FULFILLMENT OF OKUN'S LAW IN THE CITY OF POSADAS, MISIONES, ARGENTINA, USING STATIC MODELS

Lic. Fernández, Rodrigo A. / Mg. Simes, Horacio [1]

Universidad Nacional de Misiones

Facultad de Ciencias Económicas

Departamento de Economía y Finanzas

Centro de Estudios de Energía para el Desarrollo (CEED) [2]

Ruta Nacional Nº 12, Km 7 ½ - (N3304)

Miguel Lanús - Misiones - Argentina

E-mail: hsimes@fce.unam.edu.ar

SUMMARY

The objective of this paper is to measure the existent relationship between the growth of the GGP of the Province of Misiones, Argentina, and the unemployment growth in the same Province. For that the relationship known as Okun's Law is used, by means of which, the unemployment rate variations are considered in function of the variations in the Gross Product growth rate.

The negative relationship is analyzed between Posadas' unemployment and the growth of the provincial economy, in values consistent with different works done, be it in developed countries as those least developed ones.

One establishes that the provincial economy is isolated from big interferences but originated outside the national economy such as the Tequila Effect.

The performance during the Convertibility period was consistent with the effect of the

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economy reformations in the Argentine economy structure in terms of productivity gain.

Key Words: Okun's Law, GGP, growth, unemployment, static models.

INTRODUCTION

The regional economy analysis, starting off from the macroeconomics instrumental, usually occupies a not very outstanding place in Argentine economy literature. In the Argentine North East region, in particular, scarce contributions to the specific analysis of the different provincial economies, can be found, exceptions being those papers that show or explain the evolution and the operation of the main regional cultivations.

As to the Province of Misiones, most of the applied studies, are faced from the public administration itself, such as those that are guided towards the evaluation of specific political effects or of the evolution of some special market (for example the work demand behaviour in the labour market); with the disadvantage that presupposes a restricted circulation of those documents.

Due to this general situation, one can mention as an exception Freaza's contribution (Economia de Misiones. Aspectos y Actividades relevantes) in which one finds a descriptive analysis, of the evolution of Posadas' labour market, in the 90s. In this paper he also mentions a previous document in which projections are carried out regarding the evolution of work demand in Misiones[3] .

The present paper has as its objective to constitute a contribution in the application of instrumental analysis of macroeconomics to the Province of Misiones economy study, concentrating its study on the existent relationships between the product variation rate and the unemployment variation rate, (by means of the well-known literature specification of Okun's Law). Also, it is hoped to carry out a useful contribution for the study of economy policy measures to be designed and implemented in the Province and the region, due to the relevance of the analytic structure studied in its relationship with the economy practice and the reality of the provincial and

3 Labour demands. Province of Misiones", (UNaM) Misiones National University Faculty of Economic Sciences Research Centre, Posadas, Misiones, Argentina, March 1997. Mentioned by FREAZA (2002)

regional economy and social life.

In the paper the negative relationship is established between unemployment in Posadas and the growth of the provincial economy, in consistent values with different paper be it in developed countries or in least developed ones. The inclusion of dichotomic variables related to interferences of local and international order, allowed to establish the preponderance of the first ones regarding the second in Misiones' economy, which allows to establish that this economy is isolated from big interferences but originated outside the national economy such as the Tequila Effect.

The analysis of Okun's relationship, during the first democratic government and the development during the Convertibility period allowed to obtain the traditional results in the Argentine economy literature, regarding the effect of the economy reformations in the Argentine economy structure in terms of productivity gain.

Finally, an asymmetric relationship is established using a dynamic model that presents a greater unemployment sensibility, from the expansible phases to the recessive phases of the provincial economy.

The usefulness of these results is given due to the possibility of having an effective instrument when designing regional or provincial policies, as Okun's Law allows to establish up to what measure each economy growth percentage point, will allow to reduce local unemployment.

ABOUT OKUN'S LAW

The product growth rate and the employment growth rate are two variables whose combined analysis had a radical importance within the economy literature.

Among the first studies of this relationship we can highlight the Swedish economist Arthur Okun's [4] , contribution who found, that by means of an econometric study, that unemployment was

4 OKUN, A.M. (1962) "Potential GNP: Its Measurement and Significance" American Statistical Association Proceedings of the Business and Economy Statistics Section, 98-104.

One should recognize the easiness with which in economics, some empiric regularities quickly become laws, just as it happened to the relationship found by Okun. Another similar case is in the regularity observed by professor Phillips, later known as " Phillips' curve", recognized by wide sectors of the economy doctrine, as a law.

related to the product. At present, this relationship is known as "Okun's Law"[5], and it postulates the existence of an inverse relationship between the product variation rate and the unemployment variation rate.

At present Okun's Law is expressed in the following way:

$$u_t - u_{t-1} = \theta * (g_t - gn_t) \qquad (1)$$

Where, u = unemployment rate,

gt = product percentage growth

gnt = growth of the product needed to maintain the unemployment level in t constant as to t-1.

O = growth proportion in t which exceeds the one that maintains the level of constant unemployment regarding the period t-1 that is translated in an unemployment decrease.

Intuitively, the equation (1) allows to calculate the percentage of product increment surplus, that should be obtained to diminish unemployment rate.

For an appropriate interpretation of this relationship one should consider that, be it the production, as the work offer, are essentially dynamic phenomena. In this sense, the production can show improvements coming from, on one hand, the upgrade of capital goods or improvements characteristic of the work capacities, and on the other hand the constant incorporation of new workers to the labour market. To achieve to lower the unemployment rate, it is necessary to subtract to the product rate growth, on one hand, the productivity earnings, and on the other hand, the growth characteristic of the work offer.

The relationship found by Okun, in the case of the United States during 1960-1992, was the following:

$$\begin{aligned} u_t - u_{t-1} &= \theta * (g_t - gn_t) \\ \theta &= 0{,}5 \\ gn_t &= 2{,}25 \end{aligned} \qquad (2)$$

The Equation (2) is understood in the following way: for each percentage point of growth of

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the gross product of the United States above the rate of 2.25, the unemployment rate diminishes half a percent point, in economy terms, the variable gn_t is measured by the sum of the growth of the labour force and of its productivity, while the parameter (-) measures the effect transmission of the growth of the product that exceeds the rate of growth before analyzed on the unemployment rate. For this reason, given the inversely proportional relationship that exists between the product growth rate and the unemployment growth rate, the coefficient (-) will adopt a negative sign in the econometric estimate.

Far from maintaining itself constant through time, successive studies have been confirming the validity of the present time original contribution[6], or alternatively, changing the way of seeing the relationship between growth and unemployment: proposing an asymmetric relationship in the recessions than in the expansions. [7]

Regarding the application of macroeconomic instrumental in the analysis of regional economies one can mention, the recent contribution in the case of Spain, PÉREZ-RODRÍGUEZ-USABIAGA'S (Dynamic Analysis of the Relationship between Economy Cycle and Unemployment Cycle in Andalusia in comparison with the Rest of Spain, 2002)[8] who carry out a study of the validity of Okun's Law for the case of Andalusia in comparison with the rest of Spain.

Within the national environment, there have not been many papers that try to estimate this relationship for Argentina. However, there stands out ABRIL-FERRULLO-CÓRDOBA'S (1998) recent paper, who estimated Okun's relationship for the country using information of the 1980-1996 [9] period. .

CHARACTERIZATION OF THE SERIES USED

As was mentioned in the introduction, the studies of the regional or provincial economies concentrate on the realization of a descriptive statistic analysis of the main macroeconomic

6 BLINDER, A.S. (1997) "Is there to Core of Practical Macroeconomics that We should All Believe? ", American Economy Review 87, 240-43.

7HARRIS, R., SILVERSTONE, B., (2001) "Testing for asymmetry in Okun's law: To cross-country comparison"., Economics Bulletin, Vol. 5, No. 2 pp. 1-13

8 PÉREZ, J., RODRÍGUEZ, J., USABIAGA, C., (2002), "Analísis Dinámico de la Relación entre Ciclo Económico y Ciclo de Desempleo en Andalucia en comparación con el Resto de España", Foundation Center of Andalusian Studies.

9 ABRIL, J.C., FERULLO, H.D., CÓRDOBA, A.G, (1998) "Estimación de la relación de Okun: Argentina 1980-1996", Faculty of Economy Sciences, University of Tucumán and CONICET.

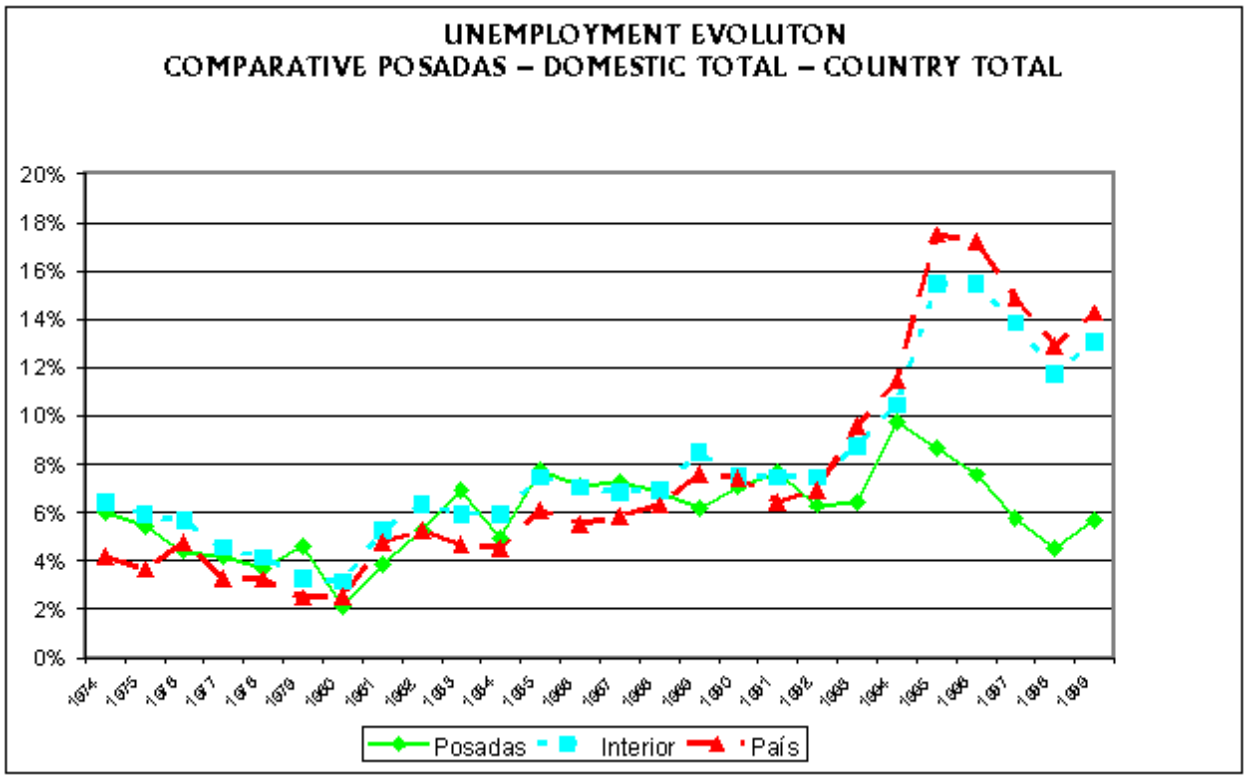
variables, such as Geographical Gross Product (GGP) and unemployment rate. For example, in FREAZA (2002) to the descriptive analysis are added projections of the labour demand until 2005. However, there is no advance in analytic structures that relate the variables.

Unemployment Evolution in Posadas agglomerate

Extending the analysis carried out by FREAZA (2002) where the evolution of the unemployment was studied during the period 1980-2000; in this present section the evolution of this variable is analyzed for a similar period, incorporating the comparative analysis of the values found for the Country Domestic Total.

Chart I shows the evolution of the unemployment rate for the Posadas agglomerate, comparatively with the Domestic Total and the Country Total , for the period 1974-1999.

Chart I



Given the characteristics observed in the evolution of the variable, the analysis can be carried out dividing the period total in three different stages.

Period 1974-1981

The evolution found shows a decreasing tendency in the three regions being examined throughout the referred years, varying from a rate average of 5.55% until a rate average of 2.62%. The values observed in the different regions are shown very close to each other, although the evolution is different. In Posadas, at the beginning of the period the total of unoccupied reached 6.00%, while within the country the figure was of 6.50%, and the Country Total of 4.2%. When concluding the period the registered unemployment rates were of 2.20%, 3.20% and 2.6%, in Posadas, Interior and Country Total, respectively.

Period 1982-1994

During the second period an inverse tendency is observed, registering a growing behaviour as much in Posadas as in the Domestic Total and Country Total. One can observe that during the two periods analyzed, the three regions show similar behaviours, with a lower rate in the Posadas agglomerate, with 6.40 % of unoccupied, while in the Domestic Total and Country Total the registered values were of 8.80% and 9.60%, respectively.

Period 1994-1999

Throughout the third period the Posadas unemployment rate, differs substantially from the other two regions studied, which represents a variation regarding the evolution observed during the two periods previously analyzed. With a decreasing tendency, in the year Posadas registered an unemployment rate of 4.50%, while the Domestic Total and in the Country Total the registered rates were of 13.10% and 14.30%, respectively.

In FREAZA (2002), the explanation to this appreciable difference would be due to:

- On one hand, to the behaviour of the rate of activity of the different regions, as Posadas showed a decreasing behaviour, while the Country Total, the evolution of the same rate

was increasing (the author finds plausible the hypothesis according to which the Posadas' labourer, when not being able to incorporate himself to an employment in a long period of time, decides to give up the search). In the Domestic Total there is also verified an upward tendency in said rate.

- On the other hand, the dissimilar behaviour would be explained so much by the categorization carried out of a proportion of the unemployed as the underemployed (for methodological reasons), as much as for some characteristics peculiar to the Posadas agglomerate (be it frontier traffic and distribution of social plans on behalf of the Government).

An additional explanation is found in the different economy impact that the external interferences and the structural internal shocks would cause in the different analyzed regions, due to the characteristics peculiar to each region. In this sense, the Posadas agglomerate could be showing a better answer so much as to the interferences introduced in the Argentine economy by the Tequila effect, of the mid nineties, as to the modifications under the social and economy conditions introduced in the years 1983 and 1991 by the return of democracy and the beginning of the Convertibility Plan, respectively.

It is necessary to observe, however that beyond the quantitative differences in the behaviour of the analyzed regions (accented during the third stage), and their evolution show important symmetries to those years in which the different regional economies do not receive great structural shocks.

For this paper other ones were consulted: FREAZA'S (2002), as well as GONZÁLEZ VILLAR, SINTES, BAEZ'S (2004), to have knowledge of the general characteristics of the labour market and how the Misiones' economy functions.

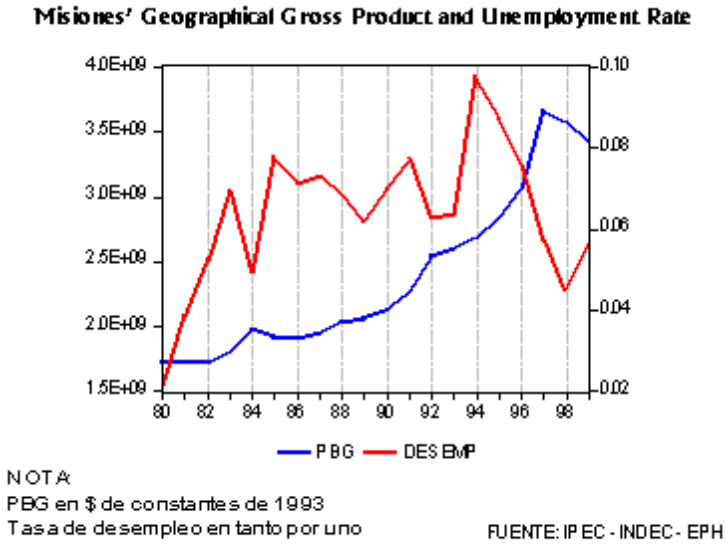
Also from 1980 to 1999[10] historical series were gathered of Misiones' Geographical Gross Product according to the information provided by the Provincial Institute of Statistics and Censuses, the Posadas unemployment rates according to the Homes Permanent Survey, as well

10 In order to have a greater number of observations an analysis was attempted until 2004. However, discrepancies were observed in the connections of the series, in such a way that the values of the 1993 base year Geographical Gross Product, presented different values to current and constant prices. That added to the fact that the IPEC does not possess an up-to-date deflator that allows to obtain homogeneous series at constant values at the present time, determined the election of the period of analysis before referred.

as the series of the Argentine DGP.

The analysis of these series allows distinguishing the negative relationship at first sight between production evolution and unemployment rate, as one observes in Chart II.

Chart II



Note:

Gross Geographical in Pesos in 1993 constants
Unemployment rate in … per one .
Source: Prov. Inst. Of Stati. And Cen. IPEC – INDEC - EPH

Throughout this paper, the different transformations or adaptations of the series of data will be explained, according to the requirements of the model.

METHODOLOGICAL CONSIDERATIONS

Contemporary economy literature has shown a growing interest to guide the researchers towards the analysis of the so called Okun's dynamic relationship, that supposes the use of current technical econometrics as correction models of errors, that consist on dynamic models in which the movement of the variables in any period is related with the existent breach in the previous periods regarding the long term equilibrium.

In particular PÉREZ-RODRÍGUEZ-USABIAGA'S (2002) use the econometrics technique of Self-regressive Vectors that allow to determine the causation direction of effects among the variables considered in the model, as well as the interactions and feedbacks among variables starting off from the form in which the model is specified; for that quarterly Geographical Gross Products and unemployment series are used..

In this paper, as there is an absence of other papers that would serve as comparison, the approach was adopted of advancing progressively, beginning with a simple version of Okun's relationship, and introducing successive improvements or upgrades to the models.

On the other hand, it is necessary to clarify that the EPH only raises the information of the state of the labour market in the Greater Posadas agglomerate, and not in the whole Province. That is why, the relationship that will be established, will be that of the evolution between unemployment in Posadas and the Geographical Gross Product, which is adopted as PROXY variable of the activity level in the Agglomerate itself.

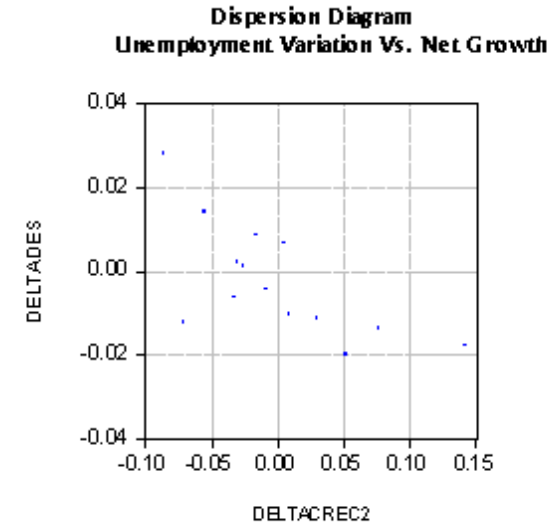
OKUN'S TRADITIONAL VERSION

Okun's Law original version, can be defined as a static version, already sets off from the supposition that the normal growth rate of the product (defined as that necessary to maintain the unemployment rate at the same level) is constant for the whole analysis period. In the particular case of the United States this rate is calculated in 3%[11], in the case of Argentina at present, values that oscillate between 1.3% and 8.3% have been considered[12]

In the case of Posadas one can clearly observe the negative relationship between unemployment and the growth starting off from the analysis of Chart III, which shows the dispersion of the variations of both variables. In this Chart some observations can be identified with anomalous behaviour, in particular in the southeast quadrant that shows unemployment reductions, simultaneously with reductions of the Province Geographic Gross Product.

11 DONRNBUSCH, FISCHER, (1991).
12 ABRIL-FERRULLO-CÓRDOBA (1998).

Chart III



Source: Own production

In the section that follows the static version of Okun's Law is developed, beginning with the explanation in the way of estimating the rate of normal growth, and then proceeding to comment the results of the estimate.

ESTIMATES OF THE GROWTH NORMAL RATE OF GN_T

To proceed to the (-) parameter estimate, mentioned in equation 1, first is it necessary to have an estimate of the normal growth rate of the economy, in this case corresponding to Misiones' economy.

For the gn_t estimate one can proceed in two ways [13] .

- Intuitive Way: it considers the population's growth and productivity between 1991-2001, using for that the information of the respective censuses carried out in the two years mentioned. The estimated values in this way will be taken as control values.

13 For a treatment different to the parameter c_t one can consult ABRIL, FERULLO, CÓRDOBA (998)

· Econometric Way: estimating the parameter gn_t by means of Okun's own relationship, and comparing the figures obtained with those derived in the models estimated in first instance.

One should remember that said parameter is similar to the sum of the growth of the population physical factor (labour offers) and of the growth of labour productivity.

Therefore two different alternatives have been elaborated:

· Considering the inter-census variation of the total population, between the 1991 Province CENSUS and the 2001 CENSUS, annualised, and the variation of the Geographical Gross Product Per capita between both censuses. The result obtained is an annual productivity growth rate increase of 2.63%.

· Considering the inter-census variation of the Economically Active Population of the Province, between the 1991 CENSUS and the 2001 CENSUS, annualised and the variation of the Geographical Gross Product per worker between both censuses. It results in an annual productivity increase rate of 3.03%.

These results indicate that the growth rate of the product necessary to maintain constant the unemployment level could vary between 2.63% and 3.03%.

Subsequently the gn_t value will be considered using econometrics methods to later compare the results obtained with the ones recently exposed.

ESTIMATES OF OKUN'S STATIC RELATIONSHIP

The model proposed in Equation 1 can be appropriately transformed to calculate the growth normal rate, applying the distributive property, as gn_t is a constant and the parameter (-) is another one. From there it is possible to estimate Okun's relationship as a traditional regression with ordinate to the origin in which the unemployment variation will only depend on the

Geographical Gross Product growth rate:

$$u_t - u_{t-1} = \beta * (g_t + \alpha) \qquad (3)$$

Where a indicates the unemployment variation rate when the product growth rate is equal to zero and β measures the unemployment rate for each percentage increase in the growth rate.

ESTIMATE OF TRADITIONAL OKUN RELATIONSHIP

Even when the previous transformation does not present any difficulty, most of the current statistical packages can estimate Equation 1 directly if appropriately specified.

In Graph III, placed at the end of the section a comparative table with Regression I is shown, where the main statistics of the different statistical estimates of Okun's [14] relationship are presented. The advantage of the positioning of Equation 3 are that the coefficient a turns out to be directly the normal growth rate.

Interpretation of the results obtained:

- α At first sight it is observed that the sign of the variables is the expected ones.
- β The coefficient C(1) only associated the variable CREC, presents a value of -0.15506; the coefficient corresponding to the normal growth rate gives a value of 0.050135 (5.0%), both variables are statistically significant to 5%.
- γ The combined probability, determined as starting from statistical F, is significant to 1%
- δ The correlation coefficient R^2 is of 0.33683 a low value

The model indicates that for 1% of product growth above its natural rate estimated in the same model in 5%, unemployment diminishes an average of, 0.15%.

14 One can see in the seventh line of the graph that the equation used is Equation 1, which due to the transformation commented previously, is equivalent to Equation 3.

The relationship of traditional Okun: Alternative I

The low R^2 of the Regression I, as well as the conclusions that are derived from ABRIL, FERULLO, CÓRDOBA'S (1998), regarding the existence of structural changes in the Argentine economy starting off from 1991, makes advisable the use of an outline of DUMMY variables that allows to capture certain effects that could be distorting the relationship obtained. Reason why the following model is proposed:

$$u_t - u_{t-1} = \theta * (g_t - gn_t) + \sum \delta_{i,t} * DUMMY_{i,t} \qquad (4)$$

To the original outline the following DUMMYS were added:

· DEMOCOM: It captures the effect of the beginning of the democratic governments in Argentina and adopts the value 1 in 1983

· DEMOCPRIM: It captures an effect of change of expectations as consequence of the implementation of the Austral Plan, a possible explanation for the reduction of unemployment with a contract of real production in 1986, in which value 1 is adopted.

· CRIHIP89: It captures the effect of 1989 Hyperinflation, it adopts a value 1 in said year

· CRITEQ: It captures the effect of the Tequila Crisis, it adopts a value 1 in 1995

· RES98: It captures the effect of the Recession that begins in 1998

The values corresponding to Regression II are shown in Graph III at the end of the section with the main statistics of the resulting model.

Interpretation of the obtained results:

- At first sight it is observed that the sign of the variables is the expected ones, except for the coefficient C(6) related with the variable CRITEQ that sought to gather the Tequila Effect

- The coefficient C(1) associated only to the CREC variable, presents a value of -0.304170; the coefficient corresponding to the normal growth rate gives a value of 0.05368 (5.3%), both variables are statistically significant to 1%

- The combined probability, determined as from the statistical F, is significant to 1%

- The correlation coefficient R2, is not the best indicator in this case due to the introduction of multiple explanatory variables, on the other hand the Adjusted R2 is of 0.567366 that behaves as a significant improvement regarding the original situation

- In general it can be observed that the model of Regression I is robust as long as they do not change the signs of the original variables

- The introduction of the DUMMYS shows that different interferences of national order have affected the relationship between employment and local growth

- Some of the proposed DUMMYS are not statistically significant to 10%

The model predicts that for each increase of 1% in the product, above its natural estimated rate in a 5.3% in this formulation, unemployment diminishes an average of 0.30%. In this case the incorporation of DUMMY variables to capture specific crisis effects that could be affecting the normal functioning of the relationship between growth and unemployment allows a significant improvement in the statistics; at the time that it reveals the influence of local interferences such as recession, hyperinflation, the beginning of the democratic governments. On the other hand, the sign contrary to the expected one in the variable that sought to capture the effect of an exogenous interference and from the exterior would show the relative isolation of Misiones' economy regarding these kinds of interferences.

THE RELATIONSHIP OF TRADITIONAL OKUN: ALTERNATIVE II

With the objective of making the model more efficient an alternative was evaluated, which was summarized in two DUMMYS the negative interferences:

- CAMBMOD01: It captures the Tequila effects and the 1998 Recession within the plan called the Convertibility Plan, and it adopts the value 1 in 1995, 1998 and 1999
- CAMBMOD02: It captures the effects previous to the 1987 Spring Plan and the 89 Hyperinflation within the first democratic government, and it adopts the value 1 in 1986, 1987 and 1989

The values corresponding to Regression III are shown in Graph III at the end of the section with the main statistics of the resulting model.

Interpretation of the obtained results:

a) At first sight it is observed that the sign of the variables are the expected ones

b) The coefficient C(1) only associated the variable CREC, presents a value of -0.217706; the coefficient corresponding to the normal growth rate gives a value of 0.073792 (7.3%), both variables are statistically significant to 1%

c) The combined probability, starting off from statistical F, is significant to 1%

d) The correlation coefficient R^2, is not the best indicator in this case due to the introduction of multiple explanatory variables, on the other hand the Adjusted R^2 is of 0,542014 that behaves as a significant improvement regarding the original situation, and a slight worsening regarding Regression II

e) In general it can be observed that the model of Regression I is robust as long as they do not change the signs of the original variables

f) The introduction of the new DUMMYS shows the impact of the main interferences of

the national order that have affected the relationship between employment and local growth as long as both are statistically significant

The interpretation of the results from the model is the following one: for each increase of the product in 1%, above its natural estimated rate in this formulation in 7.3%[15], unemployment diminishes on the average, of approximately 0.22%.

The DUMMYS that want to capture the effects of the negative interferences, result consistent with a phenomenon commonly found in Argentine economy literature regarding the increase of economy vulnerability, from exogenous interferences, since the coefficient of the variable corresponding to the period 1991 - 1999 are greater in absolute value than the one obtained for the 1983 - 1989 period.

PROVING THE STRUCTURAL CHANGE IN OKUN'S RELATIONSHIP

FREAZA (2002) suggests the possible existence of a structural change in unemployment behaviour starting off from the implementation of the Convertibility Plan [16]. When evaluating the possibility of structural change in Regression I for 1991, the year in which Convertibility begins, the following result is obtained:

Graph I

Chow Breakpoint Test: 1991 – Regresión I			
F-statistic	0.539428	Probability	0.593979

15 The increase of the natural rate as to the specification of variables that capture the effects of negative interferences is natural. However, as in fact they are filtering specifically the negative interferences the value of the "natural rate" would be over estimated, and therefore it would not be correct to speak of natural rate in these cases.

16 In this sense FREAZA (2002) subscribes the CONESA (2001) hypothesis, according to which, the drop of employment, in Argentina in general, observed in the historical series of the labour market, would be the consequence of the "exchange delay" caused by the Convertibility Plan, and the consequent substitution of national labour for foreign labour, and even for process itself of machinery import.

Log likelihood ratio	1.319643	Probability	0.516943

Graph II

Chow Breakpoint Test: 1995 – Regresión I			
F-statistic	2.214620	Probability	0.143637
Log likelihood ratio	4.915850	Probability	0.085612

In Graph II, one can see that while when applying the statistic F for 1995, H_0 cannot be rejected as "No existence of Structural Change.", when applying the test based on the estimators of Maximum Verisimilitude the statistics estimated results significant to 10%, and the H_0 could be rejected.

This last result is consistent with FREAZA'S (2002) consideration that towards 1996 the Convertibility Plan had consolidated and in general the changes in the economy structure would have been completed.

In the face of the ambiguity of the results obtained with the traditional model, one intents to explain the existent relationship between product growth rate variation and the unemployment growth rate, keeping in mind in the analysis as the economy of the period that is analyzed as the political structure (governance structure)[17] within which the economy activity is developed. In this sense one tried to evaluate the behaviour of the relationship between unemployment and growth considering two DUMMY variables, one for the first democratic government from 1983 to 1989 (years in which DEMOCALF takes the values 1) and another for the Convertibility Plan that summarizes between 1991 and 1999 (years in that CONVERTIB takes values 1).

17 The institutional structure of a country or region, together with the different institutional relationships established in formal and informal terms are identified (within the economy school known as the New Institutional Economy) as "governance structure."

The values corresponding to Regression IV are shown in Graph III at the end of the section with the main resulting statistical model, considering as outstanding the variables CAMBMOD01 and CAMBMOD02 that in Regression III summarized the effects of the main negative interferences in every period.

Interpretation of the obtained results:

a) At first sight it is observed that the variables of the model proposed in the Regression III maintain their sign

b. The associate coefficient only to the variable CREC, presents a value of -0.232374; the coefficient corresponding to the ordinate at the origin, gives a value of 0.01555 (equivalent to a rate of normal growth of 6.69%), both variables are statistically significant to 1%

c. The combined probability, determined as from statistical F, is significant to 1%

d. The correlation coefficient R^2, is not the best indicator in this case due to the introduction of multiple explanatory variables, on the other hand the Adjusted R^2 results from 0.869863 that behaves as a significant improvement regarding all the models considered previously.

e. The introduction of the new DUMMYS points out a behaviour differed in for the considered periods, however it is necessary to highlight that both are not statistically significant

f. A term MA(1) was incorporated that supposes a structure of mobile average errors, which explains the improvements in the estimate

g. The combined significance of the considered variables is highly significant

From the results of the regression the following can be concluded: for each increase of the product in 1%, above its natural rate, unemployment diminishes, at the average of 0.23%.

Even though the DUMMYS: DEMOCALF and CONVERTIB statistics are not significant, their signs are consistent with the interpretation of the Convertibility period, regarding the manpower ejector effect, and of productivity increase, in comparison during the first democratic government, each percentage growth point, behaved a slight additional improvement in the reduction of unemployment.

Graph III

Variable	Regression I	Regression II	Regression III	Regression IV
CREC	-0.15506	-0.30417	-0.217706	-0.232374
t-statistical	-2.938443	-4.649144	-4.670476	4.562557
gn_t	0.050135	0.05368	0.073792	---
t-statistical	2.56082	5.559601	5.267076	---
AR	---	---	---	---
t-statistical	---	---	---	---
MA	---	---	---	-0.989418
t-statistical	---	---	---	-253.5106
Dummies	---	FIVE	TWO	TWO
R^2	0.33683	0.711577	0.618345	0.835678
Adjusted R^2	0.29782	0.567366	0.542014	0.753518
Probability (F-statistical)	0.009182	0.009155	0.001923	0.000407
Akaike info criterion	-5.75708	-6.063369	-6.099068	-6.625971
Schwarz criterion	-5.657665	-5.715418	5.900239	--6.27802
Source: Ownelaboration				

CONCLUSIONS

In the paper the diverse specifications have been considered, of a generic model based on Okun's static relationship, in which constant rate of natural growth was considered.

In the static models, the parameters associated to the growth rate are located between -0.15 and -0.30, indicating that for each growth variation point, above the natural growth rate, unemployment diminishes between 0.15% and 0.30%. Although for the region of North East Argentina it has not been possible to obtain relative information to estimate values of this rate, and therefore the contribution of this paper carried out in the field of the approached study, the obtained values are consistent with the range of estimated values for different countries as one can see in Graph IV.

Graph IV

	REGION	YEAR	(-)	SOURCE
1	Germany	1981-1994 1978 -1999	-0.42 -0.39	BLANCHARD, O. (1996) HARRIS, R., SILVERSTONE, B., (2001)
2	Andalusia	1984-2000	-0.17	PÉREZ, J., RODRÍGUEZ, J., USABIAGA, C., (2002
3	Australia	1978-1999	-0.50	HARRIS, R., SILVERSTONE, B., (2001)
4	Canada	1978-1999	-0.39	HARRIS, R., SILVERSTONE, B., (2001)
5	United States	1981-1994 1978-1999	-0.47 -0.44	BLANCHARD, O. (1996) HARRIS, R., SILVERSTONE, B., (2001)
6	Spain	1984-2000	-0.13	PÉREZ, J., RODRÍGUEZ, J., USABIAGA, C., (2002)
8	New Zeland	1978-1999	-0.41	HARRIS, R., SILVERSTONE, B., (2001)
9	United Kingdom	1981-1994 1978-1999	-0.49 -0.26	BLANCHARD, O. (1996) HARRIS, R., SILVERSTONE, B., (2001)
10	Argentina	1980-1996	-0.14	ABRIL, J.C., FERULLO, H. D., CÓRDOBA, A.G. (1998)
11	Costa Rica	1976-2001	-0.20	ARIAS C., E., KIKUT V., A., MADRIGAL B., J. (2002)
12	Peru	1970-1999	-0.08	GARABITO, C., (2002)
13	Puerto Rico	1963-2002	-0.25	LEMOIS, F., (2003)

Starting off from the different specifications one could identify the relevance of the national economy interferences, as the recessions, hyperinflation, and the Convertibility as processes of economy reformations.

When comparing the functioning of the relationship in the 80s during the first democratic government, and the one that happens starting off from the implementation of Convertibility the classic results are obtained in the Argentine economy literature, regarding the impact of the reformations in the labour market, as well as the effects derived from the increase in productivity and the consequences on Okun's relationship.

Therefore, this paper seeks to carry out an original contribution to the study of the existent relationship between product growth rate, and the of unemployment growth rate in the city of Posadas (under different specifications of the well-known rational structure in economy literature known as "Okun's Law"). Due to that, this paper can be considered as the base on which it is possible to carry out new contributions in the study of the relationship field among those variables mentioned within the environment of the local economy reality, either extending the analysis to different periods, or by means of the use of specifications different to Okun's Law.

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