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TECHNICAL INSTRUMENTS AND CONCEPTUAL DEFINITIONS: THEORETICAL AND PRACTICAL IMPLICATIONS OF THE CHANGE ON THE DEFINITION OF UNEMPLOYMENT IN COLOMBIA

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ABSTRACT

On June 2000 the Colombian National Department of Statistics (DANE) adopted a new definition to measure unemployment following standards suggested by the International Labour Organisation (ILO). The change of definition implied a reduction of the unemployment rate of about two percentual points. In this document we contrast the Colombian experience with another international experiences, and analyse the empirical and theoretical implications of this change of definition using two different kind of quantitative estimations: in the first one we contrast the main features of the different categories classified according to the old and new definition of unemployment (employed, unemployed and out of the labour force) using the EM algorithm; in the second one we test the implications of the ILO definition in terms of time expended on job-searching. We find empirical implications about structural unemployment and its relationship with the educational profile of unemployed people, and theoretical features that challenge the standards of the ILO's unemployment definition.

JEL Classification: J64, J21.

Keywords: unemployment, ILO Classification, labour force states, measurement errors.

RESUMEN

En junio de 2000 el Departamento Nacional de Estadística de Colombia adopto una nueva definición de medición de desempleo siguiendo los estándares sugeridos por la organización Internacional del Trabajo (OIT). El cambio de definición implico una reducción de la tasa de desempleo en cerca de dos puntos porcentuales. En este documento contrastamos la experiencia colombiana con otra experiencias internacionales, y analizamos las implicaciones empíricas y teóricas de este cambio de definición usando dos tipos de estimaciones cuantitativas: en la primera se contrasta las principales características de las diferentes categorías clasificadas según la definición nueva y vieja de desempleo (empleado, desempleado y fuera de la fuerza laboral) usando el algoritmo EM; en la segunda se pone a prueba la implicación del desempleo estructural y su relación con el perfil educacional de personas desempleadas y las características teóricas que enfrentan los estándares de la OIT en la definición de empleo.

Clasificación JEL: J64, J21

Palabras clave: desempleo, clasificación de la OIT, estado de la fuerza laboral, error de medición.

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Introduction

Within the methodological foundations of research in social sciences, a *conceptual instrument* has been defined as the categories used in producing a report, whereas *technical instruments* are the specific methods to collect the information regarding our conceptual instrument (Scott, J. 1990). According to this, and related with the definition of unemployment, the household surveys include a set of questions addressed to identify the labour status of people, and once the condition of being unemployed is identified, the most standard –first hand– technical instrument is the amount of unemployed people and from it, the unemployment rate.

International Conferences of Labour Staticians (ICLS) are held with the purpose of providing stable criteria on the methods of collection of information and the standard definition of concepts. From its first meeting, in 1923, the International Conference of Labour Staticians, has underlined the importance of maintaining regular definitions of conceptual instruments on providing regular administrative records in order to maintain the standards of quality and trust of official statistics. However, despite or in behalf of this recommendations, countries have modified the definitions of the technical or conceptual instruments used as base of public statistics.

This document deals with the specific theoretical and empirical considerations regarding the modification of the definition of unemployment, specially the one developed on the Colombian Household Survey from year 2000 onwards. We will contrast this case study with studies applied for the cases of Italy and England. Special attention will be developed to the quantitative consequences of qualitative definitions, the political economics of each modification and the theoretical considerations of this qualitative definitions.

The structure of the document goes as follows. On the first part of the document we review the process of standardisation of labour statistics developed by ILO with the advice of the International Conference of Labour Staticians, followed by two country-cases: England and Italy. On the second part we present the main features and consequences of the change of methodology on the Colombian Household Survey. We start part four introducing the main logics of our quantitative exercise and finally the results of this estimation are presented.

1. Change of definitions of Unemployment as a conceptual instrument. Some international Experiences

The International Organisation of Labour (ILO), among his specific activities as an institution who makes part of the UN organisation, has promoted the adoption of international standards about labour statistics, in particular, by following many of the resolutions adopted by the International Conference of Labour Staticians (ICLS) since his Resolution I adopted by the Eight Conference (1954).

Resolutions adopted by the ICLS, as a difference from the ones that emanates from the ILO, do not require ratification, and, as a consequence of that, they do not binding upon states and in case of being accepted, they do not require supervision. According to Bolle (1999), given the fact that the interaction between the statistical work of the ILO, the participation of staticians in

the ICLS's and the national statistical services is an ongoing process, this makes binding to the Conference's resolutions unnecessary. Despite of this interaction, technical sovereignty of countries on this matters had lead to very interesting situations.

1.A CHANGE OF UNEMPLOYMENT DEFINITION IN ENGLAND: CLAIMANT COUNT

In 1983 the British government changed the definition of unemployment to be applied. An unemployed person became that one who was 18 years old and over and was claiming unemployment-related benefits. For Vournas (1999), this is the consequence of a common practice developed by governments all through the 80's and 90's: to identify the conceptual with the technical instruments. Registration of the unemployed to a particular assistance program became the definition of unemployment and the instrument used to count the unemployed.

Consequences of this policy have been identified: first, time series based on the previous definition became discontinuous. Second, the official rate of unemployment, defined as the ratio between people aged 18 and over claiming unemployment-related benefits, and the total workforce,¹ actually fell. Those excluded from the new definition and who, in another kind of definitions would be considered unemployed, became *invisible* (Vournas, 1999, p. 2). The author estimates that the reduction was from 170.000 to 190.000 unemployed people, a political strategy from the British government recognised on a report of the Bank of England:

......although unemployment is falling because there are more jobs, it is also true that much of the decline in the claimant count which has occurred since mid-1986 has been due to a shift in the unemployment/ employment relationship resulting from changes in the Government's range of Special Employment Meaures —especially the introduction of more rigorous availability for work tests and the rapid growth of the Restart programme (quoted in SSAC, 1991, p. 59)

Taken from Vournas (1999)

This change on the definition on unemployment generated a very interesting wave of research documents, some of them with technical comments and estimations, and some others with ideological or political critics. Levitas (1996) is one of the ones who combines all the previous considerations. Apart from considerations on the political role of unemployment statistics on the same sense of Vournas, Levitas criticises even the standard ILO unemployment definition, from the point of view of the classification of OLF (Out of the Labour Force) people who are older than 50 years old. On Levitas' terms, some part of the reduction of unemployment on the ILO definition is explained by unemployed discouraged people who stops on looking for jobs: "..unemployment carries a stigma of failure. And rather than aspire to the seemingly impossible, people will redefine their own situation. A definition as retired..... The line between 'unemployment' and 'non-employment' or 'economic inactivity' is imposed upon a reality that is far more complex and fluid." (Levitas, 1996, p. 60).

Total number of people in employment, self employed people, unemployed on the relevant year according to the definition, army forces, and people undergoing training-for-work programs.

1.B ISTAT AND ILO: THE CASE OF ITALY

We must remind that countries have the technical sovereignty on whether they ratificate or not the resolutions of the ICLS, which allows the countries to combine the technical issues suggested by ICLS and to adapt them to the specific features of national labour markets. Adaptations of this kind usually have happened related with the length of time that has passed since the unemployed person did his/hers last job-search activity.

On 1992, as a consequence of the activities of coordination from Eurostat, the Italian National Institute of Statistics (Istat) adopted the standard definitions of ILO employment status. From this adaptation process, the modification that raised the higher level of testing studies has been the one that reduced the allowed time for job-search activities. The Istat criterion requires, for a person to be classified as unemployed, that active steps for seeking work have been taken, disregarding of how far in the past this steps happened. This is a huge difference from the ILO-ICLS criteria, that states that one active search step should have happened within the last month. Given the profile of the Italian Welfare State system compared with the English one, this did not imply polemical fiscal or political debates, but in some sense it dramatically reduced the Italian unemployment rate: around 30% of Italian job seekers are not classified as unemployed: they are usually called *potential labour force*.

Among the first studies that challenged the accurateness of this new classification was the research of Rettore and Trivellato (1993) who tested the way that labour supply's behaviour have changed comparing the new and old definition and found that the estimation of a model of labour supply shows significative sensitiveness to the way the labour force state (i.e. employment status) is defined. On a posterior work, Battistin et. Al (2000) tested the accuracy of the new definition using Bayesian statistical methods to compare the similarities or differences between poblational groups classified according to the ILO-ICLS criteria and does not find special differences between unemployed people who did their last job-search more than a year ago, unemployed people who did their last search between two and 12 months ago and those ones who searched for a job in the last month. Finally, Viviano (2002) uses the methodology of Jones and Ridell (1999), which is based on the estimation of the transition probabilities among individuals classified on different states of the labour market (employed, unemployed, etc). The conclusion, in words of the author is that "....the standardised ILO definition of unemployment is too rigid for a relevant part of the Italian labour market".

2. CHANGE OF CONCEPTUAL AND TECHNICAL INSTRUMENTS FOR UNEMPLOYMENT IN COLOMBIA. EMPIRICAL CONSIDERATIONS

On year 2000 the Colombian Bureau of Statistics (DANE) finished a process that has been under development since 1996, and that was addressed to improve the quality, precision and opportunity of public employment statistics which comprised the following initiatives:

- Revision and updating of methodological frameworks and sample criterion.
- Revision of the operative processing procedures.
- Implementation of digitalised cartography to be used on field procedures.

The final steps of this procedure were the adoption of a Continual Collection System and the acceptation of the recommendations of the Sixteenth International Conference of Labour Statisticians (ILS) held in Geneva in September 1998. The whole new set of modifications has been applied on what is now called the Continual Household Survey (ECH). The acceptation of the ILS suggestions implied two main groups of changes on employment categories:

2.1 CHANGES ON EMPLOYMENT STATUS

From Unemployed to Employed: Non-Remunerated Familiar Workers (NRF's) who worked between 1 and 15 hours a week, and who previously were classified as unemployed are considered now as employed. The previous classification was considered a discrimination against women and young workers, who are the most frequent part-time workers.

From Unemployed to Inactive: On the new classification, individuals who were unemployed but explicitly considered themselves not immediately available to start to work, and those unemployed ones whose reasons to quit on active job-search were not considered valid ones (See Table 5, Appendix), are now considered Out of the Labour Force (i.e. inactive).

The main consequences of the change of concepts of the methodological framework are presented on table 1.

 $Table \ 1$ Old and New definitions of employment for Colombia (year 2000)

lology			New Methodology ECH	
	ployed		Employed	OLF's
Old Methoc ENH	Uneml	1. Not immediately available to start to work		
		2. Without a valid reason to quit on job-search		
		3. NRF's who worked between 1 and 15 hours the last week of reference.		

Notes:

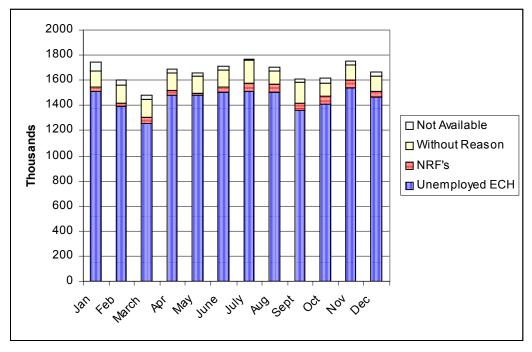
OLF's: Out of the Labour Force

NRF's: Non-Remunerated Familiar Workers

For purposes of comparison, the DANE run both the Quarterly (NHS) and Continual Household Methodologies all through year 2000. Afterwards, only the Continual Household Survey (ECH) has been applied, but given the structure of the questionnaire applied, it is possible to simulate both the employment structure of the ECH in terms using data from the ENH and the employment structure of the ENH from data of the ECH. Compatibility of time series for the main labour indicators have been estimated by Suárez and Buriticá (2002) and Lasso (2002).

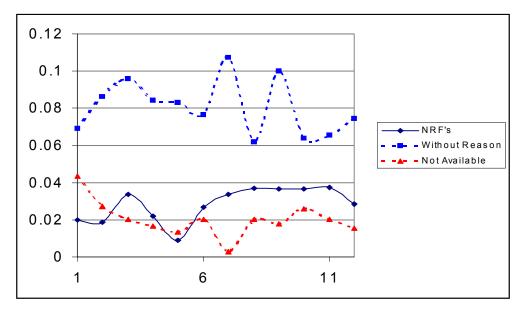
Figure 1, 3 and 4 show the progressive reclassification of unemployed from NHS to ECH: on Figure 1 we can see the different classifications of unemployed people before they are re-classified through ECH definitions. Despite of the optical effect of the figure, percentual composition of the components of unemployment is not stable although it does not show any seasonal pattern. However, there seems to be a very interesting pattern between two components: unemployed people who does not have a valid reason to quit on active job-search and unemployed people who

 $Figure \ 1$ Components of Unemployment by criteria. Year 2000



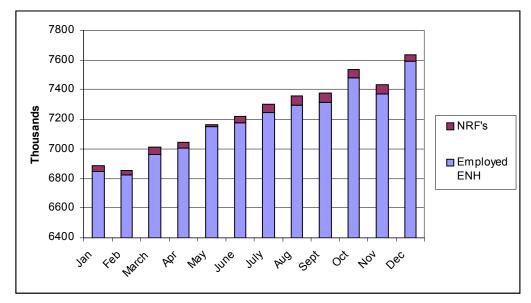
Source: DANE. Main seven Colombian cities.

 $Figure \ 2 \\$ Percentual Composition of Unemployment for three kinds of classifications



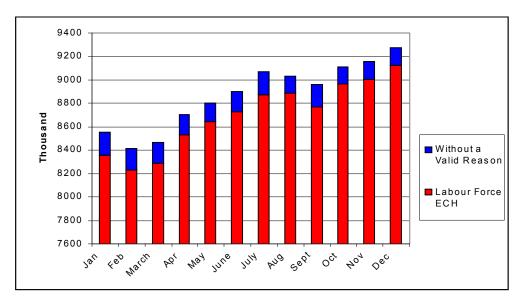
Source: DANE. Author's calculations. Main seven Colombian cities.

FIGURE 3
EMPLOYED WORKERS ACCORDING TO NEW CLASSIFICATION. YEAR 2000



Source: DANE. Main seven Colombian cities. NRF's: Non-Remunerated Familiar Workers

FIGURE 4
New composition of Labour Force. Year 2000



Source: DANE

are not available to start to work immediately. Figure 2 displays the percentual distribution of our three most interesting components before they are reclassified. The dotted lines present some kind of correlation (a significative correlation index of 0.538) that lead us to wonder if there is some kind of overlapping relationship between this two categories.

The first transformation was applied to NFR's who have worked between 1 and 15 hours on the week of reference. Those workers were reclassified from unemployed to employed. Figure 3 shows the magnitude of the transformation, which is not outstanding. This new employed workers accounted for around 2% of the total employment being 1.6% the lowest participation and 2.3% the highest one.

The last transformation involved unemployed workers without a valid reason to quit on active job-search and unemployed workers who were not immediately available to start to work. According to the advocacy of ILS, this workers should be reclassified as inactive (out of the labour force). Figure 4 shows the new composition of the labour force.

Resuming, this are the main consequences of the change of definitions:

- It reduced unemployment. In the twelve months of year 2000, an average of 216.000 people (12.9%) were no longer classified as unemployed.
- It increased employment. On average, through year 2000, 47.250 Non-Remunerated Familiar Workers, who previously were considered unemployed, increased the employment count. Employment grew out on 0.65%.
- It reduced labour participation. 168.250 unemployed workers without a valid reason to quit on active job-search, on average, were reclassified as out of the labour force.
- The effect on the unemployment rate is not straight. It depends on the combination of two different movements, unemployment and labour force status. Unemployment became reduced but in a lower proportion than the reduction on the labour force. For the whole period of year 2000, unemployment got reduced on around 2 percentual points.

4. Our main problem. Does it have theoretical support?

Our quantitative exercises will be addressed to test if this new qualification, once we analyse the specific features of the people involved, follows some kind of theoretical sense. In order to do that, we will apply most of the logic provided by Battistin et. Al (2000) trying to adapt it to the specific Colombian case.

At this moment we can summarise most of the technical instruments that we have been dealing with and try structure them on the conceptual instruments that they are suppose to resemble. Table 2 shows the different kinds of categorical indexes that we will proceed to reclassify according to the conceptual instruments on four different methodological surveys: the Old-Strict ILO criterion (1983), the Istat criterion (prior to 1992), the old Colombian ENH criterion (prior to year 2000) and the new Colombian ECH criterion.

Table 2

Categorical Definitions for Conceptual Instruments

Categorical Index	Features		
OCC	At least one hour of work in the week of reference (or some kind of attachment to a job with temporary absence)		
S1	No hours of work in the week of reference Looking for a job Last step for seeking work undertaken during the last month Immediately available for work		
S2	No hours of work in the week of reference Looking for a job Last step for seeking work (> one month, < = six months) Immediately available for work		
S3	No hours of work in the week of reference Looking for a job Last step for seeking work (> six months, < = one year) Immediately available for work		
S4	No hours of work in the week of reference No search step taken yet Immediately available for work		
NS1	No hours of work in the week of reference Has not searched for a job but has a valid reason to quit on job-searching (See Table ?, Classification of Reasons of Job-Search Discouragement) Immediately available for work		
NS2	No hours of work in the week of reference Has not searched for a job and does not have a valid reason to quit on job-searching Immediately available for work		
NS3	No hours of work in the week of reference Is not immediately available for work		
I	No hours of work in the week of reference Is not immediately available for work Has not searched for a job		

From now on our problem will be focused on the transition from unemployment to OLF, according to three kinds of criteria: active job-search, desire to work, and availability for work. In terms of job-search, the Colombian ECH methodology is mostly focused on the length of the period expend searching for a job than in the job-search method, so it allow us to overpass the critics to "passive" or "active" methods of search (Flinn and Heckman, 1983; Jones and Ridell, 1999), and their classification as unemployed activities or people who are out of the labour force.

On table 3, taking the procedure of Battistin et. Al (2000) as departure point, we will summarize the procedure used to adjust the three "true" conceptual instruments (T = E, employed; U, unemployed and OLF, out of the labour force) with the technical instruments defined by four different kinds of criteria, the "strict" ILO definition (1983-1998), the "mild" ISTAT definition (prior to 1992), the ENH Colombian definition (prior to 2000) and the ECH Colombian definition (2000 onwards).

Table 3				
CONCEPTUAL INSTRUMENTS AND TECHNICAL INSTRUMENTS				
IN FOUR DIFFERENT CRITERIA				

State	Т	"STRICT" ILO (83)	ISTAT (92)	ENH (76-00)	ECH (00)
Employed	E	OCC	OCC	OCC	OCC
Unemploye d	U	S1	S1, S2, S3, S4	S1, S2, S3, NS1, NS2, NS3	S1, S2, S3, NS1
Inactive	OLS	S2, S3, S4, NS1, NS2, NS3, I	NS1, NS2, NS3, I	I	NS2, NS3, I

If we define x as the vector of observable characteristics of each person in the reference population and f(x) its distribution, we would expect straightforward, the following equations to hold:

$$f(x \mid OCC) \neq f(x \mid S1) \neq f(x \mid I) \tag{1}$$

Now, given that:

- We expect that OCC,S1, and Ito be the accurate technical instruments of our conceptual instruments E,U and OLS.
- We expect that the set of observable characteristics *x* affects the probability of membership to each labour state, so each distribution would reflex that.

On our specific case, if the ECH unemployment definition holds, we would expect

$$f(x | R) = f(x | S1)$$
 with $R = S2$, NS1

And

$$f(x|R) = f(x|I)$$
 with $R = S3$, $NS2$, $NS3$

We can test an alternative situation where, if we suppose that S2, S3, NS1, NS2 and NS3 are a combination of features of unemployed and inactive (i.e. OLS) people. We thereby must have a convex combination of f(x|S1) and f(x|1) to be applied to S2, S3, NS1, NS2 and NS3. For example, for the case of S2 we should have:

$$f(X | S2) = f(X | S1)p(S1 | S2) + f(X | I)p(I | S2)$$

Where p(S1 | S2)+p(I | S2)=1, and p(S1 | S2) is a weight of the units exhibiting S2 who, given their X characteristics, would look like S1 kind of individuals.

The logic of our exercise is to take OCC, S2 and I as our reference groups and to seek for a weighted mean of f(x | OCC), f(x | S1), f(x | NS2), able to provide a reasonable approximation to f(x | R), R = S2, S3, NS1, NS2, and NS3.

5. Specification of the Model

Following Battistin *et Al.* (2000) the logic underlying the quantitative estimation is to compare our "hazy" categories with those ones clearly defined and identified in order to check whether they hold similar or rather different features. From the statistical point of view, taking $\mathfrak{F}_A = \{f(x \mid A), A \in \tilde{A}\}$ as the group of conditional distribution functions of the *n*-dimensional observable variable *x* indexed by a point A in a discrete set \tilde{A} . In terms of weighted means, we pretend to represent each member of \mathfrak{F}_R as a weighted mean of \mathfrak{F}_T , our "true" states. For the sake of comparability our specific control group will be focused on our groups S1, S2 and S3.

The rationale underlying our exercise is to check if our "hazy" groups S2 and S3 resemble as S1 (our true unemployed state) or as I (our true inactive state). In terms of the estimation with the EM algorithm, we will estimate the maximum likelihood of the weighted means of our distributions. The mechanic of the estimation starts with trial values $p(T \mid R)^{(0)}$, and subsequent values $p(T \mid R)^{(1)}$ procured from a recursive process:

$$p(T \mid R, x)^{(1)} = \frac{f(x \mid T) p(T \mid R)^{(0)}}{\sum_{t} f(x \mid T) p(T \mid R)^{(0)}},$$
$$p(T \mid R)^{(1)} = \sum_{x} f(x \mid R) p(T \mid R, x)^{(1)}$$

As Everitt and Hand (1981) explain, the set of (1) equations restrict our f(x|R), R=S2, S3, to be convex linear combinations of \Im_T . The test is to compare the estimations of the model with the estimation of our true distributions. Finally, by using the likelihood ratio obtained from the differences between the observed and expected frequencies we calculate a goodness-of-fit statistic.

RESULTS

The data used comes from the March and September 2000 stages of the National Household Survey (ENH). From the basic sample of the Survey we selected unemployed males between 25 and 35 years old, with some basic socio-economic variables: number of weeks of active-job-search, former occupational position, occupational position looked for, age and approved years of education. The gender and age criteria were applied in order to avoid problems of labour participation and discouragement.

Our estimation sample aloud us to compare S2 and S3 against S1 and I. This is, we are going to see if unemployed people who have been searching for a job more than one month and less than six (S2) or more than six months and less than one year (S3) look like our "true" unemployed people (the old ENH criteria holds) or they look like our "inactive" people (the ECH criteria holds). We do that using a heuristic index that provides tests for correlation. We take $\hat{f}(x|R)_1$ and $\hat{f}(x|R)_0$ as the estimates under the alternative and null hypothesis respectively. We can estimate

$$\cos \theta = \frac{\hat{f}(x | R)'_1 \hat{f}(x | R)_0}{\|\hat{f}(x | R)_1\|_2 \|\hat{f}(x | R)_0\|_2}$$

as the cosine of the angle between the vectors. A value close to zero would imply that the mixture model provides good fit to $\hat{f}(x|R)_1$. The rationale underlying the concept of correlation for cosine implies that this coefficient takes values between -1 and 1. The lower value (-1) shows completely opposite behaviour, while 1 would mean similar behaviour between the two estimates $\hat{f}(x|R)_1$ and $\hat{f}(x|R)_0$.

Table 4 shows the main results of our estimation. We find some interesting theoretical findings and some statistical regularities. For the main purpose of our exercise, to check whether the ENH - ECH unemployment criteria holds compared with the Strict ILO criteria, we find as Battistin et. Al (2000) do for the case of Italy, that people exhibiting S2 and S3 do not look like people who are out of the labour force (OLS), basically, they look like unemployed (S1) kind of people. This means that time spent on active-job-search does not seem to be a function of the main socio-economic features of unemployed people, although here we recognise the lack of detailed information of our sample. Nonetheless, having included years of education as one of the features of our samples, we would suggest that is not the *amount* of years of education what accounts for long periods of unemployment but qualitative features of the human capital endowments (specific working experience, for example).

Table 4
Estimation results for the March 2000 sample

True State	Indefinite State			
True State	S2	S3		
March 2000				
Unemployment (S1)	0.8654	0.7258		
Out of the labour force (I)	0.0000	0.1432		
Sample Size	352	250		
p-values	0.0008	0.1650		
cosine	0.8907	0.8361		
September 2	2000			
Unemployment (S1)	0.9251	0.8821		
Out of the labour force (I)	0.0038	0.1057		
Sample Size	420	262		
p-values	0.0583	0.0572		
cosine	0.9023	0.8645		

Comparing S2 and S3, we find that there is not specific influence on the six months of active-job search threshold if we judge some basic features of unemployed people. Those ones who have been looking for a job for more than six months and less than one year are not different from unemployed people with lower periods of search (S1, S2).

7. Some prudent remarks

On this document we have reviewed the quantitative consequences of the adoption of some of the main features of the ILO-ICLS criteria to the Colombian case. Afterwards, we have applied most of the methodological features of Battistin *et Al* (2000) to our qualitative analysis of the new unemployment definition in Colombia. We have found that for two of the main features of analysis, the ECH, on its definition of unemployment seems to obtain more empirical support from the time expend on active-job-search definition/out of the labour force definition of ENH than from the ILO-ICLS definition of it.

Watching all this as a whole, we would like to provide some remarks about the current situation of the ECH methodology on international terms. The adoption of the ILO-ICLS for the Colombian case, via the new classification of some features of unemployed people implied a reduction of the unemployment rate of about two percentage points. However, the ECH seems to be in a middle point between the Istat definition and the ILO-ICLS definition, as the first one seems a rather generous definition of unemployment and the last one, according to our analysis, does not seem to have empirical support. Nonetheless, taxonomic classifications are never perfect as it is hard to account for heterogeneity, a very important feature of labour markets.

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APENDIX

 $\label{eq:Table 5} \textbf{Classification of Reasons of Job-Search Discouragement}$

Valid Reasons	Invalid Reasons	
There is no job available on the city	I consider myself too young or too old	
You are waiting to be called	Right now I don't want to get a job	
I don't know how to search for a job	Familiar responsibilities	
I'm tired of looking for a job	Health Problems	
I cannot find a job suitable to my profile	I am studying	
I am waiting for the high season		
I do not have the experience required	Other Reason	
I do not have resources to start an enterprise		
The employers consider me too young or too old		

 $\begin{tabular}{ll} Table 6 \\ Criteria of availability to work and working status \\ \end{tabular}$

Working Status	Wants to work and is available immediately to start to work	Does not want to work or is not available immediately to start to work
Works	Underemployed Worker	Employed Worker
Does not work	Unemployed Worker	Inactive Worker (OLF)

Source: ILO 1998