Unemployment persistence in Argentina. Micro and macroeconomic analysis of its regional incidence[*]

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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 of the shocks affecting the unemployment rate in different regions and population sub-groups are predominantly persistent (because both participation and mainly employment hysteresis). On the other hand, the microeconomic analysis allow us to detect a strong state-dependence effect (for most regions and mainly for young people and women), while duration-dependece is only significative for high unemployment periods.

Keywords: Unemployment persistence, regional unempolyment, duration-dependece and state-dependence.
JEL Codes: J64, J68, C22 and C23

1 Introduction

The behavior of Argentina's labor market is paradigmatic since, in terms of 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 have an adequate view of the current situation and the persistence of those dis-equilibriums it is first necessary to situate it in its context and to study it from a long run perspective.

In the first place, the economically active population shows a tendency to the increase. Since the past years of the latest military regime the rate of labor market participation has grown in a sustained manner reaching a historical maximum at the beginning of the 21st century, when it reached its historical maximum. This increase can be explained by several reasons. The most important ones relate to the rise of women's 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 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 in inactivity are attracted by the increased probability of finding a job. In recessions, by contrast, 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 searching for a job. 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 a 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.

The demand for labor force has suffered several unexpected changes since the beginning of the eighties, and its growth rate has fallen, in particular since 1989, when the process of "structural reforms" (inspired in the 'Washington Consensus') began. As a consequence of that process, the rates of unemployment and underemployment grew fast to reach their highest historical levels, fluctuating at a high plateau since then. This phenomenon is verified in most urban agglomerations in Argentina. During the nineties, the official argument sustained 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' situation[1]. The fact that these problems

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[1]However, this 'acceptable' situation (as the previous decade –1980-1990– could be char-

have not been resolved but seem to be here to stay, has led us to study the characteristics of the problem of unemployment persistence, or as it is called in the literature, of 'hysteresis', in greater detail and rigor. This concept, originated in 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 run' level; that is, the effect of the disruptive event 'persists'.

In the case we are discussing in this article, we postulate the hypothesis which states that after the shock involved in structural reforms, the increase in unemployment resulting from that event would 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 in the evaluation of the phenomenon from two complementary perspectives. On the one hand, 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. On the other hand, 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 sub-groups of the population, trying to find out whether a previous history of unemployment affects the probability of a person to remain 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 understood as intuitively 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.

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acterized), 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 it worsened them instead.

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

$$u_t = a.u_{t-1} + e_t \tag{1}$$

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 one (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 Persistence of unemployment in particular groups of people

When we analyze the problem of persistence in unemployment amongst particular groups of people, 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 in a person. Other elements can be causing 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 be reproducing the unemployment[2]. Apart from this, there are also systemic characteristics, such as the circumstance of the local economy (for example, high levels of unemployment in a particular region) which in conditions of low geographical mobility on the part of people, could be generating processes of persistent unemployment, independently of the characteristics of people. It is also possible that unemployment persistence within certain groups of the population be the result of the behavior of potential employers who use the past unemployment history of people as a negative filtering factor, in which case the previous "history" is not

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[2]Unemployment 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, workers with a vast experience appear as more attractive to employers as a result of having been employed for a long period of time.

the actual cause of unemployment but it acts only as a signal[3].

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 results 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 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 worse quality jobs which are more likely to be destroyed and which, for that reason, are also more likely to experience unemployment in the future.

2.3   Persistence of unemployment and public policies

The characteristics of unemployment persistence situations give insights as to the kind of public policies that are best suited to attack the problem.

2.3.1   Macroeconomic persistence and state intervention

In any economy, shocks (unexpected deviations from the trend of a variable) happen 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 will define a shock as regular if it represents unexpected variations in a variable which have no long run effects on its trend value. For example, when economic conditions worsen the rate of economically active population (EAP) tends to increase (due to an "additional worker effect" that exceeds the "discouraged worker effect" - see Panigo, 1999), while when economic conditions improve the EAP tends to return to its original level. The trend of the EAP remains stable in the long run despite shocks.

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[3] Since 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.

On the contrary, we will say that a shock is structural if it changes the long run trend in a variable. Before the Convertibility program in Argentina, for example, the under-employment rate had a stable trend 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 behavior of the trend of the under-employment series in the long run.

Besides, regular shocks could be divided into regular shocks with transitory effects and regular shocks with permanent (persistent) effects. The first ones produce effects on the level of a variable that quickly dilute, bringing the variable to its original trend level in a short time. In contrast, in the case of regular permanent shocks, the effect of the shock on a variable remains in time, disappearing slowly until the variable eventually returns to its trend level. In both cases, the variable returns to its trend level but at a different speed.

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 different alternatives of 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

In the first place, 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 run trend level. The following figure illustrates this situation.

In figure 1 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 (a month, a quarter). By then, the unemployment rate would already have gone down to its trend level[4] 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.

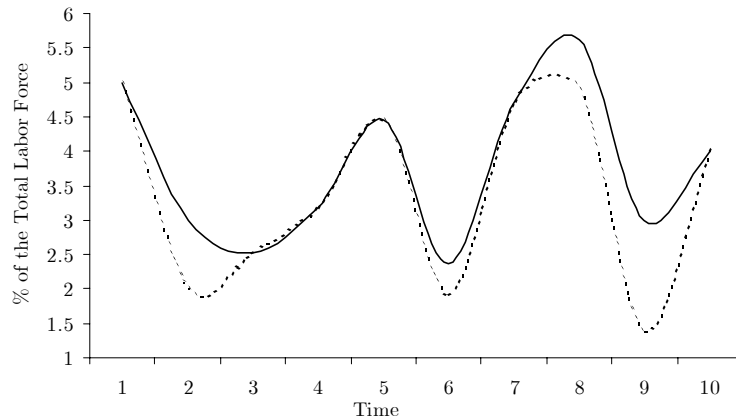[4] In this example, the trend level of unemployment is 4%.

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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 it is affected by a counter cyclical public intervention.

In this case, public intervention should, in principle, be restricted to control the consequences of higher unemployment without taking actions 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 though the evolution of the unemployment rate which will return to its trend level quickly due to the dynamics of the economy.

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 unemployment insurance[5], 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

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[5] Proposals 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 level of wages. In this way, the State could in principle guarantee a certain level of "full employment" of the labor force with price stability (Mitchell, 1998).
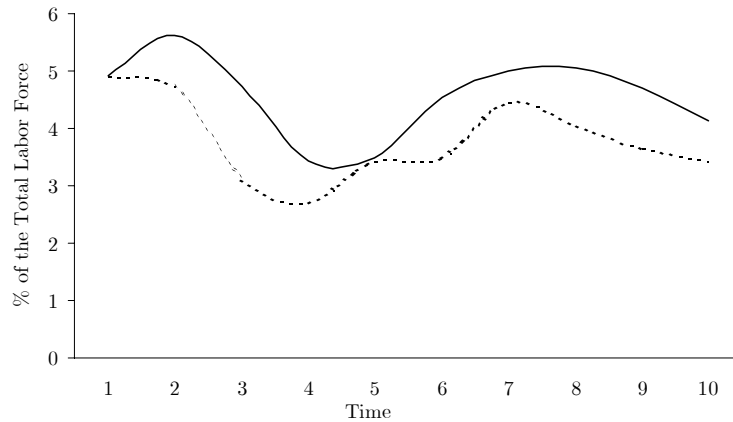
Figure 2: IMPACT OF COUNTER CYCLICAL POLICIES WHEN REGULAR SHOCKS
ARE PERSISTENT. Note: the full line represents the evolution of an artificial un-
employment rate without public intervention. The dotted line represents the same
variable when it is affected by a counter cyclical public intervention.

rate of unemployment). On the contrary, if they did not agree with the trend
level of unemployment, they should apply policies that were similar to those
which we will propose for the case of a structural shock, with the objective of
modifying the trend of the series.

Instead, if regular shocks where permanent, that is, if they had persistent
effects on the evolution of unemployment, in our example, the regular institu-
tional framework 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
is, when the variable return slowly to the long run trend) the counter cyclical
policy intervention that made 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 the permanence
for an excessive time of 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, several
periods 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
that increase uncertainty and thus relevant economic agent's liquidity preference
inducing them to consequently restrict their expenditure decisions.

Without public intervention, the series (full line in figure 2) could return to
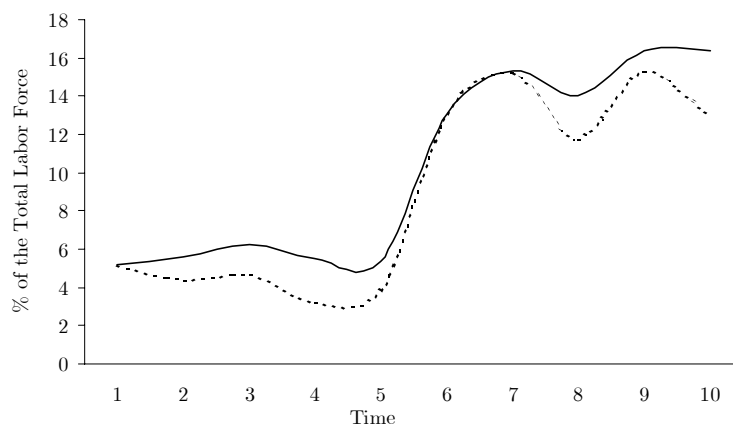
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Figure 3: EFFECT OF A STRUCTURAL SHOCK ON THE UNEMPLOYMENT RATE. Note: the full line represents the evolution of an artificial unemployment rate without public intervention. The dotted line represents the same variable when it is affected by a counter cyclical public intervention.

its "normal" value eventually 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 during a long period of time.

Lastly, let us analyze the case of structural shocks. As it can be seen figure 3, after a shock of structural type the series changes its trend level while its response to regular shocks could or could not change (in our example, this response does not change).

The structural shock produces a change in the trend of the series that does not tend 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 the figure 3) but would not be able to return the series to its previous (lower) trend.

In those 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 unemployment[6].

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[6]This type 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 to world trade structurally weakened aggregate demand for national production and thus reduced

2.3.2 Microeconomic persistence and public policies

The identification of the extension of unemployment state-dependence in the different regions and across different groups of the population 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 the periods to come. If macroeconomic policies or employment policies are effective in reducing short run unemployment, then in the future, those who recovered their employments will have a lower probability of losing it again. On the contrary, if there is no state-dependence so that a situation of individual unemployment does not depend on the personal unemployment "history", then short run public policies could reduce the unemployment rate in the short run but they will have only slight effectiveness in reducing the aggregate unemployment rates in the medium run. In fact, in this case even if an appropriate policy allows for a reduction in the unemployment rate, since individual experiences in unemployment were not important in the current individual probability of unemployment[7], then those who have regained their jobs have the same risk as before of returning to their previous state as unemployed.

It is very important 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 to "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 becoming unemployed.

Lastly, if unemployment is associated to 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 in a situation of high unemployment in a region or city, the unemployed where 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 way (of the population as a whole) and not of any particular group. The increase in the demand for labor in general would reduce no only the mass of unemployed but

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demand for domestic labor force. In consequence, after the structural shock the employment rate falls to a lower average level on a permanent basis.

[7]Or symmetrically, as we have already stated, the employment experience is not a determinant factor in the probability of dismissal.

it would also reduce the stigma associated with the fact of 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. With the use of these techniques of analyzes we would like to produce original information relating the characterization of this phenomenon.

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 an at least 'reasonable' period of time. A series with a stochastic trend, on the other hand, 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 run trend) after being hit by a shock.

Following 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)[8]: 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.

$$\triangle y_t = \alpha + \beta t + \rho y_{t-1} + u_t \tag{2}$$

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[8]For 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 significativity 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).

where y_t is the variable of interest, $\triangle$ 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 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"[9]. The estimation will be performed for the complete sample for each survey area and for each population subgroup.

2. Analyze the hypothesis of unit root with a rolling Augmented D-F test[10]: 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.

$$\triangle y_t = \alpha + \beta t + \rho y_{t-1} + \sum_{i=1}^{k} d_i \triangle y_{t-i} + u_t \tag{3}$$

The procedure consists on 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 volatility[11].

3. Estimate the coefficient of variances (variance ratio test) as a measure of non-traditional persistence[12]: An alternative non-parametric instrument to evaluate the presence of a unit root is to measure the degree of persistence. Cochrane (1988) states that 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:

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

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[9] For more details about the Phillips-Perron test see Maddala and Kim (1998).

[10] The 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).

[11] We will no perform a recursive ADF test because by construction the weight of each additional piece of information changes (decreases).

[12] Cochrane (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.

where k and σ^2 represents the number of lags and the variance operator respectively. If y_t is stationary, then $\underset{k\to\infty}{Lim}\ VR_k = 0$ and if y_t is a RW, $VR_k = 1$ for any lag size[13].

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:

$$\triangle y_t \quad = \quad DT_t + \rho y_{t-1} + \sum_{i=1}^{k} d_i \triangle y_{t-i} + u_t \tag{5}$$

$$\begin{aligned}
DT_t^1 &= \alpha + \varphi DU_t + \beta t & \text{(s. break in mean)} \\
DT_t^2 &= \alpha + \beta t + \delta DT_t^* & \text{(s. break in trend)} \\
DT_t^3 &= \alpha + \varphi DU_t + \beta t + \delta DT_t^* & \text{(both)}
\end{aligned}$$

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 break[14].

Empirical evaluation will be done 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 (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 sub-groups of the population: youths (20 to 24 years of age), adults (25 to 49 year-old), old (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 subgroups and three variable 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 break (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 groups

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

[14] For higher details see Carrera *et al.* (2003).

of the population, which requires 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: it is defined as the effect of the actual duration of a particular state on the probability of changing that state.

4. Lagged duration dependence: it is 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) [15].

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. The "pure state effects" models fail in distinguishing correctly between the consequences of long and short periods in previous states (of employment or unemployment), in such a way that a big 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 this type of models introduces, however, another problem. Duration dependence models make of the length of the periods in a state (spells) the main explicative 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 to stages where the person does not participate in the labor market) during which the individual experiences only one month

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[15]This is associated with, for example, the fact that unemployment may cause labor 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.

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 be immediately almost 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 due to the stigma that is associated with 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 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 in, for example, an excessive reporting of periods of unemployment of 12 or 24 months.

These problems can produce systematic biases 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 in 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 take to substantially biased results.

For this reason, it is common to work with a third type of model, the "experience" models. This models use as the main predictor of the entrance in 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 of a particular person to remain unemployed. The 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	Continous (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	Continous (not censored) variable for age, used both as current level and as two-period mean because of its time-variant nature.
PCHI	Time-variant continous (not 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 at 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 else, S3 is coded 1 for public services (water, light, gas and telephone) and 0 else, S4 is coded 1 for construction and 0 else, S5 is coded 1 for wholesale and retail trades and 0 else, S6 is coded 1 for transport and 0 else, S7 is coded 1 for financial, real state and business activities, and S8 is coded 1 for public employment and 0 else. 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 1: HH binary variable is almost allways constant whithin household, particularly between two consecutive by-yearly waves. Note 2: 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 model[16]. This strategy will allow us to estimate in a first stage those factors associated to unemployment though not generally captured by household surveys (unobservable characteristics). 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 to the history of unemployment of each individual included in the survey[17]. Let:

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

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 to be 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 that a person be unemployed in October 1995 or October 1999 taking into account unobservable components as well as relevant current and lagged information.

$$
\begin{aligned}
UNE_{i2}^* &= \rho UNE_{i1} + \varphi UDUR_{i1} + X_{i2}\beta + \overline{X}_i'\gamma + \phi \alpha_i + u_{i2} && (7) \\
&= \rho UNE_{i1} + \varphi UDUR_{i1} + X_{i2}\beta + \overline{X}_i'\gamma + \phi\left(\delta \eta_{i1} + w_{i1}\right) + u_{i2} && (8) \\
&= \rho UNE_{i1} + \varphi UDUR_{i1} + X_{i2}\beta + \overline{X}_i'\gamma + \phi\delta \eta_{i1} + \left(\phi w_{i1} + u_{i2}\right) && (9) \\
&= \rho UNE_{i1} + \varphi UDUR_{i1} + X_{i2}\beta + \overline{X}_i'\gamma + \tau \eta_{i1} + \nu_{i2} && (10) \\
&= \rho UNE_{i1} + \varphi UDUR_{i1} + X_{i2}\beta + \overline{X}_i'\gamma + \tau \hat{e}_{i1} + \nu_{i2} && (11)
\end{aligned}
$$

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 time-variant exogenous variables[18], 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}^*.

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

[17] For further details see also Heckman (1981).

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

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 that an unemployed person has of being unemployed in October of the same year. Both years have similar characteristics since both were recessive periods in both of which 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 on each region, as well as for several sub-groups of the population (young people, from 20 to 24 years old, adults, from 25 to 49 years of age, and old-people, from 50 to 59 years of age, men and women). With this procedure we try to evaluate the existence of differences amongst the different sub-groups of the population 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 that a person is unemployed in May has on the probability of such 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 other hand, we analyze the effect that the duration of unemployment has on the probability that a person has of remaining in such a state. Unemployment duration-dependence could be indicating the stigmatizing effects[19] that 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.

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[19] Amongst 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". Besides, this could indicate that the person has lost some of its work discipline which could increase training or supervision costs for the new laborer.

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 depth [20]. 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 shocks[21].

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 do shocks to the unemployment rate seem to have transitory effects.

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 tests[22]

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 Argentina[23].

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[20] This information can be obtain from the authors if requested.

[21] Detecting 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.

[22] The results of each of the test can be requested from the authors.

[23] This 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

These findings are reproduced in most of the sub-groups of the population (see table 6 in the appendix). Most of the results sustain 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 the regions and sub-groups of the population.

However, this information does not allow us to evaluate whether 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 that, we evaluate the persistence of regular shocks in participation and employment rates.

We can present at least two basic hypotheses.

The first one 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 sub-groups of the population traditionally thought of as "secondary workers" (such as young people and women) would prefer to keep on participating in the labor market even when the main job-searcher (in general, the adult male) obtains a new job or a pay raise which would allow the family to recover its income level to the pre-recession period.

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 transition[24]. On the other hand, it could be said

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, rolling ADF test, variance ratio test and unit root tests with endogenous detection of structural breaks); 4) Estimation of break dates: Arrufat et at 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, the most likely is that in the margin some series will appear to be stationary will 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 significativity of the structural break and avoid generating a selection bias against the hypothesis of unit root.

[24] This "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

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 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 table 7 in the appendix). 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.

Taking all together, main results appear quite persuasive. Macroeconomic analysis indicate 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 the 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

The macroeconomic results are in accordance with the microeconomic findings. In fact, in the context of a labor market with an important excess supply of labor force, not every person suffers in the same manner.

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

This result is explained by those associated to men, who represent most of the economically active population. This "negative" dependence effect for men is probably associated with the fact that the unsuccessful search for employment results in the case of men in the transition to inactivity or the employment in a low quality job (due to a reduction in the reserve wage of the unemployed male).

Amongst the young, on the contrary, 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 the young people being unemployed the probability of remaining in such a state in the near future increases. This result contradicts the common idea that implies that it is acceptable for the young 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 the unemployment history of a youngster as a negative sign, as they would do for adults; however, this idea is refuted by our study.

Driffill, 1988), or destruction of physical capital (Malinvaud ,1984; and Sneessens and Dreze, 1986).

On the other hand, we find a small state-dependence effect amongst women which contrasts with the "negative" state-dependence effect amongst men.

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

	N.E	Cuyo	GBA	N.W	Pampeana	Patag.
1995						
Total	-11.7%					
Young People				13.0%	19.6%	14.9%
Adults				9.2%		
Old People			10.8%		26.2%	
Men	-27.5%	-8.0%		-10.5%		
Women		5.9%				
1999						
Total				-6.5%	-6.3%	
Young People	20.2%	14.3%	24.4%			17.2%
Adults						
Old People	-2.0%	-15.0%				
Men		5.1%	-11.7%		-12.1%	
Women		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 express 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-significative coefficients at the 5% level were not displayed.

There are strong divergences in the duration of dependence effects between different regions and population 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 (yet 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 this results demands a particular study which goes beyond the scope of this article.

	N.E	Cuyo	GBA	N.W	Pampeana	Patag.
1995						
Total	1.1%			0.7%	1.0%	
Young People		6.4%		-30.6%		
Adults	10.3%			1.5%	1.6%	
Old People			2.9%			5.5%
Men	1.8%				1.3%	
Women				1.4%		1.5%
1999						
Total	1.7%					
Young People						
Adults	2.1%					
Old People						
Men	2.9%					
Women					-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 express 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-significative coefficients at the 5% level were not displayed.

An element that we wish to highlight is that there exists an important degree of "non observed 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 estimation[25]. 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.

This result is an indicator that the variables included in the estimation of the incidence of unemployment for these sub-groups of the population explain an important part of such incidence. The fact that state-persistence is more generalized for the young 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 young. The fact of 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 the experience of unemployment.

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[25] Detailed information can be requested from the authors.

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 to this 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 side methodological procedure (with aggregate data and individual data) allows us to obtain original evidence that highlights the size and characteristics of this phenomena in our country.

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 sub-groups of population 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.

Besides, from this point of view we found that the persistence of regular shocks in the rate of unemployment would seem to be a necessary consequence of the persistence 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 sub-groups of the population (mainly, young people and women).

The evidence makes clear that experiences of unemployment in this sub-groups are not the result of "failures" on the part of the unemployed which are not qualified or do not have the "right" personal characteristics. The incidence of unemployment within these groups of the population 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 the young and, to a lesser extent, amongst women. This finding is important since it states that, apart from the "personal" or "family" characteristics of the young and women, Argentina's labor market discriminates against those sub-groups of the population who have difficulties in finding a job if they have a previous history of unemployment.

For men there is a negative state-dependence effect that is probably associated to the unsuccessful search for a job that may induce the male to turn to inactivity or to accept a job of a lesser quality (due to the fact that as time goes

by, his reservation wage diminishes if he cannot find a job).

Regarding duration dependence, we can conclude that in periods when the general unemployment rate is higher (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 brings on the need to discuss and develop policies that could solve such acute problem. In particular, the results we provide from our proposed methodology give elements to understand better towards where the efforts must be oriented in order to make public policies effective in reducing unemployment persistence.

On the one hand, the persistence of unemployment amongst the young and amongst women 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 groups of the population, pushing them towards unemployment in spite 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 to take action with public policies at a macroeconomic level, 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 several things to say about the appropriate public policies. First, it is probable there to be 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). Second, 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, to establish 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 to design, at a general level, public policies oriented to 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%
Old people	83.3%	53.3%	58.3%	16.7%	76.2%	79.2%
Men	83.3%	66.7%	83.3%	66.7%	76.2%	87.5%
Women	100.0%	70.0%	70.8%	16.7%	83.3%	95.8%

Table 6. UNEMPLOYMENT REGIONAL 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[26].

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%
Old people	66.7%	66.7%	66.7%	88.9%	78.6%	79.2%
Men	66.7%	50%	83.3%	50.0%	54.8%	91.7%
Women	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%
Old people	100.0%	80.0%	70.8%	77.8%	76.2%	58.3%
Men	66.7%	76.7%	45.8%	50.0%	81.0%	70.8%
Women	100.0%	80.0%	75.0%	50.0%	90.5%	87.5%

Table 7. EMPLOYMENT AND PARTICIPATION REGIONAL 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[27].

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[26] The results of each of the test can be requested from the authors.
[27] The results of each of the test can be requested from the authors.