

**ACCURACY AND RELIABILITY OF SPANISH REGIONAL
ACCOUNTS (CRE-95)**

VERÓNICA CAÑAL FERNÁNDEZ

FUNDACIÓN DE LAS CAJAS DE AHORROS
DOCUMENTO DE TRABAJO
Nº 480/2009

De conformidad con la base quinta de la convocatoria del Programa de Estímulo a la Investigación, este trabajo ha sido sometido a evaluación externa anónima de especialistas cualificados a fin de contrastar su nivel técnico.

ISSN: 1988-8767

La serie **DOCUMENTOS DE TRABAJO** incluye avances y resultados de investigaciones dentro de los programas de la Fundación de las Cajas de Ahorros.
Las opiniones son responsabilidad de los autores.

ACCURACY AND RELIABILITY OF SPANISH REGIONAL ACCOUNTS (CRE-95)

Verónica Cañal Fernández*

Abstract

Are estimates accurate? Are these data reliable? Questions like these are important to the producers and users of any set of statistics. This article studies the accuracy and reliability in the Gross Value Added (GVA) at basic prices, 1995 Base. All these tasks were developed within the Spanish Regional Accounts (CRE-95) by means of a revision method. This method claims that the proximity of the first estimate to the definitive one can be a clue as to its quality. Many studies investigate the magnitude and nature of errors contained throughout the National Account System estimates; however, economic literature offers no option for judging accuracy and reliability in the main regional account aggregates, and so the methodology proposed by Mankiw *et al.* (1984) and Mankiw and Shapiro (1986) is adopted to assess the accuracy and reliability of the review process during 1999 in the GVA at basic prices according to Autonomous Communities (NUTS-2). This study analyzes five approaches that shed light on the accuracy and reliability of these revisions: examination of statistical measures of sampling biases, variances, comparison with other revisions) and analysis of revisions.

Key words: Spanish Regional Accounts; Gross Value Added; Accuracy; Reliability; Revisions.

JEL Classification: C10; E00; E01.

Corresponding author: Verónica Cañal Fernández, Department of Applied Economics, University of Oviedo, Faculty of Economics and Business, Avda. del Cristo s/n, 33006 Oviedo. Phone: 985 103716 e-mail: vcanal@uniovi.es

*Department of Applied Economics. University of Oviedo.

1. Introduction

This article presents prima facie evidence for the accuracy and reliability in the Spanish Regional Account System, 1995 Base (CRE-95). The concern lies mainly with data regarding Gross Value Added because they form the basis for the calculation of regional Gross Domestic Product (GDP) which is currently a core variable within the context of European Union funds. Because of administrative use of regional account estimates for the eligibility for regions objective 1 of the Structural Funds, requirements for the accuracy of regional GVA are high. Apart from this specific purpose, European statisticians have to comply with the quality commitment as recently laid down in the European Statistics Code of Practice. In Spain, the evolution in regional economy is attracting remarkable interest and has become a demanding agenda for the National Statistics Institute (INE) to estimate the main regional account aggregates in order to satisfy the users' basic needs. As a result, a methodology to assess the quality of sequential estimate process in the GVA at basic prices is proposed, offering the users information on the accuracy and reliability needed to guarantee subsequent estimates. The information used by way of a foundation belongs to the first estimate: the provisional, advance and definitive one for GVA in 1999 expressed in growth rates.

As a framework, this research uses the study carried out by Mankiw et al. [1984] and Mankiw and Shapiro [1986] on the estimates review of the quarterly Gross National Product in the United States from 1975 to 1982. In this approach, the underlying idea is that the closeness of the earlier to the final estimate review should indicate the highest estimate quality. Although this does not solve the problems of accuracy and reliability, this method is an initial approach to ascertain whether the first estimates are suitably oriented according to the final results- that is to say, if the first estimates are efficient approaches to the definitive results.

The accuracy of estimate analysis is based on comparison between the initial estimate and the definitive one (it refers to the entire measurement error), whereas the reliability analysis consists of assessing the successive revisions of estimates in the GVA- that is, to compare each estimate with the next closest one (assessing reliability refers to revisions and to the closeness of the initial estimated value(s) to the subsequent estimate values). Although accuracy and reliability are not necessarily related, they are connected through revisions. When estimates are subject to consistent revisions, the magnitude of the estimated error is smaller (statistics become more reliable) and the estimate approaches a real value (statistics should be exact).

With this aim in mind Mankiw and Shapiro introduce the possibility of news (new information) and noise.

This article is organized as follows. In the second section I briefly describe the major source of data used to estimate GVA and the timing of the GVA revisions. The data analyzed in the remainder of the article are also described.

Mankiw, Runkle and Shapiro's methodology (MRS) is described in the third section, which in the fourth section is used to characterize the GVA revision process by two polar cases labelled news and noise. I show that the information content in the early estimates is less than one might suppose. In particular, the standard deviation of the revision of GVA growth is consistent with the hypothesis that earlier estimates are efficient predictions of subsequent estimates, given that the standard deviation increases from the first estimate.

The final section contains the main conclusions drawn from the statistical analysis. This finding implies that the preliminary estimates are efficient given the available information- that is to say, every new figure is generally the best available estimate of the final value considering the available information at that time. Hence, it is also possible to affirm that INE uses the right statistical procedure to carry out the regional estimates.

2. The relevance of Spanish National Accounts

One of the main objectives of the research was to examine the accuracy and reliability of regional GVA which is used in the process of calculating regional GDP, which in turn feeds into calculations used to determine the allocation of Structural Funds, i.e. based on the 75% rule. Eurostat currently uses a straight-line nowcast to project forward a region's share of national GVA, and then uses more up-to-date national accounts to infer the level of regional output. However, such a methodology ignores any past movement in a regional structure, i.e. a region could have a rapidly rising (falling) share of national output, and yet this is not taken into account when projecting forward to the year needed for policy analysis. Indeed, the method is akin to assuming that regional GVA structure is characterised by a random walk, whereas the best one period ahead forecast that can be achieved is the level in the current period.

The first studies of Spanish Regional Accounts were produced due to the considerable demand for regional information that followed the creation of the *Estado de las Autonomías* outlined in the Spanish Constitution of 1978. This would allow the different Autonomous Communities to assume, among others, political, economic and

social responsibilities. Hence, regional policy has become of great importance and has made a contribution on a national level.

Furthermore, the Constitution specifies a new model for income distribution that recommends harmonious development between the different regions, reducing the differences between them (Article 131.1. *The State shall be empowered to plan general economic activity by an act in order to meet collective needs, to balance and harmonize regional and sectorial development and to stimulate the growth of income and wealth and their more equitable distribution*).

Consequently, it is necessary to implement mechanisms for financing the regions in order to develop the responsibilities delegated to the different territories by the State and to correct any imbalances in income between them. The *Ley Orgánica de Financiación de las Comunidades Autónomas* (LOFCA) was enacted in 1980 to achieve these objectives.

This law established different ways for financing the regions based, for example, on the levying of taxes by the State or in different agreements with the regions. Moreover, it provided different tools for interregional solidarity that permit the redistribution of income between the different regions and the correction of regional imbalances. In order to achieve this, the *Fondo de Compensación Interterritorial* (FCI) was created to finance a part of public investment expenditure in the comparatively less developed regions, stimulating the creation of income and wealth. Initially, all regions had access to it, but nowadays, only those that are within Objective 1¹, or are being phased-out of it, have access to the Fund. The introduction of the Single European Act in 1987 meant a strengthening of economic policy on a European level, establishing the principle of social and economic cohesion via aid to the countries and regions with a lower level of income per inhabitant (Objective 1). The need for macroeconomic information from the different regions strengthened the development of regional accounts, which were established in a similar way in all the countries of the European Union.

3. The data

In order to conduct our empirical analysis, I needed to carry out observations of data revisions. This required observing both the current or revised version of the data as well as the data as it was initially announced by the statistical institute.

Within the scope of Spanish statistics the INE is responsible for carrying out official Regional Accounting. This represents the Spanish Regional Account series, 1995 base

¹ Regions with a GDP per inhabitant below 75 per cent of the European average.

from the year 2000. In every Autonomous Community (seventeen Spanish regions), all the estimates for 1999 were compiled on this base and the nominal and real growth for the GVA were worked out. Finally, revisions were calculated following this procedure².

To carry out Spanish Regional Accounts according to the previously agreed agenda, 5 years were needed in order to turn the data into a definitive estimate. An illustration of the review in the added process is shown in Table 1 and Table 2, and provides a visualization of the existing connections between publication periods among several estimates. The timetable established for one year results t, is as follows:

- The first approximate estimate (E) for the year 1999 was published in August in the year t+1-that is to say in 2000.
- The approximate advance estimate (A) for the year 1999 was published in July in the year t+2- that is to say in 2001.
- The provisional estimates (P1, P2) for the year 1999 were published in July in the years t+3 and t+4, therefore they correspond to 2002 and 2003.
- The final estimate (D) for the year 1999 was published in July in the year t+5- that is to say in 2004.

Table 1. Timetable established for CRE-95

Published in 2000	Published in 2001	Published in 2002	Published in 2003	Published in 2004
1995 (P2)	1995 (D)	1997 (D)	1998 (D)	1999 (D)
1996 (P2)	1996 (D)	1998 (P2)	1999 (P2)	2000 (P2)
1997 (P1)	1997 (P2)	1999 (P1)	2000 (P1)	2001 (P1)
1998 (A)	1998 (P1)	2000 (A)	2001 (A)	2002 (A)
1999 (1 ^a E)	1999 (A)	2001 (1 ^a E)	2002 (1 ^a E)	2003 (1 ^a E)
	2000 (1 ^a E)			
Excel file (.xls)	Excel file (.xls)	Excel file (.xls)	Excel file (.xls) Pc-Axis ³ file (.px)	Excel file (.xls) Pc-Axis file (.px)

² The data base is available to anybody who wants to use it.

³ PC-Axis is a program developed for the handling of statistical tables. It provides versatile possibilities for editing even large tables, changing their structures, performing calculations or converting file formats. National Statistics Institute (INE) offers a number of charged and free services for retrieving data from its databases via the Internet onto the user's own PC in PC-Axis format.

Table 2. Schedule of GVA estimates

Name of estimate	Timing of estimate	Variable name
First estimate	July 2000	E
Advance estimate	July 2001	A
First provisional estimate	July 2002	P1
Second provisional estimate	July 2003	P2
Definitive	July 2004	D

The timetable set for this structural statistical product is mainly characterised by the fact that the estimates are subject to a process of revision and breakdown until they become the definitive ones. This process is determined by the regional account process dependency and at the same time by the results in the National Accounts and basic statistical information.

In order to characterize statistical revisions of the GVA at basic prices (constant and current prices) estimates, the following notation is used to analyze the growth rates that are calculated from the Spanish Regional Accounts estimates according to level.

I analyze five estimates of the GVA growth rates (see Table 3). Table 4 shows the inter-annual growth rates in GVA at current and constant prices calculated from the series according to level: the first estimate in the year 1999 is calculated from the advance estimate in 1998, the growth rate in the advance estimate in the year 1999 is calculated from the first provisional estimate in the year 1998, the ones from the first provisional estimate in the year 1999 from the second provisional estimate in the year 1998, the growth rate in the second provisional estimate in 1999 from the definitive estimate in 1998 and finally, the growth rate in the definitive estimate in the year 1999 is calculated from the definitive estimate in the year 1998.

$$\Delta GVA = \left(\frac{GVA_t - GVA_{t-1}}{GVA_{t-1}} \right) * 100$$

(1)

Table 3. Definition of variables

GVA_i^D	Definitive estimate of GVA growth rate for the Autonomous Region <i>i</i> .
GVA_i^I	Initial estimate GVA growth rate for the Autonomous Region <i>i</i> , where I = E, I = A, I = P1 or I = P2.
R_i	Revisions, difference between successive revisions (in terms of reliability) or difference between initial and definitive estimates (in terms of accuracy).
TE	First estimate of GVA growth rate.
TA	Advance estimate of GVA growth rate.
TP1	First provisional estimate of GVA growth rate.
TP2	Second provisional estimate of GVA growth rate.
TD	Definitive estimate of GVA growth rate.

Table 4. GVA interannual growth rates for 1999 (%)

Autonomous Communities	Current (C)					Constant (K)				
	TE	TA	TP1	TP2	TD	TE	TA	TP1	TP2	TD
Andalucía	6.00	7.15	6.90	6.58	6.17	3.15	4.53	4.14	4.27	3.87
Aragón	6.30	4.36	4.62	4.65	4.07	3.16	2.05	2.38	2.67	2.05
Asturias (Principado de)	6.19	4.26	3.31	2.58	1.85	2.84	1.77	1.11	0.75	0.18
Balears (Illes)	7.31	5.45	6.07	9.05	8.99	3.45	2.29	2.84	4.72	4.52
Canarias	7.08	7.85	7.93	10.17	10.01	3.61	4.88	4.70	6.47	6.16
Cantabria	6.61	7.57	8.43	7.99	7.03	3.50	4.55	5.31	5.03	4.18
Castilla y León	5.96	5.50	5.71	5.69	5.62	2.91	2.74	3.23	3.48	3.47
Castilla-La Mancha	5.64	3.09	4.04	3.45	4.53	2.72	0.51	1.06	0.84	2.09
Cataluña	6.10	6.09	6.69	6.28	6.42	3.30	3.76	4.04	3.99	4.02
Comunidad Valenciana	6.41	6.58	6.61	6.44	6.35	3.72	4.01	3.99	4.19	4.08
Extremadura	6.22	7.78	7.97	7.72	7.50	2.77	4.76	5.74	5.46	5.14
Galicia	6.26	5.65	5.28	5.37	5.95	3.12	3.25	3.11	3.35	4.09
Madrid (Comunidad de)	6.17	7.11	6.69	6.24	6.49	2.88	4.64	4.60	4.03	4.21
Murcia (Región de)	6.22	5.54	5.52	5.22	6.04	3.34	2.84	3.06	3.05	3.89
Navarra (Comunidad Foral de)	5.84	5.27	4.78	4.79	5.27	2.94	3.34	2.94	2.95	3.43
País Vasco	6.05	6.72	6.84	7.20	7.26	2.96	4.21	4.58	4.78	4.90
Rioja (La)	6.00	3.87	4.21	5.92	6.04	3.38	1.38	1.84	2.60	2.86
Ceuta y Melilla	5.92	2.10	5.96	7.23	7.63	2.64	-1.60	3.16	4.46	4.80
Spain	6.19	6.28	6.34	6.28	6.33	3.16	3.74	3.84	3.91	3.94

Source: *Spanish Regional Account* 1995 Base, National Statistics Institute (published estimates in 2000, 2001, 2002, 2003 y (and) 2004 corresponding to year 1999).

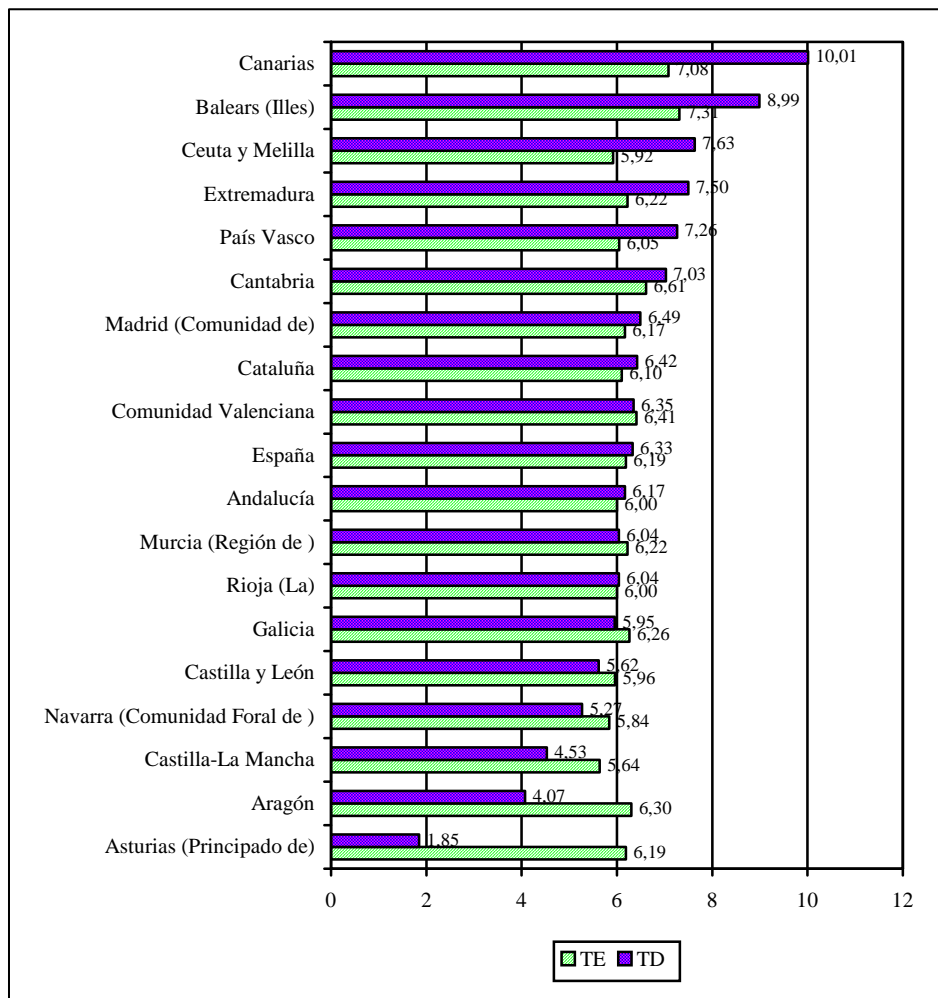
The purpose of this study is to analyze the regional GVA data currently available in the INE database in order to evaluate the data for accuracy and reliability and analyze the data across regions. The aim is to analyze these revisions in the estimates for the regional account process within the Spanish economy. These estimates are made by INE via a set of statistical procedures to determine the accuracy and reliability of the regional statistics.

The variability of growth rates leads us to think that for some users statistical data is not relevant for the purpose of judging the economic situation in the autonomous community; therefore it is just accepted or rejected depending on their opinion; and so the publication of new data is an excuse to insist on the assessment of the accuracy and reliability of statistics but does not give grounds for further thinking.

Graph 1 allows the accuracy to be judged graphically- that is to say, the existing variability between the valuation of growth for the first estimate and the definitive one. The most outstanding difference corresponds to the *Principado de Asturias*, where the first estimate is 6.19% and the definitive one 1.85%. I have to point out the case of *Canarias*, where the growth rates range between 7.8% for the first estimate and 10.01% for the definitive one.

The situation is different for constant prices (see Graph 2). Although in *Asturias* the growth rates corresponding to the different estimates decrease when the review process is applied, this decrease is not as great as it is in current prices (it ranges from the 2.84% in the first estimate to 0.18% in the definitive one). I have to emphasize the case of *Extremadura*, where from the first estimate to the definitive one, the growth rate increases by 2.37 percentage basic points.

Graph 1. Accuracy: comparison between the first estimate and the definitive one (current prices)



If the real growth rates in GVA is examined for different branches of activity for the *Principado de Asturias* or *Canarias* (see Table 5 and Table 6), I have to pinpoint the variability in terms of level and sign, which outline the need for strong methodology to judge the accuracy and reliability of the different estimates to ensure data quality. The knowledge of errors will help to use statistics correctly because the user can see the decreases of data quality as the disaggregation level increases.

Graph 2. Accuracy: comparison between the first estimate and the definitive one (constant prices)

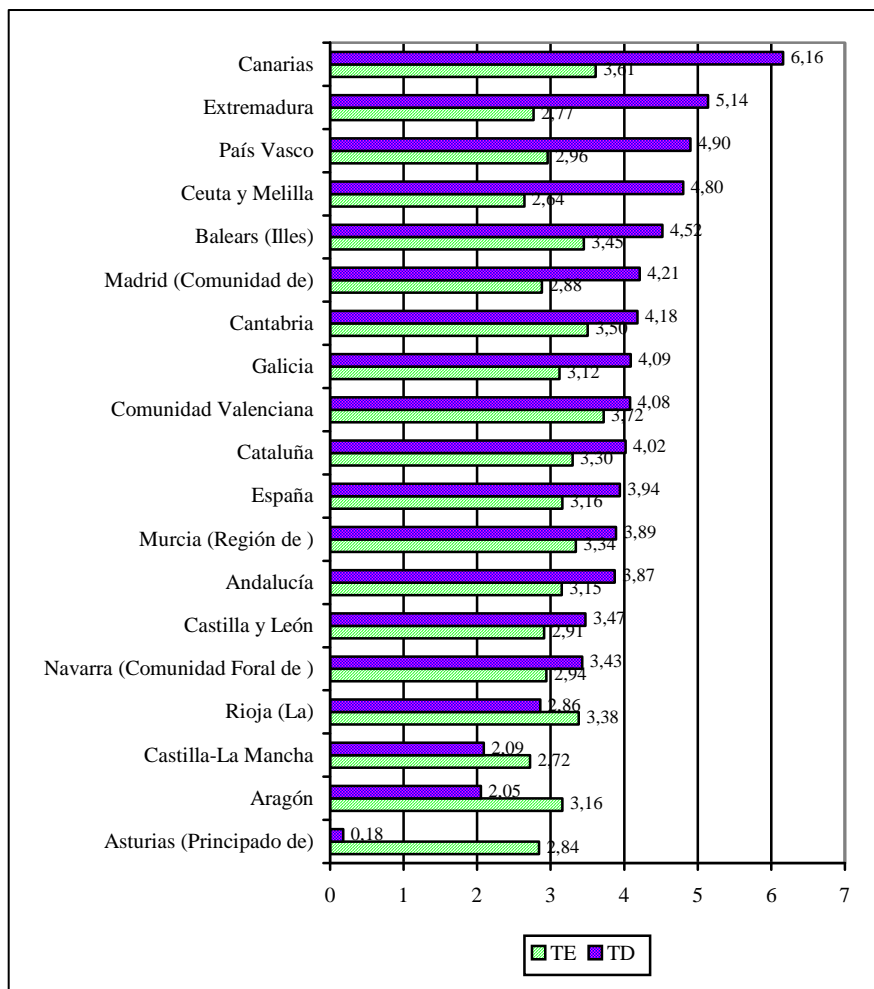


Table 5. GVA growth rate at basic prices in the Principado de Asturias according to branch of activity (constant prices, 1995 Base)

A6	Branch of activity	1999				
		TE	TA	TP1	TP2	TD
1.1	Agriculture, livestock and fishing	4.16	4.05	-3.29	-2.79	-2.85
2.1	Energy	-3.79	-4.37	-2.34	-1.79	-2.19
2.2	Industry	0.84	4.39	4.06	5.16	2.18
2.3	Construction	4.69	-0.43	0.15	0.09	0.02
3.1	Market services	4.43	1.37	0.61	-0.47	-0.45
3.2	Non-market services	1.03	2.69	0.79	-0.17	-0.18
	SIFMI	-1.54	-6.35	-6.99	-7.78	-8.32
	TOTAL	2.84	1.77	1.11	0.75	0.18

Source: *Spanish Regional Account* 1995 Base, National Statistics Institute (published estimates in 2000, 2001, 2002, 2003 and 2004 corresponding to year 1999).

Table 6. GVA growth rate at basic prices in Canarias according to branch of activity (constant prices, 1995 Base)

A6	Branch of activity	1999				
		TE	TA	TP1	TP2	TD
1.1	Agriculture, livestock and fishing	3.12	-11.18	-12.76	-12.71	-12.75
2.1	Energy	2.25	2.21	2.85	2.45	-7.18
2.2	Industry	1.67	2.52	2.73	4.20	6.09
2.3	Construction	10.82	18.51	18.20	18.44	18.35
3.1	Market services	3.69	4.11	3.61	6.35	6.22
3.2	Non-market services	0.75	3.54	4.51	4.42	4.43
	SIFMI	2.83	-3.50	-3.69	-2.54	-2.85
	TOTAL	3.61	4.88	4.70	6.47	6.16

Source: *Spanish Regional Account* 1995 Base, National Statistics Institute (published estimates in 2000, 2001, 2002, 2003 and 2004 corresponding to year 1999).

4. The MRS Approach

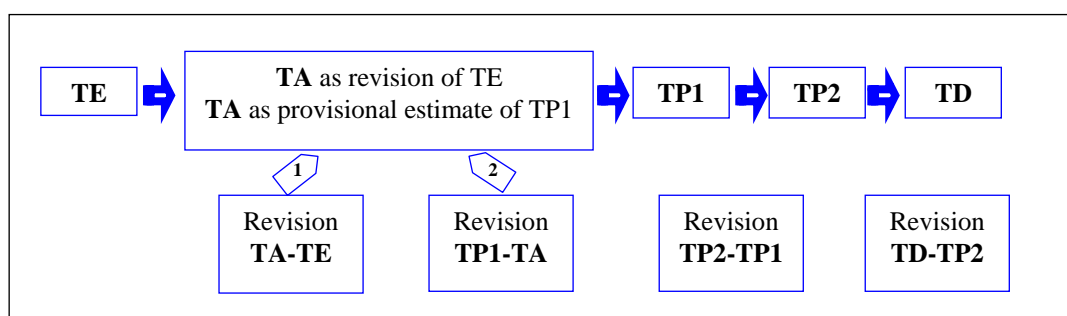
Using the methodology introduced by Mankiw, Runkle and Shapiro [1984, pp. 17-19] and Mankiw and Shapiro [1986, p. 6], I evaluate whether the review processes are *new information* (news) or *noise*.

Under the *noise* assumption the revisions (R_i) are biased, and so these revisions are correlated to the initial estimates. The initial estimate contains information that might be used to predict future revisions.

Unlike this hypothesis it is the *new information* belief according to which the revisions are not biased, and so the revisions and initial estimates are not correlated.

Now (see Figure 1), a provisional estimate⁴ can be considered as an observation of the reviewed series with a measurement error or *noise* that is not correlated with the final estimate but with the initial one. Later estimates will reduce or discard this error.

Figure 1. Relation between each GVA estimate and revisions



⁴ The provisional estimates are subject to later revisions.

On the other hand a provisional estimate can be considered an efficient prediction in the reviewed series. In this case consecutive estimates reflect *new information* to be incorporated after the initial estimate is published; that is to say, later estimates will decrease or cut out prediction error as new data or new information is gathered. Under this assumption, revisions reflect prediction errors instead of measurement errors. These two explanations for the provisional estimate have different implications in terms of revision quality.

Whether the revisions reflect measurement errors or errors generated by efficient predictions depends on the statistical procedures used for INE. Estimate revisions have intermediate estimates considered simultaneously as a review in the previous estimates and as a provisional one for later revisions- for instance, an intermediate estimate for GVA, TP1 is also good as a review for the previous estimates (TE and TA) and as a provisional estimate in later revisions (TP2 and TD).

The underlying idea is that if initial estimates constitute efficient predictions, then they should have a smaller variance (standard deviation) than the final estimate. So if the data review process includes only *new information* or *news*, then a systematic relation between the initial estimates and later revisions will not exist. In fact, a negative relation between the revisions and the initial estimates should be expected. On the other hand, when there is only *noise* in the information, the result is an excess of variance in the initial estimates with regard to the later ones, this variance will be declining as the series review process improves.

An important consideration is the concern about the methods and criteria used to analyze the accuracy and reliability for the provisional estimates. Much economic and statistical literature on the National Account System revisions tends to establish the accuracy and reliability on the provisional estimates on the statistical measurement base, which are descriptive but not satisfactory for provisional data property analysis. To give a suitable evaluation of the innovations introduced by the review process, the analysis must be integrated by using econometrics.

Theoretically, the methodology can be presented as follows. In terms of accuracy, the definitive annual estimate (current and constant prices) on the growth rates of total GVA at basic prices, GVA_i^D will be equal to the growth rate on the initial estimates, GVA_i^I plus a term of review, R_i where $i=1, 2, \dots, 17$.

$$(2) \quad GVA_i^D = GVA_i^I + R_i$$

$$(3) \quad R_i = GVA_i^D - GVA_i^I$$

If the revisions are biased (*noise*), then, the later estimates on GVA will show new information received, after initial estimates have been published. There will be a strong relation between revisions, R_i and initial estimates. GVA_i^I .

If, on the other hand, the revisions are unbiased (*new information*), then there will be an irrelevant correlation between revisions and initial estimates (GVA_i^I). As a result, the initial estimates do not contain information to predict future revisions.

In terms of reliability the methodology is the same, but I compare each review with the later one.

Mankiw and Shapiro [1986, p 10-15] use the efficient prediction test developed by Mincer and Zarnowitz [1969]. This test is based on the rational expectations theory in order to confirm the hypothesis of *new information* versus *noise*. Later, Holden and Peel [1990], together with Barrionuevo [1993], among other authors (York and Atkinson, [1997]) will use the same procedure to judge the bias and statistical efficiency.

They estimate two classic models of linear regression where the revisions are lineal functions of the initial GVA estimates (equivalent to the efficiency tests β used by Holden and Peel [1990] and Barrionuevo [1993]) (α) and the revisions are also lineal functions for the revisions of the previous period (similar to the test ρ used also by Holden and Peel [1990] and Barrionuevo [1993])

$$(4) \quad R_i = \alpha + \beta GVA_i^I + u_i$$

$$(5) \quad R_{i,t} = \alpha + \rho R_{i,t-1} + u_i$$

where $I = TE, TA, TP1$ and $TP2$, α is the intercept, which indicates the bias in the revisions β is the regression coefficient and measures the initial estimate impact on the review behaviour indicating the existing relation between initial estimates and the revisions. Finally, u_i is the random adjustment.

Holden and Peel [1990, pp. 120-127] and Barrionuevo [1993, pp. 29-30] suggest the following procedure to prove the absence of bias and the efficiency I will apply to the statistical revisions for the estimates in the Spanish Regional account. The absence of bias test is carried out by executing a least-squares regression on the review regarding a constant term. Assuming there is total bias absence, the estimate should not be statistically different from zero, and as a result, the null hypothesis is accepted. If the null hypothesis is rejected, revision errors would be able to be reduced, adjusting initial

figures throughout the intercept. In addition, unbiasedness is also important because it is a necessary condition for efficiency.

The efficiency test needs to verify the following condition:

- In a regression by ordinary least-squares (OLS) in the revisions regarding the initial estimate, the associated coefficient is zero (test β).

$$(6) \quad R_i = \alpha + \beta GVA_i^I + u_i$$

- In a regression by OLS in the revisions regarding the previous period, the coefficient is zero (test ρ). This matter involves the fact that an error in the estimate per review should not be strongly related to estimate error at a previous period.

$$(7) \quad R_{i,t} = \alpha + \rho R_{i,t-1} + u_i$$

When a null hypothesis is accepted, this is, β and ρ are together not significant, the initial estimate is an efficient prediction for the final one. Otherwise, if β or ρ are significantly different from zero, this shows us an inaccurate prediction. This implies a reduction in the variance (standard deviation) and as a result the temporary estimate may improve [York y Atkinson, 1997, pp. 242-245].

Tests β and ρ can provide an indication about the nature of the inaccuracy in the initial estimate and the adjustments needed to improve it. Barrionuevo [1993, p. 30] states that if β is zero but ρ is not, the variance in the revisions can reduce adjustment of the estimate through ρ . In this case, past estimate errors are currently repeated. On the other hand, if β is different from zero but ρ is not, the review variances can improve adjustment of the estimate through β ; in this way revisions contain information not included in the initial estimate. Both coefficients are unlike zero- the lack of accuracy is due to the way new information is included in the mentioned values.

The conventional method tells us that the prediction is efficient if the estimate coefficients are $\alpha = 0$ and $\beta = 1$. Furthermore, this method is used to assess the lack of bias. It is proved [Barrionuevo, 1993, p. 29] that under rational expectation hypothesis, this is a necessary, albeit insufficient condition of efficiency, because a set of predictions could satisfy this restriction without this minimum variance. Hence, this is all about confirming the method $\alpha = 0$ and $\beta = 0$; Holden and Peel [1990, pp. 120-127] prove this condition is necessary and sufficient.

If revisions are unbiased (*new information*) the predictions are efficient (rational). This must be consistent with the idea that the prediction errors present in the estimates

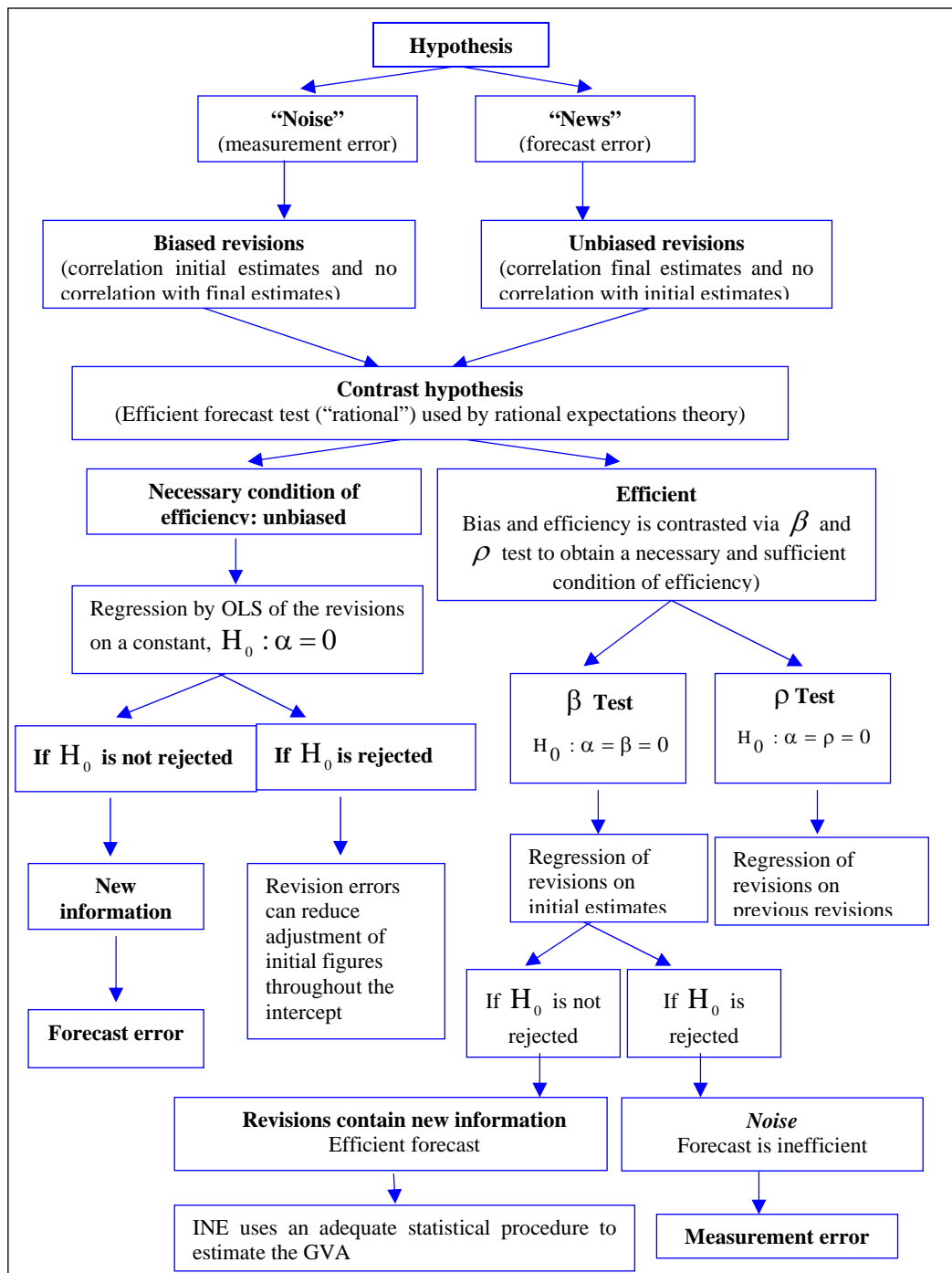
are corrected by adding new information. The revisions (R_i) and the initial estimates (GVA_i^I) are not going to be correlated (this condition is true because $\beta = 0$), and so the following assumption should be confirmed:

$$(8) \quad H_0 : \alpha = \beta = 0$$

If I reject the null hypothesis, this means that R_i and GVA_i^I are correlated, therefore the revisions will be biased. There will be a measurement error that could be corrected in later revisions.

Considering these assumptions I evaluate the statistical properties in the provisional estimates and the revisions in terms of lack of bias and efficiency. By way of a summary, Figure 2 shows how the process has been developed in this article.

Figure 2. MRS method



5. Main Results

This paragraph shows the first assessment of the evolution in the growth rates for the accounting revisions in GVA aggregates at basic prices (constant, K , and current prices, C) for each Autonomous Community in Spain during 1999.

The samples correspond to the 17 Autonomous Communities in Spain, Ceuta and Melilla, have not been included in this study due to their residual character in the official

statistics. Although it is too small a sample to provide firm conclusions and, therefore, validity of the test is reduced, the results can be used to illustrate later studies with greater sample sizes.

5.1. Descriptive analysis for the revisions

Firstly, a set of statistical instruments to assess the significance in differences between the first estimates and the definitive ones is used.

Table 7 shows that the characteristic deviation in the real and nominal growth in GVA in the 17 Spanish regions changes from 0.416 in the initial estimate up to 1.828 in the final estimate and also from 0.305 up to 1.363. If initial estimates are efficient predictions for the last ones, this would be the case in which the last estimates must have a lower standard deviation with regard to the definitive one, and so if the review process adds new information, a systematic relation between initial estimates and the definitive ones will not exist, therefore, there will be no measurement errors.

In this case the growth rates variability is consistent with the assumption of efficient predictions that the initial estimates are efficient predictions for the last ones, because the deviation increases from the first estimate to the definitive one (in terms of accuracy). Nevertheless, a decrease occurs between the second provisional estimate and the definitive one (in terms of reliability) which can suggest the existence of a measurement error (*noise*) in the corresponding review. This point will be analyzed later by suitably efficiency prediction tests.

Table 7. Means and standard deviations of GVA growth rates

	Mean		Standard deviation		Relative typical deviation	
	C	K	C	K	C	K
TE	6.256	3.161	0.416	0.305	0.066	0.096
TA	5.872	3.264	1.421	1.321	0.241	0.404
TP1	5.976	3.451	1.475	1.366	0.246	0.395
TP2	6.196	3.684	1.899	1.496	0.306	0.406
TD	6.211	3.714	1.828	1.363	0.294	0.366

The characteristic deviations (see Table 8) in the revisions range from 1.058 for the change from the first provisional estimate to the second provisional one (TP1-TP2) to 1.592 for the first estimate and the definitive one (TE-TD) at current prices and from under 0.676 up to a high 1.382 for the same review at constant prices. As a result, the typical deviations in the revisions are relatively higher than the proper specific deviations for the growth rates. Therefore, an estimate growth rate is associated with a wider interval of confidence. For instance, if the specific deviation in the review between the advanced estimate and the definitive one for current prices is 1.592

percentage points, if the growth rate in TA is 1.421 then I can only state that the final estimate (TD) will be within (-0.171;3.013). The best gap for 95% will be wider and therefore less accurate than the previous one and would range between (- 1.763 and 4.605).

Table 8. Standard Deviation of Revisions in GVA growth rates

	TA		TP1		TP2		TD	
	C	K	C	K	C	K	C	K
TE	1.311	1.284	1.345	1.331	1.621	1.382	1.592	1.275
TA			0.499	0.446	1.271	0.822	1.379	0.941
TP1					1.058	0.676	1.171	0.819
TP2							0.533	0.556

Table 9 shows the coefficients of correlation between the revisions and the data available before and after the provisional estimates; this information enables the revisions informative content to be embodied. Bearing in mind table 8, the correlation between revisions and provisional estimates must show an assumption of error measurement while the existing correlation between the revisions and the reviewed series should demonstrate a prediction error in the hypothesis. The four increased revisions are displayed in lines while the consecutive estimates are in columns. The level of significance for the correlation coefficients under the no correlation hypothesis⁵ is displayed in brackets. The blue triangle represents the correlations between the revisions and the reviewed estimates; under the null hypothesis with respect to the fact that revisions are errors generated by efficient predictions, this correlation must be zero. The orange triangle shows the existing correlations between the revisions and the provisional estimates. Under the error measurement assumption these correlations should be zero.

Table 9. Correlations between GVA growth rates and revisions

	TE	TA	TP1	TP2	TD	TE	TA	TP1	TP2	TD
	C					K				
TA-TE	0.114 (0.663)	0.957** (0.000)	0.880** (0.000)	0.573* (0.016)	0.517* (0.034)	0.003 (0.990)	0.973** (0.000)	0.919** (0.000)	0.751** (0.001)	0.683** (0.002)
TP1-TA	0.162 (0.536)	-0.065 (0.803)	0.276 (0.284)	0.344 (0.177)	0.376 (0.137)	0.000 (0.999)	-0.065 (0.803)	0.263 (0.307)	0.255 (0.323)	0.276 (0.283)
TP2-TP1	0.696** (0.002)	0.022 (0.933)	0.100 (0.703)	0.635** (0.006)	0.651** (0.005)	0.565* (0.018)	-0.059 (0.822)	-0.047 (0.858)	0.410 (0.103)	0.398 (0.114)
TD-TP2	-0.389 (0.123)	-0.365 (0.150)	-0.330 (0.196)	-0.272 (0.291)	0.009 (0.972)	-0.290 (0.258)	-0.402 (0.110)	-0.391 (0.121)	-0.451 (0.098)	-0.047 (0.859)
TD-TE	0.477 (0.053)	0.660** (0.004)	0.768** (0.000)	0.911** (0.000)	0.980** (0.000)	0.177 (0.498)	0.750** (0.001)	0.822** (0.000)	0.881** (0.000)	0.975** (0.000)

⁵ This null hypothesis is contrasted: $H_0 : \rho = 0$.

*Significant at the 5-percent level.

**Significant at the 1-percent level.

The evidence shown in the Table 9 is more consistent with the revision details such as efficient predictions than with the details of the revisions as measurement errors. Correlations in the blue triangle are small and except for the correlation between the TP2-TP1 revisions with TE, none is statistically relevant with regard to current or constant prices. On the other hand, the correlations in the orange triangle are higher and in most cases statistically significant by 1%. For instance, the correlations for revisions TP1-TA and TD-TP2 are an exception to the measurement error rejected because estimates are correlated with the mentioned revisions. This fact agrees with the value of specific deviations for the revisions presented in this table, these deviations are smaller (0.499 for the review TP1-TA and 0.533 for TD-TP2). I should point out that the situation⁶ changes in the constant prices correlation case in the orange triangle. It turns out to be more difficult to explain the revisions in GVA for the real growth rates than the revisions for the nominal growth rates, because they are not statistically significant, except for the TA-TE review. Therefore, the null hypothesis of no correlation is accepted.

The identification of specific deviations and crossed correlations between the revisions and the growth rate estimates supports the assumption that revisions are errors generated by efficient predictions rather than measurement errors.

5.2. Efficiency of the revisions

An important feature for the initial estimate is that the associate revisions are not affected by systematic bias. The notion of absence of bias normally requires equivalent predictions for the initial released estimate. On the other hand efficiency in an initial estimate requires an associated review that is not correlated with the available information when the initial estimate is made and also requires no incidence in new errors due to old ones⁷.

Table 10 shows the results in several regressions in which the revisions are a linear function for the constant and provisional estimate. Under the null hypothesis in which the revisions are errors generated by efficient predictions, all the coefficients of these regressions, including the constant one, must be zero. The results are generally

⁶ This situation is reflected in Mankiw and Shapiro's work [1986, p. 22].

⁷ See Holden and Peel [1990] and Barrionuevo [1996]. These regressions provide a useful distinction between the difference inefficient forms mentioned in section 3.

consistent with the assumption that revisions reflect *new information*. That is why I confirm the assumption of error prediction although in the specific deviations and correlations study doubts could appear, although the rationality test will clear them up. By unpredictable revisions I may confirm that provisional estimates are efficient predictions for the definitive estimate. Nevertheless, the main concern is that the revision accuracy as well as the initial estimate (TE) predicts the definitive one (TD) more than the provisional estimates predict the definitive one, therefore the question is: *is the initial estimate efficient forecasting the definitive estimate?*

The entire regression (equation 5, regression TD-TE) at current prices which analyzes the accuracy has an associated critical level of 0.052 and this is not enough to accept the assumption of prediction error. Therefore, the review is predictable, it is not accurate and there is evidence of bias, measurement error is evident. If the constant is positively significant, this means that on average the GVA revisions are positive from TE to TD⁸, and shows if revisions are rising or falling. In this case it is possible to state that the entire review (TD-TE) is underestimated (-11.450) since the remaining coefficients are not significantly different from zero. This result is consistent with the one obtained in Table 9 (shaded in grey), where the correlations between review TD-TE and the growth values support the measurement error assumption, the total review is slightly predictable and therefore not efficient.

This is proved by the low R^2 adjusted which indicates the regression success to predict the values in the endogenous variable- in this case, the revisions. This is defined as part of the variance in the dependent variable explained by independent variables. Therefore, the R^2 adjusted are negative and the statistic F are very small except for the total review which is associated with the greatest R^2 adjusted from all 17% which evidence a certain degree of predictability. This leads us to the conclusion that the remaining regressions, current and constant prices, are only important to a limited extent in the variance for the revisions, and so the revisions are unpredictable. Therefore, the most recent GVA estimate carried out by INE is an efficient prediction in the final estimate. In this case, the revisions have been done, all the available information is taken into consideration and error is due to the merging of *new information* (prediction error).

At constant prices there is no evidence of weak prediction in regressions, and so the results are consistent with the assumption that the revisions reflect *new information*.

⁸When revision is defined as a later (more recent) estimate minus an earlier estimate, a positive (negative) value of intercept (and significantly different from zero), pinpoint an overestimation of GVA growth rates.

Therefore, the adjusted R^2 are negative and the statistics F are small. In current and constant prices the review from the second provisional estimate (TP2) to the definitive one (TD) is unpredictable. This unpredictability in these revisions is strong evidence that the second provisional estimate is an efficient prediction for the definitive one.

Table 10. Regressions of revisions on growth rates in GVA (current and constant prices)

Equation	Incremental revisions				Total revisions				Incremental revisions				Total revisions			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)
Regressions	TA-TE	TP1-TA	TP2-TP1	TD-TP2	TD-TE	TD-TA	TD-TP1	TD-TP2	TA-TE	TP1-TA	TP2-TP1	TD-TP2	TD-TE	TD-TA	TD-TP1	TD-TP2
	C								K							
Intercept	-2.627	0.239	-0.208	0.489	-11.450	1.182	0.519	0.489	0.058	0.259	0.313	0.598	-1.780	1.173	0.892	0.598
Std-error	5.061	0.546	1.132	0.451	5.433	1.494	1.257	0.451	3.448	0.305	0.472	0.346	3.371	0.613	0.545	0.346
t-Statistic	-0.519	0.437	-0.184	1.084	-2.107	0.790	0.412	1.084	0.016	0.848	0.662	1.727	-0.528	1.912	1.635	1.727
Prob.	0.611	0.668	0.856	0.295	0.052	0.441	0.685	0.295	0.986	0.409	0.517	0.104	0.605	0.075	0.122	0.104
TE	0.358				1.823				0.014				0.737			
TA		-0.022				-0.143				-0.022				-0.221		
TP1			0.071				-0.047				-0.023				-0.182	
TP2				-0.076				-0.076				-0.154				-0.154
Std-error	0.807	0.090	0.184	0.069	0.866	0.247	0.204	0.069	1.085	0.087	0.127	0.087	1.061	0.174	0.147	0.087
t-Statistic	0.444	-0.253	0.388	-1.095	2.103	-0.578	-0.232	-1.095	0.013	-0.253	-0.181	-1.764	0.605	-1.267	-1.236	-1.764
Prob.	0.663	0.803	0.702	0.290	0.052	0.571	0.819	0.290	0.989	0.802	0.858	0.098	0.497	0.224	0.235	0.098
R-squared	0.012	0.004	0.009	0.074	0.227	0.021	0.003	0.074	0.000	0.004	0.002	0.171	0.031	0.096	0.092	0.171
Adjusted R-squared	-0.052	-0.062	-0.056	0.012	0.176	-0.043	-0.062	0.012	-0.066	-0.062	-0.064	0.116	-0.033	0.036	0.031	0.116
F-statistic	0.197	0.064	0.151	1.199	4.425	0.335	0.053	1.199	0.000	0.064	0.032	3.110	0.483	1.606	1.528	3.110
Prob (F-statistic)	0.663	0.803	0.702	0.290	0.052	0.571	0.819	0.290	0.989	0.802	0.858	0.097	0.497	0.224	0.235	0.097
Wald Test (Prob F-statistic)	0.471	0.689	0.662	0.557	0.142	0.530	0.710	0.557	0.950	0.268	0.403	0.237	0.201	0.091	0.222	0.237

Table 11 analyzes in detail the results on 8 regressions in consecutive revisions on the first estimate. The results for the total review of current prices agree with the ones obtained by Faust *et al.* [2000, p. 7] where all the revisions are predictable. The revisions are biased (*noise*) and are correlated with the initial estimates. This can be proved in Table 9 which shows the correlations of the initial estimate of the growth rate of GVA with revisions of the aforementioned growth rates. The critical level associated with the correlation coefficient for the review from the initial estimate to the definitive one (TD-TE) with the initial estimate (TE) is too low to accept the non-correlation assumption. In this case, if I observe the independent term, there is a tendency to lower the estimates for GVA (the associate coefficients for the revisions (3) and (5) at 5% and (6) and (7) at 10% are significantly different from zero and are also negative). The R^2 adjusted to these regressions are raised if I compare them with the rest, and so they show a certain degree of prediction. Furthermore, in these regressions $\beta = 0$ is rejected and so the predictions for the Spanish regional economy are inefficient, because all the information available is not included, when the prediction is made. This does not happen at constant prices where the total review is unpredictable; the result is endorsed by R^2 with a negative adjustment and a low F statistical value.

The predominant positive sign of the regression coefficient indicates the average degree of reversion, with initial estimates which are reviewed upwards, except for regressions (4) and (8) in which the positive initial estimates are revised downwards.

Either at current or constant prices, regression (11) is predictable; the null hypothesis in which all coefficients are zero is rejected. This involves a bias in the review and is not efficient. The measurement error assumption is accepted. This result is consistent with the one in Table 9 in which the no correlation null hypothesis is rejected for current and constant prices.

Table 11. The β test

Equation	Incremental revisions				Total revisions				Incremental revisions				Total revisions			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)
Regressions	TA-TE	TP1-TA	TP2-TP1	TD-TP2	TD-TE	TD-TA	TD-TP1	TD-TP2	TA-TE	TP1-TA	TP2-TP1	TD-TP2	TD-TE	TD-TA	TD-TP1	TD-TP2
	C								K							
Intercept	-2.627	-1.107	-10.843	3.127	-11.450	-8.823	-7.715	3.127	0.058	0.185	-3.727	1.703	-1.780	-1.838	-2.023	1.703
Std-error	5.061	1.915	3.950	1.909	5.433	4.802	4.057	1.809	3.448	1.198	1.498	1.430	3.371	2.457	2.119	1.430
t-Statistic	-0.519	-0.575	-3.674	1.637	-2.107	-1.837	-1.901	1.637	0.016	0.154	-2.486	1.190	-0.528	-0.748	-0.954	1.190
Prob.	0.611	0.573	0.002	0.122	0.052	0.086	0.076	0.122	0.986	0.879	0.025	0.252	0.605	0.465	0.354	0.252
TE	0.358	0.193	1.768	-0.497	1.823	1.464	1.270	-0.497	0.014	0.000	1.252	-0.529	0.737	-0.723	0.723	-0.529
Std-error	0.867	0.305	0.470	0.304	0.866	0.766	0.647	0.304	1.085	0.377	0.471	0.450	1.061	0.773	0.167	0.450
t-Statistic	0.444	0.665	3.757	-1.633	2.103	1.911	1.963	-1.633	0.013	0.001	2.653	-1.175	0.605	0.935	1.083	-1.175
Prob.	0.663	0.515	0.001	0.123	0.052	0.075	0.068	0.123	0.989	0.998	0.018	0.258	0.497	0.364	0.295	0.258
R-squared	0.012	0.026	0.484	0.150	0.227	0.195	0.204	0.150	0.000	0.000	0.319	0.084	0.031	0.055	0.072	0.084
Adjusted R-squared	-0.052	-0.038	0.450	0.094	0.176	0.142	0.151	0.094	-0.066	-0.066	0.274	0.023	-0.033	-0.007	0.010	0.023
F-statistic	0.197	0.402	14.117	2.666	4.425	3.655	3.855	2.666	0.000	0.000	7.042	1.380	0.483	0.875	1.174	1.380
Prob (F-statistic)	0.663	0.535	0.001	0.123	0.052	0.075	0.068	0.123	0.989	0.998	0.018	0.258	0.497	0.364	0.295	0.258
Wald Test (Prob F-statistic)	0.471	0.218	0.004	0.291	0.142	0.121	0.131	0.291	0.950	0.277	0.022	0.505	0.201	0.128	0.261	0.505

Table 12 shows the review regressions for the GVA estimates of previous revisions. Again the Wald test that indicates that the null hypothesis in which all coefficients (included the intercept) are zero is accepted. This implies the efficiency existence in the way new information is included in the estimates- in this case the past estimate errors are not repeated in later estimates, therefore the variance on the revisions cannot be improved adjusting the coefficient by ρ .

Table 12. The ρ test

Equation	(1)	(2)	(3)	(4)	(5)	(6)
Regressions	TP1-TA	TP2-TP1	TD-TP2	TP1-TA	TP2-TP1	TD-TP2
	C			K		
Intercept	0.086	0.168	0.018	0.189	0.224	0.054
Std-error	0.129	0.263	0.136	0.111	0.184	0.146
t-Statistic	0.665	0.639	0.136	1.691	1.214	0.368
Prob.	0.515	0.532	0.893	0.111	0.243	0.717
TA-TE	-0.046			-0.023		
TP1-TA		0.492			0.047	
TP2-TP1			-0.014			-0.104
Std-error	0.097	0.531	0.130	0.089	0.391	0.210
t-Statistic	-0.476	0.925	0.112	-0.261	0.122	-0.497
Prob.	0.640	0.369	0.911	0.797	0.904	0.626
R-squared	0.014	0.054	0.000	0.004	0.001	0.016
Adjusted R-squared	-0.050	-0.009	-0.065	-0.061	-0.065	-0.049
F-statistic	0.226	0.856	0.012	0.068	0.015	0.247
Prob (F-statistic)	0.640	0.369	0.911	0.797	0.904	0.626
Wald Test (Prob F-statistic)	0.636	0.471	0.987	0.268	0.407	0.864

6. Conclusions

The uncertainty regarding economic information increases with the probability of error in the underlying data and their processing and interpretation. Accurate evaluation is essential to ensure proper accountability for the large sums of public money now being devoted to regional policy. In particular, evaluating regional policy requires a much better understanding of how regions operate and interact. Rather than being 'nice to know', information on such factors as regional trade and prices are essential for a detailed understanding of the workings of the regional system.

An important characteristic on the data published by the INE is the recurrent review process they undergo before being considered definitive. This fact generates consecutive publications with different quantitative evaluations if the same subject is under study (*data vintage*).

The principal purpose of the revisions and their analysis is to identify any bias in the initial estimates and to leave a certain margin in the figures released. All the review

policy is subject to the principle that at each stage the finished estimates are released with the best data available at any given time. It is necessary to emphasize an important aspect of this approach: too many useless revisions can be a nuisance for users. To give the system more flexibility, the accuracy and reliability in regional statistics is increasing and making the methodology as well as the results obtained more transparent.

In an interdependent society like ours today, statistics are neither a luxury nor a control instrument to serve the government; it is or should be another input in the production process, public provision of highways, schools or justice, and the information provided is essential to allocate resources properly. Therefore, when a Spanish region is labelled according to its Gross National Product (GNP), in terms of the composition of activity or employment, in its expenditure framework or in the balance sheet of public administrations, etc., a message is being sent and it is the responsibility of all statistics professionals to describe the reality of the situation as accurately as they can.

Therefore, users must be aware of the need for measurement on the published data and compel data producer organizations to release an indicator of accuracy and reliability with each estimate. Ultimately, the knowledge of errors should lead to a commitment from these organizations to stop using any estimate whose degree of uncertainty exceeds a certain quota. It is about obtaining quality measurements of specific statistics carried out with a specific design; therefore, it is not possible to obtain useful results without knowledge of the data collection process.

This analysis can provide INE with a basis to assess the accuracy or reliability in the revisions of the main aggregates for GVA, since economic literature does not provide alternatives that attempt to characterize the estimate errors in GVA in regional accounting with clear information about quality and reliability of revisions and their implications.

The main conclusions for the statistical analysis prepared for the estimates of Spanish Regional Accounts are set out below.

The specific deviation results on growth rates in GVA at total basic current and constant prices decreases as new estimates are released. Therefore, this shows that estimate quality increases over time. The correlations at current prices between the growth rates and the revisions support the results obtained after analysing specific deviations, so the predicted error assumption is more acceptable than the measurement error. Nevertheless, at constant prices the review characterization is not

so clear, although correlation does not exist between revisions and reviewed series. In most cases, correlation either between the revisions and the provisional estimates does not exist, which shows a measurement error.

In terms of accuracy, the entire review of constant prices is unpredictable; this is consistent with the assumption that revisions reflect new information, except for regression of the entire review of current prices (TD-TE over TE), which is slightly predictable. Therefore, the prediction of this review makes it clear that the first estimate is not a solid efficient prediction for the definitive estimate.

In terms of reliability, the increased revisions of current and constant prices are unpredictable except for the regression in the TP2-TP1 review of the first estimate TE in test β . The prediction of this review is clear evidence that the first estimate is not an efficient prediction from the corresponding review.

The final conclusion is that, although there are exceptions, the estimates in the main regional aggregates for GVA, both at current and constant prices, can be explained as a data review process with new information more than as measurement errors, and so the National Statistics Institute follows a suitable statistical procedure in order to obtain the GVA total estimates.

Finally, it is necessary to point out that procedures to increase the standardization and representative nature of information have to be defined from a better knowledge of the sources used in different countries. Besides, this will lead to a high degree of comparability of estimates. In this sense, the completion of quality reports for regional accounts by the Member States has been a particularly important task. This has made understanding the results easier and has helped in decision-making in the socio-economic environment.

7. Acknowledgements

I would like to acknowledge the funding received from the Ministry of Education and Culture of Spain. Secretary of State of Education, Universities, Research and Development. The Directorate General for Higher Education and Scientific Research. National Plan for Research, Development and Innovation (MTM-2007-67634).

8. References

- Barrionuevo, J. M. (1996): "How accurate are the World Economic Outlook projections?", Staff Studies for the World Economic Outlook, pp. 28-46.
- Biggeri, L. and Trivellato, U. (1991): "The Evaluation of Errors in National Accounts Data: Provisional and Revised Estimates", Survey Methodology, XVII, pp. 99-119.

- Cañal, V. (2005): "Exactitud y fiabilidad de la Contabilidad Regional de España," Trabajo de investigación en el programa de doctorado "Globalización Económica y Sociedad de la Información", Departamento de Economía Aplicada, Universidad de Oviedo.
- Cañal, V. y Hernández, M. (2005): *Exactitud y fiabilidad de la Contabilidad Regional de España*, XXXI Reunión de Estudios Regionales, Alcalá de Henares, 17-18 de noviembre de 2005.
- Cañal, V. y Hernández, M. (2006): *Exactitud y fiabilidad de la Contabilidad Regional de España*, IX Encuentro de Economía Aplicada, Jaén, 8-10 de junio de 2006.
- Cole, R. (1969): *Errors in Provisional Estimates of Gross National Product*, New York, NBER, Columbia University Press.
- De la Fuente, A. (2009): *Un enlace alternativo de los Agregados de VAB y empleo de la CRE95 y la CRE00*, Colección Estudios Económicos 07-09, FEDEA.
- EUROSTAT (1995a), *Sistema Europeo de Cuentas Integradas 1995 (SEC-95)*, Luxemburgo.
- Faust, J.,; John, R. and Wright, J. (2000): "News and noise in G-7 announcements", *Board of Governors of the Federal Reserve System, International Finance Discussion Paper*, nº 690, pp. 1-22.
- Harvey, A. C.; McKenzie, C.R.; Blake, D.P.C. and Desai, M. J. (1983): "Irregular data revisions", en A. Zellner, (ed.), *Applied time series analysis of economic data*, Washington D.C.: U.S. Department of Commerce, Economic Research Report ER-5, pp. 329–347.
- Holden, K. and Peel, D. A. (1990): "On Testing for Unbiasedness and Efficiency of Forecasts", Manchester School of Economic and Social Studies, LVIII, pp.120-127.
- INE (1990): *Contabilidad Regional de España. Serie 1980-1987, Base 1980*, Madrid, INE. Artes Gráficas.
- INE (1991): *Contabilidad Regional de España. Serie 1985-1988, Base 1985*, Madrid, INE. Artes Gráficas.
- Mankiw, N. G. and Shapiro, M. D. (1986): "News or Noise? An Analysis of GNP Revisions", *Survey of Current Business*, VI, pp. 20-25.
- Mankiw, N. G.; Runkle, D. E. and Shapiro, M. D. (1984): "Are preliminary announcements of the money stock rational forecasts?", *Journal of Monetary Economics*, XIV, pp. 15-27.
- Mincer, J. and Zarnowitz, V. (1969): "The Evaluation of Economic Forecasts," en J. Mincer, (ed.), *Economic Forecasts and Expectations*, New York, NBER.

- Morgenstern, Oskar, *On the accuracy of economic observation*, Madrid, Tecnos, 2^a edition, 1970.
- Nijmeijer, H. (2006): "How to improve the quality of regional accounts estimates?", Economic and Social Council, Economic Commission for Europe, Conference of European statisticians, eighth meeting, Geneva, 25-28 April 2006.
- Nordhaus, W. D. (1987): "Forecasting efficiency: concepts and applications", *The Review of Economic and Statistics*, LXIX, pp. 667-674.
- Pichot, A. (1988) : "La comptabilité régionale", en A. Pichot, *Comptabilité nationale et modèles économiques*, France, Presses Universitaires de France, pp. 329-351.
- York, R. C. and Atkinson, P. (1997): "The reliability of quarterly national accounts in seven major countries: a user's perspective", *Journal of Economic and Social Measurement*, XXIII, pp. 239-262.
- Zarnowitz, V. (1982): "On functions, quality and timeliness of economic information", *Journal of Business*, LV, pp. 87-119.

FUNDACIÓN DE LAS CAJAS DE AHORROS

DOCUMENTOS DE TRABAJO

Últimos números publicados

- 159/2000 Participación privada en la construcción y explotación de carreteras de peaje
Ginés de Rus, Manuel Romero y Lourdes Trujillo
- 160/2000 Errores y posibles soluciones en la aplicación del *Value at Risk*
Mariano González Sánchez
- 161/2000 Tax neutrality on saving assets. The spanish case before and after the tax reform
Cristina Ruza y de Paz-Curbera
- 162/2000 Private rates of return to human capital in Spain: new evidence
F. Barceinas, J. Oliver-Alonso, J.L. Raymond y J.L. Roig-Sabaté
- 163/2000 El control interno del riesgo. Una propuesta de sistema de límites
riesgo neutral
Mariano González Sánchez
- 164/2001 La evolución de las políticas de gasto de las Administraciones Públicas en los años 90
Alfonso Utrilla de la Hoz y Carmen Pérez Esparrells
- 165/2001 Bank cost efficiency and output specification
Emili Tortosa-Ausina
- 166/2001 Recent trends in Spanish income distribution: A robust picture of falling income inequality
Josep Oliver-Alonso, Xavier Ramos y José Luis Raymond-Bara
- 167/2001 Efectos redistributivos y sobre el bienestar social del tratamiento de las cargas familiares en
el nuevo IRPF
Nuria Badenes Plá, Julio López Laborda, Jorge Onrubia Fernández
- 168/2001 The Effects of Bank Debt on Financial Structure of Small and Medium Firms in some Euro-
pean Countries
Mónica Melle-Hernández
- 169/2001 La política de cohesión de la UE ampliada: la perspectiva de España
Ismael Sanz Labrador
- 170/2002 Riesgo de liquidez de Mercado
Mariano González Sánchez
- 171/2002 Los costes de administración para el afiliado en los sistemas de pensiones basados en cuentas
de capitalización individual: medida y comparación internacional.
José Enrique Devesa Carpio, Rosa Rodríguez Barrera, Carlos Vidal Meliá
- 172/2002 La encuesta continua de presupuestos familiares (1985-1996): descripción, representatividad
y propuestas de metodología para la explotación de la información de los ingresos y el gasto.
Llorenç Pou, Joaquín Alegre
- 173/2002 Modelos paramétricos y no paramétricos en problemas de concesión de tarjetas de crédito.
Rosa Puertas, María Bonilla, Ignacio Olmeda

- 174/2002 Mercado único, comercio intra-industrial y costes de ajuste en las manufacturas españolas.
José Vicente Blanes Cristóbal
- 175/2003 La Administración tributaria en España. Un análisis de la gestión a través de los ingresos y de los gastos.
Juan de Dios Jiménez Aguilera, Pedro Enrique Barrilao González
- 176/2003 The Falling Share of Cash Payments in Spain.
Santiago Carbó Valverde, Rafael López del Paso, David B. Humphrey
Publicado en "Moneda y Crédito" nº 217, pags. 167-189.
- 177/2003 Effects of ATMs and Electronic Payments on Banking Costs: The Spanish Case.
Santiago Carbó Valverde, Rafael López del Paso, David B. Humphrey
- 178/2003 Factors explaining the interest margin in the banking sectors of the European Union.
Joaquín Maudos y Juan Fernández Guevara
- 179/2003 Los planes de stock options para directivos y consejeros y su valoración por el mercado de valores en España.
Mónica Melle Hernández
- 180/2003 Ownership and Performance in Europe and US Banking – A comparison of Commercial, Co-operative & Savings Banks.
Yener Altunbas, Santiago Carbó y Phil Molyneux
- 181/2003 The Euro effect on the integration of the European stock markets.
Mónica Melle Hernández
- 182/2004 In search of complementarity in the innovation strategy: international R&D and external knowledge acquisition.
Bruno Cassiman, Reinhilde Veugelers
- 183/2004 Fijación de precios en el sector público: una aplicación para el servicio municipal de suministro de agua.
M^a Ángeles García Valiñas
- 184/2004 Estimación de la economía sumergida en España: un modelo estructural de variables latentes.
Ángel Alañón Pardo, Miguel Gómez de Antonio
- 185/2004 Causas políticas y consecuencias sociales de la corrupción.
Joan Oriol Prats Cabrera
- 186/2004 Loan bankers' decisions and sensitivity to the audit report using the belief revision model.
Andrés Guiral Contreras and José A. Gonzalo Angulo
- 187/2004 El modelo de Black, Derman y Toy en la práctica. Aplicación al mercado español.
Marta Tolentino García-Abadillo y Antonio Díaz Pérez
- 188/2004 Does market competition make banks perform well?.
Mónica Melle
- 189/2004 Efficiency differences among banks: external, technical, internal, and managerial
Santiago Carbó Valverde, David B. Humphrey y Rafael López del Paso

- 190/2004 Una aproximación al análisis de los costes de la esquizofrenia en España: los modelos jerárquicos bayesianos
F. J. Vázquez-Polo, M. A. Negrín, J. M. Cavasés, E. Sánchez y grupo RIRAG
- 191/2004 Environmental proactivity and business performance: an empirical analysis
Javier González-Benito y Óscar González-Benito
- 192/2004 Economic risk to beneficiaries in notional defined contribution accounts (NDCs)
Carlos Vidal-Meliá, Inmaculada Domínguez-Fabian y José Enrique Devesa-Carpio
- 193/2004 Sources of efficiency gains in port reform: non parametric malmquist decomposition tfp index for Mexico
Antonio Estache, Beatriz Tovar de la Fé y Lourdes Trujillo
- 194/2004 Persistencia de resultados en los fondos de inversión españoles
Alfredo Ciriaco Fernández y Rafael Santamaría Aquilué
- 195/2005 El modelo de revisión de creencias como aproximación psicológica a la formación del juicio del auditor sobre la gestión continuada
Andrés Guiral Contreras y Francisco Esteso Sánchez
- 196/2005 La nueva financiación sanitaria en España: descentralización y prospectiva
David Cantarero Prieto
- 197/2005 A cointegration analysis of the Long-Run supply response of Spanish agriculture to the common agricultural policy
José A. Mendez, Ricardo Mora y Carlos San Juan
- 198/2005 ¿Refleja la estructura temporal de los tipos de interés del mercado español preferencia por la liquidez?
Magdalena Massot Perelló y Juan M. Nave
- 199/2005 Análisis de impacto de los Fondos Estructurales Europeos recibidos por una economía regional: Un enfoque a través de Matrices de Contabilidad Social
M. Carmen Lima y M. Alejandro Cardenete
- 200/2005 Does the development of non-cash payments affect monetary policy transmission?
Santiago Carbó Valverde y Rafael López del Paso
- 201/2005 Firm and time varying technical and allocative efficiency: an application for port cargo handling firms
Ana Rodríguez-Álvarez, Beatriz Tovar de la Fe y Lourdes Trujillo
- 202/2005 Contractual complexity in strategic alliances
Jeffrey J. Reuer y Africa Ariño
- 203/2005 Factores determinantes de la evolución del empleo en las empresas adquiridas por opa
Nuria Alcalde Fradejas y Inés Pérez-Soba Aguilar
- 204/2005 Nonlinear Forecasting in Economics: a comparison between Comprehension Approach versus Learning Approach. An Application to Spanish Time Series
Elena Olmedo, Juan M. Valderas, Ricardo Gimeno and Lorenzo Escot

- 205/2005 Precio de la tierra con presión urbana: un modelo para España
Esther Decimavilla, Carlos San Juan y Stefan Sperlich
- 206/2005 Interregional migration in Spain: a semiparametric analysis
Adolfo Maza y José Villaverde
- 207/2005 Productivity growth in European banking
Carmen Murillo-Melchor, José Manuel Pastor y Emili Tortosa-Ausina
- 208/2005 Explaining Bank Cost Efficiency in Europe: Environmental and Productivity Influences.
Santiago Carbó Valverde, David B. Humphrey y Rafael López del Paso
- 209/2005 La elasticidad de sustitución intertemporal con preferencias no separables intratemporalmente: los casos de Alemania, España y Francia.
Elena Márquez de la Cruz, Ana R. Martínez Cañete y Inés Pérez-Soba Aguilar
- 210/2005 Contribución de los efectos tamaño, book-to-market y momentum a la valoración de activos: el caso español.
Begoña Font-Belaire y Alfredo Juan Grau-Grau
- 211/2005 Permanent income, convergence and inequality among countries
José M. Pastor and Lorenzo Serrano
- 212/2005 The Latin Model of Welfare: Do 'Insertion Contracts' Reduce Long-Term Dependence?
Luis Ayala and Magdalena Rodríguez
- 213/2005 The effect of geographic expansion on the productivity of Spanish savings banks
Manuel Illueca, José M. Pastor and Emili Tortosa-Ausina
- 214/2005 Dynamic network interconnection under consumer switching costs
Ángel Luis López Rodríguez
- 215/2005 La influencia del entorno socioeconómico en la realización de estudios universitarios: una aproximación al caso español en la década de los noventa
Marta Rahona López
- 216/2005 The valuation of spanish ipos: efficiency analysis
Susana Álvarez Otero
- 217/2005 On the generation of a regular multi-input multi-output technology using parametric output distance functions
Sergio Perelman and Daniel Santin
- 218/2005 La gobernanza de los procesos parlamentarios: la organización industrial del congreso de los diputados en España
Gonzalo Caballero Miguez
- 219/2005 Determinants of bank market structure: Efficiency and political economy variables
Francisco González
- 220/2005 Agresividad de las órdenes introducidas en el mercado español: estrategias, determinantes y medidas de performance
David Abad Díaz

- 221/2005 Tendencia post-anuncio de resultados contables: evidencia para el mercado español
Carlos Forner Rodríguez, Joaquín Marhuenda Fructuoso y Sonia Sanabria García
- 222/2005 Human capital accumulation and geography: empirical evidence in the European Union
Jesús López-Rodríguez, J. Andrés Faiña y Jose Lopez Rodríguez
- 223/2005 Auditors' Forecasting in Going Concern Decisions: Framing, Confidence and Information Processing
Waymond Rodgers and Andrés Guiral
- 224/2005 The effect of Structural Fund spending on the Galician region: an assessment of the 1994-1999 and 2000-2006 Galician CSFs
José Ramón Cancelo de la Torre, J. Andrés Faiña and Jesús López-Rodríguez
- 225/2005 The effects of ownership structure and board composition on the audit committee activity: Spanish evidence
Carlos Fernández Méndez and Rubén Arrondo García
- 226/2005 Cross-country determinants of bank income smoothing by managing loan loss provisions
Ana Rosa Fonseca and Francisco González
- 227/2005 Incumplimiento fiscal en el irpf (1993-2000): un análisis de sus factores determinantes
Alejandro Estellér Moré
- 228/2005 Region versus Industry effects: volatility transmission
Pilar Soriano Felipe and Francisco J. Climent Diranzo
- 229/2005 Concurrent Engineering: The Moderating Effect Of Uncertainty On New Product Development Success
Daniel Vázquez-Bustelo and Sandra Valle
- 230/2005 On zero lower bound traps: a framework for the analysis of monetary policy in the 'age' of central banks
Alfonso Palacio-Vera
- 231/2005 Reconciling Sustainability and Discounting in Cost Benefit Analysis: a methodological proposal
M. Carmen Almansa Sáez and Javier Calatrava Requena
- 232/2005 Can The Excess Of Liquidity Affect The Effectiveness Of The European Monetary Policy?
Santiago Carbó Valverde and Rafael López del Paso
- 233/2005 Inheritance Taxes In The Eu Fiscal Systems: The Present Situation And Future Perspectives.
Miguel Angel Barberán Lahuerta
- 234/2006 Bank Ownership And Informativeness Of Earnings.
Víctor M. González
- 235/2006 Developing A Predictive Method: A Comparative Study Of The Partial Least Squares Vs Maximum Likelihood Techniques.
Waymond Rodgers, Paul Pavlou and Andres Guiral.
- 236/2006 Using Compromise Programming for Macroeconomic Policy Making in a General Equilibrium Framework: Theory and Application to the Spanish Economy.
Francisco J. André, M. Alejandro Cardenete y Carlos Romero.

- 237/2006 Bank Market Power And Sme Financing Constraints.
Santiago Carbó-Valverde, Francisco Rodríguez-Fernández y Gregory F. Udell.
- 238/2006 Trade Effects Of Monetary Agreements: Evidence For Oecd Countries.
Salvador Gil-Pareja, Rafael Llorca-Vivero y José Antonio Martínez-Serrano.
- 239/2006 The Quality Of Institutions: A Genetic Programming Approach.
Marcos Álvarez-Díaz y Gonzalo Caballero Miguez.
- 240/2006 La interacción entre el éxito competitivo y las condiciones del mercado doméstico como determinantes de la decisión de exportación en las Pymes.
Francisco García Pérez.
- 241/2006 Una estimación de la depreciación del capital humano por sectores, por ocupación y en el tiempo.
Inés P. Murillo.
- 242/2006 Consumption And Leisure Externalities, Economic Growth And Equilibrium Efficiency.
Manuel A. Gómez.
- 243/2006 Measuring efficiency in education: an analysis of different approaches for incorporating non-discretionary inputs.
Jose Manuel Cordero-Ferrera, Francisco Pedraja-Chaparro y Javier Salinas-Jiménez
- 244/2006 Did The European Exchange-Rate Mechanism Contribute To The Integration Of Peripheral Countries?.
Salvador Gil-Pareja, Rafael Llorca-Vivero y José Antonio Martínez-Serrano
- 245/2006 Intergenerational Health Mobility: An Empirical Approach Based On The Echp.
Marta Pascual and David Cantarero
- 246/2006 Measurement and analysis of the Spanish Stock Exchange using the Lyapunov exponent with digital technology.
Salvador Rojí Ferrari and Ana Gonzalez Marcos
- 247/2006 Testing For Structural Breaks In Variance With additive Outliers And Measurement Errors.
Paulo M.M. Rodrigues and Antonio Rubia
- 248/2006 The Cost Of Market Power In Banking: Social Welfare Loss Vs. Cost Inefficiency.
Joaquín Maudos and Juan Fernández de Guevara
- 249/2006 Elasticidades de largo plazo de la demanda de vivienda: evidencia para España (1885-2000).
Desiderio Romero Jordán, José Félix Sanz Sanz y César Pérez López
- 250/2006 Regional Income Disparities in Europe: What role for location?.
Jesús López-Rodríguez and J. Andrés Faña
- 251/2006 Funciones abreviadas de bienestar social: Una forma sencilla de simultaneizar la medición de la eficiencia y la equidad de las políticas de gasto público.
Nuria Badenes Plá y Daniel Santín González
- 252/2006 "The momentum effect in the Spanish stock market: Omitted risk factors or investor behaviour?".
Luis Muga and Rafael Santamaría
- 253/2006 Dinámica de precios en el mercado español de gasolina: un equilibrio de colusión tácita.
Jordi Perdiguero García

- 254/2006 Desigualdad regional en España: renta permanente versus renta corriente.
José M. Pastor, Empar Pons y Lorenzo Serrano
- 255/2006 Environmental implications of organic food preferences: an application of the impure public goods model.
Ana Maria Aldanondo-Ochoa y Carmen Almansa-Sáez
- 256/2006 Family tax credits versus family allowances when labour supply matters: Evidence for Spain.
José Felix Sanz-Sanz, Desiderio Romero-Jordán y Santiago Álvarez-García
- 257/2006 La internacionalización de la empresa manufacturera española: efectos del capital humano genérico y específico.
José López Rodríguez
- 258/2006 Evaluación de las migraciones interregionales en España, 1996-2004.
María Martínez Torres
- 259/2006 Efficiency and market power in Spanish banking.
Rolf Färe, Shawna Grosskopf y Emili Tortosa-Ausina.
- 260/2006 Asimetrías en volatilidad, beta y contagios entre las empresas grandes y pequeñas cotizadas en la bolsa española.
Helena Chuliá y Hipòlit Torró.
- 261/2006 Birth Replacement Ratios: New Measures of Period Population Replacement.
José Antonio Ortega.
- 262/2006 Accidentes de tráfico, víctimas mortales y consumo de alcohol.
José M^a Arranz y Ana I. Gil.
- 263/2006 Análisis de la Presencia de la Mujer en los Consejos de Administración de las Mil Mayores Empresas Españolas.
Ruth Mateos de Cabo, Lorenzo Escot Mangas y Ricardo Gimeno Nogués.
- 264/2006 Crisis y Reforma del Pacto de Estabilidad y Crecimiento. Las Limitaciones de la Política Económica en Europa.
Ignacio Álvarez Peralta.
- 265/2006 Have Child Tax Allowances Affected Family Size? A Microdata Study For Spain (1996-2000).
Jaime Vallés-Giménez y Anabel Zárate-Marco.
- 266/2006 Health Human Capital And The Shift From Foraging To Farming.
Paolo Rungo.
- 267/2006 Financiación Autonómica y Política de la Competencia: El Mercado de Gasolina en Canarias.
Juan Luis Jiménez y Jordi Perdiguero.
- 268/2006 El cumplimiento del Protocolo de Kyoto para los hogares españoles: el papel de la imposición sobre la energía.
Desiderio Romero-Jordán y José Félix Sanz-Sanz.
- 269/2006 Banking competition, financial dependence and economic growth
Joaquín Maudos y Juan Fernández de Guevara
- 270/2006 Efficiency, subsidies and environmental adaptation of animal farming under CAP
Werner Kleinhanß, Carmen Murillo, Carlos San Juan y Stefan Sperlich

- 271/2006 Interest Groups, Incentives to Cooperation and Decision-Making Process in the European Union
A. Garcia-Lorenzo y Jesús López-Rodríguez
- 272/2006 Riesgo asimétrico y estrategias de momentum en el mercado de valores español
Luis Muga y Rafael Santamaría
- 273/2006 Valoración de capital-riesgo en proyectos de base tecnológica e innovadora a través de la teoría de opciones reales
Gracia Rubio Martín
- 274/2006 Capital stock and unemployment: searching for the missing link
Ana Rosa Martínez-Cañete, Elena Márquez de la Cruz, Alfonso Palacio-Vera and Inés Pérez-Soba Aguilar
- 275/2006 Study of the influence of the voters' political culture on vote decision through the simulation of a political competition problem in Spain
Sagrario Lantarón, Isabel Lillo, M^a Dolores López and Javier Rodrigo
- 276/2006 Investment and growth in Europe during the Golden Age
Antonio Cubel and M^a Teresa Sanchis
- 277/2006 Efectos de vincular la pensión pública a la inversión en cantidad y calidad de hijos en un modelo de equilibrio general
Robert Meneu Gaya
- 278/2006 El consumo y la valoración de activos
Elena Márquez y Belén Nieto
- 279/2006 Economic growth and currency crisis: A real exchange rate entropic approach
David Matesanz Gómez y Guillermo J. Ortega
- 280/2006 Three measures of returns to education: An illustration for the case of Spain
María Arrazola y José de Hevia
- 281/2006 Composition of Firms versus Composition of Jobs
Antoni Cunyat
- 282/2006 La vocación internacional de un holding tranviario belga: la Compagnie Mutuelle de Tramways, 1895-1918
Alberte Martínez López
- 283/2006 Una visión panorámica de las entidades de crédito en España en la última década.
Constantino García Ramos
- 284/2006 Foreign Capital and Business Strategies: a comparative analysis of urban transport in Madrid and Barcelona, 1871-1925
Alberte Martínez López
- 285/2006 Los intereses belgas en la red ferroviaria catalana, 1890-1936
Alberte Martínez López
- 286/2006 The Governance of Quality: The Case of the Agrifood Brand Names
Marta Fernández Barcala, Manuel González-Díaz y Emmanuel Raynaud
- 287/2006 Modelling the role of health status in the transition out of malthusian equilibrium
Paolo Rungo, Luis Currais and Berta Rivera
- 288/2006 Industrial Effects of Climate Change Policies through the EU Emissions Trading Scheme
Xavier Labandeira and Miguel Rodríguez

- 289/2006 Globalisation and the Composition of Government Spending: An analysis for OECD countries
Norman Gemmell, Richard Kneller and Ismael Sanz
- 290/2006 La producción de energía eléctrica en España: Análisis económico de la actividad tras la liberalización del Sector Eléctrico
Fernando Hernández Martínez
- 291/2006 Further considerations on the link between adjustment costs and the productivity of R&D investment: evidence for Spain
Desiderio Romero-Jordán, José Félix Sanz-Sanz and Inmaculada Álvarez-Ayuso
- 292/2006 Una teoría sobre la contribución de la función de compras al rendimiento empresarial
Javier González Benito
- 293/2006 Agility drivers, enablers and outcomes: empirical test of an integrated agile manufacturing model
Daniel Vázquez-Bustelo, Lucía Avella and Esteban Fernández
- 294/2006 Testing the parametric vs the semiparametric generalized mixed effects models
María José Lombardía and Stefan Sperlich
- 295/2006 Nonlinear dynamics in energy futures
Mariano Matilla-García
- 296/2006 Estimating Spatial Models By Generalized Maximum Entropy Or How To Get Rid Of W
Esteban Fernández Vázquez, Matías Mayor Fernández and Jorge Rodríguez-Valez
- 297/2006 Optimización fiscal en las transmisiones lucrativas: análisis metodológico
Félix Domínguez Barrero
- 298/2006 La situación actual de la banca online en España
Francisco José Climent Diranzo y Alexandre Momparler Pechuán
- 299/2006 Estrategia competitiva y rendimiento del negocio: el papel mediador de la estrategia y las capacidades productivas
Javier González Benito y Isabel Suárez González
- 300/2006 A Parametric Model to Estimate Risk in a Fixed Income Portfolio
Pilar Abad and Sonia Benito
- 301/2007 Análisis Empírico de las Preferencias Sociales Respecto del Gasto en Obra Social de las Cajas de Ahorros
Alejandro Esteller-Moré, Jonathan Jorba Jiménez y Albert Solé-Ollé
- 302/2007 Assessing the enlargement and deepening of regional trading blocs: The European Union case
Salvador Gil-Pareja, Rafael Llorca-Vivero y José Antonio Martínez-Serrano
- 303/2007 ¿Es la Franquicia un Medio de Financiación?: Evidencia para el Caso Español
Vanessa Solís Rodríguez y Manuel González Díaz
- 304/2007 On the Finite-Sample Biases in Nonparametric Testing for Variance Constancy
Paulo M.M. Rodrigues and Antonio Rubia
- 305/2007 Spain is Different: Relative Wages 1989-98
José Antonio Carrasco Gallego

- 306/2007 Poverty reduction and SAM multipliers: An evaluation of public policies in a regional framework
Francisco Javier De Miguel-Vélez y Jesús Pérez-Mayo
- 307/2007 La Eficiencia en la Gestión del Riesgo de Crédito en las Cajas de Ahorro
Marcelino Martínez Cabrera
- 308/2007 Optimal environmental policy in transport: unintended effects on consumers' generalized price
M. Pilar Socorro and Ofelia Betancor
- 309/2007 Agricultural Productivity in the European Regions: Trends and Explanatory Factors
Roberto Ezcurra, Belen Iraizoz, Pedro Pascual and Manuel Rapún
- 310/2007 Long-run Regional Population Divergence and Modern Economic Growth in Europe: a Case Study of Spain
María Isabel Ayuda, Fernando Collantes and Vicente Pinilla
- 311/2007 Financial Information effects on the measurement of Commercial Banks' Efficiency
Borja Amor, María T. Tascón and José L. Fanjul
- 312/2007 Neutralidad e incentivos de las inversiones financieras en el nuevo IRPF
Félix Domínguez Barrero
- 313/2007 The Effects of Corporate Social Responsibility Perceptions on The Valuation of Common Stock
Waymond Rodgers , Helen Choy and Andres Guiral-Contreras
- 314/2007 Country Creditor Rights, Information Sharing and Commercial Banks' Profitability Persistence across the world
Borja Amor, María T. Tascón and José L. Fanjul
- 315/2007 ¿Es Relevante el Déficit Corriente en una Unión Monetaria? El Caso Español
Javier Blanco González y Ignacio del Rosal Fernández
- 316/2007 The Impact of Credit Rating Announcements on Spanish Corporate Fixed Income Performance: Returns, Yields and Liquidity
Pilar Abad, Antonio Díaz and M. Dolores Robles
- 317/2007 Indicadores de Lealtad al Establecimiento y Formato Comercial Basados en la Distribución del Presupuesto
Cesar Augusto Bustos Reyes y Óscar González Benito
- 318/2007 Migrants and Market Potential in Spain over The XXth Century: A Test Of The New Economic Geography
Daniel A. Tirado, Jordi Pons, Elisenda Paluzie and Javier Silvestre
- 319/2007 El Impacto del Coste de Oportunidad de la Actividad Emprendedora en la Intención de los Ciudadanos Europeos de Crear Empresas
Luis Miguel Zapico Aldeano
- 320/2007 Los belgas y los ferrocarriles de vía estrecha en España, 1887-1936
Alberte Martínez López
- 321/2007 Competición política bipartidista. Estudio geométrico del equilibrio en un caso ponderado
Isabel Lillo, M^a Dolores López y Javier Rodrigo
- 322/2007 Human resource management and environment management systems: an empirical study
M^a Concepción López Fernández, Ana M^a Serrano Bedía and Gema García Piqueres

- 323/2007 Wood and industrialization. evidence and hypotheses from the case of Spain, 1860-1935.
Iñaki Iriarte-Goñi and María Isabel Ayuda Bosque
- 324/2007 New evidence on long-run monetary neutrality.
J. Cunado, L.A. Gil-Alana and F. Perez de Gracia
- 325/2007 Monetary policy and structural changes in the volatility of us interest rates.
Juncal Cuñado, Javier Gomez Biscarri and Fernando Perez de Gracia
- 326/2007 The productivity effects of intrafirm diffusion.
Lucio Fuentelsaz, Jaime Gómez and Sergio Palomas
- 327/2007 Unemployment duration, layoffs and competing risks.
J.M. Arranz, C. García-Serrano and L. Toharia
- 328/2007 El grado de cobertura del gasto público en España respecto a la UE-15
Nuria Rueda, Begoña Barruso, Carmen Calderón y M^a del Mar Herrador
- 329/2007 The Impact of Direct Subsidies in Spain before and after the CAP'92 Reform
Carmen Murillo, Carlos San Juan and Stefan Sperlich
- 330/2007 Determinants of post-privatisation performance of Spanish divested firms
Laura Cabeza García and Silvia Gómez Ansón
- 331/2007 ¿Por qué deciden diversificar las empresas españolas? Razones oportunistas versus razones económicas
Almudena Martínez Campillo
- 332/2007 Dynamical Hierarchical Tree in Currency Markets
Juan Gabriel Brida, David Matesanz Gómez and Wiston Adrián Risso
- 333/2007 Los determinantes sociodemográficos del gasto sanitario. Análisis con microdatos individuales
Ana María Angulo, Ramón Barberán, Pilar Egea y Jesús Mur
- 334/2007 Why do companies go private? The Spanish case
Inés Pérez-Soba Aguilar
- 335/2007 The use of gis to study transport for disabled people
Verónica Cañal Fernández
- 336/2007 The long run consequences of M&A: An empirical application
Cristina Bernad, Lucio Fuentelsaz and Jaime Gómez
- 337/2007 Las clasificaciones de materias en economía: principios para el desarrollo de una nueva clasificación
Valentín Edo Hernández
- 338/2007 Reforming Taxes and Improving Health: A Revenue-Neutral Tax Reform to Eliminate Medical and Pharmaceutical VAT
Santiago Álvarez-García, Carlos Pestana Barros y Juan Prieto-Rodríguez
- 339/2007 Impacts of an iron and steel plant on residential property values
Celia Bilbao-Terol
- 340/2007 Firm size and capital structure: Evidence using dynamic panel data
Victor M. González and Francisco González

- 341/2007 ¿Cómo organizar una cadena hotelera? La elección de la forma de gobierno
Marta Fernández Barcala y Manuel González Díaz
- 342/2007 Análisis de los efectos de la decisión de diversificar: un contraste del marco teórico “Agencia-
Stewardship”
Almudena Martínez Campillo y Roberto Fernández Gago
- 343/2007 Selecting portfolios given multiple eurostoxx-based uncertainty scenarios: a stochastic goal pro-
gramming approach from fuzzy betas
Enrique Ballester, Blanca Pérez-Gladish, Mar Arenas-Parra and Amelia Bilbao-Terol
- 344/2007 “El bienestar de los inmigrantes y los factores implicados en la decisión de emigrar”
Anastasia Hernández Alemán y Carmelo J. León
- 345/2007 Governance Decisions in the R&D Process: An Integrative Framework Based on TCT and Know-
ledge View of The Firm.
Andrea Martínez-Noya and Esteban García-Canal
- 346/2007 Diferencias salariales entre empresas públicas y privadas. El caso español
Begoña Cueto y Nuria Sánchez- Sánchez
- 347/2007 Effects of Fiscal Treatments of Second Home Ownership on Renting Supply
Celia Bilbao Terol and Juan Prieto Rodríguez
- 348/2007 Auditors’ ethical dilemmas in the going concern evaluation
Andres Guiral, Waymond Rodgers, Emiliano Ruiz and Jose A. Gonzalo
- 349/2007 Convergencia en capital humano en España. Un análisis regional para el periodo 1970-2004
Susana Morales Sequera y Carmen Pérez Esparrells
- 350/2007 Socially responsible investment: mutual funds portfolio selection using fuzzy multiobjective pro-
gramming
Blanca M^a Pérez-Gladish, Mar Arenas-Parra , Amelia Bilbao-Terol and M^a Victoria Rodríguez-
Uría
- 351/2007 Persistencia del resultado contable y sus componentes: implicaciones de la medida de ajustes por
devengo
Raúl Iñiguez Sánchez y Francisco Poveda Fuentes
- 352/2007 Wage Inequality and Globalisation: What can we Learn from the Past? A General Equilibrium
Approach
Concha Betrán, Javier Ferri and Maria A. Pons
- 353/2007 Eficacia de los incentivos fiscales a la inversión en I+D en España en los años noventa
Desiderio Romero Jordán y José Félix Sanz Sanz
- 354/2007 Convergencia regional en renta y bienestar en España
Robert Meneu Gaya
- 355/2007 Tributación ambiental: Estado de la Cuestión y Experiencia en España
Ana Carrera Poncela
- 356/2007 Salient features of dependence in daily us stock market indices
Luis A. Gil-Alana, Juncal Cuñado and Fernando Pérez de Gracia
- 357/2007 La educación superior: ¿un gasto o una inversión rentable para el sector público?
Inés P. Murillo y Francisco Pedraja

- 358/2007 Effects of a reduction of working hours on a model with job creation and job destruction
Emilio Domínguez, Miren Ullibarri y Idoya Zabaleta
- 359/2007 Stock split size, signaling and earnings management: Evidence from the Spanish market
José Yagüe, J. Carlos Gómez-Sala and Francisco Poveda-Fuentes
- 360/2007 Modelización de las expectativas y estrategias de inversión en mercados de derivados
Begoña Font-Belaire
- 361/2008 Trade in capital goods during the golden age, 1953-1973
M^a Teresa Sanchis and Antonio Cubel
- 362/2008 El capital económico por riesgo operacional: una aplicación del modelo de distribución de pérdidas
Enrique José Jiménez Rodríguez y José Manuel Fera Domínguez
- 363/2008 The drivers of effectiveness in competition policy
Joan-Ramon Borrell and Juan-Luis Jiménez
- 364/2008 Corporate governance structure and board of directors remuneration policies: evidence from Spain
Carlos Fernández Méndez, Rubén Arrondo García and Enrique Fernández Rodríguez
- 365/2008 Beyond the disciplinary role of governance: how boards and donors add value to Spanish foundations
Pablo De Andrés Alonso, Valentín Azofra Palenzuela y M. Elena Romero Merino
- 366/2008 Complejidad y perfeccionamiento contractual para la contención del oportunismo en los acuerdos de franquicia
Vanessa Solís Rodríguez y Manuel González Díaz
- 367/2008 Inestabilidad y convergencia entre las regiones europeas
Jesús Mur, Fernando López y Ana Angulo
- 368/2008 Análisis espacial del cierre de explotaciones agrarias
Ana Aldanondo Ochoa, Carmen Almansa Sáez y Valero Casanovas Oliva
- 369/2008 Cross-Country Efficiency Comparison between Italian and Spanish Public Universities in the period 2000-2005
Tommaso Agasisti and Carmen Pérez Esparrells
- 370/2008 El desarrollo de la sociedad de la información en España: un análisis por comunidades autónomas
María Concepción García Jiménez y José Luis Gómez Barroso
- 371/2008 El medioambiente y los objetivos de fabricación: un análisis de los modelos estratégicos para su consecución
Lucía Avella Camarero, Esteban Fernández Sánchez y Daniel Vázquez-Bustelo
- 372/2008 Influence of bank concentration and institutions on capital structure: New international evidence
Víctor M. González and Francisco González
- 373/2008 Generalización del concepto de equilibrio en juegos de competición política
M^a Dolores López González y Javier Rodrigo Hitos
- 374/2008 Smooth Transition from Fixed Effects to Mixed Effects Models in Multi-level regression Models
María José Lombardía and Stefan Sperlich

- 375/2008 A Revenue-Neutral Tax Reform to Increase Demand for Public Transport Services
Carlos Pestana Barros and Juan Prieto-Rodríguez
- 376/2008 Measurement of intra-distribution dynamics: An application of different approaches to the European regions
Adolfo Maza, María Hierro and José Villaverde
- 377/2008 Migración interna de extranjeros y ¿nueva fase en la convergencia?
María Hierro y Adolfo Maza
- 378/2008 Efectos de la Reforma del Sector Eléctrico: Modelización Teórica y Experiencia Internacional
Ciro Eduardo Bazán Navarro
- 379/2008 A Non-Parametric Independence Test Using Permutation Entropy
Mariano Matilla-García and Manuel Ruiz Marín
- 380/2008 Testing for the General Fractional Unit Root Hypothesis in the Time Domain
Uwe Hassler, Paulo M.M. Rodrigues and Antonio Rubia
- 381/2008 Multivariate gram-charlier densities
Esther B. Del Brio, Trino-Manuel Níguez and Javier Perote
- 382/2008 Analyzing Semiparametrically the Trends in the Gender Pay Gap - The Example of Spain
Ignacio Moral-Arce, Stefan Sperlich, Ana I. Fernández-Saínz and Maria J. Roca
- 383/2008 A Cost-Benefit Analysis of a Two-Sided Card Market
Santiago Carbó Valverde, David B. Humphrey, José Manuel Liñares Zegarra and Francisco Rodríguez Fernández
- 384/2008 A Fuzzy Bicriteria Approach for Journal Deselection in a Hospital Library
M. L. López-Avello, M. V. Rodríguez-Uría, B. Pérez-Gladish, A. Bilbao-Terol, M. Arenas-Parra
- 385/2008 Valoración de las grandes corporaciones farmacéuticas, a través del análisis de sus principales intangibles, con el método de opciones reales
Gracia Rubio Martín y Prosper Lamothe Fernández
- 386/2008 El marketing interno como impulsor de las habilidades comerciales de las pyme españolas: efectos en los resultados empresariales
M^a Leticia Santos Vijande, M^a José Sanzo Pérez, Nuria García Rodríguez y Juan A. Trespalacios Gutiérrez
- 387/2008 Understanding Warrants Pricing: A case study of the financial market in Spain
David Abad y Belén Nieto
- 388/2008 Aglomeración espacial, Potencial de Mercado y Geografía Económica: Una revisión de la literatura
Jesús López-Rodríguez y J. Andrés Faíña
- 389/2008 An empirical assessment of the impact of switching costs and first mover advantages on firm performance
Jaime Gómez, Juan Pablo Maícas
- 390/2008 Tender offers in Spain: testing the wave
Ana R. Martínez-Cañete y Inés Pérez-Soba Aguilar

- 391/2008 La integración del mercado español a finales del siglo XIX: los precios del trigo entre 1891 y 1905
Mariano Matilla García, Pedro Pérez Pascual y Basilio Sanz Carnero
- 392/2008 Cuando el tamaño importa: estudio sobre la influencia de los sujetos políticos en la balanza de bienes y servicios
Alfonso Echazarra de Gregorio
- 393/2008 Una visión cooperativa de las medidas ante el posible daño ambiental de la desalación
Borja Montaña Sanz
- 394/2008 Efectos externos del endeudamiento sobre la calificación crediticia de las Comunidades Autónomas
Andrés Leal Marcos y Julio López Laborda
- 395/2008 Technical efficiency and productivity changes in Spanish airports: A parametric distance functions approach
Beatriz Tovar & Roberto Rendeiro Martín-Cejas
- 396/2008 Network analysis of exchange data: Interdependence drives crisis contagion
David Matesanz Gómez & Guillermo J. Ortega
- 397/2008 Explaining the performance of Spanish privatised firms: a panel data approach
Laura Cabeza Garcia and Silvia Gomez Anson
- 398/2008 Technological capabilities and the decision to outsource R&D services
Andrea Martínez-Noya and Esteban García-Canal
- 399/2008 Hybrid Risk Adjustment for Pharmaceutical Benefits
Manuel García-Goñi, Pere Ibern & José María Inoriza
- 400/2008 The Team Consensus–Performance Relationship and the Moderating Role of Team Diversity
José Henrique Dieguez, Javier González-Benito and Jesús Galende
- 401/2008 The institutional determinants of CO₂ emissions: A computational modelling approach using Artificial Neural Networks and Genetic Programming
Marcos Álvarez-Díaz , Gonzalo Caballero Miguez and Mario Soliño
- 402/2008 Alternative Approaches to Include Exogenous Variables in DEA Measures: A Comparison Using Monte Carlo
José Manuel Cordero-Ferrera, Francisco Pedraja-Chaparro and Daniel Santín-González
- 403/2008 Efecto diferencial del capital humano en el crecimiento económico andaluz entre 1985 y 2004: comparación con el resto de España
M^a del Pópulo Pablo-Romero Gil-Delgado y M^a de la Palma Gómez-Calero Valdés
- 404/2008 Análisis de fusiones, variaciones conjeturales y la falacia del estimador en diferencias
Juan Luis Jiménez y Jordi Perdiguero
- 405/2008 Política fiscal en la uem: ¿basta con los estabilizadores automáticos?
Jorge Uxó González y M^a Jesús Arroyo Fernández
- 406/2008 Papel de la orientación emprendedora y la orientación al mercado en el éxito de las empresas
Óscar González-Benito, Javier González-Benito y Pablo A. Muñoz-Gallego
- 407/2008 La presión fiscal por impuesto sobre sociedades en la unión europea
Elena Fernández Rodríguez, Antonio Martínez Arias y Santiago Álvarez García

- 408/2008 The environment as a determinant factor of the purchasing and supply strategy: an empirical analysis
Dr. Javier González-Benito y MS Duilio Reis da Rocha
- 409/2008 Cooperation for innovation: the impact on innovatory effort
Gloria Sánchez González and Liliana Herrera
- 410/2008 Spanish post-earnings announcement drift and behavioral finance models
Carlos Forner and Sonia Sanabria
- 411/2008 Decision taking with external pressure: evidence on football manager dismissals in argentina and their consequences
Ramón Flores, David Forrest and Juan de Dios Tena
- 412/2008 Comercio agrario latinoamericano, 1963-2000: aplicación de la ecuación gravitacional para flujos desagregados de comercio
Raúl Serrano y Vicente Pinilla
- 413/2008 Voter heuristics in Spain: a descriptive approach elector decision
José Luís Sáez Lozano and Antonio M. Jaime Castillo
- 414/2008 Análisis del efecto área de salud de residencia sobre la utilización y acceso a los servicios sanitarios en la Comunidad Autónoma Canaria
Ignacio Abásolo Alessón, Lidia García Pérez, Raquel Aguiar Ibáñez y Asier Amador Robayna
- 415/2008 Impact on competitive balance from allowing foreign players in a sports league: an analytical model and an empirical test
Ramón Flores, David Forrest & Juan de Dios Tena
- 416/2008 Organizational innovation and productivity growth: Assessing the impact of outsourcing on firm performance
Alberto López
- 417/2008 Value Efficiency Analysis of Health Systems
Eduardo González, Ana Cárcaba & Juan Ventura
- 418/2008 Equidad en la utilización de servicios sanitarios públicos por comunidades autónomas en España: un análisis multinivel
Ignacio Abásolo, Jaime Pinilla, Miguel Negrín, Raquel Aguiar y Lidia García
- 419/2008 Piedras en el camino hacia Bolonia: efectos de la implantación del EEES sobre los resultados académicos
Carmen Florido, Juan Luis Jiménez e Isabel Santana
- 420/2008 The welfare effects of the allocation of airlines to different terminals
M. Pilar Socorro and Ofelia Betancor
- 421/2008 How bank capital buffers vary across countries. The influence of cost of deposits, market power and bank regulation
Ana Rosa Fonseca and Francisco González
- 422/2008 Analysing health limitations in Spain: an empirical approach based on the European Community household panel
Marta Pascual and David Cantarero

- 423/2008 Regional productivity variation and the impact of public capital stock: an analysis with spatial interaction, with reference to Spain
Miguel Gómez-Antonio and Bernard Fingleton
- 424/2008 Average effect of training programs on the time needed to find a job. The case of the training schools program in the south of Spain (Seville, 1997-1999).
José Manuel Cansino Muñoz-Repiso and Antonio Sánchez Braza
- 425/2008 Medición de la eficiencia y cambio en la productividad de las empresas distribuidoras de electricidad en Perú después de las reformas
Raúl Pérez-Reyes y Beatriz Tovar
- 426/2008 Acercando posturas sobre el descuento ambiental: sondeo Delphi a expertos en el ámbito internacional
Carmen Almansa Sáez y José Miguel Martínez Paz
- 427/2008 Determinants of abnormal liquidity after rating actions in the Corporate Debt Market
Pilar Abad, Antonio Díaz and M. Dolores Robles
- 428/2008 Export led-growth and balance of payments constrained. New formalization applied to Cuban commercial regimes since 1960
David Matesanz Gómez, Guadalupe Fugarolas Álvarez-Ude and Isis Mañalich Gálvez
- 429/2008 La deuda implícita y el desequilibrio financiero-actuarial de un sistema de pensiones. El caso del régimen general de la seguridad social en España
José Enrique Devesa Carpio y Mar Devesa Carpio
- 430/2008 Efectos de la descentralización fiscal sobre el precio de los carburantes en España
Desiderio Romero Jordán, Marta Jorge García-Inés y Santiago Álvarez García
- 431/2008 Euro, firm size and export behavior
Silviano Esteve-Pérez, Salvador Gil-Pareja, Rafael Llorca-Vivero and José Antonio Martínez-Serrano
- 432/2008 Does social spending increase support for free trade in advanced democracies?
Ismael Sanz, Ferran Martínez i Coma and Federico Steinberg
- 433/2008 Potencial de Mercado y Estructura Espacial de Salarios: El Caso de Colombia
Jesús López-Rodríguez y Maria Cecilia Acevedo
- 434/2008 Persistence in Some Energy Futures Markets
Juncal Cunado, Luis A. Gil-Alana and Fernando Pérez de Gracia
- 435/2008 La inserción financiera externa de la economía francesa: inversores institucionales y nueva gestión empresarial
Ignacio Álvarez Peralta
- 436/2008 ¿Flexibilidad o rigidez salarial en España?: un análisis a escala regional
Ignacio Moral Arce y Adolfo Maza Fernández
- 437/2009 Intangible relationship-specific investments and the performance of r&d outsourcing agreements
Andrea Martínez-Noya, Esteban García-Canal & Mauro F. Guillén
- 438/2009 Friendly or Controlling Boards?
Pablo de Andrés Alonso & Juan Antonio Rodríguez Sanz

- 439/2009 La sociedad Trenor y Cía. (1838-1926): un modelo de negocio industrial en la España del siglo XIX
Amparo Ruiz Llopis
- 440/2009 Continental bias in trade
Salvador Gil-Pareja, Rafael Llorca-Vivero & José Antonio Martínez Serrano
- 441/2009 Determining operational capital at risk: an empirical application to the retail banking
Enrique José Jiménez-Rodríguez, José Manuel Fera-Domínguez & José Luis Martín-Marín
- 442/2009 Costes de mitigación y escenarios post-kyoto en España: un análisis de equilibrio general para España
Mikel González Ruiz de Eguino
- 443/2009 Las revistas españolas de economía en las bibliotecas universitarias: ranking, valoración del indicador y del sistema
Valentín Edo Hernández
- 444/2009 Convergencia económica en España y coordinación de políticas económicas. un estudio basado en la estructura productiva de las CC.AA.
Ana Cristina Mingorance Arnáiz
- 445/2009 Instrumentos de mercado para reducir emisiones de co2: un análisis de equilibrio general para España
Mikel González Ruiz de Eguino
- 446/2009 El comercio intra e inter-regional del sector Turismo en España
Carlos Llano y Tamara de la Mata
- 447/2009 Efectos del incremento del precio del petróleo en la economía española: Análisis de cointegración y de la política monetaria mediante reglas de Taylor
Fernando Hernández Martínez
- 448/2009 Bologna Process and Expenditure on Higher Education: A Convergence Analysis of the EU-15
T. Agasisti, C. Pérez Esparrells, G. Catalano & S. Morales
- 449/2009 Global Economy Dynamics? Panel Data Approach to Spillover Effects
Gregory Daco, Fernando Hernández Martínez & Li-Wu Hsu
- 450/2009 Pricing levered warrants with dilution using observable variables
Isabel Abinzano & Javier F. Navas
- 451/2009 Information technologies and financial performance: The effect of technology diffusion among competitors
Lucio Fuentelsaz, Jaime Gómez & Sergio Palomas
- 452/2009 A Detailed Comparison of Value at Risk in International Stock Exchanges
Pilar Abad & Sonia Benito
- 453/2009 Understanding offshoring: has Spain been an offshoring location in the nineties?
Belén González-Díaz & Rosario Gandoy
- 454/2009 Outsourcing decision, product innovation and the spatial dimension: Evidence from the Spanish footwear industry
José Antonio Belso-Martínez

- 455/2009 Does playing several competitions influence a team's league performance? Evidence from Spanish professional football
Andrés J. Picazo-Tadeo & Francisco González-Gómez
- 456/2009 Does accessibility affect retail prices and competition? An empirical application
Juan Luis Jiménez and Jordi Perdiguero
- 457/2009 Cash conversion cycle in smes
Sonia Baños-Caballero, Pedro J. García-Teruel and Pedro Martínez-Solano
- 458/2009 Un estudio sobre el perfil de hogares endeudados y sobreendeudados: el caso de los hogares vascos
Alazne Mujika Alberdi, Iñaki García Arrizabalaga y Juan José Gibaja Martíns
- 459/2009 Imposing monotonicity on outputs in parametric distance function estimations: with an application to the spanish educational production
Sergio Perelman and Daniel Santin
- 460/2009 Key issues when using tax data for concentration analysis: an application to the Spanish wealth tax
José M^a Durán-Cabré and Alejandro Esteller-Moré
- 461/2009 ¿Se está rompiendo el mercado español? Una aplicación del enfoque de feldstein –horioka
Saúl De Vicente Queijeiro, José Luis Pérez Rivero y María Rosalía Vicente Cuervo
- 462/2009 Financial condition, cost efficiency and the quality of local public services
Manuel A. Muñiz & José L. Zafra
- 463/2009 Including non-cognitive outputs in a multidimensional evaluation of education production: an international comparison
Marián García Valiñas & Manuel Antonio Muñiz Pérez
- 464/2009 A political look into budget deficits. The role of minority governments and oppositions
Albert Falcó-Gimeno & Ignacio Jurado
- 465/2009 La simulación del cuadro de mando integral. Una herramienta de aprendizaje en la materia de contabilidad de gestión
Elena Urquía Grande, Clara Isabel Muñoz Colomina y Elisa Isabel Cano Montero
- 466/2009 Análisis histórico de la importancia de la industria de la desalinización en España
Borja Montaña Sanz
- 467/2009 The dynamics of trade and innovation: a joint approach
Silviano Esteve-Pérez & Diego Rodríguez
- 468/2009 Measuring international reference-cycles
Sonia de Lucas Santos, Inmaculada Álvarez Ayuso & M^a Jesús Delgado Rodríguez
- 469/2009 Measuring quality of life in Spanish municipalities
Eduardo González Fidalgo, Ana Cárcaba García, Juan Ventura Victoria & Jesús García García
- 470/2009 ¿Cómo se valoran las acciones españolas: en el mercado de capitales doméstico o en el europeo?
Begoña Font Belaire y Alfredo Juan Grau Grau
- 471/2009 Patterns of e-commerce adoption and intensity. evidence for the european union-27
María Rosalía Vicente & Ana Jesús López

- 472/2009 On measuring the effect of demand uncertainty on costs: an application to port terminals
Ana Rodríguez-Álvarez, Beatriz Tovar & Alan Wall
- 473/2009 Order of market entry, market and technological evolution and firm competitive performance
Jaime Gomez, Gianvito Lanzolla & Juan Pablo Maicas
- 474/2009 La Unión Económica y Monetaria Europea en el proceso exportador de Castilla y León (1993-2007): un análisis de datos de panel
Almudena Martínez Campillo y M^a del Pilar Sierra Fernández
- 475/2009 Do process innovations boost SMEs productivity growth?
Juan A. Mañez, María E. Rochina Barrachina, Amparo Sanchis Llopis & Juan A. Sanchis Llopis
- 476/2009 Incertidumbre externa y elección del modo de entrada en el marco de la inversión directa en el exterior
Cristina López Duarte y Marta M^a Vidal Suárez
- 477/2009 Testing for structural breaks in factor loadings: an application to international business cycle
José Luis Cendejas Bueno, Sonia de Lucas Santos, Inmaculada Álvarez Ayuso & M^a Jesús Delgado Rodríguez
- 478/2009 ¿Esconde la rigidez de precios la existencia de colusión? El caso del mercado de carburantes en las Islas Canarias
Juan Luis Jiménez y Jordi Perdiguero
- 479/2009 The poni test with structural breaks
Antonio Aznar & María-Isabel Ayuda
- 480/2009 Accuracy and reliability of Spanish regional accounts (CRE-95)
Verónica Cañal Fernández