in occupations which show higher

²Unemployment effects are actually hard to distinguish from those caused by employment. The reason for this is that while unemployment causes a loss in qualification levels, employment trains workers. Therefore, we could not at first establish whether individuals have been negatively affected by their unemployment experience, or, on the contrary, whether workers with a vast experience appear more attractive to employers as a result of having been employed for a long period of time.

³Since, before recruitment the employer knows with certainty the capabilities of the potential employee, he evaluates him from his “visible” characteristics such as his unemployment history, his age, etc. These characteristics are believed to be related to the future employee’s potential productivity, but they are obviously just a signal and not an actual measure of it.

levels of job-destruction).

According to Heckman and Borjas (1980) past unemployment experiences can change the preferences, the prices and/or the pressures which help determine the actual level of unemployment. It can also happen that firms estimate the workers' productivity through their unemployment history, in such a way that those workers with a history of high employment mobility and high unemployment will be offered less secure jobs, since they lose their labor experience or their human capital while they are unemployed. Alternatively, firms may use a person's unemployment experience as a sign of low productivity on its part (Phelps, 1972 and Pissarides, 1992). Additionally, it is suggested that the individuals in a situation of unemployment will reduce their reservation wages (the minimum wage they require to accept a job offer) with the passing of time and will tend to accept lower quality jobs which are more likely to be destroyed and which, for this reason, are also more likely to experience unemployment in the future.

2.3 Persistence of unemployment and public policies

The characteristics of unemployment persistence give insights in to the kind of public policies that are best suited to deal with the problem.

2.3.1 Macroeconomic persistence and state intervention

In any economy, shocks (unexpected deviations from the trend of a variable) occur all the time. Under these circumstances, it is important to know if their effects will be persistent or will only last a short time.

A variable may suffer several types of shocks. We define a shock as regular if it represents unexpected variations in a variable which has no long-term effects on its trend value. For example, when economic conditions worsen, the participation rate tends to increase (due to an "additional worker effect" that exceeds the "discouraged worker effect" -see Panigo, 1999), while when economic conditions improve, the economically active population (EAP) returns to its original level. In this example, the EAP long-term deterministic trend remains stable despite regular shocks.

On the contrary, we say that a shock is structural if it changes the long-term deterministic trend in a variable. Before the Convertibility programme in Argentina, for example, the under-employment rate had a stable trend at

around 5% of the EAP. Due to the break produced by Convertibility, under-employment began to show a growing trend. This break is of structural character since it altered the trend behavior of the under-employment series in the long run.

Moreover, regular shocks could be divided into regular shocks with transitory effects and regular shocks with persistent effects. The former produces effects on the level of a variable that quickly dilutes, bringing the variable to its original trend level in a short time. By contrast, in the case of regular persistent shocks, the effect of the shock on a variable remains for a long time, disappearing slowly until the variable eventually returns to its trend level.

The analysis of the characteristics of the shocks which affect unemployment is very important for the selection of the appropriate public policies to combat it. The following table presents a typology representing the alternative economic policies that should be applied against the different kinds of shocks.

Type of shocks	Persistence	Changes trend?	Type of policy that would seem more appropriate
Regular-permanent	Low	No	Social assistance
Regular-transitory	High	No	Counter-cyclical
Structural	High	Yes	Structural

Table 1. SHOCK MORPHOLOGY AND POLICY IMPLICATIONS

Firstly, if regular shocks were of transitory character the best public policy would be one of limited intervention, since the effects of the shock would fade away quickly for its persistence is low. In this case, it would not be recommended to apply an intervention especially designed for this event, since the existing institutional mechanisms should take the economy back to its long-term trend level. The following figure illustrates this situation.

In Figure 1 below we have built as an example, an artificial series representing the hypothetical evolution of the unemployment rate. We show the effect of a counter-cyclical public intervention (dotted line) which operates when the unemployment rate increases beyond a certain limit (for example, a public expenditure plan starts or the interest rate is reduced to take the unemployment rate to its “normal” level). The problem here is that, until the policy intervention takes place, it could take a significant time period

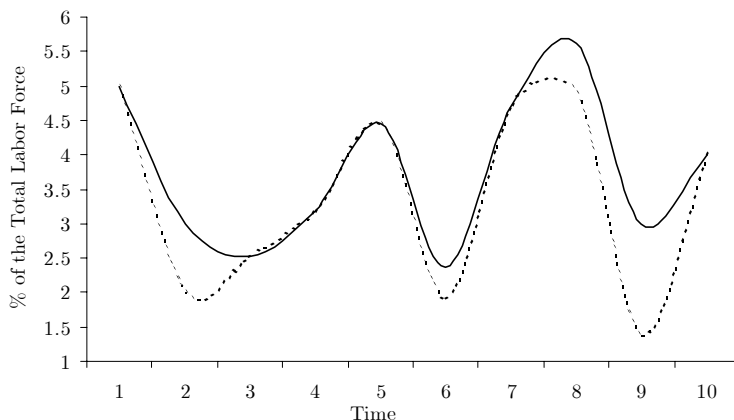


Figure 1: IMPACT OF COUNTER CYCLICAL POLICIES WHEN REGULAR SHOCKS ARE TRANSITORY Note: the full line represents the evolution of an artificial unemployment rate without public intervention; the dotted line represents the same variable when affected by a counter cyclical public intervention.

(a month, a quarter). By then, the unemployment rate would already have decreased to its trend level⁴ without intervention, because the shock was only transitory and therefore it had no permanent effects. In this case, the main effect of public intervention would be to increase the volatility of the series and to over-heat the economy.

In this case, public intervention should, in principle, be restricted to control the consequences of higher unemployment without taking initiatives towards acting on it, since due to the dynamics of the unemployment, the deviations from its trend will tend to be corrected quickly on their own.

The specific policies that would be most useful in this context would be those which assist the people affected by the shock, compensating them transitorily for the effects of the shocks, without addressing the evolution of the unemployment rate which will return to its trend level quickly as a result of the economic dynamics.

In the case of regular but non-persistent shocks, the rapid return of unemployment to its trend level could be the result of the existence of institutional mechanisms acting “automatically” to correct the disequilibrium in the labor market. For example, if there exists an automatic and generalized

⁴In this example, the trend level of unemployment is 4%.

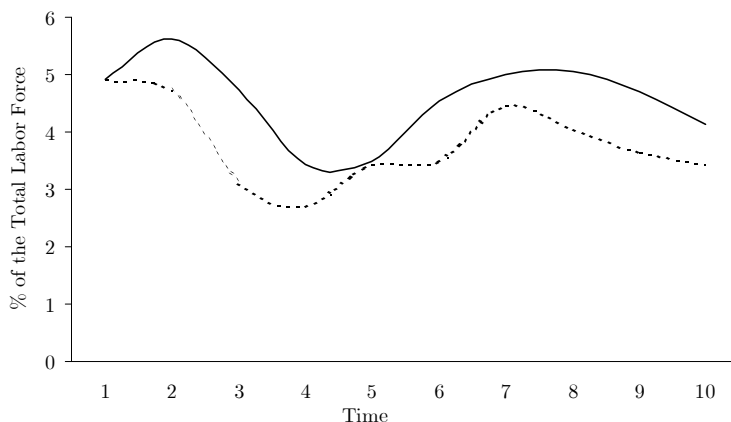


Figure 2: IMPACT OF COUNTER CYCLICAL POLICIES WHEN REGULAR SHOCKS ARE PERSISTENT. Note: the full line represents the evolution of an artificial unemployment rate without public intervention; the dotted line represents the same variable when affected by a counter cyclical public intervention.

unemployment insurance⁵, during recessions when unemployment starts to increase, the public deficit would also increase expanding aggregate demand and helping reduce unemployment.

It is worth stating that the kind of intervention that we are suggesting assumes that those who are in charge of making decisions regarding economic policy accept the trend level of the variable in question (in this example, the rate of unemployment). However, if they did not agree with the trend level of unemployment, they should apply policies that were similar to those which we propose for the case of a structural shock, with the objective of modifying the series trend.

Otherwise, if regular shocks were permanent, that is, if they had persistent effects on the evolution of unemployment, the regular institutional framework in our example would be incapable of accelerating the return of the variable to its “normal” or trend level.

As it can be seen in Figure 2, when shocks have persistent effects (that

⁵Proposals of a Kaleckian flavor such as those that would place the State as the “employer of last resort” are included within these “automatic” policies. In this scheme, the public sector offers to employ the total unemployed population paying a certain minimum wage level. In this way, the State could in principle guarantee a certain level of “full employment” of the labor force with price stability (Mitchell, 1998).

is, when the variable returns slowly to the long-term trend) the counter cyclical policy intervention that made the unemployment rate more volatile and tended to over-heat the economy when shocks were transitory, is now extremely effective and prevents the high economic and social costs derived from a high level of unemployment (in terms of Figure 2, the overall deviation from the natural rate - assumed to be 4%- is lower with policy intervention).

Given the fact that shocks are persistent, counter cyclical policies would be effective even if they are implemented with some delay, since the unemployment rate remains at a similar (higher) level, away from its original trend, for a significant time-period after the shock. From a postkeynesian point of view we could state that this kind of shock is associated with changes in the macroeconomic context which increase uncertainty and thus relevant economic agent's liquidity preference inducing them to consequently restrict their decisions on expenditure.

Without public intervention, the series (full line in Figure 2) could eventually return to its "normal" value but it would take it an excessively long time to do so. In this case, the State should act rapidly with counter cyclical policies to avoid the perverse effects of persistence in unemployment. This type of intervention would allow for unemployment to return to its trend faster (dotted line in Figure 2) than would otherwise, thus reducing the costs of having a higher than "normal" unemployment over a long period of time.

Lastly, let us analyze the case of structural shocks. As it can be seen from Figure 3, after a shock of a structural type, the series changes its trend level while regular shocks were not modified.

The structural shock produces a change in the trend of the series which tends neither to revert nor to disappear with the passing of time. In this case, a counter-cyclical policy would only slightly reduce the unemployment rate (as can be seen from the dotted line in Figure 3) but would not be able to return the series to its previous (lower) trend.

In these cases it would be convenient to develop structural reforms (institutional reforms, changes in regulations, income policies, tax policies, etc.) with the objective of returning the variable to its original trend level. Otherwise, it would be impossible to obtain a permanent reduction in the trend of unemployment⁶.

⁶These types of structural transformations are associated, for example, with reforms that change the character of a country's international relations. In the case of Argentina this is a good hypothesis. The structural reforms that unilaterally opened up the economy

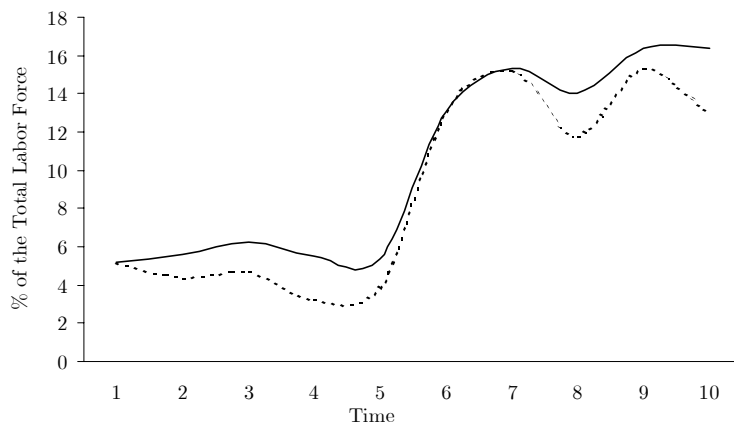


Figure 3: EFFECT OF A STRUCTURAL SHOCK ON THE UNEMPLOYMENT RATE. Note: the full line represents the evolution of an artificial unemployment rate without public intervention; the dotted line represents the same variable when affected by a counter cyclical public intervention.

2.3.2 Microeconomic persistence and public policies

The identification of the extension of unemployment state-dependence in the different regions and across different population sub-groups in a country has very relevant implications for public policy.

If there exists a strong state-dependence effect, that is, if a previous history of unemployment in any person has significant effects on its probability of remaining unemployed in the future, then policies that tend to reduce short duration unemployment – thus affecting “his/her history” of unemployment towards the future – will have permanent effects on his/her probability of remaining unemployed in future periods. If macroeconomic policies or employment policies are effective in reducing short-term unemployment, then, in the future, those who recovered their jobs will have a lower probability of losing them again. Nonetheless, if there is no state-dependence (individual unemployment does not depend on the personal unemployment “history”), then short-term public policies could reduce the unemployment rate in the short run but they will be only slightly effective in reducing the aggregate

to world trade structurally weakened aggregate demand for national production and thus reduced demand for domestic labor force. In consequence, after the structural shock, the employment rate permanently fell to a lower average level.

unemployment rates in the medium run. In this case, even if an appropriate policy allows for a reduction in the unemployment rate, those workers who have regained their jobs have the same risk as before of returning to their previous state as unemployed. This is because individual experiences in unemployment are not important in current individual probabilities of unemployment.

It is crucial to detect if we are in the presence of a situation of real state-dependence in unemployment or if, in fact, factors related to individual heterogeneity (associated with “personal” characteristics) are causing prolonged states of unemployment. If this were the case, public policies should focus on those groups of people whose characteristics make them more vulnerable to losing their jobs.

Lastly, if unemployment is associated with discriminatory practices by employers due to their lack of information on potential employees or due to mismatching between the characteristics of the unemployed and the requirements of the employers, public policies should be oriented towards improving the information available to the potential employers (for example, through employment services) or correcting the mismatch in qualifications. On the other hand, the state-dependence in unemployment could be the result of systemic factors (which go beyond the particular characteristics of the unemployed) which affect a particular person’s probability of finding a job. This could occur if, within a situation of high unemployment in a region or city, the unemployed were stigmatized. In this case, it would also be convenient for the state to develop policies that would tend to increase the demand for labor in the short run in a general fashion (for the population as a whole) and not for any particular group. The increase in the demand for labor in general would reduce not only the mass of unemployed, but also the stigma attached to being unemployed, since this type of discrimination would be less likely.

3 Methodological matters

Our paper confronts the problem of persistence of unemployment at a macroeconomic as well as at a microeconomic level. In fact, we will use several econometric techniques to find evidence of the existence of a process of persistence of unemployment in Argentina from the beginning of the nineties.

3.1 Macroeconomic persistence

At a macroeconomic level, the concept of unemployment persistence is identified, as has already been mentioned, with the idea that if an unexpected event (shock) increases (or reduces) the rate of unemployment above (or below) its “normal” level, the series may stay above (or below) this level for an indeterminate period of time even when the causes of the change in the current level of unemployment have disappeared. Empirically, there are several strategies that could be used to detect if, in a particular series, shocks have transitory (that is, the series has a deterministic trend) or permanent (that is, the trend is stochastic) effects. A way of verifying this is to check if the series returns to its deterministic trend (or to the mean in the case in which no trend exists) in at least a ‘reasonable’ period of time. In contrast, a series with a stochastic trend can be understood as the sum of every shock suffered by the series in its history. For these series there is no inherent force that could make them return systematically to a predetermined mean value or trend.

We can say that a series is stationary if it behaves in such a way that after a reasonably short period of time it returns to its “normal” level (mean or trend). On the contrary, it is said that a series is non-stationary when it does not return to its historical levels (or long-term trend) after being hit by a shock.

Using Carrera *et al.* (2003), the specific steps for the macroeconomic analysis of regional unemployment persistence in Argentina are the following:

1. Analyze the unit root hypothesis with a Phillips-Perron test (P-P)⁷: Phillips (1987) and Phillips and Perron (1988) proposed a new test using a non-parametric correction for the presence of serial correlation in the traditional Dickey and Fuller (D-F) equation for unit root tests.

$$\Delta y_t = \alpha + \beta t + \rho y_{t-1} + u_t \quad (2)$$

where y_t is the variable of interest, Δ is the first difference operator, $\alpha + \beta t$ is the deterministic component, ρ is the first order autocorrelation coefficient and u_t is the error component. The Phillips-Perron’s

⁷For the Phillips-Perron test we have used a uniform number of lags following Newey-West (1994) criterion. As regards the structure of the deterministic component of the test, we have checked in each case for the significance of using a constant, a constant and a deterministic trend or no deterministic component as a regressor. The critical values have been taken from MacKinnon (1991).

objective was to eliminate the nuisance parameters on the asymptotic distribution caused by the presence of serial correlation in the errors u_t . The idea behind the Phillips-Perron test is to use an empirical estimate for the variance and covariance error structure in order to “more closely conforms to the standard D-F distribution”⁸. The estimation will be performed for the complete sample for each survey area and for each population sub-group.

2. Analyze the hypothesis of unit root with a rolling Augmented D-F test⁹: This test will allow us to analyze the stability of the results obtained with the P-P test evaluating the shifting root hypothesis. For this purpose the rolling estimation developed by Banerjee, Lumsdaine and Stock (1992) provides a complete set of analysis.

$$\Delta y_t = \alpha + \beta t + \rho y_{t-1} + \sum_{i=1}^k d_i \Delta y_{t-i} + u_t \quad (3)$$

The procedure consists of developing rolling estimations for equation (3), obtaining maximum and minimum ADF t statistics and comparing them with the 5% asymptotic critical values. In addition, we analyze the difference between the maximum and minimum ADF statistics, which can be associated with a measure of shifting root or root volatility¹⁰.

3. Estimate the coefficient of variances (variance ratio test) as a measure of non-traditional persistence¹¹: An alternative non-parametric method

⁸For more details about the Phillips-Perron test see Maddala and Kim (1998). We did not use the alternative ERS efficient unit root test (see Elliot *et al.*, 1996) because GLS detrending improvement will not remove traditional bias concerning structural breaks in deterministic components. Therefore, we will complement standard unit root tests with more flexible specifications allowing for deterministic dynamics, stationarity hypotheses and rolling sub-samples.

⁹The estimations for the rolling ADF test were performed taking equal sized moving windows of 15 observations (with bi-yearly data). The critical values have been taken from Banerjee et al (1992).

¹⁰We do not perform a recursive ADF test because, by construction, the weight of each additional piece of information changes (decreases).

¹¹Cochrane (1991) highlights the importance of measuring the size of the Random Walk (R-W) component through the degree of persistence of shocks in the levels of the series. However, this component can have an arbitrarily low variance, so that the power of traditional Unit Root tests is arbitrarily low for small samples.

of evaluating the presence of a unit root is to measure the degree of persistence. Cochrane (1988) states that in using the Beveridge and Nelson (1981) decomposition, we can see that each series can be modeled as a combination of a non-stationary random walk (RW) and a stationary component. Therefore, it is possible to obtain a simple non-parametric measure of “shock persistence” through the following equation:

$$VR_k = \frac{V_k}{kV_1} = \frac{\sigma^2(y_t - y_{t-k})}{k\sigma^2(y_t - y_{t-1})} \quad (4)$$

where k and σ^2 represent the number of lags and the variance operator respectively. If y_t is stationary, then $\lim_{k \rightarrow \infty} VR_k = 0$ and if y_t is a RW, $VR_k = 1$ for any lag size¹².

4. Test the unit root hypothesis in the presence of structural breaks with the Perron’s test for endogenously selected breaks: Perron (1993, 1994 and 1997) proposes a modified D-F test for unit root with three different alternatives for the deterministic trend function DT_t :

$$\begin{aligned} \Delta y_t &= DT_t + \rho y_{t-1} + \sum_{i=1}^k d_i \Delta y_{t-i} + u_t & (5) \\ DT_t^1 &= \alpha + \varphi DU_t + \beta t & (\text{s. break in mean}) \\ DT_t^2 &= \alpha + \beta t + \delta DT_t^* & (\text{s. break in trend}) \\ DT_t^3 &= \alpha + \varphi DU_t + \beta t + \delta DT_t^* & (\text{both}) \end{aligned}$$

where, α is the intercept, DU_t represents the structural change in the intercept, t is the linear trend and DT_t^* allows for the structural change in the linear trend (see Maddala and Kim, 1998). For each alternative the date of break will be chosen according to the maximum observed (in absolute value) t value for the coefficient that captures the structural break¹³.

Empirical evaluation will be conducted with aggregate data for the time-series of employment, participation and unemployment (all rates), with bi-yearly frequency, from the user bases of the Permanent Household Survey

¹²For the variance ratio test we have used $k = 10, 20$ and 30 as values for the lags in variance comparisons (see Cochrane, 1991).

¹³For higher details see Carrera *et al.* (2003).

(EPH) by Argentina's National Institute of Statistics (INDEC) for the period 1985 to 1999. In each region we have evaluated the behavior of the series for 6 population sub-groups: youths (20 to 24 years of age), adults (25 to 49 year-old), elderly (50 to 59 years of age), male, female and total population.

As a whole, we will work with 18 labor market time-series (derived from combinations between 6 population sub-groups and three variables of interest -unemployment, employment and participation rates-) for each surveyed urban agglomeration (6 different regions grouping 24 urban areas). For each time-series, we will evaluate the Phillips-Perron test, three rolling ADF statistics, three variance ratio specifications and the three above mentioned alternatives for unit root tests with endogenous structural breaks (involving the estimation of 4320 different tests).

3.2 Microeconomic persistence

The study of macroeconomic unemployment persistence has been complemented by the persistence of unemployment at a microeconomic level for several population sub-groups, which requires us to give the concept of time-dependence an operational definition.

According to Heckman and Borjas (1980) at least four forms of state dependence can be defined:

1. Markov dependence: refers to the fact that the probability that an employed person loses their job differs from the probability that an unemployed person stays as such.
2. Occurrence dependence: implies that the number of previous periods of unemployment affects the probability that a worker will become or remain unemployed.
3. Duration dependence: defined as the effect of the actual duration of a particular state on the probability of changing that state.
4. Lagged duration dependence: defined as the effect of the duration of the previous state, for example unemployment (employment), on the probability of occurrence of a transition from the current state, for example employment (unemployment), to another state (employment or unemployment) ¹⁴.

¹⁴This is associated with, for example, the fact that unemployment may cause labor

The first two definitions are related to the effect that the immediately previous state has on the probability of entering the present state (these definitions are usually referred as “pure state models”). The second pair of definitions concerns the effects of the current and previous duration of a state on the probability of entering the present state (“duration dependence models”).

The “pure state models” can be convenient for the analysis but they ignore a good part of the available and relevant information. The sociological theory and much of the theoretical discussion in economics worry about the accumulation of capabilities and disabilities through the specific historical experiences in employment and unemployment. “Pure state models” fail to correctly distinguish between the consequences of long and short periods in previous states (of employment or unemployment), in such a way that a large part of the process of (dis)accumulation, which is the key to the theoretical insights, is left aside. This is, of course, the reason for the domination of duration dependence models in recent economic literature.

The use of these types of models introduces, however, another problem. Duration dependence models make the length of the periods in a state (spells) the main explanatory variable, but this evidence is especially vulnerable to memory errors (on the part of those interviewed). Assume, for example, a 5-year period (60 months in between two stages where the person does not participate in the labor market) during which the individual experiences only one month of unemployment (say, in the 31st month). This would give his labor history two employment periods of 30 and 29 months duration. However, if the person forgets to state his only month of unemployment, the mean duration (spell) of the employment periods will immediately be duplicated – simply as a result of the omission of one month of unemployment.

The reporting of unemployment periods throughout a persons’ life can be inaccurate for several reasons. Individuals tend to define or report their periods of unemployment in an incomplete manner, in particular as a result of the stigma that is attached to it, or because of the material deprivation associated with the lack of employment. Short periods of unemployment are less likely to be remembered for that reason. As the distance in time of the event of unemployment increases, it is more likely that short duration

experience to lose its ability to increase productivity. In turn, this could result in increased probability of dismissal for employees that have previously suffered long periods of unemployment.

events will be forgotten. There can also be a tendency on the part of the interviewed to report events in terms of time units that are conventional, but arbitrary. This is expressed, for example, in an excessive reporting of periods of unemployment of 12 or 24 months.

These problems can produce systematic bias on the information on employment history (Elias, 1997). In particular, certain events (especially, periods of unemployment) are suppressed. The longer the period that the person has to remember, the likelier it is that those events might be forgotten. As we have suggested, relatively unimportant omissions can have an important and disproportionate effect on the estimation of the duration of a particular state, which, in the context of the problems of confidence of the information on employment history, could lead to substantially biased results.

For this reason, it is common to work with a third type of model, the “experience” model. This model uses as the main predictor of the entrance into a particular labor state, the accumulated time in a particular state before a certain period, without regard to the number of intervals and breaks that have occurred between states in that time period. In our previous example, we would have used the whole 59 months of total employment experience.

From a microeconomic perspective, we will study the factors that affect the probability that a particular person has to remain unemployed. Our main preoccupation will be to detect whether a person’s previous unemployment history has significant effects on that probability, taking into account the possible effect of observable and unobservable “individual” characteristics.

Variable	Description
UNE	Dependent binary variable, coded as 1 for unemployed people and 0 for both employed and out-of-labor force population. As a lagged variable it identifies the "state-dependence" effect of unemployment.
UDUR	Continuous (non-censored) variable for incomplete unemployment duration (in months) reported by individuals at period 1. This variable is used to estimate lagged "duration-dependence" of unemployment.
EDU	Hierarchical time-variant variable for educational attainment, coded as 1 for elementary level or illiteracy, 2 for high school, 3 for incomplete college level and 4 for complete college or higher. For each equation we will use this variable both as level and as two-period mean.
SEX	Time-invariant binary variable, coded as 1 for men and 2 for women.
AGE	Continuous (non-censored) variable for age, used both as current level and as two-period mean because of its time-variant nature.
PCHI	Time-variant continuous (non-censored) variable for per capita household income (in level and two-period mean).
HH	Time-invariant binary variable used to identify the household head member, coded 1 for the head and 0 else.
NCH	Number of children in the household. Time-variant variable used both as level and as two-period mean.
JQ	Hierarchical time-variant variable describing job-qualification, coded as 1 for unskilled tasks, 2 for intermediate required qualification, 3 for technical posts and 4 for high-skilled or university jobs. For each equation we will use this variable both as level and as two-period mean.
S2 to S8	Time-variant binary variables used to identify the sector of activity. S2 is coded 1 for manufactured goods and 0 elsewhere, S3 is coded 1 for public services (water, light, gas and telephone) and 0 elsewhere, S4 is coded 1 for construction and 0 elsewhere, S5 is coded 1 for wholesale and retail trades and 0 elsewhere, S6 is coded 1 for transport and 0 elsewhere, S7 is coded 1 for financial, real state and business activities, and S8 is coded 1 for public employment and 0 elsewhere. Each variable will be used both as level and as two-period mean.
FS	Time-variant continuous (non-censored) variable identifying firm size through the number of employees belonging at the firm the individual is working in. For each equation we will use this variable both as level and as two-period mean.

Table 2. VARIABLES USED FOR TWO-STEP RANDOM EFFECT PROBIT EQUATIONS. Note : The reference (not included) sector is S1: production of primary goods.

For the estimation of the probability of permanence in unemployment we will use the Orme's (1997) approach to the two-stage PROBIT model¹⁵. In the first place, we estimate the factors that determine the fact that a person is unemployed, and the residues of that estimation (that is, the part that remains unexplained by the variables in the model) are included in the second stage as information on "unobservable" characteristics associated with the history of unemployment of each individual included in the survey¹⁶. Let:

$$\begin{aligned} UNE_{i1}^* &= \lambda' Z_i + \eta_{i1}, \quad \forall i = 1, \dots, n \\ \eta_{i1} &= \theta \alpha_i + u_{i1}, \text{ or equivalently} \\ \alpha_i &= \delta \eta_{i1} + w_{i1} \end{aligned} \quad (6)$$

where UNE_{i1}^* denotes the unobservable individual propensity to be unemployed in period 1 (May 1995 or May 1999 in our estimations), Z_i is a vector of strictly exogenous instruments, u_{i1} and w_{i1} are orthogonal error components in period 1 (uncorrelated with both UNE_{i1}^* and Z_i) and $\alpha_i \sim IN(0, \sigma_\alpha^2)$ identifies the time-invariant unobserved individual specific effect. An individual is observed as unemployed ($UNE_{i1} = 1$) when his propensity to be unemployed crosses a threshold level, that is, if $UNE_{i1}^* > 0$ and $= 0$ else.

In the second stage of the procedure we estimate the factors that explain the probability of a person to be unemployed in October 1995 or October 1999 taking into account unobservable components as well as relevant current and lagged information.

$$UNE_{i2}^* = \rho UNE_{i1} + \varphi UDUR_{i1} + X_{i2} \beta + \overline{X}_i' \gamma + \phi \alpha_i + u_{i2} \quad (7)$$

$$= \rho UNE_{i1} + \varphi UDUR_{i1} + X_{i2} \beta + \overline{X}_i' \gamma + \phi (\delta \eta_{i1} + w_{i1}) + u_{i2} \quad (8)$$

$$= \rho UNE_{i1} + \varphi UDUR_{i1} + X_{i2} \beta + \overline{X}_i' \gamma + \phi \delta \eta_{i1} + (\phi w_{i1} + u_{i2}) \quad (9)$$

$$= \rho UNE_{i1} + \varphi UDUR_{i1} + X_{i2} \beta + \overline{X}_i' \gamma + \tau \eta_{i1} + \nu_{i2} \quad (10)$$

$$= \rho UNE_{i1} + \varphi UDUR_{i1} + X_{i2} \beta + \overline{X}_i' \gamma + \tau \hat{e}_{i1} + \nu_{i2} \quad (11)$$

where UNE_{i2}^* denotes the unobservable individual propensity to be unemployed in period 2 (October 1995 or October 1999), UNE_{i1} is the lagged dependent variable used to identify pure Markov-dependence, $UDUR_{i1}$ is the unemployment duration in period 1 (allowing to detect "duration-dependence" effects), X_{i2} is the covariate vector including both time variant and invariant exogenous variables, $\overline{X}_i'$ is another covariate vector grouping means of

¹⁵For more details on this methodology of estimation see Neffa *et al.* (2000).

¹⁶For further details see also Heckman (1981).

time-variant exogenous variables¹⁷, u_{i2} and ν_{i2} are the orthogonal error components for period 1 and 2 respectively, and $\hat{e}_{i1}$ is the period 1 probit generalized error, used as a proxy for unobservable individual specific effects affecting UNE_{i2}^* .

Equation (11) is a random-effect probit equation with an additional regressor $\hat{e}_{i1}$ under suitable normality assumptions. Thus the first step of Orme’s two-step procedure involves estimation of (6) to generate this regressor, and the second-step involves estimation of (11) by the usual random effects maximum likelihood probit estimation technique where $\hat{e}_{i1}$ is replaced by the period 1 generalized probit residual.

We apply the above described two-step procedure using information for different regions and population sub-groups in Argentina. The analysis will be performed using the data from the Permanent Household Survey (EPH) for 1995 and 1999. Taking the May survey as the initial period for each year, we estimated the effect of different factors on the probability an unemployed person has of being unemployed in October of the same year. Both years have similar characteristics since both were recessive periods where the general rate of unemployment diminished between May and October. The information of the different surveyed areas is grouped in the six statistical regions defined by the INDEC (National Statistics and Census Institute). We estimated models for the general population in each region, as well as for several population sub-groups (young people, from 20 to 24 years old, adults, from 25 to 49 years of age, elderly-people, from 50 to 59 years of age, males and females). With this procedure we try to evaluate the existence of differences amongst the different population sub-groups in the persistence of unemployment since such differences will require specific and differentiated policies.

The main objective for the microeconomic evaluation of unemployment persistence involves state-dependence analysis from two different perspectives. On the one hand, we study the effect that the fact a person is unemployed in May has on the probability of such a person remaining in such a state in October of the same year. This kind of “Markov-dependence” allows us to calculate the independent effect that the fact of being unemployed has on the probability that a person has of finding a job or abandoning its job search. This effect is calculated independently of a number of factors (“personal” characteristics that are taken into account in the estimation). On the

¹⁷The means vector is included to pick up possible correlation between the time-varying regressors and any unobservable.

other hand, we analyze the effect that the duration of unemployment has on the probability a person has of remaining in such a state. Unemployment duration-dependence could indicate the stigmatizing effects¹⁸ the persistence of a process of unemployment has on people.

Because of our two-step procedure, microeconomic analysis of unemployment persistence involves the estimation of 144 different [random effect] maximum likelihood probit equations (36 for each of 4 analyzed waves, because of combinations between 6 regions and 6 population sub-groups) from where we will evaluate those coefficients regarding both state and duration dependence effects.

4 The empirical evidence

4.1 Macroeconomic persistence

Before beginning the analysis of the main results it is necessary to mention that, due to our particular interest in the pertinence of the implementation of counter-cyclical policies (depending on whether shocks have persistent effects or not), we will use the information on structural shocks only as an input for the correct differentiation of the transitory variations that are the center of our concerns. We will not analyze the time of the structural breaks on the different series or their statistical significance in depth¹⁹. Such information has only been used to correctly specify the cyclical and trend components for each variable, so that we can then work with the first component in the analysis of persistence of regular shocks²⁰.

In the first place, in the analysis of the aggregate series of the labor market for the different regions of the country we found that in no region are unemployment shocks transitory.

¹⁸Amongst other explanations, this could be the result of the fact that the length of unemployment spells could be taken as a sign, for firms, of the depreciation in the potential employee's "human capital". Moreover, this could indicate that the person has lost some of its work discipline which could increase training or supervision costs for the new laborer.

¹⁹This information can be obtained from the authors if requested.

²⁰Detecting the presence of structural breaks is important for the analysis of shock persistence. A series with low persistence, that is in which shocks have short run effects, could be erroneously identified by traditional tests as having high persistence if it has suffered a structural break and this event had not been taken into account. Perron's tests with endogenous detection of structural breaks gives us the chance to take into account the existence of these breaks when we analyze the response of series to regular shocks.

Region	% of the results showing persistence
GBA (Metropolitan area)	83.3%
Northwest	83.3%
Northeast	79.2%
Cuyo (Center-west)	66.7%
Pampeana (Center)	88.1%
Patagónica (South)	95.8%

Table 3. RESULTS OF THE DIFFERENT PERSISTENCE TESTS. TOTAL POPULATION UNEMPLOYMENT RATE. Source: Our own elaboration based on data from the INDEC. Note: Table 3 percentages represent the ratio between the number of tests supporting the “hysteresis hypothesis”, and the total number of tests²¹

In every region of the country, more than 60% of the results of the different tests indicate that the shocks that affect the unemployment rate do not revert rapidly. These results, although similar to those of Blanchard and Summers (1986), Brunello (1990), Mitchell (1993), Crato and Rothman (1996) or León-Ledesma (2002), differ substantially from those of Arrufat *et al.* (1998, 1999 and 2000) for the case of Argentina²².

These findings are reproduced in most of the population sub-groups (see Appendix Table 6). Most of the results confirm the hypothesis of unit root

²¹The results of each of the test can be requested from the authors.

²²These differences are probably the result of one or many of the following circumstances: 1) Characteristics of the series: In our paper, the general unemployment rate has been calculated for each of the urban areas under analysis as the ratio between the unemployed and the active population over 14 years of age. In Arrufat *et al.* (1998, 1999 and 2000) this ratio was calculated for the population as a whole; 2) Sample period: In contrast with Arrufat *et al.*, in our work the sample includes data actualized to October 1999; 3) Econometric methodology: Arrufat *et al.* (1998, 1999 and 2000), apply Zivot and Andrews (1992) tests. In this paper we have chosen a comprehensive econometric structure that includes the successive application of 4 families of tests (traditional unit root tests, the rolling ADF test, the variance ratio test and the unit root tests with endogenous detection of structural breaks); 4) Estimation of break dates: Arrufat *et al.* use a strategy that gives a lesser chance of being selected to the hypothesis of unit root. However, this could imply a selection bias since one is trying to analyze the hypothesis of unit root, and such a strategy reduces the opportunities of occurrence. Hence, what is most likely is that in the margin some series will appear to be stationary while actually they are not. To avoid this problem (which surely affects the results in Arrufat *et al.* -1998, 1999 and 2000-) we have chosen to identify the break dates from the maximum (absolute value) t value for the coefficient that represents a break in the deterministic component. In such a way we maximize the significance of the structural break and avoid generating a selection bias against the hypothesis of unit root.

or regular shocks with persistent effects. The empirical evidence shows that the persistent disequilibria in the labor market are reproduced in most of regions and population sub-groups.

However, this information does not allow us to evaluate whether or not the persistence in unemployment is the result of the persistence of shocks in the supply, or shocks in the demand of labor force. To be able to detect this, we evaluate the persistence of regular shocks in participation and employment rates.

We can present at least two basic hypotheses.

The first states that the persistence of unemployment could be the product of the high persistence of the shock to the labor force supply. This hypothesis implies the combination of an “additional worker” effect (which induces families to send additional members to the labor market in recessive periods), and changes in the organization of families. According to this last idea, the members of a family who enter the active search for a job in the recessive phase of the cycle do not abandon it when the economic situation improves. In fact, if we found a phenomena of hysteresis in the labor supply, the population sub-groups traditionally thought of as “secondary workers” (such as young people and females) would prefer to keep on participating in the labor market even when the main job-searcher (in general, the adult male) procures a new job or a pay-raise which would allow the family to recover its pre-recession income level.

A different explanation for the persistence of unemployment would be the long duration of shocks in the demand for labor force. This hypothesis implies two possible alternatives. On the one hand, it could be stated that in the face of increases in the labor supply the level of employment does not adjust rapidly to a new equilibrium level (with lower wages) due to the existence of “rigidities” that impede the process of transition²³. On the other hand, it could be said that even in the absence of “rigidities”, if aggregate demand is not sufficient, if the demand for labor force is inelastic with respect to wages and the supply of labor force is completely elastic at the ongoing wages (a common situation in periods of generalized unemployment), then

²³These “rigidities” are explained in different ways: adjustment costs, efficiency wages (Lindbeck and Snower, 1988), “insiders-outsiders” (Blanchard and Summers, 1986; and Lindbeck and Snower, 1988), unions and bargaining theories (McDonald and Solow, 1981; Oswald, 1985; Nickell and Andrews, 1983; Udden-Jondal, 1993; Bruno and Sachs, 1986; and Calmfors and Driffill, 1988), or destruction of physical capital (Malinvaud, 1984; and Sneessens and Dreze, 1986).

the unemployment rate would be persistent as long as there is a lack of enough effective demand (Davidson, 1994).

Our estimations show that both labor supply shocks as well as labor demand shocks are essentially persistent (see Appendix Table 7). However, results supporting the hypothesis of “permanent” shocks are more robust for employment (demand shocks) than participation rates (supply shocks). These results are common for most regions and population sub-groups.

Taken all together, the main results appear quite persuasive. Macroeconomic analysis indicates the absence of mechanisms that systematically return the unemployment rate to its historical level after a shock. Labor force supply as well as labor force demand factors explain this behavior, since both present systematic resistance to return to their original levels after a shock has displaced them from their “normal” position.

4.2 Microeconomic persistence

In the context of a labor market with an important excess supply of labor force, not every person suffers in the same fashion.

For the population as a whole (table 4), state-dependence is present only for one region in 1995 (Northeast) and two regions in 1999 (Northwest and Pampeana) and it presents an unexpected sign: being unemployed in May reduces the probability of remaining in such a state in the next survey period (October).

This result is basically explained by male coefficients. The “negative” dependence effect for males is probably associated with the fact that the unsuccessful search for employment results, in the case of males, in the transition to inactivity or to employment in a low quality job (due to a reduction in the reservation wage of the unemployed male).

Amongst the youth, however, there is strong persistence in unemployment. The state-dependence coefficients are strongly positive in 1995 as well as in 1999, although they vary from region to region. This implies that amongst unemployed youth the probability of remaining in such a state in the near future increases. This result contradicts the common idea implying that it is acceptable for young people to move from one job to the next one until they have found one that is adequate for their expectations. This explanation suggests that firms do not take youth unemployment as a negative sign, as they would do for adults; however, this idea is refuted by our study.

On the other hand, we find a small state-dependence effect amongst females which contrasts with the “negative” state-dependence effect amongst males.

Finally, we found that there is a positive though weak correlation between the unemployment rate and the state-dependence coefficient. When a region or population sub-group experiences a higher incidence of unemployment, state-dependence tends to increase.

1995						
	N.E	Cuyo	GBA	N.W	Pampeana	Patag.
Total	-11.7%					
Young People				13.0%	19.6%	14.9%
Adults				9.2%		
Elderly People			10.8%		26.2%	
Males	-27.5%	-8.0%		-10.5%		
Females		5.9%				
1999						
Total				-6.5%	-6.3%	
Young People	20.2%	14.3%	24.4%			17.2%
Adults						
Elderly People	-2.0%	-15.0%				
Males		5.1%	-11.7%		-12.1%	
Females		0.5%	5.9%			

Table 4. STATE DEPENDENCE. Source: Our own estimation based on data from INDEC. Note: Marginal probabilities presented in this table were calculated as usual, using the maximum likelihood coefficients of each second stage random effect probit model. These marginal effects denote the impact of past unemployment in May 1995 and May 1999 on the probability of being unemployed in October 1995 and October 1999 respectively. Marginal probabilities derived from non-significant coefficients at the 5% level were not displayed.

There are strong divergences in the duration of dependence effects between different regions and population sub-groups. In 1995 we find a “positive” (direct) effect of the unemployment duration on its persistence in most of the regions amongst the different groups. This direct effect of unemployment duration on the probability of remaining unemployed, tends to disappear in 1999 for most regions and population groups.

In periods of higher unemployment rates (such as the recession in 1995), the duration of unemployment works as a highly stigmatizing factor. It is

likely that under such circumstances employers adjust their selection procedures, using unemployment duration as a filter. Given the fact that in our estimation model the alternative to unemployment could either be finding a job or going into inactivity, the existence of a positive coefficient on unemployment duration indicates that people insist on their (so far unsuccessful) search for employment.

A notable exception to the general behavior is the one corresponding to 1995 for the sub-group of young people in the (Northeast) region. In this case, the coefficient of duration dependence is strongly negative. The analysis of these results demands a particular study which goes beyond the scope of this article.

1995						
	N.E	Cuyo	GBA	N.W	Pampeana	Patag.
Total	1.1%			0.7%	1.0%	
Young People		6.4%		-30.6%		
Adults	10.3%			1.5%	1.6%	
Elderly People			2.9%			5.5%
Males	1.8%				1.3%	
Females				1.4%		1.5%
1999						
Total	1.7%					
Young People						
Adults	2.1%					
Elderly People						
Males	2.9%					
Females					-0.8%	

Table 5. DURATION DEPENDENCE. Source: Our own estimation based on data from INDEC. Note: Marginal probabilities presented in this table were calculated as usual, using the maximum likelihood coefficients of each second stage random effect probit model. These marginal effects denote the impact of lagged unemployment duration (unemployment duration in May 1995 and May 1999) on the probability of being unemployed (in October 1995 and 1999 respectively). Marginal probabilities derived from non-significant coefficients at the 5% level were not displayed.

An element that we wish to highlight is that there exists an important degree of “unobserved heterogeneity” in the population. That is, the variables included in the estimations only pick up a relatively limited part of the

factors that affect the incidence and persistence of unemployment. There are a number of “unobservable” elements that were captured in the first stage of the two-stage estimation procedure through the residual of the first stage estimation²⁴. This is evident in the fact that the residual incorporated as an explanatory variable in the second stage is generally very significant amongst every sub-group with the exception of the young people.

This result is an indicator that the variables included in the estimation of the incidence of unemployment for these population sub-groups explain an important part of such incidence. The fact that state-persistence is more generalized for young people than for the rest of the population while the residual of “non-observable” is not significant amongst them, indicates the presence of discrimination against the youth. Being young is in itself a factor of discrimination while for the rest of the population we find that there are other factors which help explain unemployment probabilities.

The effects of the control variables included in the estimation (such as age, educational attainment, sector of activity, income level, household chief status, house tenancy regime, and the number of children in the home) are not analyzed since they are not the main objective of this study. However, we should state that the coefficients associated with these variables are similar to those found in other recent studies (Féliz, Panigo and Pérez, 2000a, 2000b)

5 Synthesis and conclusions

In this article we present a methodology for the analysis of processes of unemployment persistence. The application of a two-fold methodological procedure (with aggregate data and individual data) allows us to obtain original evidence that highlights the size and characteristics of this phenomenon.

In the concrete application of this strategy to the case of Argentina, we found that, from a macroeconomic (aggregate) perspective, most of the shocks affecting the unemployment rate in the different regions and population sub-groups are predominantly persistent. This evidence indicates the need to develop a set of counter-cyclical policies to make up for the lack of endogenous adjustment mechanisms in the labor market.

Moreover, we found that the persistence of regular shocks in the rate of unemployment would seem to be a necessary consequence of the persistence

²⁴Detailed information can be requested from the authors.

in labor supply shocks as well as on labor demand shocks. However, the results indicate that the slow adjustment in the rate of employment after a regular shock, is the main determinant of the persistence of unemployment.

Our results on the persistence of aggregate unemployment are partly compatible with the results of the microeconomic analysis that allow us to detect a strong state-dependence in unemployment for the individuals of different population sub-groups (mainly, young people and females).

The evidence makes clear that experiences of unemployment in these sub-groups are not the result of “failures” on the part of the unemployed who are not qualified or do not have the “right” personal characteristics. The incidence of unemployment within these population sub-groups cannot be explained simply as a product of individual characteristics. The evidence is consistent with a situation in which people who enter unemployment due to a “negative” shock, have difficulties in finding a job for reasons that are beyond their control.

This would indicate that there exists a strong degree of state-dependence in unemployment for youth and, to a lesser extent, females. This finding is important since it states that, apart from the “personal” or “family” characteristics of young people and females, Argentina’s labor market discriminates against those population sub-groups who have difficulties in finding a job if they have a previous history of unemployment.

For males there is a negative state-dependence effect that is probably associated with the unsuccessful search for a job that may induce the male to turn to inactivity or to accept a job of a lower quality (due to the fact that as time goes by, his reservation wage diminishes if he cannot find a job).

With regards to duration dependence, we can conclude that in periods when the general unemployment rate is high (such as the recession in 1995), the time in unemployment acts as a highly stigmatizing factor. Thus, it is probable that in periods of high unemployment employers adjust their selection mechanisms, accentuating the use of unemployment duration as a filter.

The existence of extended periods of persistence of unemployment in Argentina during the nineties provokes the need to discuss and develop policies that could solve such acute problem. In particular, the results we provide from our proposed methodology give a better understanding towards where exactly the efforts must be oriented in order to make public policies effective in reducing unemployment persistence.

Firstly, the persistence of unemployment amongst the youth and amongst females in particular indicates the need to establish public policies oriented specifically towards these groups. This idea arises from the fact that Argentina's labor market tends to discriminate against both population subgroups, pushing them towards unemployment despite of their personal characteristics, capabilities and qualifications.

In the second place, we found strong indications that the persistence of unemployment is a problem resulting from labor demand shocks which have persistent effects. This would indicate the need macroeconomic intervention, oriented to increase aggregate demand and, indirectly, the demand for labor force, to recover the a favorable trend on employment.

Furthermore, the existence of persistence in shocks on labor force supply introduces interesting points concerning the appropriate public policies. Firstly, it is probable that there is a certain interaction between labor demand shocks and shocks to the supply of labor. The "additional worker" effect plays an important role in this interaction (Féliz, Neffa et al, 2001, Féliz, Deledicque et at, 2002). Secondly, the transformations in the structure of households which have resulted in the incorporation of non-traditional job seekers produces persistent effects in the families' labor supply (Féliz, Deledicque et at, 2001). In this situation, the most adequate public policies should be oriented, on the one hand, towards increasing global demand for labor force and, on the other, toward establishing mechanisms that allow for families to decide, without compulsion, on the participation of their members in the labor market.

In conclusion, as it can be appreciated, our methodological proposal not only provides important evidence on the characteristics of the process of unemployment persistence in Argentina, but also gives clues as to the design of public policies oriented toward the elimination of the disequilibria in the labor market. In consequence, we believe that the instruments proposed constitute an important tool for the analysis of the dynamics of the labor market and the design of employment policies which relate to macroeconomic policies.

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6 Appendix

Sub-group	GBA	N.W.	N.E.	Cuyo	Pampeana	Patag.
Young people	83.3%	70.0%	62.5%	33.3%	59.5%	91.7%
Adults	100.0%	63.3%	62.5%	50.0%	88.1%	75.0%
Elderly people	83.3%	53.3%	58.3%	16.7%	76.2%	79.2%
Males	83.3%	66.7%	83.3%	66.7%	76.2%	87.5%
Females	100.0%	70.0%	70.8%	16.7%	83.3%	95.8%

Table 6. REGIONAL UNEMPLOYMENT PERSISTENCE FOR DIFFERENT POPULATION SUB-GROUPS. PERCENTAGE OF RESULTS SHOWING PERSISTENCE. Source: Our own elaboration based on data from the INDEC. Note: Table 6 percentages represent the ratio between the number of tests supporting the “hysteresis hipotesis” and the total number of tests²⁵.

Sub-group	GBA	N.W.	N.E.	Cuyo	Pampeana	Patag.
Participation Rate						
General	33.3%	83.3%	79.2%	61.1%	57.1%	79.2%
Young people	66.7%	66.7%	75.0%	72.2%	83.3%	79.2%
Adult	66.7%	70.0%	62.5%	66.7%	64.3%	79.2%
Elderly people	66.7%	66.7%	66.7%	88.9%	78.6%	79.2%
Males	66.7%	50.0%	83.3%	50.0%	54.8%	91.7%
Females	33.3%	66.7%	66.7%	33.3%	71.4%	75.0%
Employment Rate						
General	100.0%	90.0%	75.0%	61.1%	92.9%	83.3%
Young people	83.3%	66.7%	79.2%	77.8%	73.8%	91.7%
Adult	100.0%	90.0%	41.7%	77.8%	85.7%	54.2%
Elderly people	100.0%	80.0%	70.8%	77.8%	76.2%	58.3%
Males	66.7%	76.7%	45.8%	50.0%	81.0%	70.8%
Females	100.0%	80.0%	75.0%	50.0%	90.5%	87.5%

Table 7. REGIONAL EMPLOYMENT AND PARTICIPATION PERSISTENCE FOR DIFFERENT POPULATION SUB-GROUPS. PERCENTAGE OF RESULTS SHOWING PERSISTENCE. Source: Our own elaboration based on data from the INDEC. Note: Table 6 percentages represent the ratio between the number of tests supporting the “hysteresis hipotesis” and the total number of tests.

²⁵The results of each of the test can be requested from the authors.