RECENT DEVELOPMENTS IN NON-FINANCIAL CORPORATIONS' MARK-UPS

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Introduction

In recent years the competitiveness of the Spanish economy has improved sharply, most visibly so in terms of unit labour costs. As a result, and in terms of ULCs, as at end-2013 the cumulative losses in competitiveness since the onset of EMU had been practically corrected in full. With regard to changes in the HICP, the high differential built up in the 1997-2007 period has only been partly reduced, owing in part to dearer energy prices and to the increase in indirect taxation and in administered prices. The trend of the GDP deflator, which has been more contained in Spain than in the euro area in recent years, did not suffice to offset the downturn in relative prices in the upswing prior to 2007.

To understand the factors behind these relatively uneven developments across this set of variables, it is worth analysing the behaviour of business mark-ups, which are the relevant variable for characterising corporate decisions on the extent to which the behaviour of production costs passes through to sale prices. However, mark-up analysis faces the difficulty of addressing a variable which normally cannot be observed directly. To negotiate this problem, one approach involves calculating business mark-ups at an aggregate scale by means of the gross operating surplus (GOS)/gross value-added (GVA) ratio of non-financial corporations (NFC). Nonetheless, this approach is not free from problems. Firstly, the GOS includes, among other factors, the return on capital and depreciation costs, which hampers its interpretation as corporate profit. In addition, an aggregate analysis masks sectoral differences that may be significant. Secondly, the measurement of GOS may differ depending on the statistical sources used, partly reflecting the methodological discrepancies in its compilation, as has occurred in the case of the Spanish economy in the recent period.[1]

Prompted by the foregoing discussion, and with the aim of obtaining a measure of mark-ups that better represents the developments it is sought to examine, this article firstly estimates the mark-up of price over marginal cost of Spanish NFCs for the 1995-2011 period, drawing on disaggregated firm-level information. Secondly, it studies some of the possible determinants of the mark-ups over marginal cost estimated, especially those relating to the financial position of firms, or others, which may influence the degree of competition in which firms take their decisions.[2]

This type of analysis requires, therefore, the use of disaggregated information at the level of the firm or of the productive sector. Specifically, following the methodology used by Montero and Urtasun (2013)[3], the analyses below used data from a panel of non-financial corporations that covers practically all two-digit sectors of activity for the 1995-2011 period.[4] This sample combines information drawn from financial statements and from

1 For example, whereas National Accounts data are prepared using the ESA 95-harmonised accounting criteria, other sources – such as the Central Balance Sheet Data Office or the State Tax Revenue Service – are governed by business accounting rules. This means that, beyond sampling differences, the treatment of inputs and of certain taxes may differ in the respective databases as may, as a result, the calculation of the different approaches to the surplus and mark-ups.

2 See Rotemberg and Saloner (1986) or, more recently, Etro and Colciago (2010), and the references in this latter article.

3 This text is currently under revision with a view to its forthcoming publication as a Banco de España working paper.

4 More than 347,000 firms are handled for a total of more than 2 million observations.

supplementary questionnaires compiled under the Banco de España Central Balance Sheet Data Office Annual Survey (CBA) and from the processing of the accounting information filed in the Mercantile Registers (CBB).[5] In this way a sample with a high level of representativeness is achieved, both by sector and by company size.

The article is structured as follows. The second section describes the dynamics of the mark-ups over marginal cost estimated with microeconomic data, while the third section looks into the possible determinants that would explain their behaviour during the most recent period. The final section draws the main conclusions.

Price-cost mark-ups: a microeconomic approach

Under the usual assumption that firms take their price, cost and production decisions to maximise profits, the optimal price is that at which the revenue attributable to the production and sale of the last unit of output (marginal revenue) equals the production cost of that unit (marginal cost). This ratio of price to marginal cost is known as the mark-up. However, while price is a directly or indirectly observable variable[6], marginal cost is empirically difficult to measure and its theoretical characterisation depends, among other factors, on the assumed properties of the production function for the firm in question.

In the paper on which this article is based, a conceptual framework that is common in the related literature is used to derive a relationship between production and productive factors that allows mark-ups to be estimated using corporate balance sheet data.[7] In particular, firms are considered to minimise their production costs and act as price-takers in the markets for productive factors, while in the product market they enjoy a certain market power when setting their prices. Moreover, to estimate mark-ups it is necessary to make some type of assumption about firms' production function. In this case, a generic function has been adopted with the usual properties and with returns to scale that do not vary over time. This latter assumption seeks to reflect the fact that during relatively short periods of time, such as that considered in this study, the main technological parameters of firms' production function do not change substantially.[8]

In the context of the conceptual framework described, a measure of the mark-up is estimated drawing on disaggregated data of Spanish non-financial corporations from the CBA and CBB, during the 1999-2011 period. Chart 1 shows the changes in this estimated variable for all NFCs, with two clearly differentiated stages being discernible: an initial period, running to 2007, in which the mark-up holds approximately stable around values slightly higher than unity, which is what would correspond to perfectly competitive markets, followed by the period spanning economic crisis, to 2011, in which it rises continuously. To interpret this result it must be borne in mind that an increase in the gap between prices and marginal costs may be consistent with a fall in total corporate profits, when prices are relatively insensitive to the contraction in demand and in activity. Box 1 offers a straightforward illustration of this situation in which Spanish firms may possibly have found themselves during the crisis.

Chart 2 shows the changes in the estimated mark-up for a classification of NFCs in six aggregated major sectors of activity (see Table 1 for a definition of these sectors). On the

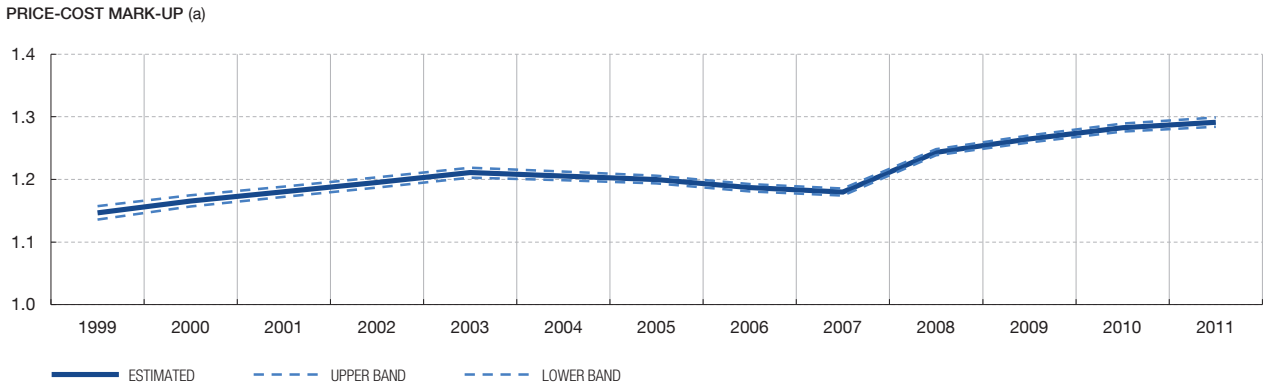
5 For more details on these databases, see *Central Balance Sheet Data Office. Annual results of non-financial corporations, 2011,* Banco de España (2012).

6 In some papers, e.g. Gilchrist et al. (2013), corporate balance sheet data are combined with price micro-databases.

7 This general conceptual framework was originally developed by Hall (1986). See also Klette (1999).

8 As a measure of robustness, this assumption has been tested using data from National Accounts sectors of activity for the 1995-2010 period, following the methodology proposed by Basu (1996).

ESTIMATED MARK-UPS FOR NON-FINANCIAL CORPORATIONS CHART 1



SOURCE: Banco de España.

a See Montero and Urtasun (2013) for the estimation details.

basis of these data, very similar behaviour across sectors can be seen for the estimated mark-ups (see the left-hand panel of Chart 2)[9], following a relatively stable course to 2007 – except in the case of the primary sectors, which are more volatile – and a subsequent rise, the intensity of which varies according to the sector. Further, a notable degree of synchronisation is attained by the mark-ups of the three main sectors of activity (manufacturing, market services and construction), although in this latter sector their recent increase has been appreciably lower.

In sum, the results of the estimates based on disaggregated data show that the behaviour of Spanish firms' mark-ups has followed a fairly uniform pattern across sectors of activity[10], which suggests the possible presence of common factors explaining a large portion of the changes, in particular during the recent crisis period. This matter is analysed in the following section.

Determinants of mark-ups

Analysis of the data used reveals a clearly countercyclical behaviour of mark-ups during the crisis period.[11] Although there is no commonly accepted theoretical approach to the more plausible cyclical behaviour of the mark-up, there is abundant theoretical and empirical economic literature that would justify this type of relationship between the cycle and mark-ups, in particular for the US economy. Indeed, some recent empirical analyses, such as that by Gilchrist et al. (2013) for the US economy, suggests that firms tend to exhaust every possibility to raise mark-ups when their external financing conditions turn more unfavourable.

In the case of the European economies, mark-ups are highly influenced, among other factors, by the particularities of their labour markets, namely the high duality these show. In this setting, a considerable portion of the adjustment in the face of severe cyclical shocks is based on the destruction of temporary employment, which allows a cut in labour costs and an increase in productivity, resulting – all other things being equal – in improved mark-ups. Bakker and Zeng

9 The interpretation of the price-cost mark-up in the energy, gas and water sector is more complex, as regulated industries are involved.

10 Montero and Urtasun (2013) also present mark-up estimates classifying the corporations by their size – in terms of employment – and find, once again, a fairly uniform pattern over time, albeit with some differences among the smallest strata (firms with 1-19 employees), the medium strata (20-249) and the biggest (over 250).

11 There is some evidence that this behaviour has not been an isolated phenomenon within the euro area, since other countries subject to financial instability during the recent period (such as Portugal and Ireland) have also shown the same pattern.

PRICE-COST MARK-UPS, ACTIVITY AND PROFITS: AN EXAMPLE

BOX 1

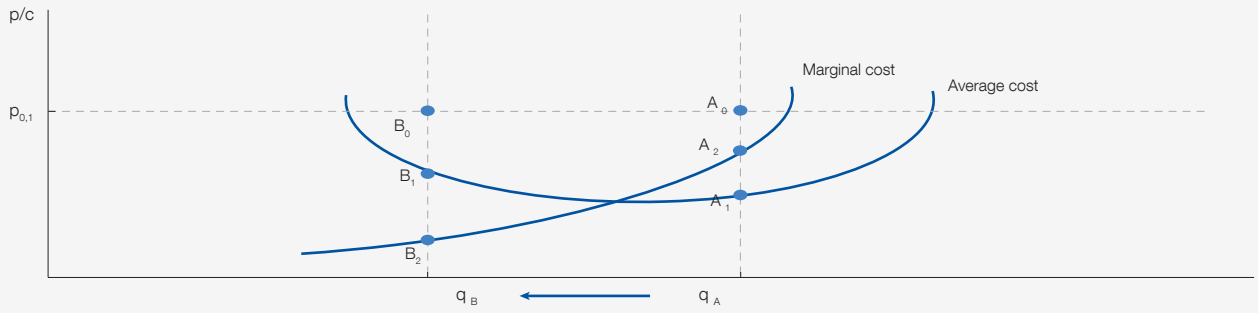
Spanish corporations' mark-ups have, on the whole, tended to increase recently, against the background of a highly marked contraction in activity which has seen sales volumes and corporate profits fall. Specifically, on combined CBA and CBB data, non-financial corporations' sales fell 12% in nominal terms from 2007 to 2011 (equivalent to a decline of 14% in real terms, obtained on the basis of the GDP deflator) and their profits shrank by 38%.

The following example illustrates how a decline in demand, in a setting in which firms find incentives to hold their prices relatively unchanged, due to the structure of the market in which they are operating, to their financial situation or to whatsoever other factors (including possible nominal rigidities), may give rise naturally to an increase in price-cost mark-ups and to a simultaneous decline in profits.[1]

1 This example draws on some of the cases considered by Kimball (1995) and Rotemberg (2008).

The accompanying chart depicts the usual cost curves of a firm under microeconomic theory which, in the short run, cannot adjust immediately any of its production factors. Its average costs, or cost per unit of output, move on a rising slope as from a certain volume of output. Let us consider a starting situation in which the firm presents a volume of output, q_A, which, for a level of prices, p_0, is consistent with a positive profit flow, insofar as the unit margin (the difference between price and average cost, which corresponds to the distance between points A_0 and A_1) is positive. For the purposes of illustrating in a very simple fashion the joint effect of a decline in demand and of a high level of price rigidity, it shall be assumed for the sake of simplicity that the latter does not change at all when demand contracts to a quantity q_B. In this new situation, the mark-up of price over marginal costs, which in the chart coincides with the distance between B_0 and B_2, would have increased, while the unit margin (the vertical distance between B_0 and B_1) would fall. And this, combined with the lower volume of output, would mean a lower overall profit, in line with the foregoing data relating to Spanish NFCs in the most recent period.

DETERMINING MARK-UPS ON THE BASIS OF AVERAGE AND MARGINAL COSTS: AN EXAMPLE (a)



SOURCE: Banco de España.

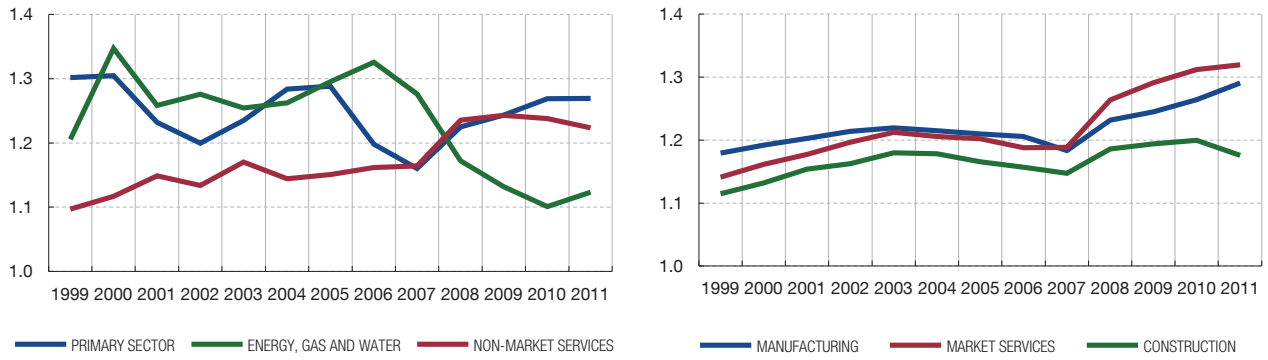
a In this chart, for the sake of simplicity, neither the demand curve nor the marginal revenue curve are depicted.

(2013) present evidence along these lines for the EU economies during the recent period. The foregoing factors, which contribute to explaining much of the reduction in unit costs in the Spanish economy in the period under study, do not however explain on their own a partial pass-through of cost adjustments to final prices. For this, other types of factors must be looked at that are consistent with the above-mentioned estimated increase in mark-ups.

One possible explanatory factor for the countercyclical behaviour of mark-ups[12] is that related to the financial scenario firms face during a crisis or deep recession. Chevalier and Scharfstein (1996) and, more recently, Gilchrist et al. (2013) show that, in a setting of strong financial pressure (high debt and tightening of financing conditions), firms may

12 See Rotemberg (2008) for a summary of other types of explanatory factors of the countercyclicality of business mark-ups.

ESTIMATED PRICE-COST MARK-UPS FOR THE DIFFERENT SECTORS OF ACTIVITY (a) CHART 2



SOURCE: Banco de España.

a See Montero and Urtasun (2013) for the estimation details.

DEFINITION OF THE SECTORS AND CORRESPONDENCE TO NACE Rev.2 TABLE 1

	Description	NACE Rev. 2 section
Primary sector	Agriculture, forestry, fishing and mining and quarrying	A-B
Manufacturing	Manufacturing industry	C
Energy, gas and water	Electricity, gas, steam and air conditioning supply. Water supply; sewerage, waste management and remediation activities	D-E
Construction	Construction	F
Market services	Wholesale and retail trade, transport, accommodation and food service activities, information and communication, real estate activities, etc.	G-J, L-N
Non-market services	Education, health care, social services, arts and recreation activities, and other services	P-S

SOURCE: INE.

decide to raise their price-cost mark-up, despite the weakness of demand and the possibility of losing market share, as a mechanism to generate internal funds and to meet financial obligations, to improve their financial position, to fund investment projects and to weather potential financial shocks. In this respect, Gilchrist et al. (2013) provide evidence that US firms in a worse financial position set prices which, on average, were higher than those of their competitors with healthier balance sheets during the 2008-2009 recession.

To assess the empirical significance of this hypothesis, and of other factors described below, regressions are considered in which the dependent variable is the increase in the estimated price-cost mark-up between 2007 and 2011 for the various sectors of activity in question. To proxy the effect of financial pressure on Spanish corporations' policies, a measure of financial pressure based on the debt/assets ratio is constructed, as is usual in the literature on financial frictions.[13] Specifically, the borrowed funds adjusted for liquid assets/total assets ratio is considered.[14] The expected sign of this ratio is positive, in line

13 Other measures of financial pressure have also been used, such as the financial burden of debt and the debt ratio not adjusted for liquid assets, with similar results being obtained. For further details, see Montero and Urtasun (2013).

14 Liquid assets are defined as short-term financial assets plus cash and cash equivalents (deposits).

DETERMINANTS OF THE PRICE-COST MARK-UP OF SECTORS OF ACTIVITY IN THE 2008-2011 PERIOD TABLE 2

	Description
Initial price-cost mark-up	Estimated price-cost mark-up for the 2001-2007 period
Debt ratio	Borrowed funds adjusted for liquid assets/total assets ratio. Sectoral average in 2007
Concentration index	Herfindahl-Hirschman concentration index, consisting of the sum of the squares of the market shares of each firm
Capital stock	Tangible fixed assets, including land and buildings. Sectoral average in 2007
Innovation intensity	Intangible assets/total assets ratio. Sectoral average in 2007

SOURCE: Banco de España.

with the arguments set out above; that is to say, the greater the financial pressure, the greater the expected increase in mark-ups.

In addition, other variables are considered which, in principle, may contribute to explaining the behaviour of price-cost mark-ups (see Table 2). Thus, with the aim of proxying the effect of the competitive structure of goods and services markets on the change in mark-ups during the period under analysis, the average level of the mark-up in each productive sector before the start of the crisis in 2007 is included in the estimates as an explanatory variable. Furthermore, it is attempted to capture other types of elements related to market power, and not included in the foregoing indicator of the average level of mark-ups, by adding a measure of sectoral concentration.[15] Another aspect that should be considered is firm size, proxied by means of the capital stock[16], although the effect of this variable on mark-ups, a priori, is difficult to anticipate in a recessionary setting [Odagiri and Yamashita (1987)]. For one thing, it may be considered as a variable that captures the existence of barriers to entry and, therefore, reinforces the degree of concentration in the industry, which would justify a positive theoretical effect on mark-ups. For another, the capital stock may, in part, be a sunk or irrecoverable cost, meaning that in industries with higher average capital requirements, firms would tend to set lower mark-ups to ensure a higher rate of capacity utilisation, enabling it to withstand such costs. Lastly, a proxy for the degree of innovation or of R&D intensity in the sector is added.[17] A priori, market power is expected to increase the greater this ratio is, owing to the fact that this would allow greater product differentiation or gains in productive efficiency. A greater intensity of intangible assets might also reflect an endogenous reaction by the firms already established in the sector to the threat of the potential entry of new firms, acting as a barrier to entry [Sutton (1998)].

Estimation results using the least squares estimator weighted by the share in total GVA of each sector are presented in Table 3. Firstly, the estimates suggest that the increase in mark-ups in the recessionary period was positively correlated to the variable that captures the degree of financial pressure. In other words, in the sectors of activity where the debt ratio was higher, mark-ups grew by a greater proportion. Moreover, the estimated coefficients would indicate that this effect is of significant economic relevance. These results support, therefore, the hypothesis that firms might be setting higher mark-ups as a means of internal financing, with the aim of enhancing their financial position.

Secondly, a positive – and statistically significant – relationship is obtained between the level of mark-ups at the start of the period and their growth from 2007 to 2011. That is to

15 The measure chosen is the Herfindahl-Hirschman concentration index, consisting of the sum of the squares of the market shares of each firm.
16 The average capital stock in 2007 for each sector, defined as tangible fixed assets, including land and buildings.
17 The ratio of intangible assets to total assets.

REGRESSIONS ON THE DETERMINANTS OF PRICE-COST MARK-UPS IN 2008-2011 TABLE 3

	Weighted least squares estimator (a) (b) Dependent variable: change in martk-ups between 2011 and 2007		
	[1]	[2] (c)	[3] (d)
Debt ratio	0.501 *** (0.172)	0.579 *** (0.174)	0.256 ** (0.102)
Initial price-cost mark-up	0.690 ** (0.282)	0.902 *** (0.290)	0.540 ** (0.224)
Concentration index	-0.116 (0.097)	-0.095 (0.096)	-0.053 (0.051)
Average capital stock	-0.039 *** (0.009)	-0.040 *** (0.009)	-0.014 * (0.007)
Intangible assets ratio	-0.281 (0.193)	-0.358 * (0.185)	-0.318 ** (0.142)
Constant	-0.110 (0.092)	-0.171 * (0.190)	-0.071 (0.072)
No. of observations:	57	46	44
R^2	0.599	0.646	0.258

SOURCE: Banco de España.

a Level of statistical significance: * 10%; ** 5%; *** 1%. Weights: share in GVA.
b All the explanatory variables are dated in 2007. See Table 2.
c Column [2]: excludes observations from the non-market sectors and from the primary sector.
d Column [3]: As in column [2], and it also excludes observations from "Coke and refined petroleum products".

say, price-cost mark-ups would have tended to grow more in those sectors where there was greater market power before the crisis.[18]

The remaining factors considered would not be statistically significant, except the average stock of capital, whose sign is negative, which might denote that this variable acts more as an exit than as an entry barrier; that is to say, the difficulties in liquidating tangible fixed assets would prevent a greater exit rate on the part of firms, which would result in a relatively high number of competitors and, therefore, in downward pressure on mark-ups.[19]

Conclusions

This article estimates recent developments in Spanish non-financial corporations' mark-ups for the 1995-2011 period. The results from the empirical exercise with microeconomic data reveal that the behaviour of mark-ups during the last recessionary phase was countercyclical, in a generalised fashion both in terms of sectors of activity and of firm size. The increase in the gap between prices and marginal costs may be consistent with a fall in overall corporate profits, against a background of strongly contracting activity and some downward price stickiness, such as that which has characterised the Spanish economy in recent years.

The article also provides evidence on the role that certain determinants may have played when it comes to explaining these developments, although their simultaneous confluence

18 This result might indicate the presence of a high persistence of market power in the various sectors of the Spanish economy, which would be consistent with the fact that it depends on institutional and regulatory factors that change slowly over time.

19 Columns 2 and 3 of Table 3 show the results of the regression, eliminating from the estimate a series of singular sectors of activity, related to non-market sectors or to anomalous behavior (such as manufacture of coke and refined petroleum products). As can be seen, the results are highly robust to the exclusion of these sectors.

in a period as convulsive as that analysed in this article calls for particular caution when interpreting certain results. The latter include most notably the positive relationship identified between the degree of financial tension in each sector, measured through the debt ratio, and the growth of their mark-ups. This observation suggests that some firms might be partly alleviating the adverse effects derived from restrictive conditions of access to external financing with the generation of internal funds by means of setting relatively higher mark-ups. The progressive reactivation of external funding channels – essentially bank channels, in the case of a substantial portion of Spanish corporations – should provide, in keeping with this observation, for a gradual reduction in price mark-ups over marginal costs. The empirical results additionally reveal that, in those industries where a higher level of mark-ups was observed at the start of the crisis, there would also have been a higher increase in mark-ups during the crisis. That would provide some evidence about the need to push through further structural reforms in the markets for goods and services enabling those increases in mark-ups associated with an insufficient level of competition to be corrected.

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