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The Spanish Corporate Sector in the Euro: 2000-2014

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Abstract

Membership of the Eurozone benefited the corporate and other institutional sectors of the Spanish economy in the form of lower interest rates that boosted a period of high corporate investment and growth. The financial crises interrupted the growth process and the Spanish economy has gone through a severe recession. Looking backwards, analysts have diagnosed the first years of the Spanish economy in the Euro as a period of loss of competitiveness, excessive investment and excessive external debt. This paper examines profitability, investment and leverage of the Spanish corporate sector in the years 2000-2007 under the lens of what could be expected if profit-maximizing firms experience a permanent reduction in the financial cost of capital. Next we identify the vulnerabilities to which the corporate sector was exposed at the start of the crisis, and complete the examination for the rest of the period 2008-2014. In the expansion period operating assets grew faster than output and return on assets decreased, as predicted by the model. In this period internally generated cash flows were not sufficient to finance the high investment rate and corporate leverage ratios almost double. In the years of the crisis capital deepening stops, profits increase and corporations generate cash flows above investment flows that use to repay debt.

Key words: Profitability, Investment, Leverage, Spanish Corporate Sector, Crisis.
JEL Classification: M 21, D 33, E 22

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1. Introduction

The private sector of an economy includes mainly households and firms. Firms are entities that produce goods and services that sell in markets (often in competition with other firms) adopting two main legal forms: solo self-employed individuals, and *corporations* [1]. The Spanish Non Financial Corporations, NFC, include all firms producing and selling goods and services in and from Spain under the legal form of a corporation, except financial intermediaries and alike. The corporate sector of the Spanish economy includes approximately 1,3 millions of firms, produce 57% of the total value added of the Spanish economy, and invests three quarters of total gross capital formation. The performance of the corporate sector very much determines the performance, growth, employment, per capita income, of the whole economy and this paper examines such performance in the first fifteen years of Spain as full member of the European Monetary Union. During the period 2000-2014 the Spanish economy has experienced a five years period of accelerated growth, 2003-2007, together with five years, 2008-2012 of severe contraction. Understanding the economic factors that may explain the boom and bust of the Spanish economy in the Euro should be of great help in the assessment of prospects of present and future growth.

National Accounts elaborated by the National Statistical Office, INE, provide information of flows of revenues from sales and other activities of NFC located in Spain, as well as information on costs incurred in such production and sales, on flows of capital investments, and on dividends paid to the shareholders. The Banco de España elaborates and quarterly publishes the Financial Accounts of the Spanish economy that include the assets and liabilities aggregate for the whole economy and separate for the institutional sectors, among them the sector of NFC. In this paper we first organize the flows of revenues and costs from National Accounts into the "income statement" aggregate for the whole non-financial corporate sector, similar to the income statement that records the transactions of a single corporation. Next, we do a similar task with the

[1] The main corporate legal forms in Spain are Sociedades de Responsabilidad Limitada (SRL), Sociedades Anónimas (SA) and Cooperativas. SRL and SA represent 80% of the all firms with employees and employ 90% of the salaried employees.

Financial Accounts and organize the data to reproduce the "balance sheet" aggregate for the non- financial corporate sector, in both unconsolidated and consolidated terms.

The income statement includes the gross value added and its distribution into labor costs, and compensation to capital and entrepreneurial inputs. The assets side of the balance sheet separates total assets into financial and operational assets; liabilities include corporate debt with explicit cost, and equity. We further separate financial assets from the rest of the world and liabilities issued by Spanish NFC corporations held by the rest of the world, and assess their relative importance. One limitation to keep in mind is that the income statement and the balance sheet are elaborated independently and using different data sources, while accounting statements of individual corporations come from the recording of transactions using double entry books keeping. The internal consistency between stocks and flows assured by double entry accounting of firm level transactions cannot be assured at the aggregate level[2].

The aggregate flows and stocks are examined along several lines of inquire. First we examine the flows that determine the allocation of value added and other sources of non-operational income into labor and capital attributed income (functional income distribution). The value added in operations is equal to the money value of goods and services produced in Spain, less the money value of intermediate goods and services acquired to the rest of institutional sectors of the economy, including imports from abroad. The value added from operations in Spain is allocated into compensation for labor and capital services used to produce in Spain, and entrepreneurial rents. Most of the non-operational income corresponds to financial income i.e. income in the form of interests and dividends that corporations earn in return of investing in financial assets. The part of value added in operations attributed to operational assets used in production plus the financial income in return of investing in financial assets, go to pay interest on debt financing, direct taxes, mainly corporate taxes, and dividends to the shareholders; what is left, if any, will be retained in the business.

[2] Banco de España (2013) contains a detailed explanation of the characteristics of data from National Accounts and of data from Financial Accounts and how the two are related with data collected from income statements of individual corporations as presented in the Central de Balances. See also Salas Fumás (2014).

Second, we examine the composition of assets and liabilities in the balance sheet, distinguishing between financial and operational assets in the assets side, and between debt with explicit cost and equity in the liability side. The Financial Accounts data allows us to elaborate a balance sheet with unconsolidated accounts data and with consolidated accounts data. The unconsolidated data does not separate the financial assets and the liabilities held and issued by other NFC in Spain, and the financial assets and liabilities held and issued by other institutional sectors, including the rest of the world. The consolidated data avoids the double counting by netting out assets held and liabilities issued by NFC in Spain. The consolidated accounts include, in the asset side, the operating assets deployed to produce and sell in Spain, and the financial assets issued by other institutional sectors different from the NFC in Spain, including the rest of the world. The liability side includes debt and equity issued by Spanish NFC to finance the consolidated assets, held by the rest of national institutional sectors and by the rest of the world. Given its absolute and relative importance we also present separate information on financial assets (cash and deposits, loans, shares) issued by non residents and held in the balance sheet of NFC, and on financial liabilities (loans and equity) issued by Spanish NFC and held by the rest of the world.

The third block of analysis focuses on rates of return, and their determinants, calculated as the ratio between the corresponding figure of flow of profits, and the corresponding figure of the stock of invested assets. The possibility of calculating rates of return is one of the advantages of combining flows and stocks aggregated for the whole Spanish corporate sector. Economic analysts most often examine the National Accounts, flows, and Financial Accounts, stocks, independently ones of the others; rates of returns, ratios of flows over stocks, are rarely calculated. We obtain separate rates of return for the operational assets and for the financial assets, as well as estimates of returns on equity and on average costs of debt. These rates of return, compared with the financial costs, measured by the cost of debt, will provide relevant information on the incentives to invest since the investment decision is affected by expectations of returns compared with the cost of financing the investment.

The forth analysis of the data focuses on the generation of profits and cash flows and on their uses or destinations in dividend payments, investment in productive capacity, and changes in financial assets net of changes in liabilities. For several years, the corporate

sectors of many developed economies are in a situation where saving, in the form of retained earnings plus depreciation, is higher than the flow of gross investment in operating assets. This situation has been viewed as anomalous by academics and policy makers because it goes against what can be expected from the corporate sector, namely to behave as an engine of growth by continuously discovering and launching innovative projects. The analysis in this paper will focus on whether the Spanish corporate sector is contributing or not to the "global saving glut"[3] and if so we query for the destination of these excess savings.

The fifth and last issue addressed in the paper is on the evolution of corporate investment in production capacity in Spain during the fifteen years period of study, and particularly comparing this investment in the pre and in the post crisis period: Did the corporate investment in the pre and crisis year performed accordingly with what could be expected given the observed return on assets and cost of finance? In 2008 the Spanish corporate sector showed a ratio of debt over GDP substantially higher than the ratio of debt to GDP in other Euro countries. Deleveraging became a business priority and it is worth asking whether this priority delayed or not the recovery of capital investment considering the evolution of corporate profits in the same time period.

We view and interpret the flows and stocks of the Spanish non-financial corporate sector as if they were the values in transition to and equilibrium resulting from profit maximizing decisions of a representative firm that, in this particular case, extends its activities to the whole economy. Of course, this is a clear simplification of the reality since it ignores the high heterogeneity in terms of sizes, economic sectors, products and markets, growth or stagnation, new and old, of firms in an economy. Another limitation of the analysis is that the stocks and flows combined are not stocks and flows registered by a double entry accounting system, as it would be the case if we were dealing with the balance sheet and income statement of a particular corporation. Even though the important limitations of examining the corporate sector of the economy as we were examining the behavior and performance of a single corporation, we believe that the exercise is worthwhile for several reasons.

[3]See Bernanke (2005), Loeys et al (2005), Bnerjee (2015), Gruber and Kamin (2015).

First, by focusing in the non-financial corporate sector instead of in the whole economy we reduce heterogeneity and gain precision in some of the results of the analysis. For example, the functional distribution of value added between labor compensation and capital income with corporate data avoids including as part of the non labor income the labor compensation of solos self-employed, registered as non labor income in the National Accounts for the whole economy. Additionally, within the part of value added attributed to capital services in the corporate sector it is possible to distinguish between several measures of profits, for example profits before and profits after interest on debt and taxes. If would be interesting to integrate the analysis of the corporate and non corporate sector, activities of solo self-employed individuals, into a single analysis of the whole non financial sector of the market economy, but this is not possible because National Accounts include the business activity of the solo self-employed within the institutional sector of households.

Second, the aggregate flows and stocks result from adding up flows and stocks of individual firms; when we examine the time evolution of stocks and flows under the lens of aggregate outcomes of profit maximizing decisions we have a benchmark with which to compare observed and predicted behavior. The joining of the Euro changed the monetary and financial conditions of the Spanish economy. In particular, the Euro soften the constraint that limited the access to external finance of the Spanish economy, reduced the risk premium charged by financial investors and, overall, Spanish corporations experience a reduction in the cost of capital, compared with this cost in the pre Euro period. When interpreting the data we will do so taking into account the changes in the ratio between flows and stocks expected from a reduction in the cost of capital when firms make profit-maximizing decisions.

Third, although there can be some mismatches and inconsistencies between flows and stocks that are not elaborated under the consistence constraints imposed by double entry accounting, being able to calculate rates of return and costs of finance has the advantage over using only profit margins and labor unitary costs that rates of return and cost of capital are variables that enter directly in the investment decisions by firms. Profit margins and/ or labor unit costs alone do not capture the incentives to invest with the same precision as rates of return and costs of capital do.

The rest of the exposition is organized as follows. Section 2 presents the organization of accounts in the Income statement, Balance Sheet and Flow of funds that will be used to examine the empirical data. The following sections from 3 to 7, present the results of the analysis along the main fine lines of inquire listed above. In section 8 we compare the observed evidence with predictions from a simple behavior model of a representative firm, presented in the Appendix. The conclusions summarize the main results of the analysis, and draw some implications on the relevance of the kind of economic analysis presented in this paper.

2. The links between National Accounts and accounting statements

The activity and performance of NFC in the period of study, 2000-2014, will be analyzed using the conventional accounting statements, Income, Balance sheet and Flow of funds, adapted to the peculiarities of the information provided by the original sources, National Accounts (for the Income statement and Flow of funds), and Financial Accounts (for the Balance Sheet).

2.1.Income statement

Firms obtain revenues from selling the produced goods and services in the markets, and pay for the resource inputs used in production. Firms may generate income from non-operational activities, for example interest income from financial assets, as well as costs attached to this income, for example the costs of financing the assets. The accounting conventions imply that actual but not opportunity costs being registered in external financial statements. This is particularly relevant for the cost attributed to the capital input, which includes the interest of the debt used to finance the productive assets but excludes the (opportunity) cost of equity.

For the purpose of the present analysis, the income statement resulting from organizing the accounts reported in the National Accounts corresponding to NFC, is the following:

Gross Value Added (GVA)
-Production taxes + Subsidies
- Labor compensation
= *Gross Operating Profit*
-Amortization and other expenses
=*Operating Profit*
+Financial Income
+Other property rents
= *Profit Before Interest and Taxes (PBIT)*
-Interest on Debt
-Corporate and Property Taxes
= *Net Profit*

For a single firm, the GVA is the difference between the money value of what is produced in the time period (a year in our case), and the cost of the goods and services used in production purchased to other firms. For the Non Financial Corporate Sector of the economy is the difference between what is produced and sold by corporations located and operating in Spain minus the intermediate goods and services purchased to other national institutional sectors, included the inputs imported from abroad. In other words, it is the value added by production operations in Spain attributed to the services incorporated from labor and capital employed in such production.

The GVA is allocated into three uses: pay taxes, net of subsidies, related to production activities, compensate employees for the costs of the labor services provided, and compensate capital and entrepreneurial inputs. The labor compensation is pre-contracted while the compensation to capital and entrepreneurial inputs is residual, although with different priority (debt holders that finance the productive assets pre contract an interest and reimbursement schedule with the corporation while compensation to equity holders is all residual). The user's cost of capital services is not accounted for in the calculation of economic profits because at least part of this cost is a opportunity cost (particularly the financial opportunity cost of equity holders) and the

accounting rules only register explicit costs (such as interest on debt and estimated amortization). The Operating profit is the residual profit from operations in Spain, with which to compensate the financial cost of operating assets and, possibly, entrepreneurial inputs.

As we will see later, NFC hold an important volume of financial assets, in addition to the capital assets used to produce goods and services in Spain, as well as other proprietary assets. The assets generate income, Financial income and Property income, that will be added to the GVA to obtain the Corporate income of NFC. In the income statement the Financial and Property income are added to the profit from operations to obtain the Profit Before Interest and Taxes, i.e. the profit attributed to all assets of the corporations (operational and financial), before the opportunity financial costs of the money invested in those assets. The income statement continues with Interest expenses and taxes, which are explicit costs of the assets held by the corporations, and finally the Net Profit, or residual income disposable to compensates equity holders and entrepreneurs.

2.2. Balance Sheet and generation and uses of funds

We write the equality between assets and liabilities in a balance sheet as follows:

$$FA + OA = D + E$$

Where *FA* indicates Financial assets, *OA* indicates Operating assets, D is the amount of debt and E is the amount of Equity. We consider that accounts receivable and accounts payable, often included among the financial assets and debt of NFC, respectively, are assets and liabilities generated in the normal production of goods and services and for this reason are included, net, as part of the operating assets of NFC. The resulting Operating assets are then calculated as follows:

Operating Assets= Fixed Assets + Inventories + Accounts Receivable- Accounts Payable + Cash

The accounts in the simplifies balance sheet above other than Operating assets, are rewritten in a more detailed way in unconsolidated and in consolidated ways, as follows:

Unconsolidated:
Financial Asset (FA) = FA of NFC (except Accounts Receivable and Cash) + FN of Other Spanish Institutional Sectors + FA of Rest of the World

Debt = Debt to NFC (except Accounts Payable) + Debt to Other Spanish Institutional Sectors + Debt to Rest of the World

Equity = Equity of NFC + Equity of Other Spanish Institutional Sectors + Equity of the Rest of the World

Consolidated:
Consolidated FA = Financial Assets – FA of NTC (except Accounts Receivable and Cash) = FN of Other Spanish Institutional Sectors + FA of Rest of the World

Consolidated Debt= Debt – Debt to NFC (Except Accounts Payable) = Debt to Other Spanish Institutional Sectors + Debt to Rest of the World

Consolidated Equity = Equity – Equity of NFC = Equity of Other Spanish Institutional Sectors + Equity of the Rest of the World

2.3. Flow of funds

The equivalent to the simplified balance sheet in terms of flows is written as[4]:

$$\Delta FA + \Delta OA = \Delta D + \Delta E$$

Operating assets change over time as the result of investment in production capital, I, $\Delta OA=I$. Changes in equity, ΔE include retained profits, RB, and issues/cancelation of

[4]This way of writing the generation and uses of businesses' cash flows is taken from Gruber and Kramen (2015).

shares ΔC. Retained profits, in turn, are equal to profits B minus dividends paid, DI; that is $RE = B\text{-}DI$. Then, $\Delta E = B\text{-}DI + \Delta C$. Substituting in the equation above,

$$\Delta AF + I = \Delta D + B - DI + \Delta C$$

And

$$B = (DI - \Delta C) + I + (\Delta AF - \Delta D)$$

The left hand side of this equation is the net profit of the business and the right hand side includes the three possible destinations of these profits: pay dividends to the shareholders (net of shares issues of cancelations), invest in operating assets, and change the stock of financial assets net of variations in debt. In the equations above investment I is net of amortization, i.e. net of the part of new investment needed to replace the capital consumed in production. The equation of profits and their uses could be written in terms of internally generated cash flows and uses of these cash flows by adding amortization AM to both sides of the equation: B+AM = Cash Flow (CF) internal; I+AM = Gross Investment (GI):

$$CF = (DI - \Delta C) + GI + (\Delta AF - \Delta D)$$

The so-called "corporate saving glut" refers to a situation where corporations save more than they invest, i.e., corporations contribute to financing the rest of the economy. The situation is considered anomalous because it is understood that the role of corporations is precisely discover entrepreneurial opportunities and make the investments needed to exploit them. Most of the time, in the aggregate, firms do not have sufficient own savings to finance these investments and have to borrow from the rest of the economy. The need of funds (-) or the surplus of funds (+) of corporations from their saving and investment decisions can be expressed, with the notation above, as follows:

$$Excess\ (+)\ Needs\ (-)\ of\ funds = (B - DI) - I = \Delta AF - (\Delta D + \Delta C)$$

We will examine if Spanish corporations participate of the saving glut or not.

3. Income and profits

Table 1 presents the time evolution of the income statement, from value added (production minus intermediate consumption) to net profits, of Spanish NFC in the period 2000-2014. The information is presented in absolute values at current prices, Table 1.a, and in values relative to the Gross Value Added (GVA) of the Spanish NFC, Table 1b. The Table is elaborated form National Accounts, NA, data. Corporations have three sources of income: value added from production and sales activities in Spain, financial income received as compensation of financial assets, and other property income. The bottom of Table 1a shows the total income of NFC and the ratio relative to Spanish GDP. By far, the Gross Value Added, GVA, is the largest component of total income, around 95% of the total; interest income from financial and assets and property income represent around 4% and less than 1% of the total, respectively. The exception is year 2014, when GVA reduces its contribution to 92,5% and interest income increases to almost 7%. In the period 2000-2007 the contribution of NFC to national income represents 52% of the GDP. During the crisis, the contribution increases in five percentage points to around 57%[5].

NFCs use income to pay salaries and wages, to compensate the investors that finance the production capital and the entrepreneurs, and to pay corporate taxes. The labor costs in Table 1 are salaries and wages paid to employees and managers of NFC involved in producing goods and services in Spain. Assets are financed with debt and equity. The cost of debt is pre contracted and corporations have to reimburse the debt to lenders at contracted dates. The compensation to equity is residual and equal to the net profit, i.e. the profit left after all pre-contracted payments are made, and net of corporate taxes. Corporations do not report a cost of equity and therefore it is not possible to separate net profit into cost of equity and economic profits, even though the two are conceptually different (economic profits can be considered the reward to entrepreneurial inputs). The corporate income left after paying the labor costs will, one way or the other, be paid to owners of capital (some of them business owners and entrepreneurs). Then, corporate income will be broadly divided into labor income and capital income.

[5] The comparison of percentages of GVA of corporations over Spanish GDP over time may be distorted by the revision of the National Accounts, transferring value added from Households to Corporations, made by the Spanish Statistical Office at different moments of time.

Table 1. Income Statement Spanish NFC: 2000-2014

Table 1a. Absolute values

	2000	*2001*	*2002*	*2003*	*2004*	*2005*	*2006*	*2007*	*2008*	*2009*	*2010*	*2011*	*2012*	*2013*	*2014*
Gross Value Added (GVA)	324.475	352.059	376.561	400.062	426.500	458.902	499.224	552.507	605.083	590.719	581.786	573.008	557.406	546.035	550.911
-(Production taxes + Subsidies)	52	345	55	-231	61	194	-1.233	-2.413	-1.461	-1.313	-1.706	-1.479	139	1.316	1.642
-Labor compensation	203.928	223.374	239.663	255.893	271.693	291.207	317.671	346.559	371.166	355.712	347.732	341.663	320.793	307.983	312.718
Gross operating profits	120.495	128.340	136.843	144.400	154.746	167.501	182.786	208.361	235.378	236.320	235.760	232.824	236.474	236.736	236.551
-Amortization and other expenses	56.952	61.309	65.893	71.432	78.225	84.444	92.783	101.246	107.642	112.643	112.871	115.619	119.013	119.604	121.727
Net operating profit	63.543	67.031	70.950	72.968	76.521	83.057	90.003	107.115	127.736	123.677	122.889	117.205	117.461	117.132	114.824
+ Financial income	12.491	13.101	13.996	16.398	17.343	19.994	22.585	22.313	30.352	29.306	23.608	32.228	29.588	30.800	40.673
+Other property rents	1.200	-2.156	-1.812	168	-20	2.055	3.419	5.623	1.390	1.930	1.082	786	3.836	3.536	3.913
Profit before interest and taxes	77.234	77.976	83.134	89.534	93.844	105.106	116.007	135.051	159.478	154.913	147.579	150.219	150.885	151.468	159.410
-Interest on debt	19.986	24.745	23.143	22.453	24.868	30.985	39.359	55.975	63.598	34.982	33.134	39.770	39.424	26.814	20.793
-Corporate taxes	16.613	16.756	19.256	21.576	25.014	30.335	34.108	41.567	25.474	19.015	16.168	15.782	19.772	17.960	18.589
Net profit	40.635	36.475	40.735	45.505	43.962	43.786	42.540	37.509	70.406	100.916	98.277	94.667	91.689	106.694	120.028
Total Corporate Income (GVA+ Financial income+ Other property income)	338.166	363.004	388.745	416.628	443.823	480.951	525.228	580.443	636.825	621.955	606.476	606.022	590.830	580.371	595.497
Spanish GDP (M, current prices)	646.250	699.528	749.288	803.472	861.420	930.566	1.007.974	1.080.807	1.116.207	1.079.034	1.080.913	1.070.413	1.042.872	1.031.272	1.041.160
Corporate Income/GDP	0,523	0,519	0,519	0,519	0,515	0,517	0,521	0,537	0,571	0,576	0,561	0,566	0,567	0,563	0,572

Source: Own elaboration form National Accounts

Table 1b. Values relative to GVA

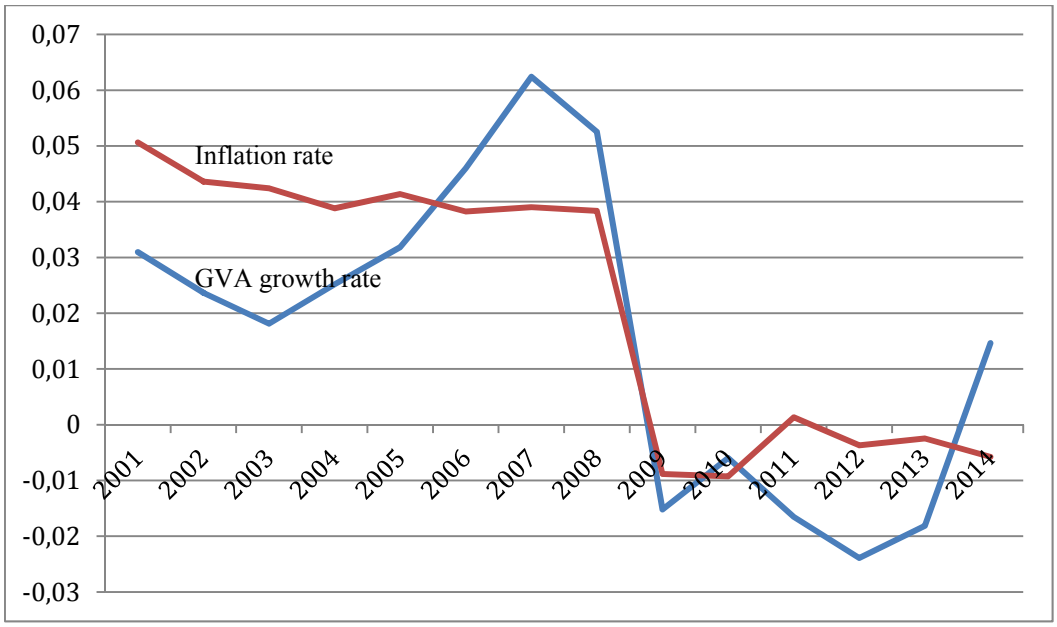
	2000	*2001*	*2002*	*2003*	*2004*	*2005*	*2006*	*2007*	*2008*	*2009*	*2010*	*2011*	*2012*	*2013*	*2014*
Gross Value Added	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
-(Production taxes + Subsidies)	0,001	0,001	0,000	-0,001	0,000	0,000	-0,002	-0,004	-0,002	-0,002	-0,003	-0,003	0,000	0,002	0,003
-Labor compensation	0,628	0,634	0,636	0,640	0,637	0,635	0,636	0,627	0,613	0,602	0,598	0,596	0,576	0,564	0,568
Gross operating profits	0,371	0,365	0,363	0,361	0,363	0,365	0,366	0,377	0,389	0,400	0,405	0,406	0,424	0,434	0,429
-Amortization and other expenses	0,176	0,174	0,175	0,179	0,183	0,184	0,186	0,183	0,178	0,191	0,194	0,202	0,214	0,219	0,221
Net operating profit	0,196	0,190	0,188	0,182	0,179	0,181	0,180	0,194	0,211	0,209	0,211	0,205	0,211	0,215	0,208
+ Financial income	0,038	0,037	0,037	0,041	0,041	0,044	0,045	0,040	0,050	0,050	0,041	0,056	0,053	0,056	0,074
+Other property rents	0,004	-0,006	-0,005	0,000	0,000	0,004	0,007	0,010	0,002	0,003	0,002	0,001	0,007	0,006	0,007
Profit before interest and taxes	0,238	0,221	0,221	0,224	0,220	0,229	0,232	0,244	0,264	0,262	0,254	0,262	0,271	0,277	0,289
-Interest on debt	0,062	0,070	0,061	0,056	0,058	0,068	0,079	0,101	0,105	0,059	0,057	0,069	0,071	0,049	0,038
-Corporate taxes	0,051	0,048	0,051	0,054	0,059	0,066	0,068	0,075	0,042	0,032	0,028	0,028	0,035	0,033	0,034
Net profit	0,125	0,104	0,108	0,114	0,103	0,095	0,085	0,068	0,116	0,171	0,169	0,165	0,164	0,195	0,218

Source: Own elaboration from Table 1a

The period 2000-2008 was of high output growth so the nominal GVA of NFC almost double in this period. With the crisis, growth experienced a sudden stop and the corporate sector started a period of nominal output contraction that continued until 2013. Figure 1 shows the decomposition of the annual rate of nominal growth of GVA in the price component and in the real output component. The price index to deflate nominal GVA of NFC is the deflator of GVA for the Spanish economy. The real growth rate of the GVA is the nominal minus the price inflation.

In the period 2000-2008, price inflation contributed to nominal corporate output growth with an annual growth rate above 4%. Since 2009, and for the rest of the period, price inflation has been negative. Real GVA grows at rates between 2% and 3% in the years 2001-2005 and accelerates to a maximum real growth rate above 6% in 2007. The inertia of growth continued in 2008 but in 2009, with the crisis, the annual growth rate of GVA was negative -1,5%. Negative real growth rates continued during several years, until the 1,4% growth rate, positive, observed in 2014. The cumulative loss of real output in the period 2008-2013 was 7,7%.

Figure 1. Price Inflation Rate and Real Rate of Growth of GVA for Spanish NFC



Source: INE and Table 1a.

The growth of the corporate sector in the years of the Euro has not been even across economic sectors, with construction quite ahead of the rest of activities. In 2000, the GVA of the construction sector, not all of it included into the corporate sector since self-employment is highly relevant in construction, amounts to 18% of the GVA of the non-financial corporate sector of the Spanish economy; in 2006 this percentage was 25%. From 2006 on the GVA of the construction sector grew at lower rates than the GVA of all NFC, contributing to large extent to the depression of the Spanish economy. During the five years 2009-2013, the real GVA of construction declined at a cumulative annual average rate of -9%; in 2014 the GVA of the construction sector is 12% of the GVA of NFC, less than half of what it was in 2006. Although the rapid expansion, until 2007, and the sharp decline, since 2008 till 2014, of the construction sector must have affected substantially the pattern of growth of the Spanish economy in the Euro, the rest of exposition will focus on the corporate non-financial sector as a whole.

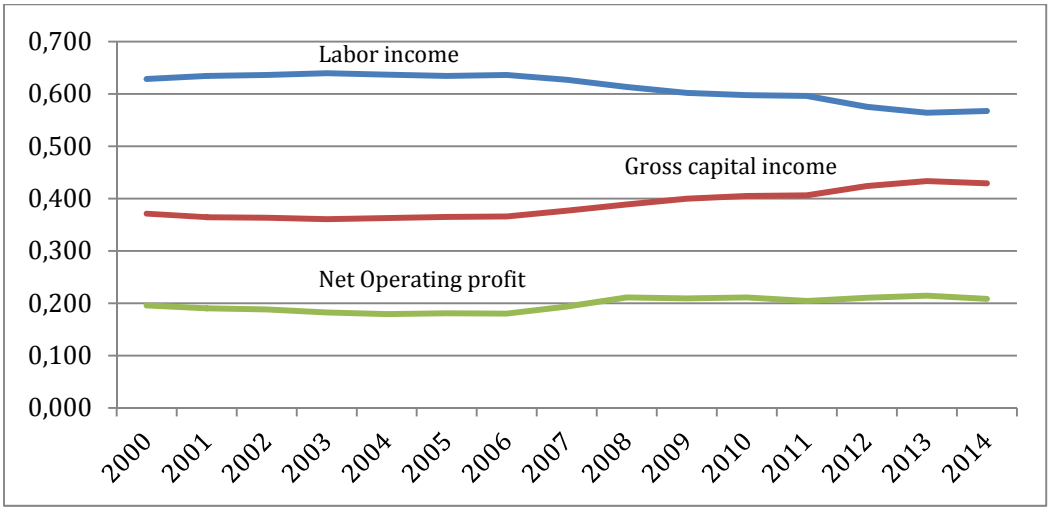
3.1. Distribution of GVA and corporate income

The GVA of NFC is the gross income generated with activities of production and sales conducted in Spain. Production and sales consume labor and capital inputs from operating assets. The labor cost in the income account of Table 1a is the payment to employees for their services in Spain, most of them consumed in the production of goods and services also in Spain. Therefore, the GVA is divided between labor income and capital income from operations in Spain, Figure 2. A distinction is also made between gross capital income and net operating income (equal to gross capital income minus amortization).

In the pre period, 2000-2007, the compensation to the labor input represents 63.5% of the GVA of NFC. The rest of GVA, 36,5%, corresponds to the capital income from operations in Spain. Since 2008 the share of labor compensation in the GVA of NFCs has been going down steadily and in 2014 is 56,8% almost 7 percentage points less than in the pre crisis years. The share of gross capital income has increased accordingly, except for some variations in production taxes but of small absolute value. The time evolution of the share of net operating income in the GVA first decreases in the period 2000-2006 (from 19,6% to 18%) and later increases again in 2007 and 2008 to remain stable, slightly above 20%, afterwards. The difference between gross capital income and

net operating income is equal to amortization and other expenses so amortization first decreases, since 2000 till 2006, and later on it maintains an increasing trend, probably because operating assets depreciate at higher rates in the crisis.

Figure 2. Labor and Capital Income from Operations in Proportion to GVA: Spanish NFC



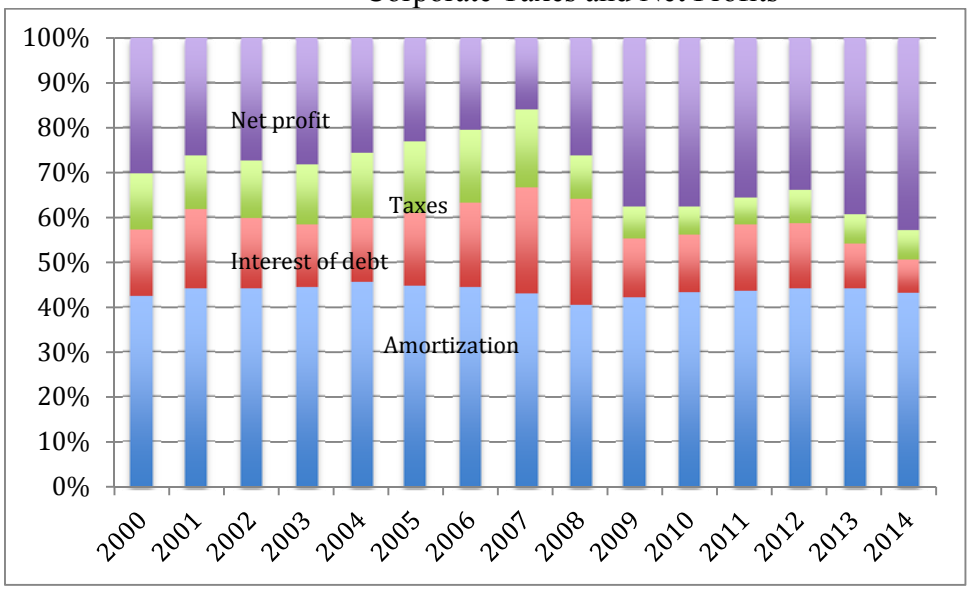
Source: Table 1b.

In addition to the gross profit income coming from the GVA of operations in Spain, the financial assets of NFC receive direct cash compensation in the form of financial income and other property income. In 2003-2007 the sum of the three sources of capital income, from operations in Spain, from financial assets and from properties, represents approximately 40% of total income of the NFC. During the crisis this proportion goes up steadily to a value of 47,2% in 2014. In the pre crisis period the gross profits from operations in Spain represent around 89% of total gross capital income; since 2007 the proportion has been decreasing till 84,1% in 2014; meanwhile income from financial assets was increasing.

The gross capital income of corporations is distributed into amortization, interest of debt, corporate taxes, and net profits, Figure 3. The proportion of amortization in the total capital compensation is very stable over time, around 43%, while the proportions of the rest of components vary over time. In the period 2000-2003, interest of debt, corporate taxes and net profits represented, respectively, 15%, 13% and 27% of gross capital income. In the following years till 2007, interest of debt and taxes increase

steadily while net profits decrease; the respective proportions in 2007 are 24%, 18% and 16%. With the crisis the composition changes again; in 2014 net profits represent 43% of total capital income, while interest of debt and taxes each represent each 7% of all capital income.

Figure 3. The Distribution of Capital Income of NFC in Amortization, Interest of Debt, Corporate Taxes and Net Profits



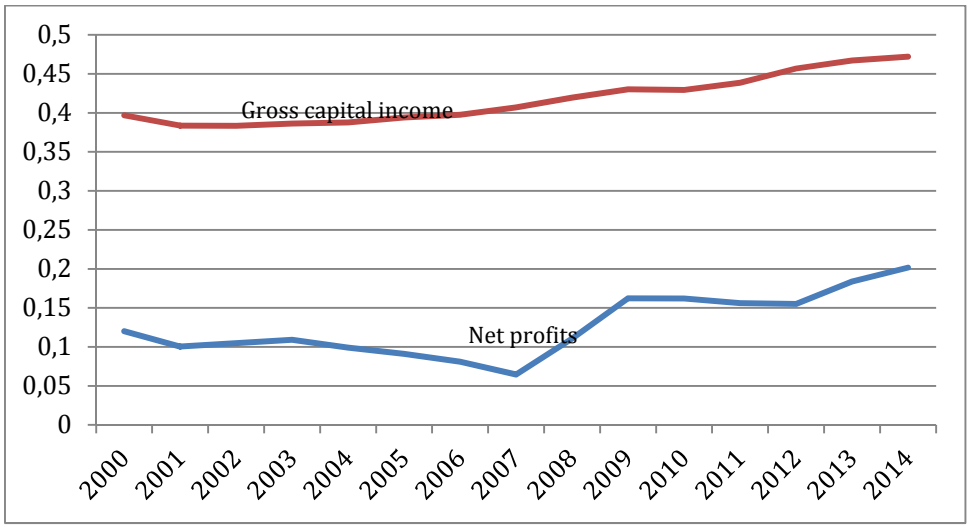
Source: Table 1b

Net profits, the residual, represent 12% of corporate income in 2000 and the proportion goes down to a minimum of 6,5% in 2007 (Figure 4). The decline in net profits is the consequence of higher interest payments and higher taxes. During the years of the crisis, the proportion of corporate net profits over total income multiplies per three and increases from 6,5% in 2007 to 20% in 2014. Half of the percentage points of this increase come from the higher proportion of capital income in total corporate income, and the other half from lower proportion of interests of debt and of corporate taxes. The increase in relative capital income includes capital income from operations and capital income from financial assets and properties.

According to Figure 2, net operating income relative to GVA has been fairly stable in the period 2008-2014. Therefore the contribution of net capital income from operations in Spain, to the relative increase in corporate net profits during the years of the crisis has been practically zero. The increasing trend in net profits observed in Figure 4, from

2008 and beyond, is explained by the evolution of financial income and, more importantly by the reduction in the proportion of interest paid and taxes. The important reduction in the proportion of interests on debt on capital income and on total corporate income occurs in years 2013 and 2014 (and is expected to continue in 2015), coinciding with the years of high monetary expansion by the European Central Bank.

Figure 4. Gross Capital Income and Net Profits in Total Corporate Income



Source: Table 1

4. Balance sheet and leverage

The Financial Accounts of the Spanish economy, elaborated and published by Banco de España, provide quarterly information on assets and liabilities of the Spanish economy as a whole, and information on the same variables for each institutional sector, including the NFC. With the available information it is possible to elaborate the balance sheet, assets and liabilities, of the corporate sector, both unconsolidated and consolidated. As anticipated in section 2 the unconsolidated balance sheet includes all assets and liabilities of the corporate sector, including those resulting from financial transactions among corporations in Spain. The consolidated balance sheet results from netting out the assets and liabilities from transactions among corporations in Spain so what is left corresponds only to transactions between the corporate sector and the other institutional sectors, including the rest of the world.

Balance sheet information on NFC in Spain is presented in Tables 2, 3 and 4; the tables are elaborated following the explanation given in section 2. Table 2 is the balance sheet with unconsolidated data, that is including financial assets and liabilities from transaction between corporations in Spain. Table 3 is the balance sheet with consolidated data where assets and liabilities from transactions within the corporate sector in Spain are eliminated. The distinction between unconsolidated and consolidated accounts affects to financial assets and to all liabilities, debt and equity, but operating assets are unaffected. Finally Table 4 presents separate information on financial assets, and liabilities, debt and equity in the balance sheet of Spanish NFC, from transactions with the rest of the world. Financial assets include loans and shares that to a large extend correspond to operating assets financed and controlled by Spanish corporations to produce and sell goods and services abroad (foreign direct investment). The finance from the rest of the world comes mainly in the form of loans and equity.

The unconsolidated total assets and liabilities of the Spanish NFC, as calculated here i.e. netting out bank deposits from the unconsolidated debt, amount to 1,2 billion euros in year 2000 and increase to a maximum 2,87 billions in 2007. Since 2008 the total assets do not show a clear time trend, Table 2. For the whole economy the stock of unconsolidated assets are 4,5 millions in 2000 and 10 billions in 2014. The increasing trend in total unconsolidated assets in the period 2000-2007 occurs in both, operating and financial assets. After 2007 operating assets remain stable until 2012 and decrease in 2013 and 2014. Financial assets, on the other hand, decrease in 2008 and 2009 and since then increase so in 2014 they amount to 1,39 billion euros, the highest value in the series. Unconsolidated debt net of bank deposits increases over time faster then unconsolidated equity and the maximum value of 1,26 billions of unconsolidated debt in 2011 is 3,5 times the debt in year 2000. Operating assets are valued at replacement costs and financial assets at market prices so changes in values of respective stocks over time reflect changes in volume and changes in prices. Debt is valued at face value so changes in asset prices are gains or losses for equity holders only.

Table 2. Balance sheet of Spanish NFCs. Unconsolidated accounts: 2000-2014

	2000	*2001*	*2002*	*2003*	*2004*	*2005*	*2006*	*2007*	*2008*	*2009*	*2010*	*2011*	*2012*	*2013*	*2014*
Operating assets	680.212	760.617	836.587	914.385	1.019.121	1.165.572	1.345.486	1.520.055	1.552.865	1.520.297	1.531.334	1.540.396	1.499.567	1.372.163	1.290.803
Financial assets*	522.580	638.416	677.941	733.553	829.113	962.901	1.179.327	1.349.971	1.301.890	1.200.572	1.245.904	1.326.021	1.361.288	1.369.723	1.387.316
Assets	**1.202.792**	**1.399.033**	**1.514.528**	**1.647.938**	**1.848.234**	**2.128.473**	**2.524.813**	**2.870.026**	**2.854.755**	**2.720.869**	**2.777.238**	**2.866.417**	**2.860.855**	**2.741.887**	**2.678.119**
Debt*	353.150	439.828	502.419	554.924	623.705	724.056	889.325	1.081.962	1.208.279	1.239.702	1.244.667	1.263.204	1.222.556	1.131.221	1.060.690
Equity	849.642	959.205	1.012.109	1.093.014	1.224.529	1.404.417	1.635.488	1.788.064	1.646.476	1.481.167	1.532.571	1.603.214	1.638.299	1.610.666	1.617.429
Liabilities	**1.202.792**	**1.399.033**	**1.514.528**	**1.647.938**	**1.848.234**	**2.128.473**	**2.524.813**	**2.870.026**	**2.854.755**	**2.720.869**	**2.777.238**	**2.866.417**	**2.860.855**	**2.741.887**	**2.678.119**

*Financial assets and Debt are net of bank Deposits

Source: Own elaboration from Financial Accounts

Table 3. Assets and Liabilities of Spanish NFC from Consolidated Accounts: 2000-2014

	2000	*2001*	*2002*	*2003*	*2004*	*2005*	*2006*	*2007*	*2008*	*2009*	*2010*	*2011*	*2012*	*2013*	*2014*
Financial assets (FA)	299.296	354.324	375.057	404.620	453.125	526.643	642.756	737.233	757.400	758.765	801.195	824.429	792.336	769.096	778.185
Deposits	89.658	103.622	118.289	130.484	142.447	162.114	189.888	210.561	220.662	225.689	227.717	218.904	205.884	207.923	211.275
Bonds, loans, shares and other	209.638	250.702	256.769	274.136	310.678	364.529	452.868	526.672	536.737	533.076	573.477	605.525	586.452	561.173	566.910
Operating assets	680.212	760.617	836.587	914.385	1.019.121	1.165.572	1.345.486	1.520.055	1.552.865	1.520.297	1.531.334	1.540.396	1.499.567	1.372.163	1.290.803
Total Assets	**979.508**	**1.114.941**	**1.211.644**	**1.319.005**	**1.472.246**	**1.692.215**	**1.988.242**	**2.257.288**	**2.310.265**	**2.279.062**	**2.332.529**	**2.364.825**	**2.291.903**	**2.141.259**	**2.068.988**
Debt	364.803	431.135	491.958	555.331	632.390	744.563	931.627	1.139.010	1.275.504	1.319.389	1.319.438	1.303.353	1.234.936	1.139.053	1.067.554
Bank loans	248.426	289.566	327.423	368.760	425.732	519.131	672.925	840.593	941.054	955.817	936.837	908.940	838.645	743.733	666.557
Other	116.377	141.569	164.535	186.572	206.658	225.433	258.702	298.417	334.449	363.572	382.600	394.413	396.291	395.320	400.997
Equity	614.705	683.806	719.686	763.674	839.856	947.652	1.056.615	1.118.277	1.034.761	959.673	1.013.090	1.061.472	1.056.966	1.002.207	1.001.435
Total Liabilities	**979.508**	**1.114.941**	**1.211.644**	**1.319.005**	**1.472.246**	**1.692.215**	**1.988.242**	**2.257.288**	**2.310.265**	**2.279.062**	**2.332.529**	**2.364.825**	**2.291.903**	**2.141.259**	**2.068.988**
Debt/Assets	0,37	0,39	0,41	0,42	0,43	0,44	0,47	0,50	0,55	0,58	0,57	0,55	0,54	0,53	0,52
FA/Assets	0,31	0,32	0,31	0,31	0,31	0,31	0,32	0,33	0,33	0,33	0,34	0,35	0,35	0,36	0,38
Bank debt/Debt	0,68	0,67	0,67	0,66	0,67	0,70	0,72	0,74	0,74	0,72	0,71	0,70	0,68	0,65	0,62
Debt-De/Assets-De	0,31	0,32	0,34	0,36	0,37	0,38	0,41	0,45	0,50	0,53	0,52	0,51	0,49	0,48	0,46

Source: Own elaboration from Financial Accounts

Table 4. Financial Assets of the Rest of the World and Finance From the Rest of the World (R of W) of Spanish NFC: 2001-2014

	2000	*2001*	*2002*	*2003*	*2004*	*2005*	*2006*	*2007*	*2008*	*2009*	*2010*	*2011*	*2012*	*2013*	*2014*
Financial assets of Rest of the World															
Cash and deposits	11.018	10.813	11.883	13.304	13.909	14.782	15.570	15.354	14.032	12.405	11.344	11.303	11.701	11.891	10.998
Loans	17.601	24.650	26.940	28.891	35.821	42.915	48.889	57.322	63.992	69.813	69.566	66.451	68.640	69.751	74.343
Shares	100.462	127.608	121.699	116.568	121.362	137.195	171.537	204.905	228.311	241.086	270.181	299.415	291.318	286.183	304.143
Others	41.282	45.039	48.419	50.076	50.785	53.817	62.737	64.777	57.771	53.480	54.953	60.007	59.215	55.724	56.727
Total	**170.362**	**208.110**	**208.942**	**208.839**	**221.878**	**248.709**	**298.733**	**342.357**	**364.106**	**376.783**	**406.044**	**437.177**	**430.874**	**423.549**	**446.212**
Finance from Rest of the World															
Loans	74.484	99.310	121.019	142.321	159.939	176.404	203.898	236.822	265.290	282.906	292.693	296.676	289.737	281.973	284.102
Equity	217.095	239.496	249.934	264.880	295.291	323.790	355.931	407.796	412.458	392.794	407.373	408.112	410.658	453.846	494.405
Others	33.024	34.980	34.921	35.003	36.571	39.927	46.374	51.649	50.930	47.512	45.054	44.649	43.692	42.632	44.352
Total	**324.602**	**373.786**	**405.875**	**442.204**	**491.801**	**540.122**	**606.203**	**696.267**	**728.678**	**723.212**	**745.119**	**749.437**	**744.087**	**778.451**	**822.859**
Financial Asset R of W/ Financial Assets	0,57	0,59	0,56	0,52	0,49	0,47	0,46	0,46	0,48	0,50	0,51	0,53	0,54	0,55	0,57
Finance R of W/Total Liabilities	0,33	0,34	0,33	0,34	0,33	0,32	0,30	0,31	0,32	0,32	0,32	0,32	0,32	0,36	0,40
Equity R of W/ Equity	0,35	0,35	0,35	0,35	0,35	0,34	0,34	0,36	0,40	0,41	0,40	0,38	0,39	0,45	0,49

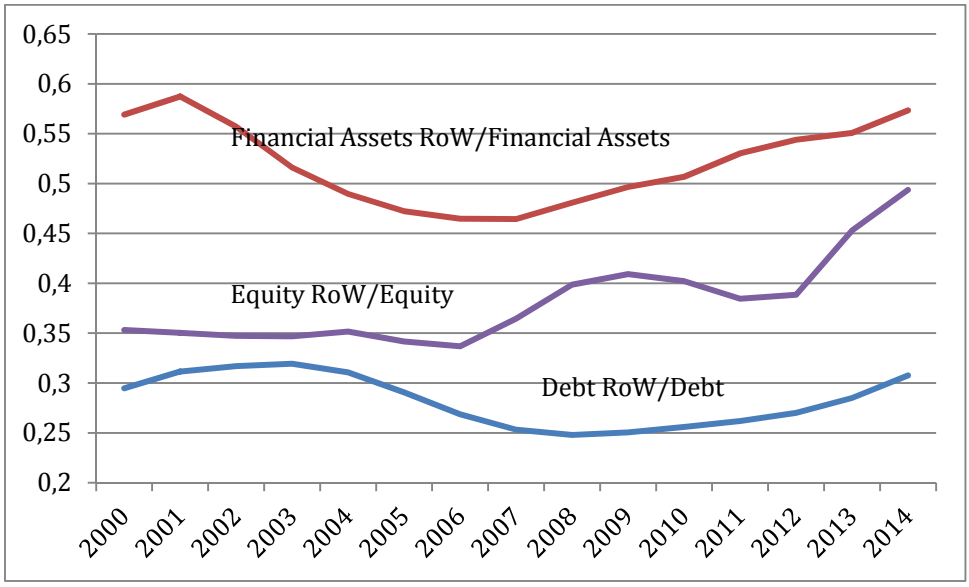
The netting out of assets and liabilities from operations between NFC in Spain, i.e. the data from consolidated accounts, reduces the total assets and total liabilities compared with unconsolidated values, Table 3. Consolidated assets and liabilities are 90% of the unconsolidated ones in 2000 and less than 76% in the final years of the period, indicating an increasing trend in intra corporate transactions over time. The contraction in consolidated assets affects only to financial assets and to debt and equity since operational assets do not come out of financial transactions. In absolute terms, consolidated assets of NFC amount to 1,17 billions in 2000 and more than double to 2,4 billion euros in 2007. The 2,16 billions of consolidated assets in 2014 are 0,3 billions lower than the maximum 2,46 billions of consolidated assets in 2010 and 2011. In the asset side the largest contraction occurs in Operating assets, 0,24 billions, while in the liability side the contraction concentrates almost exclusively in debt, 0,28 billions.

The consolidated assets and liabilities in Table 3 are presented in greater detail than the unconsolidated ones in Table 2. Financial assets represent between, the lower, 35% of total assets in 2008, and the highest, 42% in 2000; in 2014 they are 40% of the total assets. Around three quarters of the financial assets are long term (bonds, loans, shares) and the rest bank deposits. Debt over total assets in consolidated accounts increases over time at similar pace than the unconsolidated ones, but with lower values of the ratio: 34% in 2000, 54% in 2009 and 45% in 2014. If bank deposits of NFC are tied to bank loans then it makes sense to estimate the consolidated debt net of bank deposits. If we do so, the ratio of debt minus deposits over total assets minus deposits starts at 28% in 2000, increases up to 49% in 2009 and decreases again to 39% in 2014. Bank debt represent around two thirds of total consolidated debt of NFC in the early and in the end years of study. Most of the variation in the ratio of consolidated debt over total assets during the period of study is associated with the evolution of bank debt on total debt, with a maximum of 76% in 2007 and 2008.

The third piece of balance sheet data we present, is the volume of assets issued by institutions in the rest of the world held in the balance sheet of Spanish NFC, and the volume of liabilities issued by Spanish NFC and subscribed by the rest of the world, every year from 2001-2014, Table 4. Assets from the rest of the world are around 21% of the total consolidated assets of NFC in 2001; the proportion decreases to 15% in 2007 and 2008, and increases again in the following years to 21% in 2014. Liabilities of

the rest of the world are stable around 30% of total liabilities of NFC in the period 2001-2012 and then experience an increase to 37% and 39% in 2013 and 2014, respectively. The difference between assets and liabilities is positive all the years, meaning that the rest of the world finances part of the operating assets and financial assets of the corporate sector in Spain. The largest amount of net finance from the rest of the world of the corporate sector is 0,4 billions in 2007, three times the value in 2001; in the years of the crisis this amount first decreases, 0,30 billions in 2011, and rises again to 0,37 billions in 2014. In relative terms, in 2001 net finance from the rest of the world represent 12,3% of corporate assets in Spain; in 2007, 19,1%, and in 2014, 21,8%.

Figure 5. Assets in Rest of the World (RoW) and finance, equity and debt, from RoW



Source: Tables 3 and 4

For the whole time period, more than half of the total consolidated financial assets of NFC correspond to assets issued by the rest of the world (the proportion only departs substantially from half in 2007 when it goes down to 41%); to a large extend the 0,17 billions in 2000 and the 0,45 billions in 2014, are the financial counterparts of operating assets of Spanish parent corporations in subsidiaries abroad. According to these numbers around 20% of the total consolidated assets of Spanish NFC correspond to operating assets deployed to produce abroad. In the liability side, loans from the rest of the world are 25% of total debt finance of NFC in the early years of the time period;

they decrease to 21% in 2007, and increase again till 30% in 2014. Equity from the rest of the world relative to total consolidated equity has been increasing steadily over time, from 30% in the early 2000 to 42% in 2014 (Figure 5). In 2014 equity issued by Spanish NFC held outside the world amounts to half a billion, out of a total consolidated equity of 1,18 billions. The rest of the world contributes directly to finance the assets of NFC in larger absolute and relative amounts with equity than with debt.

4.1. Leverage ratios

Corporate debt generates fixed claims in interest payment and cancelation of principal that, if unattended will jeopardize the survival of the business activity. Too higher levels of debt expose firms to levels of financial risk that can lead to insolvency and bankruptcy. The corporate processes of leveraging and de-leveraging often receive a lot of attention by policy makers and business analysts.

Table 5 shows the values of commonly used ratios of corporate leverage using information from Tables 1 to 4 above. The first one is the ratio of debt over total assets, with unconsolidated (from Table 2) and with consolidated (from Table 3) values of numerator and denominator. A third calculation of the ratio uses debt net of bank deposits in the numerator and the denominator of the ratio, justified by the possible tie of deposits to bank loans. The so called "stock ratios", those comparing outstanding debt and outstanding assets that back it up, are complemented with ratios that combine stock and flows, in our case debt over corporate income and debt over profit before interest and taxes plus amortization. The ratio of debt over corporate income is the counterpart of the commonly used debt over GDP; Corporate income should be preferred to GDP because the corporate sector is the first responsible for paying back the debt. However for informative reasons the ratio of corporate debt over GDP is also included in the list of ratios. The ratio of debt over profit before interest and taxes plus amortization, PBIT + Amort., is the number of years needed to pay back the principal of the debt with the current flow of generated cash excluding interest payment and taxes.

All the ratios show a similar pattern over time: Leverage steadily increases until 2007, levels off for several years, until 2011, and decreases in the last three years of the period (see also Figure 6). Except in the first and the final years of the period, when the two are

similar, the rest of the time debt over total asset with consolidated accounts gives a value of the leverage ratio higher than when calculated with unconsolidated ones. When debt is net out of bank deposits, the leverage ratio is around 6 percentage points lower than when it is not. The stock-debt ratios in 2001-2003 remain very stable around 37% (debt over assets) and 30% (debt net of deposits over assets). In 2009 these ratios reach the maximum value of 54% and 49%, respectively. In 2014 they are lower than in the peak year, 45% and 39%, but still 8-9 percentage points above the values in the early years of the period.

The stock and flow ratios, on the other hand, initiate an increasing trend from the beginning of the period but the trend accelerates after 2003 and continued until 2007, when the ratios level off before decreasing in the later part of the period. The ratio of debt over corporate income (debt over profit plus amortization) starts with a value around 1,18 (3,15) in 2000 and goes up till 2,10 (5,28) in 2010 (2007). The respective values of the ratios in 2014 are 1,63 and 3,57, approaching the values of 2004 and 2005.

The last row of Table 5 shows the ratio of debt (net) in Table 2 over Spanish GDP at current prices in the period of study. In year 2000 consolidated corporate debt is 63% of the Spanish GDP. In 2009 consolidated corporate debt is 122% of the GDP, more than twice the value in year 2000. Since 2011 corporate debt has been decreasing and in 2014 is 90% of the GDP, still higher than the ratio in the early years of the period.

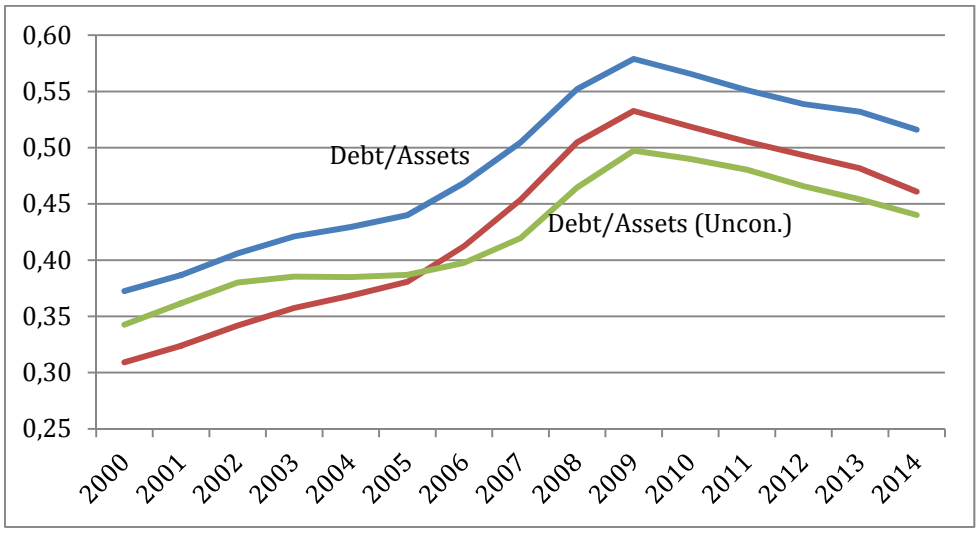
Table 5. Leverage Ratios of Spanish NFC: 2000-2014

	2000	*2001*	*2002*	*2003*	*2004*	*2005*	*2006*	*2007*	*2008*	*2009*	*2010*	*2011*	*2012*	*2013*	*2014*
Stock ratios															
Debt/Assets	0,37	0,39	0,41	0,42	0,43	0,44	0,47	0,50	0,55	0,58	0,57	0,55	0,54	0,53	0,52
Debt-Dep. /(Assets-Dep.)	0,31	0,32	0,34	0,36	0,37	0,38	0,41	0,45	0,50	0,53	0,52	0,51	0,49	0,48	0,46
Debt/Asset, Unconsolidated	0,34	0,36	0,38	0,39	0,38	0,39	0,40	0,42	0,46	0,50	0,49	0,48	0,47	0,45	0,44
Stock and flow															
Debt/Corporate income	1,08	1,19	1,27	1,33	1,42	1,55	1,77	1,96	2,00	2,12	2,18	2,15	2,09	1,96	1,79
Debt-Dep./Corporate Income	0,81	0,90	0,96	1,02	1,10	1,21	1,41	1,60	1,66	1,76	1,80	1,79	1,74	1,60	1,44
Debt/ PBIT + Amor.	2,88	3,27	3,48	3,64	3,87	4,11	4,66	5,03	4,96	5,17	5,26	5,05	4,73	4,35	3,92
Debt-Dep. /PBIT + Amor.	2,17	2,49	2,65	2,78	3,00	3,21	3,71	4,10	4,10	4,28	4,35	4,20	3,94	3,55	3,14
Debt/GDP	0,56	0,62	0,66	0,69	0,73	0,80	0,92	1,05	1,14	1,22	1,22	1,22	1,18	1,10	1,03

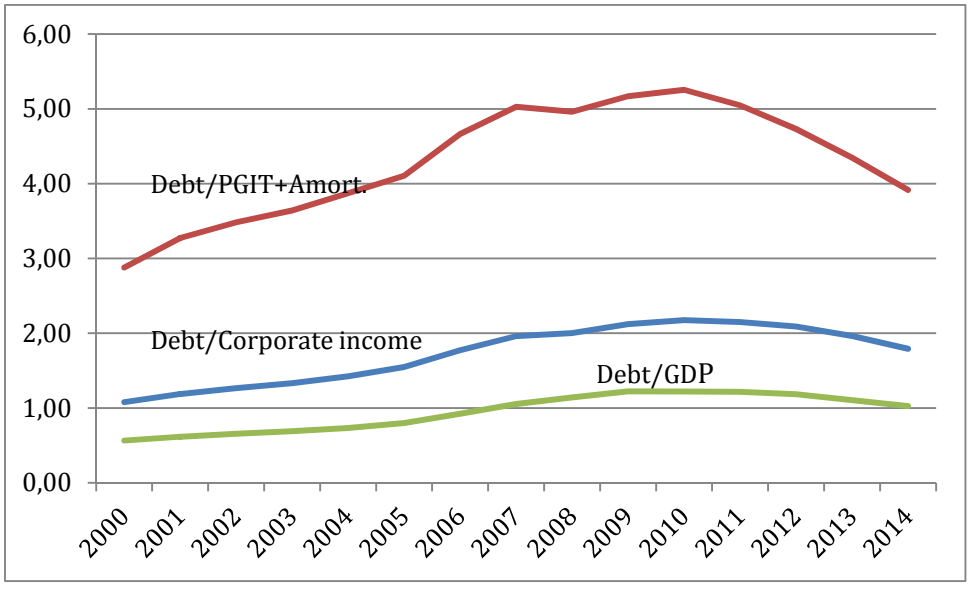
Source: Own elaboration form National and Financial Accounts

Figure 6. Leverage Ratios Spanish NFC

a. Stocks



b. Stock and Flows



Source: Table 5

Notice that the ratio of corporate debt over GDP of the economy can be expressed as the product of the ratios,

Debt/GDP = (Debt/Assets) x (Assets/Corporate Income) x Corporate Income/GDP.

That is, the proportion of total assets financed by debt, times the assets needed to generate one euro of corporate income, and times the proportion of corporate income in the Spanish GDP. For example, the 1,03 ratio of corporate debt over GDP in 2014 is the combined result of a debt over assets ratio of 0,44, of 4,1 assets per euro of corporate income, and 0,57 ratio of corporate income over GDP. Along the period of study the three ratios follow a similar time trend although the ratio that contributes the most to the observed time evolution of debt over GDP is the ratio of debt over total assets, followed by the ratio of assets over corporate income.

5. Rates of return and cost of debt

One of the advantages of combining flows and stocks in the analysis of behavior and performance of the corporate sector is the possibility of using flows and stocks in the calculations of rates of return on invested assets and of the average costs of debt. Corporations earn economic profits only if returns of invested assets are greater or equal to the cost of capital, and economic profit is a key variable in the analysis of investment and growth.

Spanish NFCs earn financial income from their financial assets and profits from producing goods and services in Spain. Therefore, they earn a return on the financial assets, on the operational assets, and on total assets:

ROA Operations = Operating profit/Operating assets
ROA Financial Assets = Financial income/Financial assets
ROA Total = (Operating profit + Financial income) / Total assets

The ROA Operations can in turn be decomposed as the product of profit margin, Operating profit per euro of GVA, and the average productivity of Operating assets, GVA per euro invested in operating assets:

ROA Operations = (Operating profits/ GVA) x (GVA/Operating assets)
(*Margin x Productivity*)

Table 6. Rate of Return on Assets, Operational, Financial and Total of Spanish NFC: 2000-2014

	2000	*2001*	*2002*	*2003*	*2004*	*2005*	*2006*	*2007*	*2008*	*2009*	*2010*	*2011*	*2012*	*2013*	*2014*
ROA AO	0,093	0,088	0,085	0,080	0,075	0,071	0,067	0,070	0,082	0,081	0,080	0,076	0,078	0,085	0,089
ROA FA	0,024	0,021	0,021	0,022	0,021	0,021	0,019	0,017	0,023	0,024	0,019	0,024	0,022	0,022	0,029
ROA Total	0,063	0,057	0,056	0,054	0,051	0,048	0,045	0,045	0,055	0,056	0,053	0,052	0,051	0,054	0,058

Source: Tables 1 and 2

Table 7. ROA of Operations and Determinants, Margin and Productivity of Capital, of Spanish NFC: 2000-2014

	2000	*2001*	*2002*	*2003*	*2004*	*2005*	*2006*	*2007*	*2008*	*2009*	*2010*	*2011*	*2012*	*2013*	*2014*
ROA Operations	0,093	0,088	0,085	0,08	0,075	0,071	0,067	0,07	0,082	0,081	0,08	0,076	0,078	0,085	0,089
Margin (Operating Profit/GVA)	0,196	0,19	0,188	0,182	0,179	0,181	0,18	0,194	0,211	0,209	0,211	0,205	0,211	0,215	0,208
Productivity (GVA/Operating Assets)	0,477	0,463	0,45	0,438	0,418	0,394	0,371	0,363	0,39	0,389	0,38	0,372	0,372	0,398	0,427

Source: Tables 1 and 3

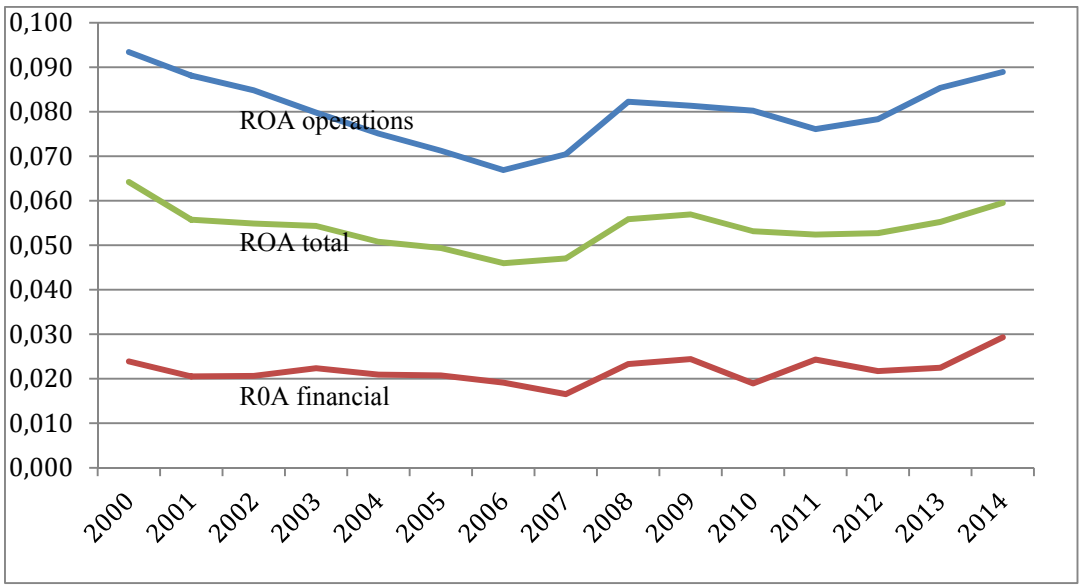
Table 8. Average Cost of Debt and Return on Equity, ROE, of Spanish NFC: 2000-2014

	2000	*2001*	*2002*	*2003*	*2004*	*2005*	*2006*	*2007*	*2008*	*2009*	*2010*	*2011*	*2012*	*2013*	*2014*
Cost of debt	0,057	0,056	0,046	0,040	0,040	0,043	0,044	0,052	0,053	0,028	0,027	0,031	0,032	0,024	0,020
ROE	0,066	0,053	0,057	0,060	0,052	0,046	0,040	0,034	0,068	0,105	0,097	0,089	0,087	0,106	0,120

Source: Tables 1, 2 and 3.

The results of the rates of return calculations appear in Table 6 and Figure 7. The ROA of operations shows first a decreasing trend, from 9,3% in the year 2000, to 7% in 2006 and 2007. In the years of the crisis the rate of return first increases and next remains stable at values around 8% until 2013 when it starts rising again; in 2014 the ROA of operations is close to 9%. The Financial income and the Interest payments reported in National Accounts are unconsolidated, i.e. they do not net out the intra corporate payments between NFC in Spain. For this reason the ROA on financial assets is calculated as the ratio between Financial income (Table 1) and unconsolidated Financial assets (Table 2)[6]. ROA of financial assets is around 2% in most of the years of the period, except in year 2014 that increases up to 2,9%. Finally, the ROA of total assets is calculated as the ratio between Profit before Interest and Taxes divided by total unconsolidated assets. The value of ROA total starts at 6,3% in 2000 and decreases to 4,5 in 2006 and 2007; in the following years it raises again to 5,8% in 2014. The time evolution of the ratio is very much determined by the time evolution of ROA of Operating assets (Figure 7).

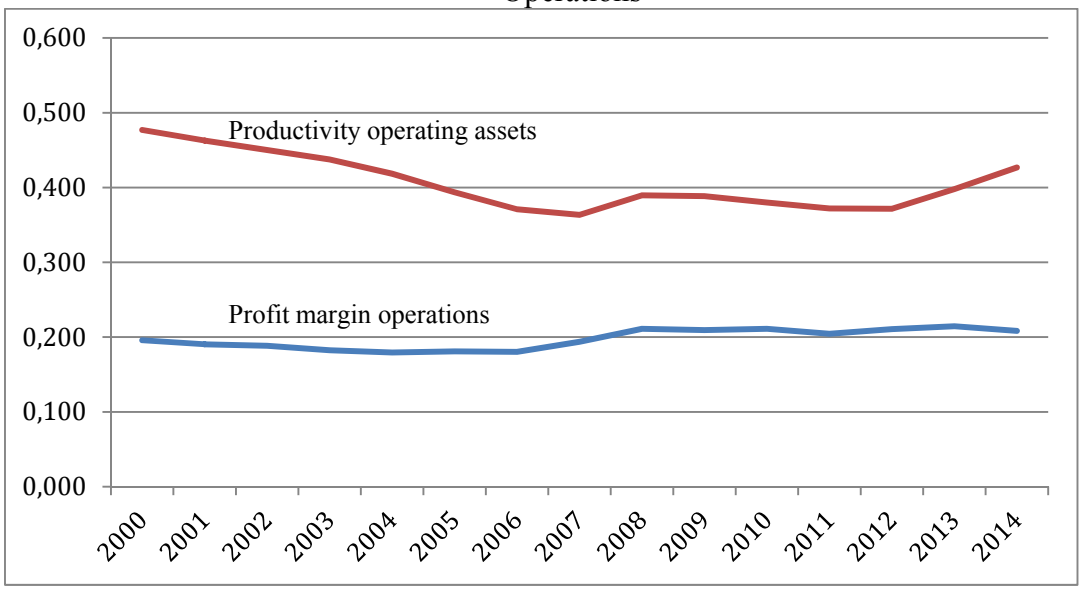
Figure 7. Rates of Return on Operating Assets, Financial Assets and Total Assets



Source: Table 3

[6] In the calculation we use financial assets net of Deposits considering that bank deposits can be to a large extend tied to bank loans. The calculation of cost of debt later on also uses debt minus deposits in the denominator.

Figure 8. Productivity of Operating Assets and Profit Margin as Determinants of ROA Operations



Source: Table 3

The decomposition of ROA of Operations as profit margin of operations, times productivity of operating assets, will tell us if one of the two variables dominates the other or the two contribute in a similar manner, in explaining the time evolution of ROA of operations; Table 7 and Figure 8. In the years 2000-2007 both productivity of operating assets and margin contribute to the decline of ROA, although the main driver of ROA in this period is the productivity of operating assets. After 2007 productivity of capital goes up but without any particular trend, except in the final years of the period. Profit margin also recovers slightly from the lower value in 2007 but it has been quite constant since 2008 at values slightly above 20%. The time evolution of profit margin of operations is the result of the evolution of labor compensation over GVA, decreasing in the late part of the period (Table 1) and the increase in the amortization rate from 6%-7% of Operating assets in the period 2000-2007, to 8%-9% in 2008-2014.

5.1. Financial returns

Corporations hold financial assets that generate financial income and use debt, for which they pay interest income, and equity, to finance operating and financial assets. The ROE or return on equity is the rate of return that summarizes the financial returns

of equity holders (residual), combining into a single figure profits from operations, financial income, interest costs and the leverage ratio.

Table 8 and Figure 9 show the values of Cost of Debt and ROE, the two ratios that summarize the financial performance of the corporate sector. The cost of debt represented in Figure 9 is calculated in both, nominal and real terms, i.e. nominal minus the ex post rate of change in the level of prices (change in the GDP deflator) of the corresponding year. Then,

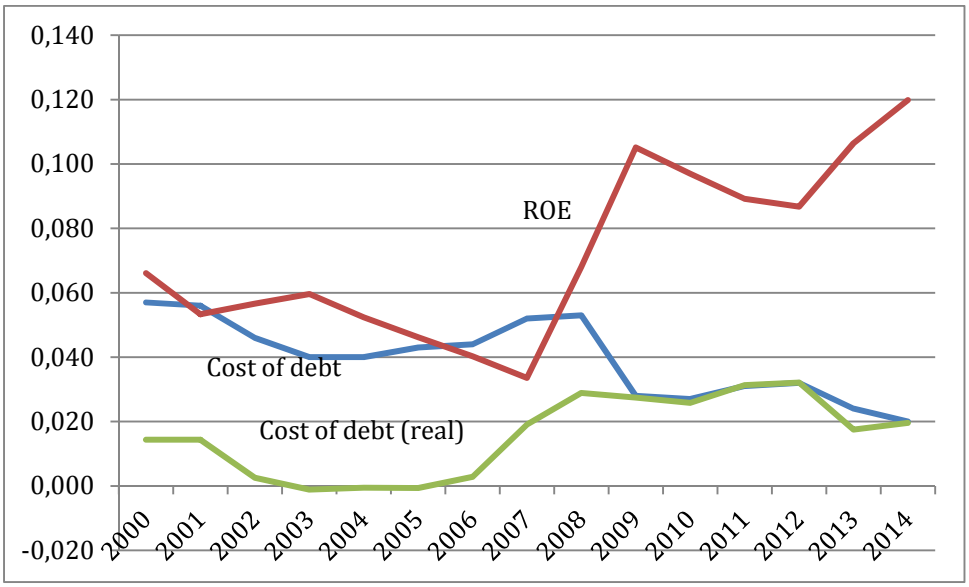
Cost of debt (nominal) = Interest payments /Debt (unconsolidated)
Cost of debt (real)=Cost of debt (nominal)- Year change in GDP deflator
ROE = Net profit /Equity

The calculation of the cost of debt in real terms is justified because the rate of return on assets and the return on equity with which is compared, are also expressed in real terms: profits in the numerator are expressed in current prices while assets in the denominator are expressed at current replacement values. In the case of the cost of debt the numerator is at current prices but the debt in the denominator is expressed at face value.

The average cost of debt, nominal, decreases in the first years of the period but starts rising in 2006, continuing the upper trend until 2008 when the cost of debt is similar to the value in year 2000. The response to the crisis by the ECB, especially the expansion of monetary policy, had the effect of decreasing average cost of debt to a value around 3% in the years 2010-2012. In the last two years of the period, 2013 and 2014, with the intensification of the expansion of the monetary policy in the Euro zone, the costs of debt financing went down again to values around 2% in 2014. When nominal cost of debt is adjusted to take into account the changes in the level of prices, the picture is different. Our measure of real cost of debt decreases in the first years of the period and remains at values practically equal zero from 2003 to 2006. In 2007 the real average cost of debt rises again and remains at 3% until the intensification of the expansionary monetary policy in the last two years of the sample period. During the years of the crisis

and particularly in the late ones, the evolution of real cost of debt has been pushed upwards by the negative inflation rates[7].

Figure 9. Average Cost of Debt and Return on Equity, ROE



Source: Table 8

The time evolution of the return on equity, ROE, is very much determined by the evolution of the return to assets, ROA. In 2009 when the nominal cost of debt goes down, the leverage effect (difference between ROA and nominal cost of debt) raises the ROE more than it could have been anticipated from the rise in the ROA. Overall, the ROE shows high time volatility: 6,6% in the year 2000, 3,4% in 2007 and 12% in 2014. To such time variability contribute the time evolution of ROA, together with the time evolution of the cost of debt and of the leverage ratio.

6. The flow of funds: corporate saving and investment

We now examine the uses of cash flows (profit plus amortization) generated by NFC, in terms of saving and investment decisions. The exposition follows closely (Salas-Fumás

[7] We have compared the average cost of debt calculated here with the cost debt of NFC reported in the Statistics Bulletin of Banco de España calculated using data from Central de Balances (Integrated Data Base). The two estimates are quite similar until year 2007 but from 2008 on the cost of debt estimated with CB data is substantially higher than the estimated here. For example in 2014 the CD estimate for the cost of debt in that year is 3,7%, compared with the 2% estimated here. We have recalculated the ROE of NFC in the years 2008-2014 using the cost of debt estimated in CB as the measure of average cost of outstanding debt (net), The new values of ROE start at 6,5% in 2009 and 2009 and then increases steadily till 8,8% in 2014 (compared with the 12% reported here).

and Santillana, 2016). The scheme of origin and uses of funds presented in section 2 identifies three possible destinations of corporate cash flows: invest in production capital, pay dividends to the shareholders, and change financial assets net of change in liabilities.

Table 9 shows the absolute values of profits and amortization that determine the total internally generated cash flows, as well as the absolute values of the uses of cash flows in the three possible uses. The bottom part of the table shows the uses of funds in relative terms to total cash flow. Generated cash flows increase over time along the whole time period. The rises and falls of net profits in the years 2000-2007 are more than compensated by the steady increasing trend in amortization. The investment flow increases year by year in the period 2000-2007 and capital investment in 2007 is twice what it was in the year 2000. With the crisis the investment flow decreases 30% in the two years 2008 and 2009 and remains stable at the low values until 2014, when it increases again. Dividends paid increase regularly over time, in the pre and in the crisis period: dividends in 2014 are two times the dividends paid in 2007 and 3,6 times the dividends in year 2000.

Finally, the change in financial assets net of change in liabilities is negative in the pre crisis period, until 2008, and positive in the years after. This means that in the pre crisis years Spanish NFC increased their liabilities in addition to variations in their financial assets, in order to compensate the deficit of internally generated cash flows, insufficient to finance the dividends and the gross investment in operating capital. Since 2009 the internal cash flows exceed dividends and capital investment, and continues this way until 2015. During these years the corporations have internal cash flows at their disposal to be used in increasing financial assets, reduce debt or repurchase shares.

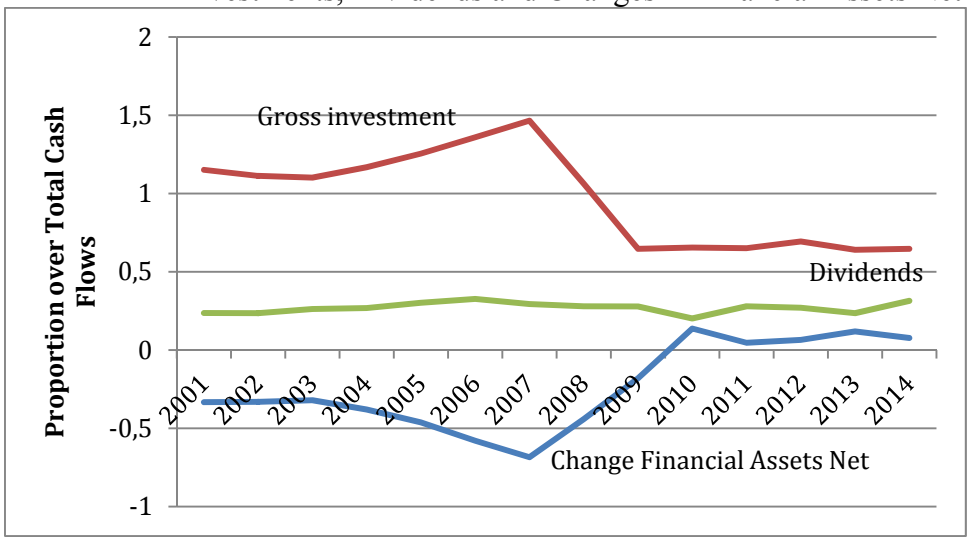
Table 9. Internally Generated Cash Flows and their Uses: 2000-2014

	2000	*2001*	*2002*	*2003*	*2004*	*2005*	*2006*	*2007*	*2008*	*2009*	*2010*	*2011*	*2012*	*2013*	*2014*
Net Profit	40.635	36.475	40.735	45.505	43.962	43.786	42.540	37.509	70.406	100.916	98.277	94.667	91.689	106.694	120.028
Amortization	49.509	53.775	58.088	63.015	69.434	76.196	83.750	91.439	97.564	100.335	103.480	107.984	110.163	110.509	113.246
Cash Flow	**90.144**	**90.250**	**98.823**	**108.520**	**113.396**	**119.982**	**126.290**	**128.948**	**167.970**	**201.251**	**201.757**	**202.651**	**201.852**	**217.203**	**233.274**
Gross Investment	98.762	103.952	109.955	119.551	132.511	150.656	171.645	189.016	178.667	130.104	132.042	131.828	139.949	139.184	150.855
Dividends	21.454	21.329	23.269	28.420	30.487	36.255	41.211	37.949	46.898	56.152	40.723	56.665	54.671	51.091	73.302
Change Financial Assets Net	-30.072	-35.031	-34.401	-39.451	-49.602	-66.929	-86.566	-98.017	-57.595	14.995	28.992	14.158	7.232	26.928	9.117
Relative to cash flow															
Gross Investment	1,096	1,152	1,113	1,102	1,169	1,256	1,359	1,466	1,064	0,646	0,654	0,651	0,693	0,641	0,647
Dividends	0,238	0,236	0,235	0,262	0,269	0,302	0,326	0,294	0,279	0,279	0,202	0,280	0,271	0,235	0,314
Change financial Assets Net	-0,334	-0,388	-0,348	-0,364	-0,437	-0,558	-0,685	-0,760	-0,343	0,075	0,144	0,070	0,036	0,124	0,039

Source: Own elaboration from National Account

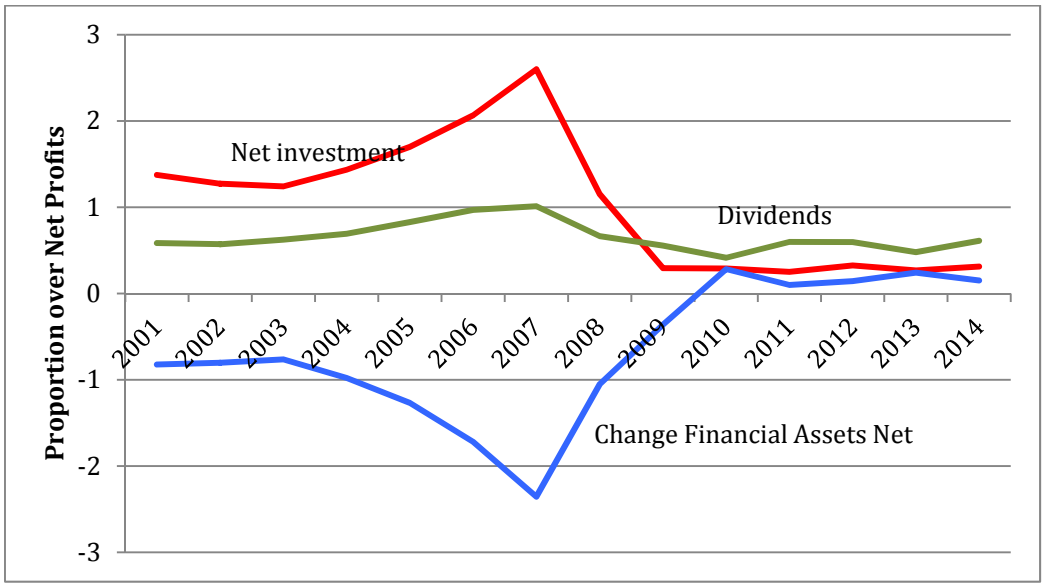
When uses of cash flows are expressed in relative terms, bottom part of Table 9 and Figure 10, the proportions of each possible uses of the cash flows in the period 2000-2003 are remarkably stable: corporations invest 1,1 euros per euro of cash flow in operational capital, pay 0,25 euros of dividends per euro of cash flow and have a deficit to cover with external funds of 0,35 euros per euro of internal cash flow. In the years 2004-2007, corporations increase the ratio of investment to cash flow to 1,47 in 2007, maintained the ratio of dividends stable, and the deficit increased to the highest value in the period, 0,76 euros per euro of internal cash flow, in 2007. In the years of the crisis, the investment ratio has been stable at values around 0,65 euros per euro of internally generated cash flow and dividend ratios are at values of 2000-2003, 0,25 euros per euro of cash flow. On average, during the years of the crisis Spanish NFC dedicate 10% of their internally generated cash flow to increase financial assets or reduce their outstanding debt.

Figure 10. Internal Cash Flows and Relative Uses in Gross Operating Capital Investments, Dividends and Changes in Financial Assets Net



Source: Own elaboration from National and Financial Accounts: NFC

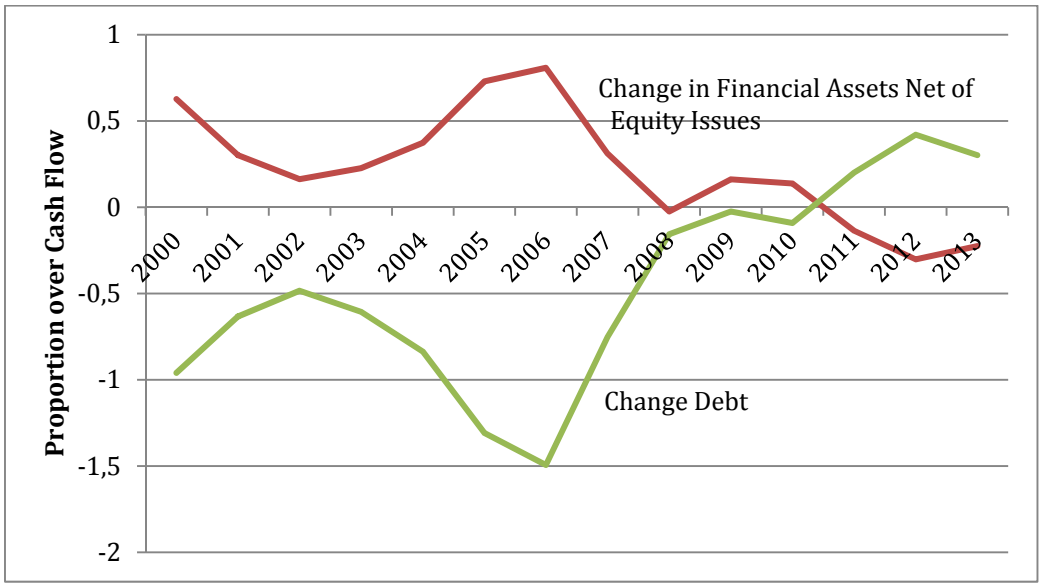
Figure11. Net Profits and Relative Uses in Net Operating Capital Investments, Dividends and Changes in Financial Assets Net



Source: Own elaboration from National and Financial Accounts: NFC

Figure 11 is similar to Figure 10 except that it represents the uses of net profits, not of cash flows. Now, gross investment that is the relevant use of funds when the origin of funds is the internal cash flow is replaced by net investment (gross investment minus amortization). In general, dividend payment decisions are based on net profits, and the net investment is the money value of assets invested to expand (if positive) or reduce (if negative) the stock of operating assets to produce in Spain. The time pattern of the variables represented in the two figures are similar, although volatility is more pronounced in Figure 11 than in Figure 10, which is explained by the stabilizing effect of amortization. A remarkable thing from Figure 11 is that dividends paid in 2007 are practically equal to the net profits of the corresponding year; therefore in 2007 the retained profits had a cero contribution to available internal funds. During the years of the crisis the dividends pay out ratio has returned to the values between 50% and 60% of the years immediately after the Euro.

Figure 12. Variations in Debt (changed of sign) and Variations in Financial Assets Net of Equity Issues



Source: Own elaboration from National and Financial Accounts: NFC

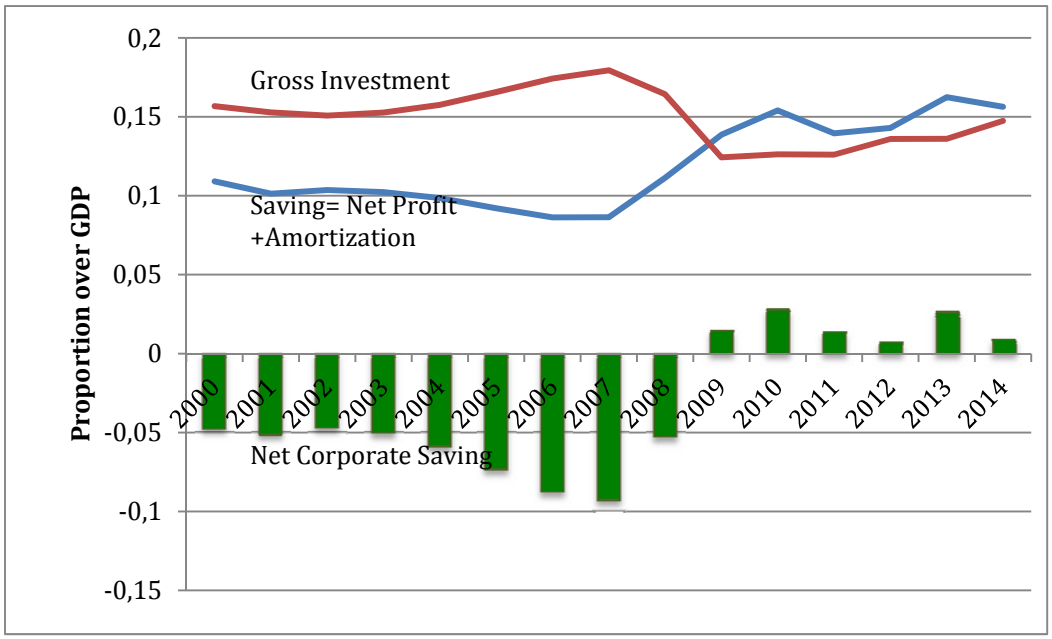
The difference between retained earnings and net investment in operational capital determines the net savings of the corporate sector. When savings are negative corporations need external funds to finance capacity expansion and dividends paid; when they are positive the corporate sector increases financial assets, reduces debt or pays extra dividends purchasing shares. Most likely, corporations will decide on the three uses of cash flows, pay dividends, invest in operating assets or vary the financial assets net of variation in liabilities, all together. It could be, for example, that corporations reduce investment in operating capital and/or dividends because they give priority to increase financial assets (expand capacity in subsidiaries abroad) and/or to reduce debt. It is then a relevant part of the analysis examining the time evolution of changes in financial assets net of changes in liabilities to see if corporate decisions on this variable could have conditioned capital investment decisions or not.

Figure 12 shows the join variation in financial assets minus the variation in equity from new equity issues or share repurchases, on the one hand, and the variation in outstanding debt on the other. In the pre crisis period corporations increase net financial assets, and increase the outstanding debt at the same time. In the first years of the crisis corporations moderate the changes in the financial variables and since 2011 they reduce financial assets net of variations in equity and also reduce the level of outstanding debt.

6.1. Corporate saving glut in Spain

The situation of internally generated corporate cash flows higher than dividends payment and investment in operating capital, has received the name of "corporate saving glut", the recognition that corporations contribute to the excess of saving worldwide. Bernanke and others claim that excess savings, corporate and non corporate, is one of the important factors to blame for the slow recovery from the recent crisis (excess of saving can also be described as insufficient corporate investment). In Spain there is evidence of "corporate saving glut" since 2009. In other developed countries, including the USA, the excessive savings of the corporate sector has been going on practically since year 2000.

Figure 13. Corporate Investment and Savings Relative to GDP



Source: Own elaboration from National Accounts

Figure 13 shows the evolution of net corporate saving in Spain as it is usually presented in studies on corporate saving glut, i.e., the difference between gross corporate savings (retained earnings plus amortization) and gross investment in operating capital, all figures normalized by the Spanish GDP of the corresponding year. In the years 2000-2003, the Spanish NFCs invest more than they save in an amount approximately equal to 5% of the Spanish GDP (10% of the GVA of the corporate sector). In the years that

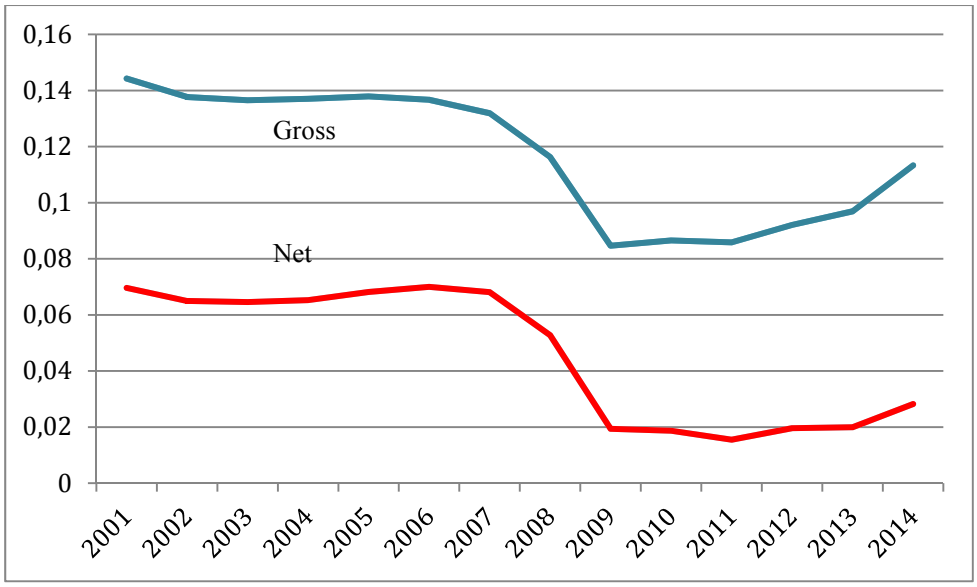
follow, the negative net savings steadily increases and in 2007 investment exceeds savings in an amount equivalent to 10% of the Spanish GDP (close to 20% of the GVA of the corporate sector). At the end of the period, years 2011-2014, the excess of savings reaches a value close to 2,5% of the Spanish GDP.

7. The investment in operational assets and its determinants

This final section about empirical evidences on decisions and performance of Spanish NFC in the years 2000-2014 focuses on investment in operating capital assets and its determinants. New investment in operating assets replaces all or part of the existing capacity consumed in production activities; when the gross investment flow is higher than amortization of existing installed capital assets, the asset base and capital production capacity expand. Although the ratio of investment flow per euro of profit or cash flow, examined in the previous section, can be relevant information to examine whether internally generated cash flows are sufficient or not to finance new investment, we will focus now on the ratio of investment in t over the stock of operating assets average in year t, that indicates the annual rate of growth in operating capital as well as the rate of net capacity expansion, Figure 14.

In the years 2000-2007 the gross and net investment rates stay relatively stable at values around 14% and 7%, respectively. This implies an amortization rate, difference between gross and net investment rate, estimated at 7%. With the crisis, the gross rate decreases practically to half of what it was before, while the net rate decreases proportionally more: from the highest value of 7,5% of operating assets in 2006 and 2007, to the lowest one of 1,6% in year 2011, in part because the amortization rate increases during the years of the crisis (almost 9% of operating assets in 2014). The sharp reduction in corporate capital investment in the crisis that was also evident in the previous section when looking at the ratio between investment flows and generated cash flows or profits, appears again when looking at rates of growth of operating capital stocks.

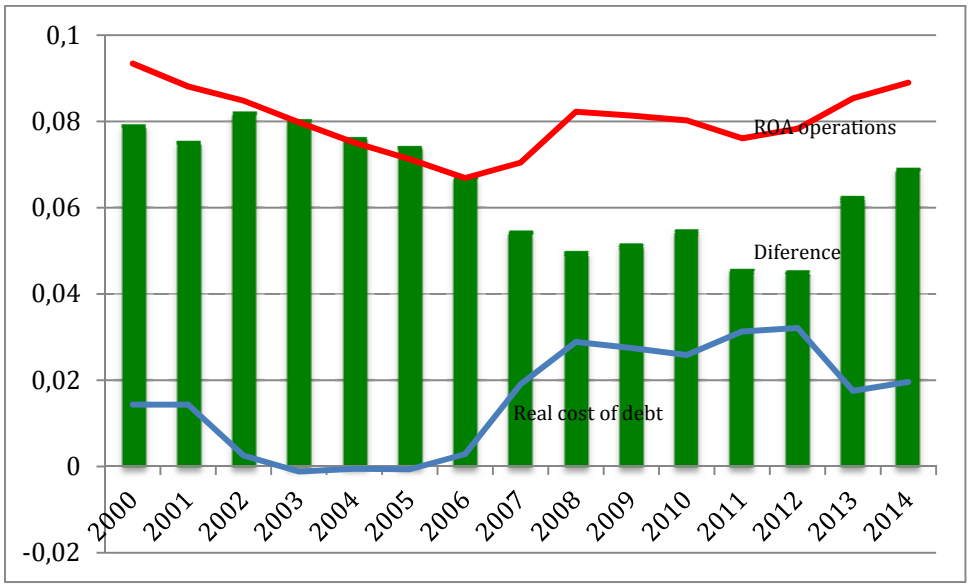
Figure 14. Investment Rates in Operating Assets (Gross and Net of Amortization, Capital Formation in year t over average stock of operating assets in year t)



Source: Own elaboration from National and Financial Accounts: NFC

Why did corporations reduce investment rates with the crisis? Corporate investment will be sensitive to managerial expectations on rates of return and cost of capital. Since the investment examined in the paper is investment in capital formation to produce in Spain, operating assets, the rate of return to focus on is the ROA of operations from Table 5. The average cost of corporate debt will be the proxy of financial cost of capital used here. When comparing ROA and cost of debt it must be taken into account that ROA of operations is a real rate of return since operating profits in the numerator and the stock of operating assets at the end of the corresponding year are both valued at current prices. The average cost of debt, on the other hand, is a ratio between current interest payments divided by debt at face value, i.e. it is a measure of nominal average interest rate. To make the two comparable the measure of cost debt used in the calculation of the incentives to invest is the real cost of debt. Then, the measure of incentives to invest in year t used in this analysis is the difference between ROA operations and real cost of debt, in year t-1. The values of the differences for the corresponding years appear in Figure 15.

Figure 15. Incentives to Invest: ROA Operations, Real Cost of Debt and the Difference



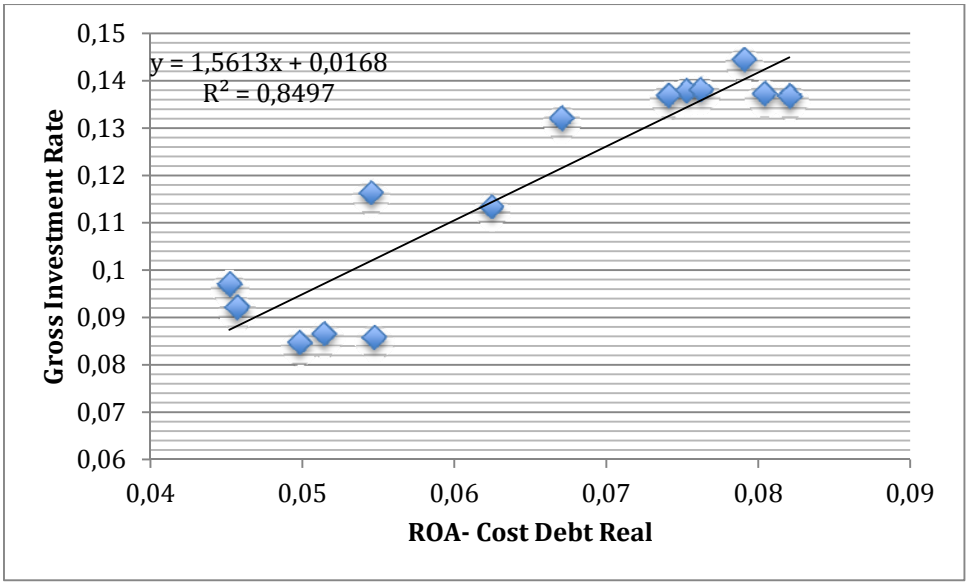
Source: Tables 3 and 4

The difference between ROA operations and real cost of debt is higher in the period 2000-2005. In these years ROA of operations decreases but so it does the real cost of debt too. In fact, the real average cost of debt is practically zero every year in the period 2002 till 2006. The increase in the real cost of debt in 2007 and 2008, coinciding with the tightening of monetary policy by the BCE, reduced substantially the difference between ROA and cost of debt, incentives to invest, even though the recovery of the ROA. The high real cost of debt in the core years of the crisis 2008-2012 coincides with a period of zero price inflation and the fragmentation of monetary markets in the Euro zone. In 2013 and 2014 the incentives to invest increase mainly because the real cost of debt decreases as a result of the intense monetary activism of the ECB.

Figure 16 shows the line-fit of a simple regression with dependent variable the rate of gross investment in period t, and explanatory variables a constant and the difference between ROA and average cost of debt real in year t-1. The goodness of fit is high and, as expected, there is a positive association between the difference between ROA and cost of debt real, and the gross investment rate. If we do a similar exercise with ROA minus the nominal cost of debt as explanatory variable, the correlation between the two variables disappears. The preliminary evidences support the relevance of price inflation

in investment decisions, and confirms that the zero real cost of debt during several years contributed to large extent to the high rate of capital investment in the corporate sector.

Figure 15. Gross Investment Rate in Operating Assets as a Function of the Difference Between ROA Operations and Cost of Debt Real



8. What drives behavior and performance of Spanish NFC in the Euro ?

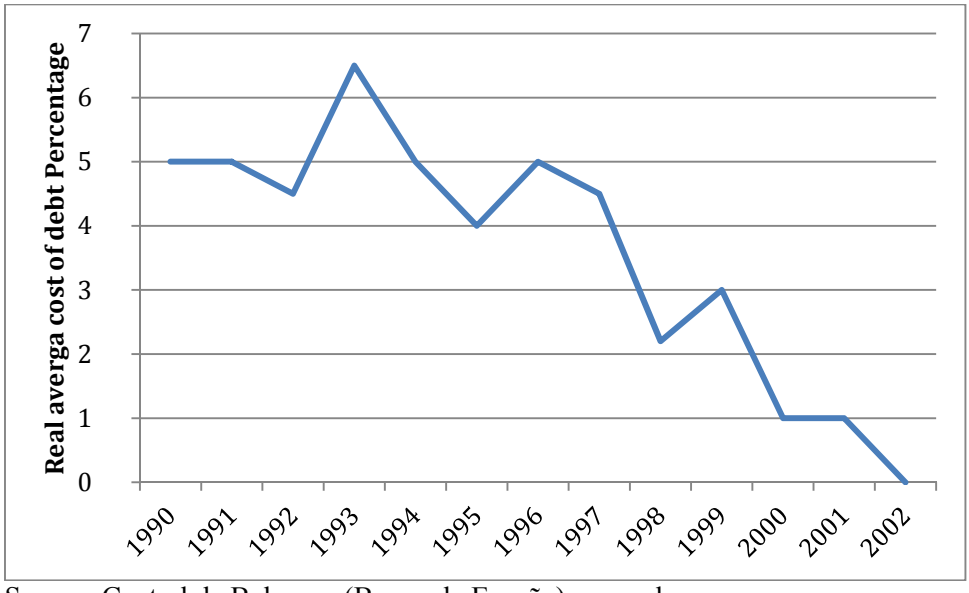
Our interest in this section is in examining the evidence on behavior and performance of Spanish NFC presented in the previous sections, under the lens of the anticipated behavior and performance of a profit maximizing firm, when the financial cost of capital experiences a permanent fall. For this purpose, the Appendix presents some of the endogenous profit maximizing values of relevant performance variables, as a function of exogenous parameters and inputs and output prices. We start with the examination of the time evolution of financial cost of capital in Spain in the pre and in the post Euro period to estimate the contribution of the Euro to the permanent fall in this cost.

Figure 17 shows the real average cost of debt (nominal average cost minus ex post inflation rate measured by the annual change in the GDP deflator price index) for Spanish NFC on the period 1990-2002, calculated with data from the Central de Balances (Banco de España). We use Central de Balances data because it is available

for the pre Euro years and we are interested in how the financial cost of capital changes when Spain joins the Eurozone. We use real cost of debt to estimate the financial cost of capital instead of nominal one because the benefit expected from joining the Euro is in the form of a reduction in the risk premium, compared with the risk premium under the Peseta, and the risk premium is better captured after netting out the effect of inflation expectations on nominal interest rates.

In the pre euro period, the real cost of debt for Spanish corporations was on average around 5%. Since 1998, when Spain joining the Euro was a credible alternative, real average cost of debt has been steadily decreasing to reach a value of practically zero in 2002 (the same value that was calculated with National Accounts data (Figure 15). The sharp decline in real average cost of debt of Spanish NFC documented by Figure 17 coincides with a period of time when year inflation in Spain was around 4% (Table 1), two percentage points higher than 2% inflation target that guided monetary policy decisions by the ECB. Since an inflation rate twice the inflation target of the monetary policy of the ECB is unsustainable in competitive terms, zero is not a realistic estimate of the permanent real cost of debt for the Euro period. Rather, if inflation in Spain eventually converged to the target of 2%, a value between 2% and 3% would be a more reasonable estimate of the permanent real cost of debt.

Figure 16. Real Average Cost of Debt for Spanish NFC in the pre Euro from the Central de Balances-Banco de España Data



Source: Central de Balances (Banco de España), several years.

In the rest of this section we will examine the response of NFC if entrepreneurs and managers anticipate a permanent fall in the real financial cost of capital from 5% to 2,5%; that is, as if economic agents attributed to the Euro a permanent reduction in the risk premium charged in the cost of capital of 2,5 percentage points. The analysis will be done separate for the periods 2000-2007 and 2008-2014, since it is possible that with the crisis some of the expectations on the cost of finance were revised.

8.1. Period 2000-2007

Real variables

From the evidence presented in previous sections the aggregate of the Spanish non-financial corporate sector evolved from 2000 to 2007 in the following way (non financial variables):

- Labor costs per euro of GVA remain stable at the value around 0,64 (Table 1b, Figure 2).
- The ratio of GVA over operating assets, average productivity of operating capital, evolves from 0,48 in 2000, to 0,36 in 2007 (Figure 7).
- ROA of operating assets decreased from 0,093 in 2000 to 0,070 in 2007 (Figure 6).

According to equation (1) in the Appendix, the profit-maximizing firm chooses inputs and output quantities such that the proportion of labor costs over GVA in equilibrium is equal to β, the elasticity of output to labor inputs. Considering that the ratio of labor cost to GVA is stable with a value of 0,64, β=0,64 seems the reasonable estimated value the elasticity of output to labor inputs from the aggregate data.

Equation (4), also in the Appendix, implies that for the profit maximizing firm the ratio of operating assets at current prices over output also at current prices is equal to c/α. Where c is the user cost of capital, c = r + d, real interest rate r plus depreciation rate d; and α is the elasticity of output to capital service inputs. The depreciation rate in the

period 2000-2007 is estimated to be d=0,07, while r, the real cost of debt before the Euro is estimated equal to 5%. Therefore c=0,12 in the pre Euro estimate of the real user cost of capital. The value of GVA over the stock of operating assets in 2000 is equal to 0,48, Table 3, therefore equation (4) implies 0,48 = 0,12/α. This gives an estimated value of the elasticity of output to capital services of α=0,25. The estimated elasticity of output to labor and capital imply decreasing returns in the production technology since $\alpha + \beta = \gamma = 0{,}89 < 1$. With these estimates, the GVA from operations is allocated as follows: 64% to compensate labor, 25% to compensate for the user cost of capital and 11%, (1-γ) p Q, to economic or entrepreneurial profits. If the entrepreneur and financier coincide then the entrepreneur-financier receives 36% of GVA.

Finally, from (5) the estimated ROA of operations resulting from the values of the parameters is ((1-β)/α) c – d – production taxes = (0,36/0,25) 0,12 -0,07 -0,001 = 0,10. This value is higher than the observed ROA from operations in 2000, 9,3%, because of rounding of the values of the parameters and because there are other expenses different from labor costs and amortization that represent around 0,5% of operating assets.

If Spain joining the Euro implies that the financial cost of capital goes down to 2,5%, the user cost of capital per euro of invested assets is now c= 9,5% (2,5%+7%, assuming the same depreciation rate). Equation (4) predicts that if the cost of capital goes down the average productivity of operating assets, GVA divided per operating assets, will also go down. Substituting the new cost of capital in (4), we get a ratio of GVA over operating asset of 0,095/0,25 =0,38, practically equal to the observed value of productivity of capital in 2007 (Table 3). Although the lower cost of capital with the Euro was probably the input of production and investment decisions in 1999-2000, adjustment costs imply that the transition from the initial 0,48 ratio of GVA over Operating assets in 2000 to the new desired one of 0,38 would be made gradually. What the evidence suggests is that by 2007 the adjustment process would be completed.

As for the ROA of operations, equation (7) predicts that if the cost of capital falls, ROA of operations will also fall. Assuming the same values of α=0,25 and β =0,64, as well as the same depreciation rate d = 0,07, the new predicted ROA for 2007 is (0,36/0,25)

0,095 -0,07-0,001 =6,7%, compared with the observed ROA of 7%[8]. The lower ROA of operations after the fall in the cost of capital includes the effect of lower net profit margin according to equation (6), resulting from the higher depreciation per euro of GVA caused by the increase in α/c. Figures 8 captures the reduction in net profit margin of operations, 2 percentage points, from 2000 to 2007.

The lower financial cost of capital with the Euro increases the profit maximizing output, equation (8) in the Appendix. The value of c=0,095 in the Euro is 21% lower than c=0,12 before the Euro. Since the elasticity of output to changes in c is -0,25/(1-0,89)=-28% (Appendix), the 21% decrease in the user cost of capital implies a permanent increase in output of NFC of (-0,21) x (-28%) = 5,9%[9].

Financial variables

We focus on the ratio of debt over GVA. From equation (5) in the Appendix the predicted value of this ratio is μα/c, where μ is the ratio of debt over operating assets. The balance sheet of Table 3 includes operating and financial assets so we observe the ratio of debt over total assets, financial and operational, but not a separate debt ratio for operational and for financial assets. Then we take the value of debt over total assets (consolidated), μ=0,37, as the relevant debt ratio in 2000. Substituting, in the equation, 0,37 (0,25/0,12)=0,77 is the predicted ratio of debt over GVA in year 2000 if debt financed only the operational assets. But corporations have operational and financial assets and the total debt in the balance sheet finances the total assets not only the operational ones.

Financial assets represent approximately 31% of the total assets (consolidated) in 2000; this means that corporations hold *b* =0,31/0,69 =0,45 Euros of financial assets per euro

[8]In 2007 the actual amortization rate is 6,3%, not the assumed 7% constant we use in the calculation of estimated ROA of operations. Additionally there are other expenses different from amortization and labor cost that lower ROA beyond the values calculated here.

[9]The relative change in the user cost of capital, c from changes in the financial cost, r, is higher for assets with long economic life than for assets with short living life. For example, real estate assets, housing for example, with depreciation rate d of 2% (50 years life), the cost of capital in the pre Euro period would be 7% and after the Euro 4,5%, that is a 45% reduction in the user cost, compared with the 21% reduction in the user cost of the average asset. The bias of growth towards the construction and real estate sectors with the crises with the Euro we referred to above, may well have to do with the fact that the lower financial cost increased relatively more the economic value of long lived assets than average lived ones.

of operational assets. If each euro of operational assets generates 0,77 Euros of debt per euro of GVA, the predicted total debt per euro of GVA in year 2000 is 0,71 (1+b) = 0,77 (1,45) = 1,12; the observed value of Debt over Corporate income is 1,08 and of Debt over GVA 1,12 (Table 5)[10].

With c= 0,095 in the Euro, the predicted ratio of debt attributed to operating assets over GVA increases from 0,77 in the pre euro period to 0,37 0,25/0,095 =0,97, an increment of 26,5%, if the ratio of debt over assets, leverage, continues at 0,37. This implies a total debt over GVA equal to 0,97 1,45 = 1,40, compared with the 1,12 calculated for the year 2000. With the same leverage, a fall in the user cost of capital will increase the ratio of debt over GVA because the lower cost of capital implies higher profit maximizing capital intensity (higher ratio of operating assets over GVA) than the capital intensity when the cost of capital was higher.

According to Table 2 the debt over total assets increases from 0,37 in 2000 to 0,50 in 2007 and the proportion of financial assets over total asset changes from 0,31 to 0,33. With the new leverage and proportion of financial assets ratios, the predicted ratio of total debt over GVA is now (0,50 0,25/0,095) (1.5) = 1,95 (observed value of 1,96). The total estimated increase in Debt over Corporate income from 2000 to 2007 is then 74% (1,95/1,12 -1), 25 percentage points attributed to the increase in capital intensity from the lower cost of capital, 39 percentage points from the joint effect of higher leverage (from 0,37 to 0,50) and higher ratio of financial assets over total assets (from 0,31 to 0,33) and 10 percentage points to the interaction of the two[11].

The effect of higher capital deepening in the increase in corporate Debt over Corporate income in 2007 compared with the value in year 2000 is the direct consequence of the effect of lower cost of capital on the profit maximizing demand of operating capital input. The increase in the leverage ratio of Debt over total Assets in the same time period is out of the conceptual model outlined in the Appendix. From the theory of corporate finance firms decide the ratio of debt over economic value of assets financed

[10]The debt ratio in Figure 4 is total debt divided by total income of NFC. The total income includes GVA plus financial income but since financial income is only 3% of the total we ignore it in the calculations to simplify the exposition.

[11] The changes in the ratio of Debt over Corporate income could be translated to changes in the ratio of Debt over GDP with information about the ratio of Corporate income to GDP (Table 1).

weighting the tax benefits of tax deductible interest of debt, with the costs of bankruptcy, both in the margin. The assets in our calculations are valued at replacement cost not at market value; it could be that in the period of economic expansion market value of assets were above replacement costs and relative to market value the leverage ratio did not change as much as we observe in terms of assets valued at replacement cost.

Another explanation could be that the expectation of lower cost of finance reduced the expected cost of bankruptcy attributed to debt finance. For the same tax savings benefits of leverage, the Spanish NFC increased the desired, value maximizing, leverage ratio with the Euro. What is important to keep in mind from our analysis is that lower cost of capital increases capital deepening and with the same leverage ratio, Debt over Corporate income and Debt over GDP will increase accordingly.

8.2. Period 2008-2014

Real variables

In the period of the big recession, 2008-2014, some relevant variables of our analysis evolve quite different from what they did in the years before:

-The participation of labor compensation in GVA decreases in the crisis from 0,64 in 2007 to 0,57 in 2014 (Table 1b and Figure 2).
-The GVA over operating assets reversed the decreasing trend and since 2008 has been stable under 0,40, except in 2014 that increases to 0,43 (Table 7, Figure 8).
-The ROA of operations increases from 0,07 in 2007 to 0,089 in 2014 (Table 6 and Figure 7).

In the profit-maximizing context of the Appendix, with price taking firms in the product markets and market salaries, the reduction in the proportion of labor compensation over GVA can only be explained by a reduction in the elasticity of output to labor input β. This elasticity is a parameter of the production technology that determines the relative intensity of the labor input in production, for a given value of relative prices of inputs labor and capital. A lower value of the elasticity would indicate that the crisis modified

the production structure of the Spanish economy in the direction of more generalized use of less labor-intensive production technologies. If the construction sector is an example of highly labor-intensive activity, the loss of activity and output in the construction sector during the crisis could be one of the factors behind the parallel contraction in the participation of labor compensation in the GVA during the crisis.

From the theory results of the Appendix, the lower participation of labor income in GVA cannot be explained as the consequence of lower salaries and higher average labor productivity also in the years of the crisis. The reason is that productivity is endogenous and depends itself on the market salary (see the section on labor costs, below). The Appendix also shows that the ratio of labor compensation to GVA depends on other parameters when firms have market power in the final markets and workers bargain for a participation in corporate income beyond the resulting from market determined salaries[12]. Market power lowers participation and bargaining power increases it. It is unlikely that in the crisis, with excess capacity and increasing exports, overall market power increased in the Spanish corporate sector, but labor market reforms probably lowered the bargaining power of workers. How much of each potential effects are behind the observed reduction in the participation of labor income in GVA during the crisis is difficult to tell. For the exploratory purposes of this paper we assume that part of the decrease in the participation is transitory and with the recovery of the construction sector and with growing employment a reasonable estimate of the new elasticity of output to labor input after the crisis is 0,6.

The lower labor participation as the result of a shift to production technologies less labor intensives does not necessarily implies that the capital intensity, α must increase in compensation. In fact such increase alone would be inconsistent with the evidence that the ratio GVA over operating assets, equal to c/α, increases with the crisis, as shown in Figure 7 (higher values of α are expected to decrease the ratio). If β decreases and α stays constant, the technological shift is towards production functions with lower returns to scale (lower $\alpha + \beta$).

[12] See also Karabarbounis, Neiman (2014) who present a more detailed model of the determinants of labor share income in an economy with representative production function of the CES form and market power of firms in product markets.

If α=0,25, the ratio of GVA over operating assets equal to 0,40 implies a value of the cost of capital *c*=10% (solving from *c/α*=0,40 with *α*=0,25 we obtain *c*=10%). If the depreciation rate continues at the 7%, then the real financial cost *r* would now be 3%, instead of the 2,5% estimated for the pre crisis period; economic agents may have reduced their expectations on how much the Euro has reduced the risk premium on cost of finance in Spain (the differential between interest rates of 10 years Government bonds between Spain and Germany is close to 150 percentage points, when it was zero in the pre crisis years). As for the ROA of operations, the predicted value with β=0,6, α=0,25, d=0,07 and c=10%, is ROA=9%. This value is in line with it is observed one 2014.

The shift towards production technologies with lower β and higher scale diseconomies, and the revision upwards in the cost of capital *r* from 2,5% to 3%, both have cumulative negative effects on output. According to the profit maximizing output presented in section 2, the 0,005 increase in the financial cost of capital implies an increase of 5,2% over the initial cost of c=0,095; this increase has a negative effect on the profit maximizing output of -1,5%. If the lower β from 0,64 to 0,60 is confirmed then the reduction in scale economies will likely contribute to reduce the output produced from the initially estimated with values of parameters and prices in the pre crisis period.

Financial variables

The ratio of Debt over Corporate income, Table 2, Figure 6, says at values slightly above 2 from 2008 till 2012 and decreases in 2013 and 2014 to the values of 1,79. To this reduction contribute the lower capital intensity consequence of the increase in the cost of capital (the increase in the cost of capital from 9,5% to 10% lowers the profit maximizing capital intensity ratio, from 0,25/0,095 =2,63 to 0,25/0,10 = 2,5) and the lower debt to assets ratio, 58% in 2009 and 52% in 2014. However the higher proportion of financial assets in total assets, 33% in 2009 and 38% in 2014, contributes positively to the ratio of debt over corporate income.

8.3. The corporate sector in the start of the crisis

In the summer of 2007 appeared the first symptoms of the financial crisis that shortly after would turn into a great recession. We focus now on the situation of the Spanish corporate sector in the years immediately before the start of the crisis.

Shortly after Spain joined the Euro, the estimated real average cost of debt for Spanish NFC went to zero (Figure 14 and Figure 17), mainly because of the positive differential of inflation in Spain relative to inflation in the Eurozone. In 2006 the ECB changed the monetary policy rising interest rates that were immediately translated to the interest of corporate debt. With the volume of debt also increasing, in 2007 the interest on debt represented more than 10% of GVA of NFC, Table 1b, when in 2003 it had been half this figure. Also in 2007, NFC paid the highest amount of taxes on profits and property up to 7,5% of GVA. The high interest and tax charges explain that in 2007, just before the crisis, the ROE of Spanish NFC went down to the lowest value of the whole time period, 3,4% (Table 5). In 2007 NFC pay dividends in an amount similar to their net profits while investment in operating capital and financial assets continued at the pace set in years before. With these decisions, in 2007 the NFC needed external funds to finance outflows for investment in a record number of 18,5% of their GVA (9,3% of Spanish GDP). In the two years 2006 and 2007 NFC accumulated an excess of outflows above amortization and retained earnings of 36% of the GVA (Figure 13), all financed with external funds since retained earnings were practically zero.

In just three years, since December 2005 to December 2008, Spanish NFC increase their consolidated debt in 0,53 billion euros, and the ratio of debt over total assets, consolidated increased from 44% in 2005 to 55% in 2008. In 2007 bank debt reaches the maximum proportion of consolidated debt, 74%, as well as the difference between assets and liabilities with the rest of the world (with two euros of liabilities per euro of assets), Table 4. When the crisis consolidates in 2008 and 2009, the Spanish corporate sector was at its highest financial vulnerability: corporate savings dried, due to the higher interest of debt, the higher taxes and the maintaining of dividend payments; at the same time, investment in operational and financial assets were at historical high: in the three years, 2006-2008 financial and operational assets, consolidated, in the balance sheet of corporations increased in 0,62 billion euros when in the same period GVA of

the corporate sector increased only 0,09 billions[13]. The severity of the crisis worldwide and the vulnerability recently accumulated by Spanish corporations, explain well the severity of the damages the crisis caused in the corporate sector and in the whole Spanish economy.

8.4. Labor unit costs and employment

Data on number of employees of NFC in Spain are not publicly available and this is the reason that the examination of the performance of the corporate sector has focused mainly on capital and investment decisions and not at all on labor decisions[14]. However, from the profit maximization results shown in the Appendix we can make some predictions on the evolution of variables such as labor productivity and unit labor costs in the corporate sector that we believe are relevant. even though they cannot be directly contrasted with the observed data.

Labor productivity and the labor unit cost are the two most relevant labor-related variables from the policy point of view. From equation (1) in the Appendix, average labor productivity, equal to output divided by number of employees, in the equilibrium, is given by $Q/L = (w/p)/\beta$ (real salary divided but the elasticity of output to the labor input). The labor unit cost is the ratio of nominal labor cost per employee divided by average productivity; from the profit maximizing condition, labor unit cost $w/(Q/L) = p\beta$. For a fixed elasticity β, productivity increases with the real wage, w/p, and the labor unit cost increases with the price of output, p.

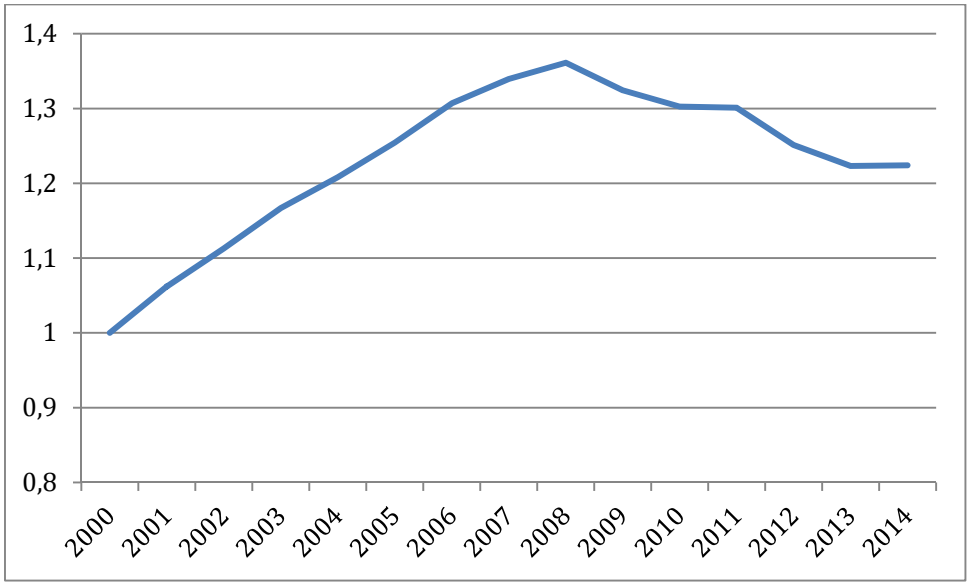
The simple profit maximization model predicts a time pattern in the evolution of productivity similar to the real wage, and a time pattern of the unit labor cost parallel to that of the GDP deflator, if elasticity β stays constant. The lower ratio of labor

[13]The investment and activity in the construction sector in these years contributed to the expansion of the whole corporate sector: In the period 2004-2008 capital formation in the construction sector represented more than 20% of all capital formation in the Spanish economy.

[14] According to EPA data, in 2000 the number of occupied, excluded solo self-employed, in the non agricultural private sector of the economy were 9,5 millions and this number increases to 13,6 millions in 2007. This implies an annual cumulative rate of increase in occupied people of 5,1%, which is probably applicable to the NFC too. The rate of growth in occupied people in the period 2000-2007 is lower than the 7% estimated rate of increase in operating assets (capacity), which would be consistent with the prediction from the profit maximization conditions that the capital stock per employee increases when the cost of capital decreases and salary remains constant. The moderation of salaries when employment was increasing at 5% was possible because immigration flows were at record high during this period.

compensation to GVA in the years of the crisis points out to a possible decrease of elasticity β in the years of the crisis; if this were the case then one would expect higher average productivity and lower labor unit cost during the crisis than before. Figure 18 shows the predicted unit labor cost of the Spanish NFC in the period 2000-2014 from the profit maximizing conditions indicated before. The numbers are referenced to a value for the year 2000 equal to 100; the time evolution of output price p is set equal to the time evolution of the GVA price deflator for the whole Spanish economy (Figure 1), and the value of β has been substituted by the share of labor compensation over CVA of NFC, Table 1b.

Figure 18. Predicted Unit Labor Cost Index for Spanish NFC: Year 2000 equal to 100



Source: Own elaboration as described in the text

The increasing trend in unit labor costs from 2000-2008 is explained entirely by the evolution of the price of output index. The decreasing trend during the years of the crisis would be explained almost entirely by the decreasing trend in the share of labor cost over the total GVA of the corporate sector. The time pattern of unit labor cost shown in Figure 18 is similar to the observed one for the whole Spanish economy calculated as the ratio between nominal cost per employee and average labor productivity. The unit labor cost calculated here is based on the premise that observed labor productivity is endogenously determined by profit maximizing decisions on output and number of employees. Therefore, the drivers of unit labor costs are

exogenously taken parameters such as the price level and the elasticity of output to the labor input.

Conclusion

This paper intends to examine and explain the behavior and performance of the Spanish NFC during the first 15 years that Spain has been a member of the Euro, 2000-2014. The first half of the period was one of high economic growth, while in the period 2008-2014 the Spanish economy goes through a great depression. We provide evidence supporting the view that the expansion in the years after the introduction of the Euro was to a large extent attributed to the benefits of the Euro-currency in the form of lower real cost of finance, quantified in 2,5 percentage points, from 5% to 2,5% cost of debt finance, for Spanish corporations. The experience of the crisis and the fragmentation of financial and monetary markets within the Euro that followed, suggest an increase in the real cost of finance for Spanish NFC to 3%, which implies a user cost of capital per euro invested in assets of c= 10%, assuming the historical depreciation rate of 7%.

The data presented here also indicates that the share of labor compensation in GVA of the corporate sector equal to 64% in the years 2000-2007, goes down to 56% in the years of the crisis, which is interpreted as evidence of a possible change in the representative production technology in the Spanish corporate sector, so that the elasticity of output to labor input would now be closer to 0,6 than to 0,64 in the pre crisis period[15]. Since the evidence does not support a change in the calculated elasticity of output to capital services, equal to 0,25, the lower elasticity of output to labor inputs implies lower returns to scale, 0,85 in the crisis, than before, 0,89. This has implications for the distribution of GVA since from now on it is expected that labor compensation will approach 60% of GVA, capital compensation will continue at 25% and economic profits will rise to 15% of GVA.

In the new steady state the Spanish corporate sector will have an stock of operating assets 2,5 (α/c =0,25/0,1) times the GVA. These assets will earn a pre tax rate of return

[15]We mentioned before that the explanation of the lower share of labor compensation over GVA of NFC during the crisis, in terms of a shift towards less labor intensive technologies, is tentative until other explanations such as change in market power in product markets or lower participation of employees in the positive intra marginal rents resulting from diseconomies of scale in production, are investigated.

of 9% (((1-β)/α) c –d =(0,4/0,25) 0,10 -0,07), equal to an operating profit margin of 22% times a productivity of operating assets of 40%. If financial assets return to the proportion of 33% of total consolidated assets, more representative of the whole period than the 38% figure of 2014, and the income from financial assets is also maintained at the historical average value of 5% of total Corporate income, the total consolidated assets of Spanish NFC, financial and operational, will be approximately 3,6 times the Corporate income with which NFC contribute to the Spanish GDP (2,5 1,5 /1,05). With the leverage ratio debt to assets approaching 50%, the ratio of debt over total corporate income will approach 1,8. Finally, if the corporate sector continues contributing 57% to the GDP, corporate debt over GDP will be 1,03 euros of debt per euro of GDP[16].

Financial assets include loans and shares that are counterpart of operating assets deployed abroad that create value added and profits in the countries where production takes place[17]. The ratio of corporate debt over Spanish GDP distorts the measure of leverage ratio, compared with that resulting using only the debt that finances operating assets in Spain. The financial risk of corporate financial assets should be evaluated relative to the economic value of the assets abroad (profitability, risk) that they finance, rather than relative to the Spanish GDP or corporate income.

The steady state profitability, cost of capital and balance sheet structure, should be compatible with a gross investment rate of 11% and a rate of capacity expansion of 3%-4% (net investment flow in operating assets over the average stock of operating assets). This calculation follows from the regression line of Figure 14, GI/K= 0,017 +1,56 (ROA operations –r), where GI/K is the gross investment rate, and incentives to invest equal to ROA – r = 0,09-0,03=0,06, and depreciation rate of d=0,07. The gross investment rate of 11% represents 27,5% of gross investment per euro of GVA, around 150.000 millions of Euros at the current GVA (the gross capital formation in 2015 is 28% of GVA according to National Accounts). At the current levels of interest

[16] The ratio of debt over assets of 50% is still high compared with the values before the growth rally of the years 2004-2007. For example the average value of the leverage ratio in 2000-2003 is 40%. In addition, if deposits are tied to bank debt then it would be justified to net out deposits from financial assets and from bank loans and again the ratio would be lower (average 33% in 2000-2003). Moreover with financial assets net of deposits, the ratio of financial assets relative to operational assets is 0,44. With the leverage ratio of 33% and 1,44 euros of total assets per euro of operational assets the estimated corporate debt net of deposits over GDP is 0,68.

[17] In 2014 financial assets from RoW amount to 0,446 billions and total financial assets net of bank deposits are 0,567 so the former are around 80% of the latter.

payments, corporate taxes and dividends, amortizations and retained earnings are sufficient to finance this investment. In the situation of the first years of the Euro (when interests of debt and taxes consumed more internally generated cash than today, proportionally, and net profits were 10%-12% of GVA), with the same dividend payout corporations would depend on external funds, bank credit, to finance gross investment in capital formation.

The expansion of operating assets, production capacity, of NFC in Spain at an annual rate of 3% and a similar rate of increase in labor services, employment, imply a real rate of growth in output of the corporate sector of 2,55% at the current estimated scale economies of the production technology of 0,85. The contribution to output growth from growth in TFP, if any, would be added to the 2,55% figure. This is a rate of growth in line with the corporate output growth in the first years of the Euro, 2000-2003.. If growth, included the contribution from TFP growth, goes up to 3% with the current 57% contribution of the corporate sector to Spanish GDP, the contribution of growth of corporate sector to GDP growth is 1,7%. In the years 2006 and 2007 real rate of growth of the corporate sector was 5%-6%, coinciding with a period when the capacity of the corporate sector was growing at 7%, the employment was growing at more than 5% and the scale economies were at 0,9. But the conditions for investment and growth in the years 2003-2007 are unlikely to repeat in the foreseeable future: the investment rate was in part directed towards closing the gap between existing and desired ratio of capital stock to output after the fall in the user cost of capital with the euro; the real cost of debt was 0% during several years; and the construction and real state sector was booming fueled by the generous financial conditions.

During the years of the crisis Spanish NFC increase the financial assets from the rest of the world in their balance sheet, at the same time that operating assets in Spain decrease, specially in the last two year, 2013 and 2014. In 2014 NFC have around 0,4 billions of Euros in their balance sheet which more likely are counterpart of operating assets in subsidiaries producing abroad. Although the internationalization of Spanish corporation is a need and foreign direct investment is part of the process, it is also true that with the current level of high unemployment especially among young and qualified people in Spain, investing abroad instead of investing at home has a opportunity social cost that should be accounted for in policy and business decisions. The recovery in corporate

investment with current ROA of operations and current real cost of finance should contribute to reverse the situation towards another one where operating assets increase at least as much as financial assets from abroad do. The increase in corporate equity in the liabilities for the rest of the world in the balance sheet of NFC in the years 2013 and 2014 suggests that multinationals and foreign firms perceive the economic attractiveness of producing in Spain, but the turn around from decreasing to increasing stock of operating assets it is not yet evident in 2014.

The reduction in corporate operating assets, through accelerated depreciation and sales, coincides in time with the period of "corporate saving glut" (internal cash flows higher than dividends payment plus gross investment in operating assets). The corporate saving glut is the final result of the combination of factors, lower investment flow in operating assets, higher depreciation, lower interest income and lower corporate taxes, compared with pre crisis values, in relation to GVA. The initiatives of the ECB to keep interest rates low, contribute to increase the free cash flows of corporation by reducing the interest payments in existing debt. Spanish NFC use the free cash flow from all sources to cancel outstanding debt, and less to expand investment in operating assets. The monetary policy of the BCE, together with the lower effective corporate taxes in the crisis, appear as being more effective in generating cash to pay back debt, than in stimulating investment in operating assets to produce in Spain. What we cannot tell is whether the priority to reduce the presumed excess debt from the past, is the reaction to a deterioration of the assets abroad that back financial assets in the balance sheet of the Spanish corporate parent companies, to a deterioration of the economic value of the operating assets in Spain, or to the combination of the two factors.

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Appendix

The examination of behavior and performance of the Spanish non financial corporate sector in the selected fifteen years period will be undertaken under the premise that the observed data is the aggregate of individual corporate decisions that respond to a external shock in the form of a permanent reduction in the real cost of capital when Spain became full member of the Euro zone. The first part of this section is to identify the predicted changes in the values of ratios between flow and stock variables used in the analysis, in response to what is expected to be a permanent reduction in the cost of capital. In the second part of the section we present a brief recall of the main balances between flows and uses of funds (profits and cash flows) under double entry accounting.

Predictions from profit maximization

Consider a firm that produces an output to sell in the market at price *p* with two inputs labor and capital, both purchased in the market at respective input prices *w* and *c*. The rental cost of capital is equal to $c = (r + d)\, p_K$, where *r* is the real (nominal minus variation in the price of capital services) financial cost, p_K is the replacement market price of one unit of capital services, and *d* is the depreciation rate. The production function that relates inputs and level of output per unit of time is of the Cobb Douglas type, $Q = AL^{\beta}K^{\alpha},$ where *Q* is the level of output, *L* is the amount of labor input, *K* is the capital service input, *A* is the TFP parameter, and α, β are the output to capital and to labor inputs elasticity, respectively, with $\alpha + \beta < 1$ to make sure that maximum profits are finite. Capital is financed with Debt, *D*, and equity, *E* so that $p_K K$ = *D*+*E*. The financial structure is given by the leverage ratio $\mu = \frac{D}{D+E}$.

From the profit maximizing conditions we select the following results that will be referenced in the recap section, with variables valued at their optimal or desired values:

(1) Share of labor cost in monetary output = $\frac{wL}{pQ} = \beta$

(2) Share of cost of capital services in monetary output = $\frac{cp_K K}{pQ} = \alpha$

(3) Share of economic profits in monetary output $=\left(1-(\alpha+\beta)\right)pQ=\gamma pQ$

(4) Capital intensity in production= $\frac{p_K K}{pQ}=\frac{\alpha}{c}$

(5) Debt per unit of monetary output= $\frac{D}{pQ}=\frac{D}{p_K K}\frac{p_K K}{pQ}=\mu\frac{\alpha}{c}$

(6) Net profit margin $=\frac{pQ-wL-dp_K K}{pQ}=(1-\beta)-d\frac{\alpha}{c}$

(7) Net return on assets, ROA= $\frac{pQ-wL}{p_K K}-d=\frac{1-\beta}{\alpha}c-d$

(8) Profit maximizing output $Q=A^{\frac{1}{1-\alpha-\beta}}\alpha^{\frac{\alpha}{1-\alpha-\beta}}\beta^{\frac{\beta}{1-\alpha-\beta}}\left(\frac{cp_K}{p}\right)^{\frac{-\alpha}{1-\alpha-\beta}}\left(\frac{w}{p}\right)^{\frac{-\beta}{1-\alpha-\beta}}$

The Euro changed the monetary conditions of the Spanish economy and more specifically lowered the financial component of the cost of capital, *r,* compared with the cost in the Peseta era, for households and firms. From the first order conditions of profit maximization above, we formulate some predictions on how the relevant ratios among endogenous variables above, will likely respond to the expectation of a permanent reduction in the financial cost of capital, *r*:

i) The share of labor costs (1), capital costs (2) and economic profits (3) in GVA will remain unchanged.

ii) The intensity of capital in production (4) will increase over time.

iii) The debt to monetary output ratio (5) will increase even though the (accounting) leverage ratio remains unchanged.

iv) The net profit margin (6) is expected to decrease

v) The ROA (7) is expected to decrease.

vi) Changes in cost of capital *c* affect output (8) with elasticity $-\frac{\alpha}{1-\alpha-\beta}$

Market power and bargaining power of employees

If the firm has market power it means that it faces a price inelastic demand for the products sold in the market. Define by η the price-elasticity of demand, in absolute value, with η>1. Given the inverse demand function, $p = BQ^{\frac{-1}{\eta}}$ where B is a positive constant, the profit function of the firm is given by,

$$\Pi = pQ - cp_K K - wL = BQ^{\frac{\eta-1}{\eta}} - cp_K K - wL$$

Solving for the profit maximizing conditions, (1) and (2), the share of labor and capital compensation over total money value of output in the equilibrium solution change now to,

$$\frac{wL}{pQ} = \beta\frac{\eta-1}{\eta}$$
$$\frac{cp_K K}{pQ} = \alpha\frac{\eta-1}{\mu}$$

In a competitive market the price elasticity tends to infinite and the equations would be the same as before. With maker power the elasticity is finite an since the lower bound is higher than one the share of labor and capital input costs relative to total revenues, GVA in our analysis, will be lower than with no market power. This means higher entrepreneurial or economic profits, and ROA, under market power than without it.

Bargaining between employees and employers can take place under different scenarios: one where employees bargain only for higher wages, and another where employees bargain for wages and employment, total labor compensation income. Considering the second scenario, more efficient in terms of welfare creation, the cost to revenues equation above does not change for the capital input but it does change for the case of labor compensation.

If w_M is the market salary, or salary that would earn the employees if the bargaining with employers would broke up, and λ is the bargaining power of employees, (1-λ) the corresponding to employers, with values between 0 and 1, the labor compensation equation above is modified as follows (Nash bargaining solution):

$$\frac{wL}{pQ} = \beta\frac{\eta-1}{\eta} + \lambda\left(1-(\alpha+\beta)\frac{\eta-1}{\eta}\right)$$

With demand of labor in the profit maximizing solution determined for the value of L such that marginal productivity of labor is equal to market salary, $\frac{\Delta pQ}{\Delta L} = w_M$.

The share of labor compensation in GVA increases with the bargaining power parameter λ. If bargaining power of employees is sufficiently high labor compensation relative to GVA can be higher with market power than with no market power. The condition is $\lambda \geq \frac{\beta}{\beta+\alpha}$. Since β in general will be greater than α, in order to have higher share of labor compensation in GVA with market power than without it, employees would have to have more bargaining power than the employers, which can be considered unrealistic. Therefore, the share of labor compensation in GVA when employees have bargaining power is likely to be lower under market power than under perfect competition.