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Spain: Selected Issues

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SPAIN

Selected Issues

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Approved by the European Department

July 8, 2011

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I. How Much Has Spain's Private Sector Rebalanced? Exiting from a Credit and Housing Boom[1]

Rebalancing is underway, with flows adjusting significantly, but with more modest progress on reducing stocks. The weight of construction and real estate in GDP, employment, and new lending has largely adjusted from previous excessive levels, but will likely remain weak as overhangs (including of housing prices and unsold units) persist. Private sector debt levels have stabilized at high levels – how much they have to fall is unclear, but it could be significant and long lasting.

A. Introduction

1. **The Spanish economy has built several imbalances that markets have identified as potential vulnerabilities** (fiscal deficits/debt, external deficit/debt, high household and corporate debt/ borrowing, the oversize construction sector, low private savings). These are being unwound. Until they have fully done so, the economy will face headwinds. But what exactly were the imbalances, how much have they unwound, how much further have they to go, and how much longer will this take?

2. **Rebalancing is a concept in search of a theory.** There is limited literature on rebalancing per se. There is an ongoing discussion on rebalancing at the global level, for example within the G20, but the country level discussion of rebalancing is incipient.[2] Still, if rebalancing is sometimes hard to define (what does it cover? what is the balance we are looking for? have economies ever been balanced?), imbalances are slightly easier to identify.

3. **The paper focuses on two major private sector internal imbalances: (i) the excessive weight of construction and real estate, and (ii) the excessive leverage in the economy**. In the case of Spain, three imbalances are commonly identified, including by Spanish authorities: (i) excessive weight of residential real estate in GDP, (ii) rapid expansion of credit and leverage in the private sector, and (iii) current account deficits. This paper deliberately leaves out adjustment in the public sector (which can be seen as a response to the initial private sector imbalances) and the external aspects of adjustment (which can be seen as the flipside of private domestic imbalances).

B. Spain's Boom and Private Sector Imbalances: a Legacy of Stocks

4. **The boom has left Spain with relatively high household and particularly corporate debt compared to the euro area**. Though the initial level of corporate debt was already high in Spain (albeit below the euro area average in 1999), it now largely exceeds

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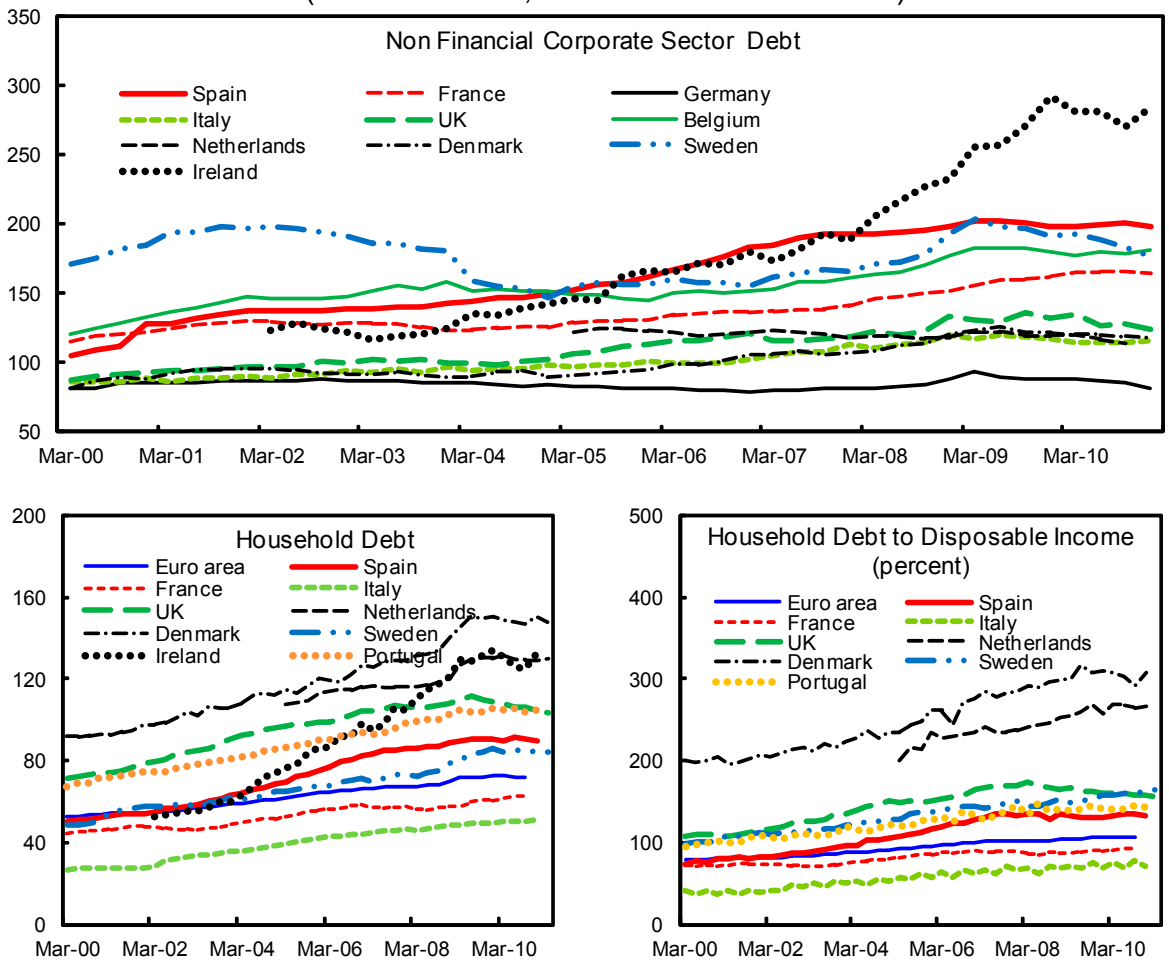
[1] Prepared by Jerome Vacher.

[2] Recent country specific attempts include Tokuoka (2010) for Japan and Nabar and Syed (2011) for Asia. These focus on ways to increase private consumption (Japan) or investment (Asia).

most EU countries, with the exception of Ireland. Spain's household debt to income ratio has also significantly diverged from the average of the euro area since 2001. The UK, the Netherlands, Denmark, Sweden and Portugal have all higher household debt to income ratios than in Spain.[3]

Figure 1. Corporate and Household Debt
(Percent of GDP, unless otherwise indicated)

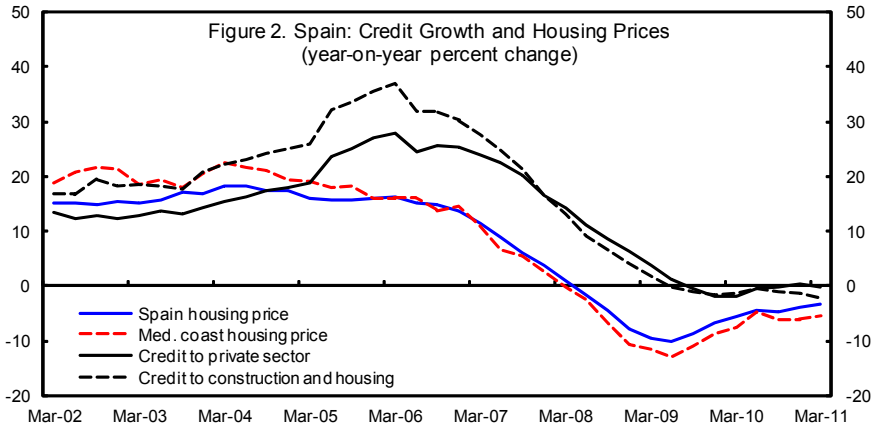


Sources: Eurostat; National Central Banks; and IMF staff estimates.

5. **Housing and leverage have been moving in tandem.** This is reflected both in the increased lending to construction and real estate activities and in the strong co-movement of housing prices and credit (Figure 2). Gimeno and Martinez-Carrascal (2006) show that house prices and mortgages in Spain are interdependent in the long run: loans for house purchases depend positively on house prices, while house prices adjust when this credit aggregate

[3] For the Netherlands and Denmark, specific features of the mortgage market (a higher prevalence of mortgages, combined with different amortization profiles of mortgages) are likely a major factor. In the Netherlands for instance, the high level of mortgage debt is explained by the prevalence of interest only and contractual savings mortgages which delayed redemption of the principal and fiscal deductibility of mortgage interest payments.

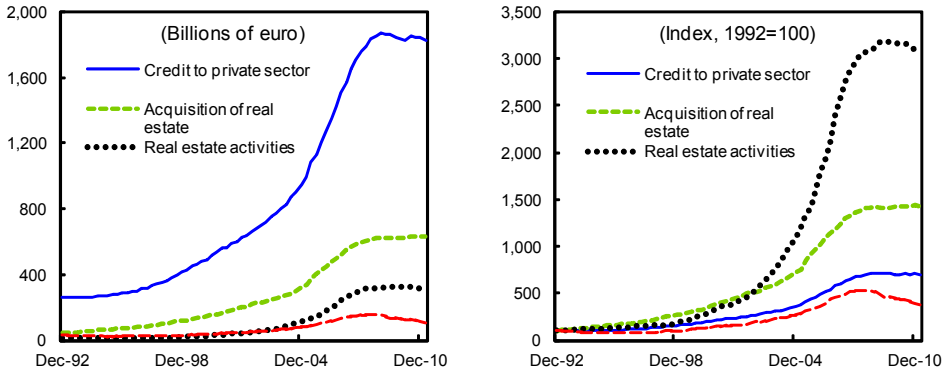
departs from the level implied by its long run determinants. In the short run, the two variables have a positive contemporaneous impact on each other, indicating the existence of mutually reinforcing cycles in both variables.[4]



Sources: Banco de Espana; and Tinsa.

6. **The increase in corporate sector indebtedness has been driven in large part by the housing boom.** During the boom years of 2004-2008, construction explained 8 percent of private sector credit growth, real estate activities (largely real estate development) 22 percent, and the acquisition of real estate (mortgages) 33 percent.[5] Real estate activities have contributed disproportionately to the increase in corporate credit, much more than construction itself, which seems less out of line (Figure 3). The outcome is that as a result of the boom, construction and real estate sector debt owed to Spanish banks represent a relatively high 10 and 30 percent of GDP respectively. The boom also dragged down the economy's productivity (Box 1).

Figure 3. Spain: Credit to the Real Estate and Construction Sectors



Sources: Banco de Espana; and IMF staff estimates.

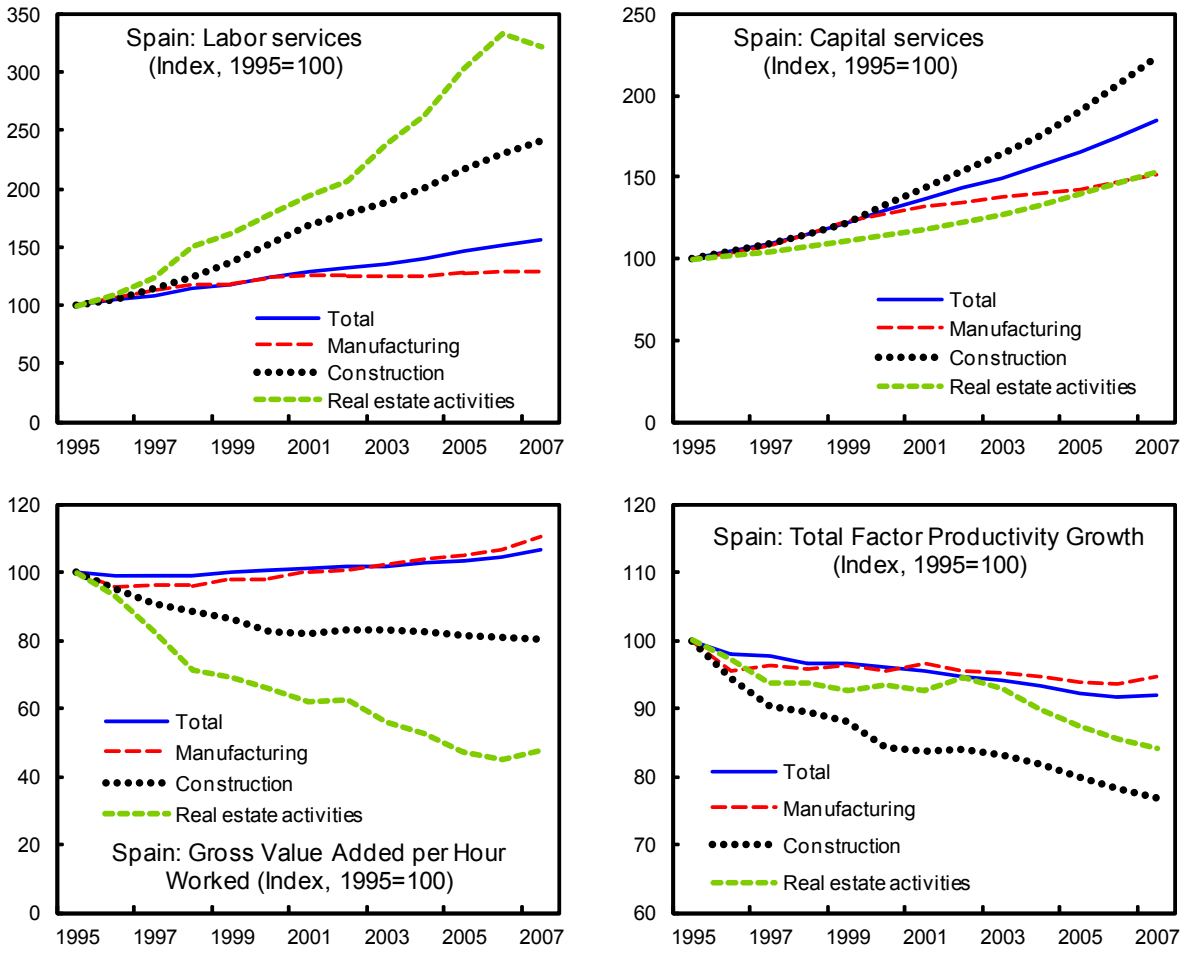
[4] The average maturity of mortgages in Spain has increased substantially during that period, from 12 years in 1990, to 22 years in 2000, and 28 years at the peak of 2007.

[5] Hence construction and real estate activities explain more than half of the increase in bank lending to the corporate sector during the boom years.

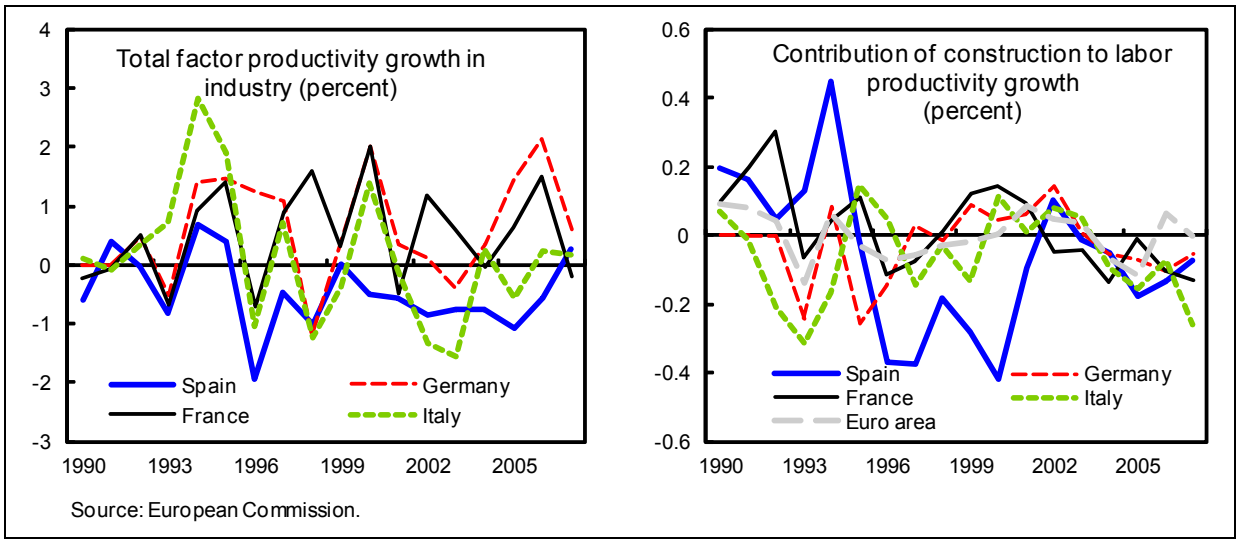
Box 1. The Low Return of the Housing Boom

The housing boom was a poor investment for Spain and dragged productivity down. The average contribution of residential investment to GDP growth in the boom years was high (0.5 percent and one sixth of GDP growth). Spain differs from other countries with significant house price appreciation (e.g. the UK) in that it has seen not only a house price boom but a construction boom as well. This has mobilized significant resources, in capital and especially labor. Besides leaving a legacy of stocks (housing units, unemployment and debt) the payoff in terms of productivity and total factor productivity has been low. And because it does not increase export capacity but still requires construction inputs that are imported in part, it had also a direct effect – albeit small - on the trade balance.

While the housing boom had a negative effect, productivity has been lagging in other sectors as well. Total factor productivity growth in Spain has been low across sectors, and this cannot be explained only by the increasing weight of construction. Less than half of the difference in productivity levels with the rest of euro area can be attributed to a different sectoral composition of the economy (FEDEA, 2010). Thus lowering the weight of construction will have some immediate payoff in terms of labor productivity growth but will likely not be sufficient to bridge Spain's aggregate total factor productivity gap with the euro area in the medium run.



Source: EU Klems database.



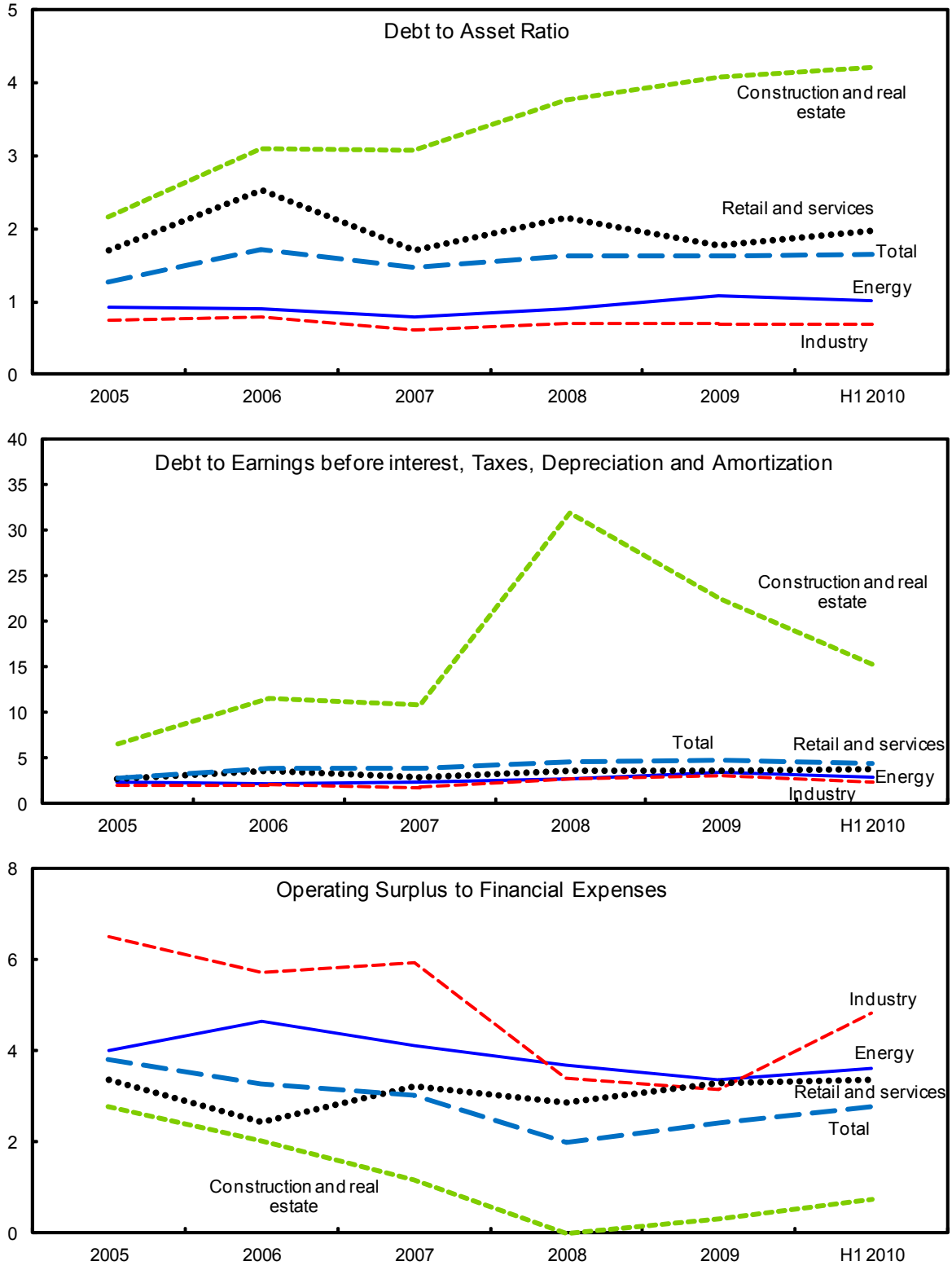
7. **The construction and real estate sectors are large, highly leveraged and rely more on bank financing than in other countries**. Traditionally, construction and real estate are activities more leveraged than other sectors. In Spain, this stands out clearly for large companies listed on the stock market, though this also reflects the financial profile of large companies that have expanded abroad and in activities that range beyond their original specialization (Figure 4). More broadly, not only the sector is more leveraged than other sectors, but the Spanish construction sector is also more leveraged than its peers (Figure 5). The construction sector in Spain also tends to rely more on bank debt than in other countries (Figure 6).[6] This would explain in part the high exposure of the Spanish banking system to these sectors.

8. **The construction and real estate sectors apart, leverage in the corporate sector is similar to euro area countries with higher income levels.** This is true on average for Spain, while some sectors (like hotels and restaurants) appear more leveraged. This suggests that the relatively high level of corporate indebtedness prevalent in Spain will not necessarily go away only with the scaling down of construction and real estate activities. Excluding construction and real estate activities, corporate debt could be estimated as representing the equivalent of 143 percent of GDP, still higher than the euro area average.[7]

[6] In the BACH database some real estate developers are included in the construction sector.

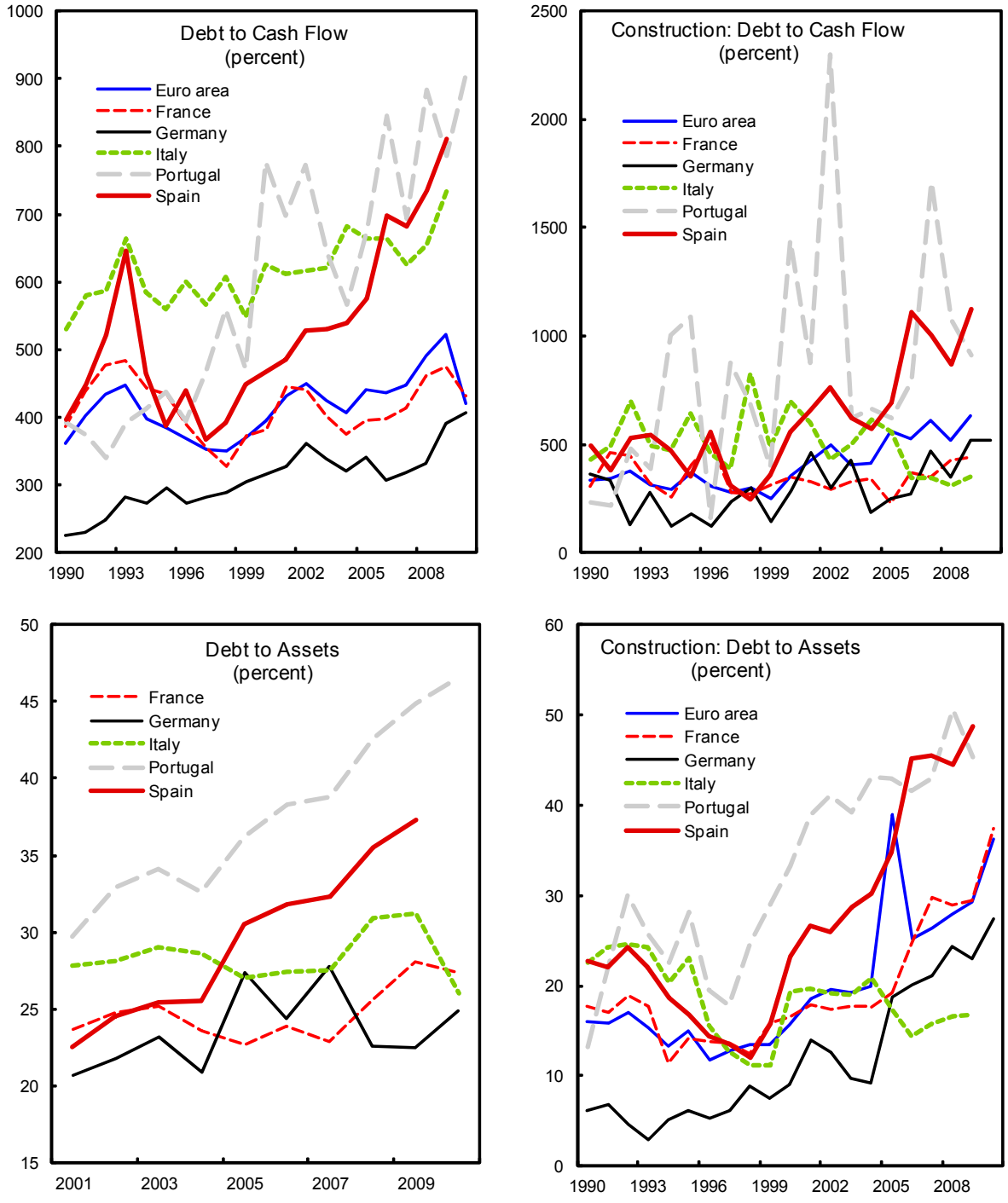
[7] Since the breakdown of corporate debt by sector other than debt owed to banks is not available, we assume a share of non bank debt of 56 percent for construction and 29 percent for real estate activities (based on BACH data).

Figure 4. Spain: Financial Ratios by Sectors, Listed Companies
(percent)



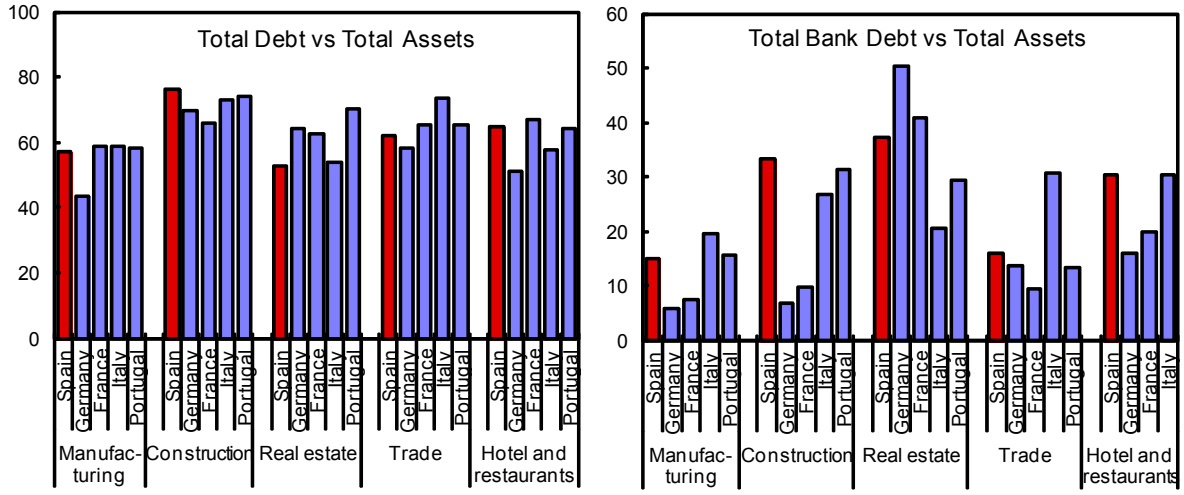
Source: Comision Nacional del Mercado de Valores (CNMV).

Figure 5. Corporate Sector: Selected Financial Ratios



Source: IMF Corporate Sector Vulnerability Utility.

Figure 6. Bank Debt by Sector of Activity
(percent)



Source: BACH-ESD Database.

9. **The boom also leaves a legacy of concentrated debt burdens across households.** Household debt in Spain is largely concentrated in mortgages (80 percent) and the share of households with mortgages in Spain is similar to France and Germany (ECB, 2009). Still, those households who have debt tend to be more leveraged. Another country with high home ownership, Italy, has also the lowest percentage of households with mortgages in the euro area and low leverage, about half that of Spain.[8]. Beyond these aggregate differences, Spain's median household debt to income ratio is significantly higher in poorer (as measured by wealth) and younger households.[9] The prevalence of debt is also proportionately more important in households that are not employed. Despite a high proportion of the young living with their parents and a high youth unemployment rate, it is also noteworthy that the prevalence of mortgages and the median debt to income ratio among the young (less than 35) is higher in Spain than in the US (which overall has a similar median debt to income ratio but a higher prevalence of debt).

[8] The data comes from household finance surveys prepared by the Spanish and Italian central banks. Central banks and statistical offices of the euro area are engaged in an effort to coordinate and harmonize household finance surveys under the leadership of the ECB (http://www.ecb.int/home/html/researcher_hfcn.en.html). Few surveys are published, and the level of dissemination is among the highest in Spain and Italy.

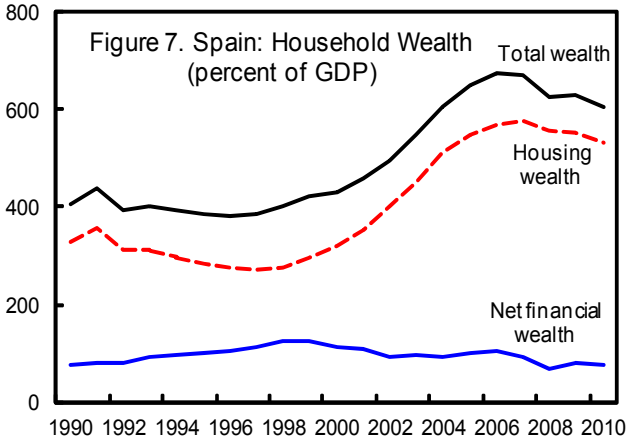
[9] In Spain the share of households in the two lowest income deciles owning their primary residences increased from 70.6 percent to 78.1 percent between 2005 and 2009 (Banco de Espana, 2010a). Debt service has increased by 1.8 percentage point during that period, but more so for the young (3.9 percentage points).

Table 1. Selected Countries: Household Debt

	Median debt to income		Percentage with any type of debt			Percentage with mortgages		
	Spain	Italy	Spain	Italy	US	Spain	Italy	US
Total households	104.7	45.3	50.1	27.8	77.5	26.3	12.6	49.4
Male (head of household)		49.1		30.3			14.2	
Female (head of household)		39.3		22.1			9.0	
By household net wealth (percentile)								
Less than 25	139.4	26.1	50.1	26.4	69.5	21.8	2.6	16.1
25-50	151.7	68.1	53.5	27.7	88.2	36.4	14.6	58.1
50-75	87.0	74.7	47.5	31.2	78.8	28.3	18.5	63.7
75-90	61.8	32.9	51.3	25.8	76.0	18.3	11.8	63.4
90-100	98.6	45.1	46.3	27.8	70.2	19.3	15.5	58.4
By age (head of household)								
Less than 35	217.4	58.3	68.6	36.8	84.6	45.6	15.4	40.0
35-44	142.7	78.0	72.3	42.0	87.7	51.4	22.8	60.2
45-54	89.9	42.2	60.0	39.3	86.6	27.9	18.7	64.2
55-64	41.0	28.8	48.5	24.8	77.7	13.3	8.9	54.2
65-74 1/	55.3	16.5	22.9	8.6	62.1	4.6	2.3	41.6
More than 74	18.5		9.9		35.0	1.9		15.1
Employed	121.3	49.1	68.4	36.8	86.6	41.8	18.1	57.9
Not employed	100.9	22.0	36.7	11.8	55.2	15.8	3.7	31.0

Sources: Banco de Espana; Banca d'Italia; and US Federal Reserve.
1/ Data for Italy are more than 65.

10. **The capacity to bear these debt burdens has been supported by the high levels of wealth in Spain, albeit largely concentrated in real estate.** The main mitigating factor to the high household debt is the particularly high level of household wealth in Spain (estimated at six times GDP), and mainly concentrated in real estate - 87 percent of their household wealth vs. an average of 60 percent in the euro area (Figure 7). This reflects a high homeownership ratio (82.3 percent), a significant degree of ownership of secondary houses, and overall a strong preference for housing as a saving instrument. The high home ownership ratio also implies that a given ratio of debt service to income is less of a burden in Spain as households pay less in rent.



Source: Banco de Espana.

C. To What Extent Have Imbalances Unwound So Far?

11. **Flows have significantly adjusted, much in line with other recent experiences of countries with housing booms and busts**. The nominal decline of lending flows, construction activity and employment is sharp and largely in line with the experience of other countries with housing booms and busts (Table 2). The large employment in construction (as well as the weight of construction in GDP/investment) has adjusted substantially, explaining a large part of the increase in unemployment (Figure 8). Construction employment - at8.5 percent of total employment – has adjusted substantially from its peak (13.1 percent). It is lower than the Spanish average over the last 30 years (9.9 percent) but still higher than at the trough experienced in the mid-80s (7.3 percent in 1985). Employment in construction tends to be structurally higher in Spain than in the rest of Europe and the question going forward is whether construction employment will "undershoot" and for how long (Figure 9). For the time being, the large decline in construction employment has helped foster an improvement in productivity and - together with some wage moderation - an improvement in unit labor costs.[10]

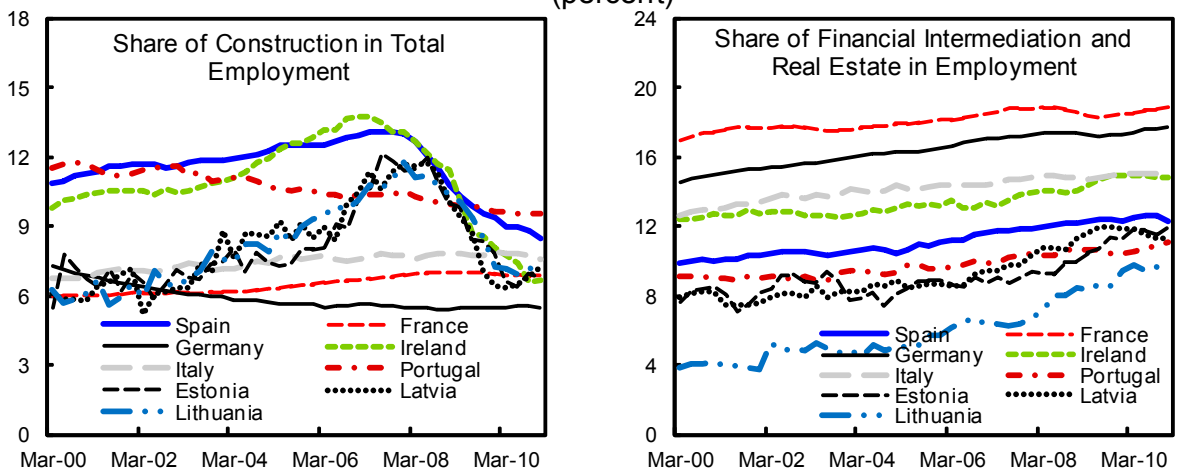
Table 2. Selected Flows and Stocks Adjusment from Peak
(percent)

	Decline from peak			
	Spain	UK	Ireland	US
	Flows			
New mortgages	-81	-64	-74	
New consumer loans	-78		-72	
Housing starts	-94	-47		-73
House sales	-46	-53		-77
Construction employment	-42	-11	-58	-29
	Prices			
House prices	-15	-11	-27	-31
Peak to trough		-18	-38	
Alternative house price indexes				
Tinsa	-19			
of which Med. Coast	-27			
Idealista				
Madrid	-16			
Barcelona	-20			
Fotocasa	-26			
	Stocks			
Credit to the private sector	-2	-6	-31	-7
Household mortgages	-1	0	-21	-1
Consumer credit	-8	-20	-15	-6
Credit to real estate activities	-4	-24	-30	-15
Credit to construction	-30	-26	-70	-21
Inventory of unsold units	0	n.a.	n.a.	-10

Sources: Banco de Espana; Eurostat; National authorities; and IMF staff estimates.

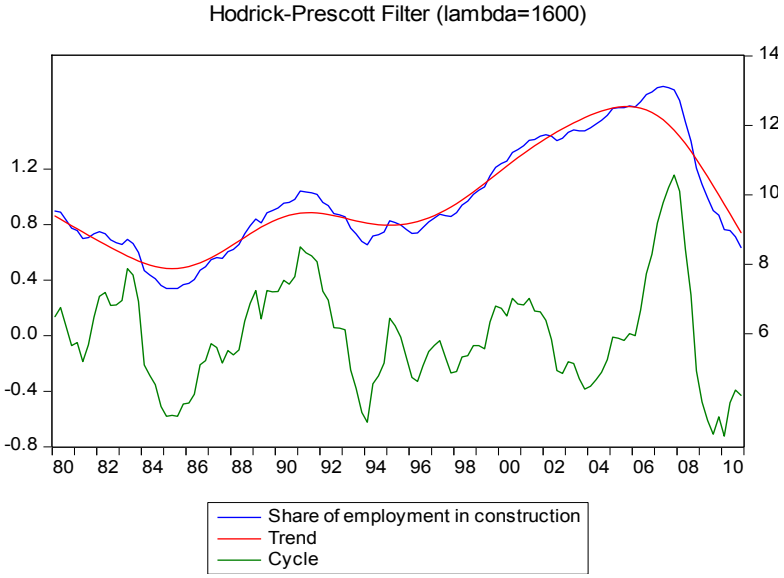
[10] Though the rise in Spanish unemployment is broader than a construction story, the decline in construction employment explains around 40 percent of the increase in unemployment since 2008.

Figure 8. Employment in Construction
(percent)



Source: Eurostat.

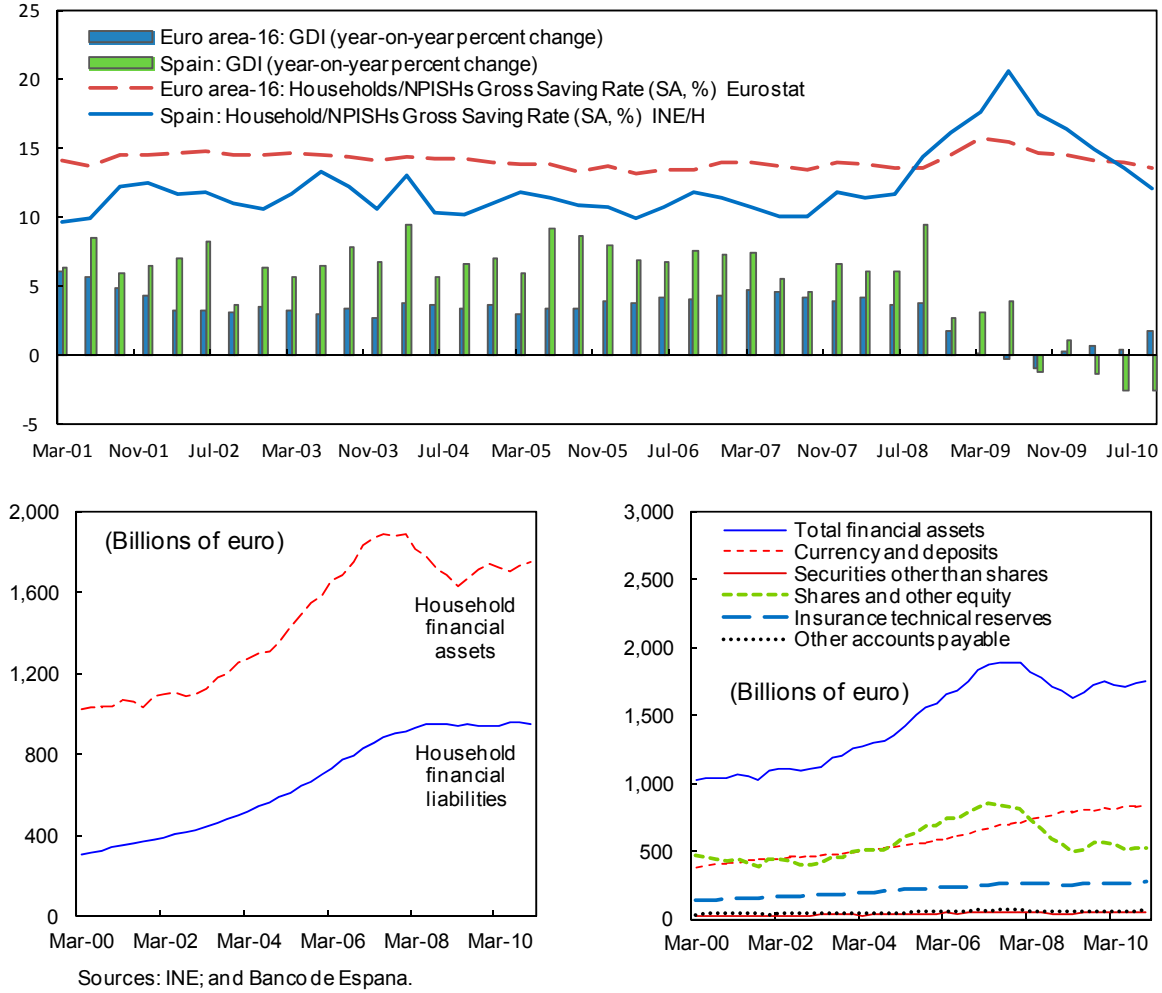
Figure 9. Spain: long term trends in the share of construction employment



12. **Household and corporate saving ratios saving have also temporarily and rapidly adjusted to deal with stretched balance sheets**. However, this large adjustment seems to have been temporary, in particular for household saving (Figure 10). Households' gross saving rate had for many years been below the euro area average until the second half of 2008, when it jumped sharply to above the euro area average. However, in early 2010, the ratio fell sharply back to below the euro area average (though still a bit higher than during the boom years and than in other countries with high household debt levels such as the US, UK, Netherlands), possibly as household disposable income started to fall significantly. The increase and subsequent decline of the household saving ratio has been the sharpest across

Euro area countries.[11] This modest improvement has helped stabilize, but not decrease the stock of household liabilities.

Figure 10. Spain: Evolution of Household Saving, Financial Assets and Liabilities



Sources: INE; and Banco de Espana.

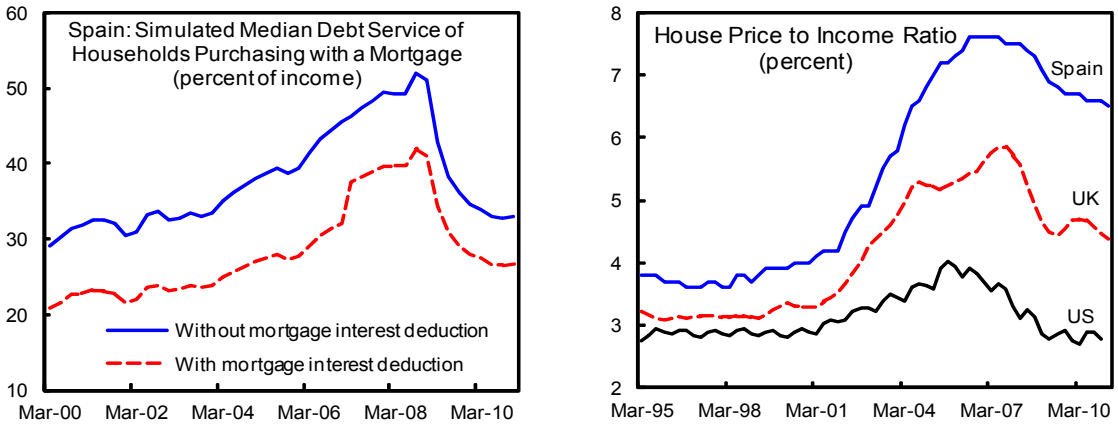
13. **The house price adjustment seems about two-thirds completed.** Judging by official house price indexes, prices have fallen less in Spain than in Ireland and the US, though similar to the UK (which had less expansion in its housing stock and construction activities).[12] The adjustment seems about two-thirds completed compared to estimates of the initial degree of overshooting, with a 20 percent decline in real terms, close to the average of

[11] Some of the high volatility of the Spanish household saving rate has been attributed to the large share of wealth held by Spanish households in real estate. The fact that real estate assets can be fairly illiquid in a downturn could lead to sharp increases in the saving rate.

[12] For the US, there are also significant regional differences, with much sharper declines in states in where the expansion of the housing stock has been substantial (Florida, Nevada, and California in particular).

housing busts in the euro area (ECB, 2009), but likely still with more to go in nominal terms (Table 3).[13] Other price indices suggest prices have fallen further, but still have more to go. Affordability indicators have improved, notably as mortgage rates went down, but not enough to stimulate demand. Nonetheless, the more recent pick up in mortgage rates and the end of the mortgage interest deduction from income tax as of January 1, 2011 - a measure correctly aimed at addressing distortions in the housing market—will also affect affordability for new mortgages (Figure 11).[14]

Figure 11. Selected Affordability Indicators



Sources: Banco de Espana; Halifax; National Association of Realtors; and US Census Bureau.

14. **The stock of unsold units may take around another four years to clear.** The lowest estimates of the stock of unsold units are at close to 700 000 units, with considerable regional variations but with a downward adjustment that has only started at the end of 2010. These only include newly completed units, and do not fully include units repossessed by financial institutions, unsold secondary market houses, or unfinished units.[15] Long run sustainable

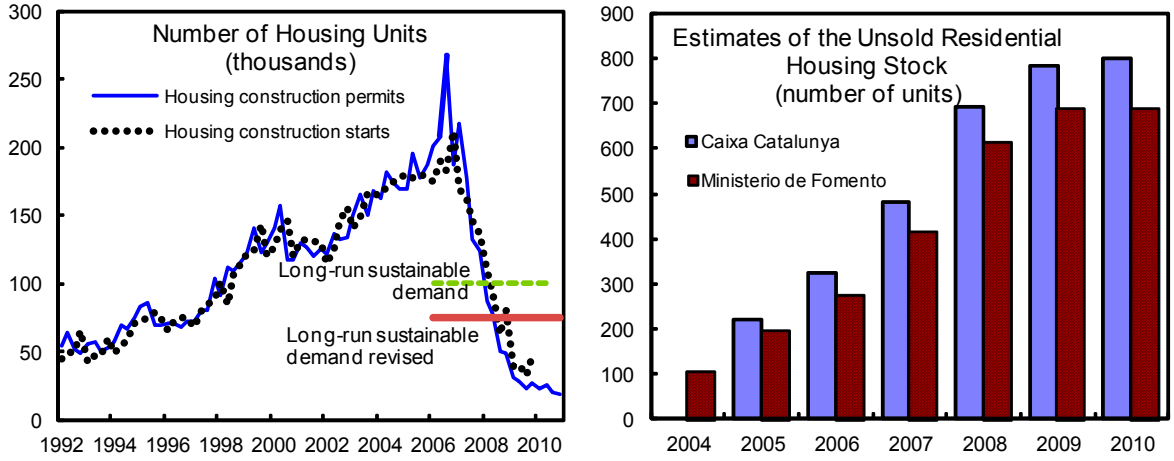
[13] ECB (2009) estimates the average adjustment during housing busts in the euro area at 18 percent in real terms and 37 percent in nominal terms. The adjustment in real terms three years after the peak is also comparable to the decline registered during the previous housing crisis in Spain at the beginning of the 1990s (Banco de Espana, 2010b), though the current cycle is more inventory driven and does not beneficiate from a rapid decline of real interest rates as experienced in the second half of the 1990s.The Bank of Spain expects a decline of 25 percent in real terms from peak to trough in 2012 (Banco de Espana, 2011).

[14] 95 percent of Spanish mortgages are at variable rates, and adjust in line with the Euribor12 months. Mortgage interest deductibility has been capped at a low level, starting January 2011. The mortgage interest deduction prevalent until January 2011 included a tax credit of 15 percent of the principal and interest and capped at €9000. The mortgage interest deduction is now only applicable to households with less than €24 000 in income. The house price-to-rent ratio remains higher than in other countries. Rents (on new rentals) have adjusted downwards with declines from peak of between 10 and 26 percent in the three largest cities (Madrid, Barcelona and Valencia).

[15] Units repossessed by financial institutions are estimated at between 100 and 200 000 units.

demand estimated by IMF (2009) and updated in light of revised demographic projections, points to a sustainable demand of about 300 000 units/year (Figure 12).[16] In light of this and current housing starts and completions, it would take about four years to clear the inventory (e.g. taking into account the fact that for technical reasons the housing inventory cannot go down to zero).

Figure 12. Spain: Housing Inventory and Estimates of Demand for Housing



Sources: Spanish Housing Ministry; Catalunya Caixa; and IMF staff estimates.

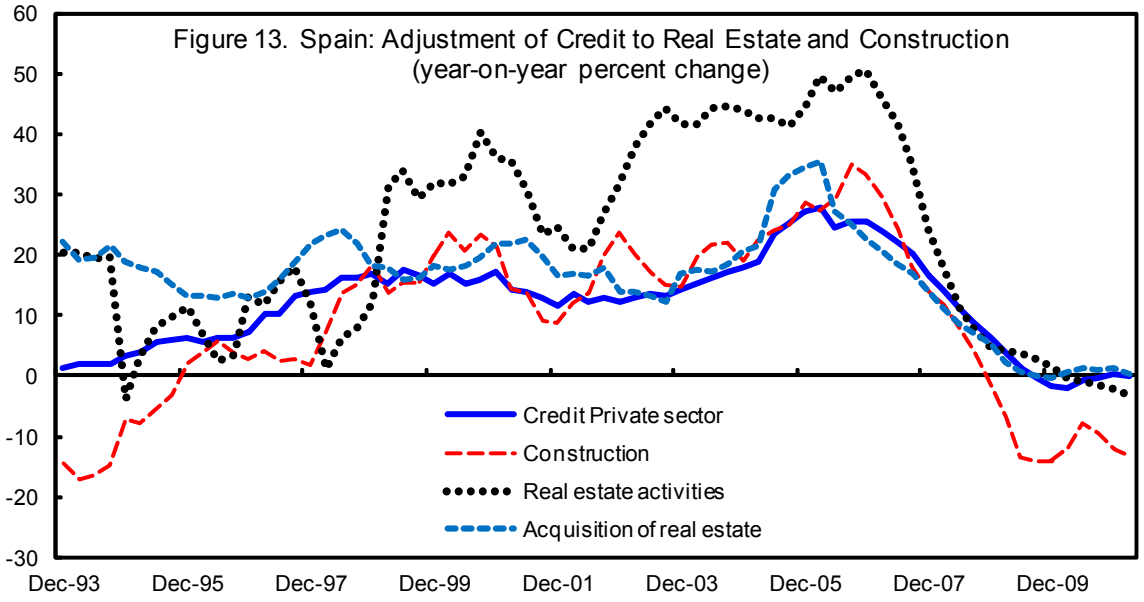
Table 3. Estimates of Real House Price Overvaluation for Spain
(percent)

IMF (WEO 2007, 2008)	17
European Commission (2010)	24
ECB (2010)	20
Affordability index	33
Log-linear regression	3
House price to rent ratio	29
Static asset pricing framework	20
Goldman Sachs (2011)	20
The Economist (2011)	39

15. **The adjustment of credit stocks has barely begun**. It is normal for the stock of mortgages to take a long time to adjust, given the maturity structure of the loan portfolio. Credit to construction has adjusted significantly, as it has done in the previous comparable recession episode in Spain (1993-1994). But there has been relatively little adjustment in the

[16] The estimates are notably based on demographic projections, rates of household formation and estimates of secondary houses (for more details see IMF 2008). These have been updated, notably in light of a downward revision of population forecasts, as published by the Spanish National Statistics Office (population forecasts up to 2020). Downward revisions to population growth are largely explained by a decline in immigration flows.

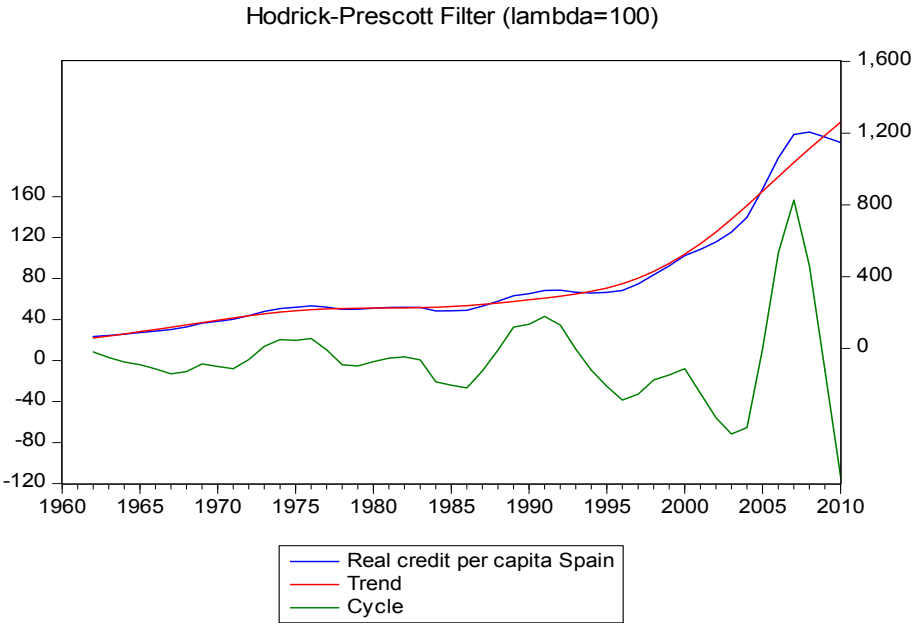
large stock of loans to real estate activities (Figure 13). The stock net of provisions has adjusted significantly but it remains that the gross stock has declined modestly. Despite a lower average maturity, it has adjusted in line with the mortgage portfolio, and much less than in other countries (Table 2). Not all loans are directed to property development, but this could suggest that a part of loans to developers (in particular) is being renegotiated to help them cope with the deep downturn in the sector.



16. **How much further the credit deleveraging has to go is inherently uncertain and depends on whether the comparison is with Spanish trends or other countries.**

- **Based on Spanish history, credit per capita is now below trend**. Using the same methodology as in Mendoza and Terrones (2008) to identify credit booms, an Hodrick-Prescott identifies deviations from the Spanish trend of real credit per capita between 1962 (first data point available) and 2010 (Figure 14). There is a clear deviation from trend starting in 2004 and a previous boom and bust episode at the beginning of the 1990s is also correctly identified. According to this measure, the credit boom in Spain has been unwound.

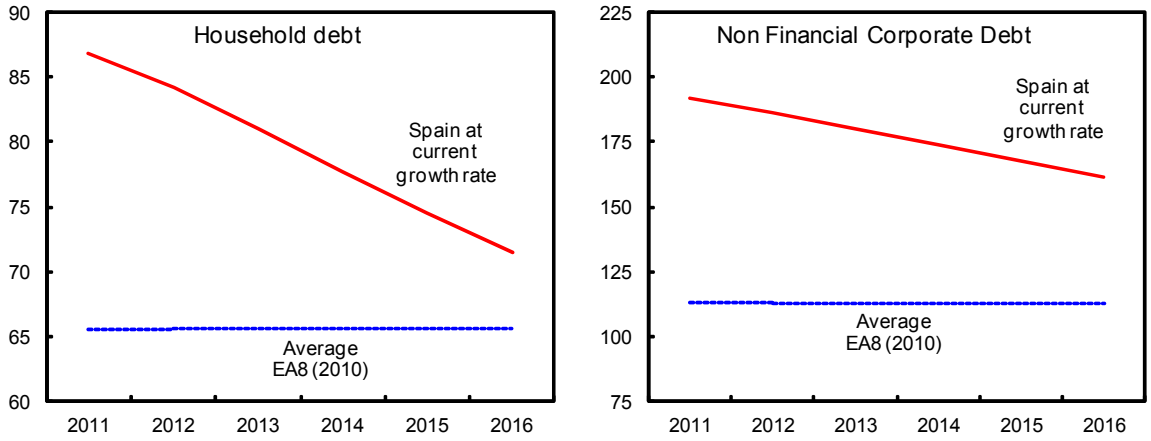
Figure 14. Spain: Identification of credit booms



- **Compared to cross-country estimates, however, credit levels may have significantly further to unwind**. Cross country comparison can only provide a very rough guide as to what is the appropriate level of debt in a single country. However, unwinding to levels of peer countries would be challenging in a low growth environment. As an illustrative scenario, at the current rate of nominal credit growth (year on year declines of ½ percent for household debt and 1 ½ percent for corporate debt), and based on the IMF WEO forecasts for nominal GDP, household, but not corporate, debt would significantly converge to the current averages for the euro area in 2016 (Figure 15).[17] Achieving convergence for both households and corporate over this timeframe implies annual average nominal credit growth of around -2 percent for household debt, but -17 percent for corporate debt. In other words, unless credit contracts for the next 5 years, private debt ratios will still likely be higher in Spain than in its euro area peers.

[17] Weighted average data for 8 Euro area countries with longstanding and highly developed financial systems (France, Italy, Germany, Austria, Belgium, Netherlands, Luxembourg, Finland). Euro area program countries (Greece, Portugal, Ireland) were excluded from the sample.

Figure 15. Spain: Evolution of Household and Corporate Total Debt at Current Rates of Adjustment (percent of GDP)



Source: IMF staff estimates.

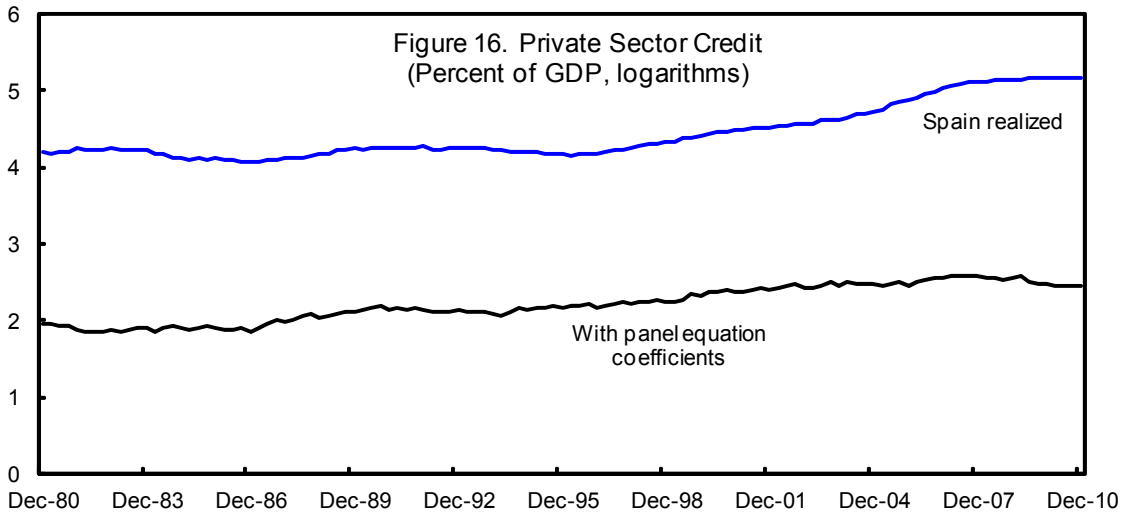
- **Spain seems to have diverged from cross country levels of credit determined by fundamentals**. Panel estimates of the relationship between private credit and a set of economic fundamentals (GDP per capita, credit to the government, inflation, interest rates, intermediation spreads), on a sample of 22 advanced economies, suggest relationships in line with similar studies (e.g. European Commission (2010)), with strong positive effects from GDP per capita, negative effects from inflation (on the development of intermediation, rather than through the impact on real interest rates and demand for credit) and credit to the government (Table 4). They also point to high country fixed effects coefficients for Spain and suggest a level of credit which may have been deviating from fundamentals for long periods of time, perhaps explained by other Spain specific factors, such as a high rate of home ownership and preference for home tenure.

Table 4. Cross country estimates of private sector credit and relationship with fundamentals

Dependent variable: Private sector credit (percent of GDP)		
	Excluding Spain	Including Spain
Constant	-13.13	-11.03
Government credit (percent of GDP)	-0.10 ***	-0.11 ***
GDP per capita	1.57 ***	1.40 ***
Long term bond yield	0.21 ***	0.18 ***
CPI	-0.04 **	-0.03 **
Intermediation spread	-0.04 *	-0.04 *

Fixed Effects Least Square; 22 advanced economies; quarterly data (1980-2010). All variables in log.

*** significant at 1%, ** significant at 5%, * significant at 10%.



17. **Evidence from the literature on cross-country experiences with deleveraging after crisis episodes also point to a potentially long rebalancing in Spain.** The growing literature on deleveraging after crisis episodes shows that deleveraging can take a long time, on average 6-7 years, starting two years after a crisis (e.g. Reinhart and Reinhart, 2010; Tang and Upper, 2010; McKinsey, 2010). The literature has focused on evidence from the aftermath of banking crises, unfortunately much less so on housing booms per se (which makes it less applicable to the case of Spain). The general experience is that deleveraging is due in equal parts to a fall in nominal credit, GDP growth and inflation.[18] Often (e.g. Finland in the 1990s) the deleveraging has been led by a sharp increase in net exports, stimulated by an exchange rate devaluation. Although a devaluation was experienced in 1993, this option is no longer open to Spain, and to significantly deleverage options are few going forward (a decrease in nominal debt and/or an increase in nominal GDP).

D. Conclusions and Policy Implications

Spain's long period of economic expansion relied on a double boom that produced two large and interlinked private sector imbalances:

- Excessive weight of construction and real estate (in GDP, employment and lending). These flows have largely adjusted, but are likely to remain at weak levels for some years as overhangs (for example of unsold units) are unwound.
- Excessive debt levels. These have stabilized but have not fallen. Household savings rates initially jumped with the crisis, but have since fallen back (though household

[18] The average adjustment after 17 systemic banking crises was of 38 percentage points of GDP (Tang and Upper, 2010).

investment has remained lower). Credit to the construction sector is falling significantly, but not credit to the real estate sector. How much further credit has to unwind is unclear and an equilibrium level of credit is difficult to estimate. But judging by cross-country comparisons, credit to the private sector, and in particular to the corporate sector may have further to fall, which could mean years of negative credit growth in the absence of a sustained expansion in output.

Though it is largely a market driven process and macroeconomic policies will play a critical role, more specific policy options could also help, in particular:

- Ensuring the ongoing financial sector reform promptly delivers the needed "cleansing", especially in fully recognizing losses in the real estate sector. Avoiding a situation of "zombie lending" (to real estate activities) and delayed adjustment as in Japan (Caballero et al, 2008) should be a priority. More so than reaching a given level of credit, it is important that a reallocation of credit can take place towards the more productive and innovative sectors of the economy. This might require more decisive action to resolve unviable real estate developers and shrink the size of sector.
- Continuing the reform of the housing market with the primary purpose of allowing the market to clear, either through enhanced price discovery (for example through greater use of tools like multiple listing systems), or through greater development of the rental market (currently a third of the euro area average).

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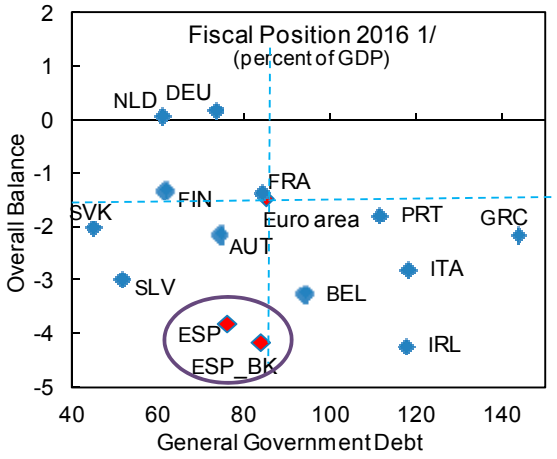
II. Re-Assessing Spain's Fiscal Sustainability: 3 Percent and Beyond[1]

In the medium term, Spain's fiscal deficit is projected to fall and government debt to remain relatively low compared to euro area peers. However, in the longer term, Spain is subject to significant spending pressures, like most advanced countries, arising from age-related spending, reflecting unfavorable demographic trends and subdued growth prospects. The full implementation of the draft pension reform combined with substantial medium-term consolidation to reach the Medium-Term Objective of a balanced budget by 2016 (the MTO) would be needed to ensure that the debt ratio would remain below 60 percent by 2060. This, however, critically assumes that economic growth strengthens in the longer-term, which will likely require substantial structural reform.

A. Introduction

1. **At first glance, Spain's public finances over the medium term do not present a particularly worrying picture**. Although the deficit hit 11.1 percent of GDP in 2009, it is on course to fall to about 6 percent in 2011 and the government is targeting 2.1 percent of GDP by 2014. General government debt is also likely to remain below 85 percent of GDP over the medium-term –lower than projections for the euro area as a whole –even if allowance were to be made for full utilization of the €99 billion allotted to Spain's Fund for Orderly Restructuring of the Banking Sector (FROB). However, in the longer term, Spain's public finances, like most advanced countries, face serious challenges arising mainly from age-related spending, especially pensions, reflecting unfavorable demographic trends, and subdued growth prospects. To help contain the pressure from aging and ensure the sustainability of its public finances, in January 2011, Spain has proposed a pension reform, and in February, it enacted "the Sustainable Economy Law" to set the foundation for a more solid recovery in economic growth.



Sources: WEO; and IMF staff projections.
1/ ESP_BK when assuming full utilization of the €99 billion allotted to Spain's FROB.

2. **The objective of this note is to assess Spain's long-term fiscal sustainability taking into account the impact of recent developments**. By exploring alternative scenarios, it illustrates the important effects that recently implemented policies and reforms may have, and also highlights the need for fiscal consolidation to go beyond the 3 percent target in 2013 to achieve the MTO quickly thereafter.

[1] Prepared by Keiko Honjo.

B. Spain's Current Fiscal Position

3. **The global financial crisis exposed the underlying structural weakness of Spain's public finances that had been masked by the credit and housing market boom**. During 1995-2007, the fiscal position shifted from a deficit of 6½ percent of GDP to a surplus of about 2 percent, and public debt was nearly halved to 36.1 percent of GDP. The large improvement reflected lower interest payments associated with euro adoption and strong increases in tax revenues on the back of the housing boom and strong employment growth. With the collapse of the housing market in the wake of the global financial crisis, the substantial contribution of the construction sector to the tax base was substantially, and probably permanently, reduced. Combined with the effects of a large fiscal stimulus to assist the economy through the downturn, Spain's fiscal position deteriorated sharply, with the deficit peaking at 11.1 percent of GDP in 2009. Measures adopted by the government brought the deficit down to 9.2 percent of GDP in 2010, and the government has committed to reducing the deficit further to 2.1 percent by 2014.

4. **The government's ability to reach this near-term objective is subject to significant risks**. The outlook for revenue is particularly uncertain given weak growth prospects reflecting a protracted recovery in the housing market and the pressures on households and corporations to deleverage and restore their balance sheets. Continued reliance on spending restraints also poses a significant challenge given Spain's high degree of government decentralization and the structural nature of regional governments' expenditure (especially health and education).

5. **And over the long run, the European Commission (2009) classified Spain as one of the few countries subject to high long-term sustainability risks reflecting population aging and a slowdown in population growth coupled with a weak initial budgetary position**. Costs associated with aging were projected to rise by 9 percent of GDP through 2060 in Spain, compared with about 5 percent in the euro area, mainly reflecting a substantial increase in pension expenditure.

Age-related Spending Projections
(Percent of GDP)

	2007	2010	2030	2060	Change 2007-60
Total	19.2	20.0	22.4	28.2	9.0
Pensions	8.4	8.9	10.8	15.1	6.7
Health	5.5	5.6	6.3	7.2	1.7
Long-term care	0.5	0.7	1.0	1.4	0.9
Education	3.5	3.4	3.4	3.6	0.1
Unemployment	1.3	1.4	0.9	0.9	-0.4

Source: European Commission 2009 Ageing Report.

Pension reform

6. **At about 9 percent of GDP in 2010, some 2 percentage points of GDP lower than the euro area average, public pension expenditure is not yet a key source of budgetary concern in Spain**. However, it is projected to surge in the coming years reflecting population aging and relatively generous benefits (Box 1). The dependency ratio of the pension system is projected to nearly double from 37 percent in 2010 to 77 percent in 2060 as the impact of retiring baby boomers kicks in, especially after 2030. Compounding these pressures is the

relative generosity of Spain's current pension system with a net replacement ratio of 85 percent (compared to 76 percent for the euro area average). In addition, the system gives incentives for early and partial retirement.

Spain: Pension System Characteristics

	Net Pension Replacement Rates 1/	Statutory Retirement Age	Average Retirement Age (2007)	Reference Period 2/	Contrib. Period (Full Pension)	Dependency Ratio 2010/60 3/	Pension Expenditure 2007	Pension Expenditure Change 2007-60 (%GDP)
Spain								
Pre-reform	84.9	65	62.1	15	35	37/77	8.4	6.7
With reform	…	67	…	25	38.5	…	8.4	3.2
France	60.4	62	59.4	25	40	58/80	13	1.0
Italy	75.3	65 (60)	60.4	Lifetime	45	65/95	14	-0.4
Germany	57.9	65	62	Lifetime	40	62/91	10.4	2.3
United Kingdom	41.5	65 (60)	62.6	Lifetime	30	…	6.6	2.7
Euro area	76.3	…	61.3	…	…	…	11.1	2.8

Source: European Commission 2009 Ageing Report OECD Pensions at a Glance 2011.
1/ For average earner, in percent of earnings.
2/ Used for benefit calculation.
3/ Number of pensioners relative to the number of contributors in public pension schemes.

Box 1. Key Aspects of the Pension System in Spain Prior to the Reform

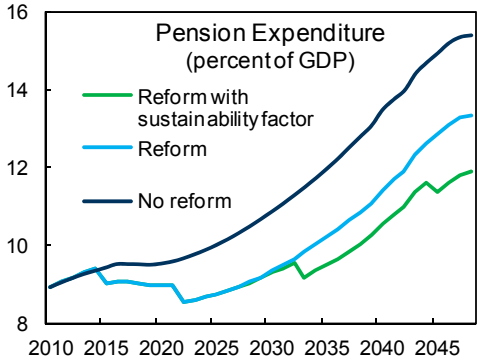
The Spanish public pension system consists of a single, earnings-related, system covering old-age, disability and survivors' pensions, financed through contributions with a means-tested minimum pension. It is mandatory for all employees and the self-employed and provides pension entitlements after a minimum contribution period of 15 years. There is also a non-contribution means-tested level, financed solely by tax revenues, granted to persons aged 65 and older, who have not acquired enough pension contributions or are not entitled to a contributory old-age pension. Pensioners can also benefit from additional services including healthcare and social services. Supplementary private pension schemes are voluntary.

Benefit calculation: The system is financed as a PAYG, with a defined benefit formula. Benefits are calculated as a percentage of a "base pension"—an average of the contributions during the last 15 years before retirement (up to a ceiling of about 160 percent of the average wage). 35 years of contribution is required to receive a full pension (100 percent of the "base pension") at the retirement age of 65.

Early-retirement is available from the age of 61 for those who entered the system after 1967 with 30 years of contribution (age of 60 for those entered before). Pension benefits are reduced by 6 to 7.5 percent per year depending on the numbers of years of contributions (reduction of 8 percent for those before 1967).

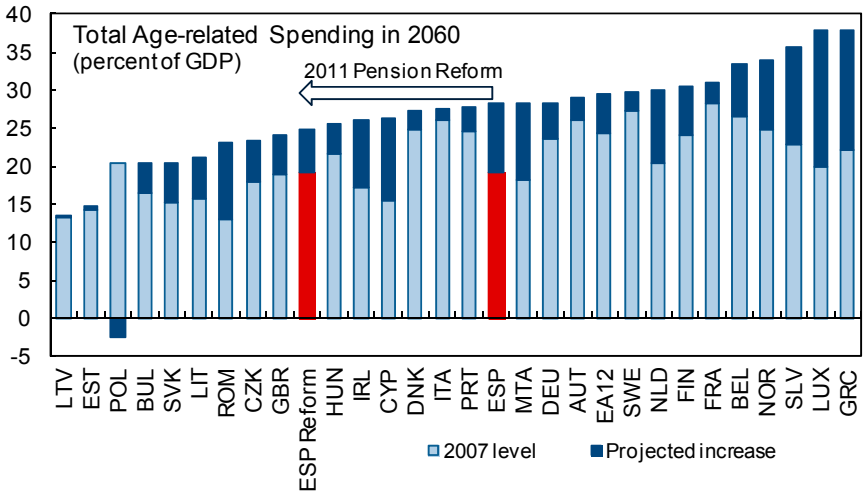
7. **To reduce future pension liabilities and strengthen the sustainability of the pension system, a draft pension reform was agreed with social partners, which has recently been approved by the Lower House.** The reform would increase the statutory retirement age from 65 to 67, to be phased in gradually over the period from 2013 to 2027. On the benefits side, the numbers of years to calculate the earnings base (reference period) will be gradually raised from 15 to 25 years, as well as the required contribution to qualify

for the full pension from 35 to 38.5 years. In addition, eligibility criteria for early retirement will be tightened as the minimum retirement age will be raised from 61 to 63 years with at least 33 years of contribution. This is combined with an increase in the penalty rate (reduction in pension) to be raised to 7½ percent per year of retirement before the statutory age. Finally, a "sustainability factor" was included aiming (although no detailed and automatic formula has been identified) at reassessing the parameters of the system every 5 years starting in 2027 to factor in any impact of any further increases in life expectancy.



Sources: Ministry of Finance; and IMF staff estimates.

8. **Staff estimates the reform would reduce pension expenditure by 2–3½ percent of GDP by 2050**. Applying further increase in retirement age beyond 2027 to take into account the impact of the sustainability factor, the savings could be considerably higher, amounting to about 3½ percent of GDP. The implementation of the pension reform would imply an important reduction of the projected age-related spending, limiting the level of total aging-related spending to below 25 percent of GDP in 2016, nearly 5 percentage points of GDP lower than that of the euro area average.



Source: European Commission "The 2009 Ageing Report".

C. Illustrative Scenario Analysis

9. **To assess Spain's long-term fiscal sustainability taking into account the latest fiscal developments and the impact of the recent pension reform proposal, a scenario analysis was used to evaluate the state of public finances in 2060**. A baseline, *no-reform* scenario, was constructed based on staff's projections until 2016, reflecting its assessment of the authorities' existing policies (excluding pension reform), and the staff's macroeconomic projections. Alternative scenarios were then constructed to illustrate the importance of

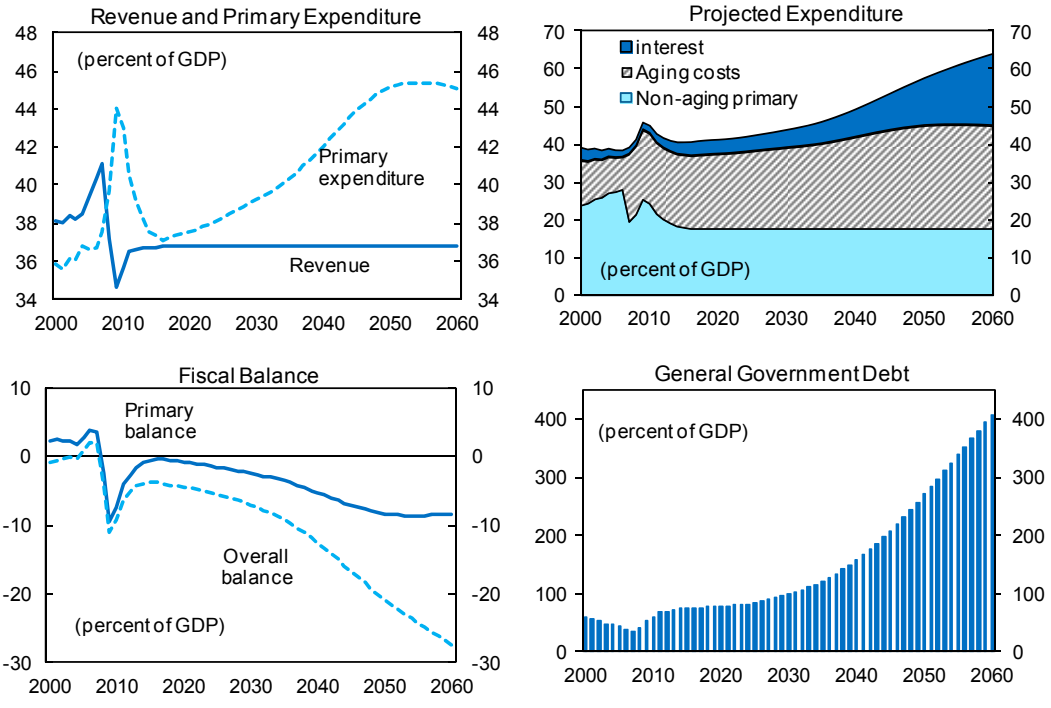
pension reform and of early fiscal consolidation (a *reform and adjustment scenario*). A *lower productivity growth scenario* shows how ensuring sustainability would be complicated by a failure to achieve the higher projected longer-term economic growth.

The baseline (*no-reform*) scenario

10. **Staff projects the deficit to decline to about 3.8 percent of GDP in 2016, corresponding to a small primary deficit of 0.3 percent of GDP and the government debt ratio to reach 76 percent of GDP**. Beyond 2016, revenue is projected to remain unchanged at the 2016 level in percent of GDP—about 4 percentage points of GDP lower than the cyclical peak in 2006-07. Non-aging primary spending is also kept constant relative to GDP from 2017 onward, so that the variation in overall primary expenditures is governed by aging costs. Projections beyond 2016 are based on the macroeconomic and demographic assumptions used in the European Commission's *Ageing Report*. In particular, aging costs are assumed to unfold as envisaged in the report through 2060.

11. **The "no reform" scenario would not be sustainable in the long run**. The primary balance deteriorates gradually to a deficit of about 2½ percent of GDP by 2030. Subsequently, this deterioration accelerates as the pressures from aging increases, with the deficit reaching over 8 percent of GDP by 2060. The debt ratio would rise to about 400 percent of GDP.

Spain: No-Reform Scenario



Sources: IGAE; Stability Report 2011-14;and IMF staff projections.

12. **The required adjustment to ensure sustainability would be substantial**. The improvement in the structural primary balance needed in 2017 to reach a target debt of 60 percent of GDP in 2060 (S1 indicator) amounts to 5.8 percent of GDP, while the adjustment to fulfill the infinite horizon inter-temporal budget constraint reaches 7.6 percentage points (S2 indicator). The decomposition of the gap suggests aging accounts for a lion's share of the needed adjustment. While the weak initial budgetary position (2017) accounts for a smaller share of the gap, this owes to a large fiscal consolidation projected in the baseline with nearly 7 percent of GDP adjustment in the primary balance by 2016.

Sustainability Indicators: Illustrative Scenarios
(Percent of GDP)

	Unchanged policy 1/				Adjustment (by 2016) 2/			Lower growth 3/	
	No reform	Bank recap 4/	Pension reform	Pension sust. 5/	2.1% of GDP	MTO	MTO Pen.	No reform	MTO Pen.
Primary balance (2016)	**-0.3**	**-0.3**	**-0.3**	**-0.3**	**1.0**	**3.0**	**3.0**	**-0.3**	**3.0**
S2	**7.6**	**7.7**	**6.0**	**4.9**	**6.1**	**4.2**	**1.4**	**11.3**	**4.5**
Initial budgetary position	1.3	1.4	1.3	1.3	-0.2	-2.2	-2.2	2.0	-1.6
Long-term changes from aging	6.3	6.3	4.7	3.6	6.3	6.3	3.6	9.3	6.1
S1	**5.8**	**5.9**	**4.3**	**3.7**	**4.1**	**2.0**	**0.0**	**8.8**	**2.7**
Initial budgetary position	1.3	1.4	1.3	1.3	-0.2	-2.2	-2.2	2.0	-1.6
Debt requirement in 2060	0.4	0.4	0.3	0.3	0.2	0.1	0.1	0.2	0.1
Long-term changes from aging	4.1	4.1	2.7	2.1	4.1	4.1	2.1	6.6	4.1
Public debt (2060)	406.7	419.0	321.5	282.9	306.5	177.6	53.8	721.3	252.7

Sources: European Commission Ageing Report 2009; IGAE; and IMF staff estimates.

1/ Based on staff projections until 2016. Productivity growth of 1.7 percent in the long-run.
2/ Additional fiscal measures to achieve 2.1 percent of GDP by 2014 or MTO by 2016.
3/ Assuming productivity growth of 1 percent from 2017.
4/ Assuming full utilization of the €99 billion allotted to Spain's FROB.
5/ Pension reform including the sustainability factor from 2027.

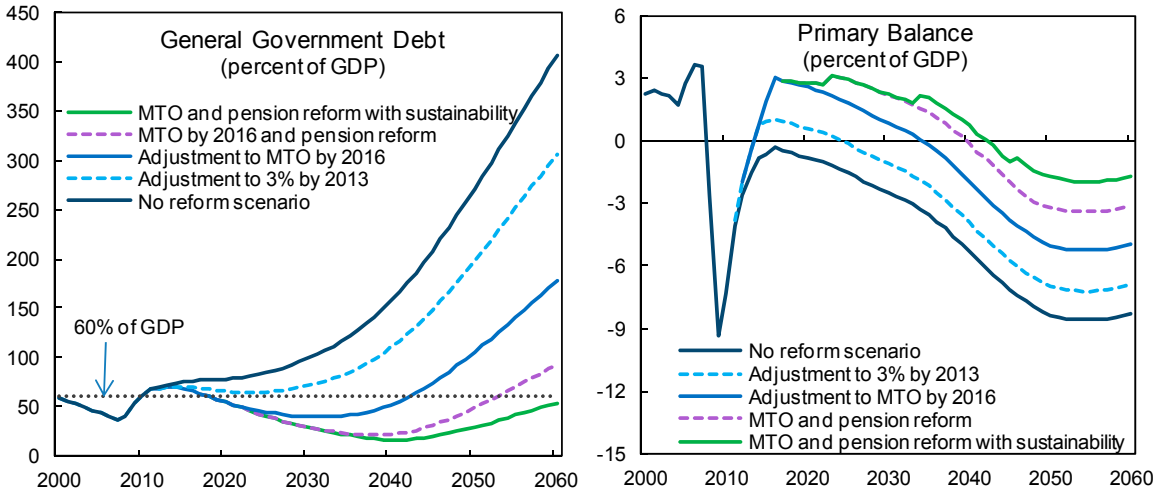
S2=Permanent budgetary adjustment need to fulfil the intertemporal budget constraint.
S1=Permanent budgetary adjustment need for debt to reach 60% of GDP in 2060.

Reform and adjustment scenario

13. **By directly tackling the spending pressure from aging, the pension reform would significantly reduce the debt build-up over the long-run**. In particular, with the sustainability factor, the pension reform is projected to lower the debt ratio by 120 percent of GDP compared with the baseline. However, because of the gradual implementation of the pension reform, the projected debt ratio would remain above 270 percent of GDP, requiring 3.7 percentage points of GDP adjustment in the primary fiscal balance in 2017 if the 60 percent of GDP debt threshold is to be met in 2060.

14. **The required adjustment to restore fiscal sustainability appears substantial but early consolidation, if sustained, can make a significant difference**. A permanent reduction in the overall deficit to 2.1 percent of GDP by 2014 as envisaged by the government SGP plan and maintaining the deficit at that level throughout the projection period would reduce the debt ratio to about 306 percent of GDP. The impact of achieving the MTO of a balanced position over the cycle by 2016 is even stronger. By maintaining a non-

aging primary surplus of 3 percent of GDP from 2017 onward, the debt ratio would only increase to about 178 percent of GDP by 2060. A combination of an early adjustment to the MTO and the full implementation of the pension reform would thus ensure maintaining the debt ratio consistently below the 60 percent threshold throughout the projection period.



Sources: IGAE; European Commission Ageing Report 2009; and IMF staff estimates.

Lower productivity scenario

15. **While the combination of early fiscal consolidation and the implementation of pension reform especially with the sustainability factor is critical to ensuring fiscal sustainability, this may still not be sufficient**. The *2009 Ageing Report* assumes constant labor productivity growth of 1.7 percent over the projection period, which is substantially higher than the average growth of 0.5 percent recorded in Spain during 1995-2007. Between 2011 and 2016, staff projects labor productivity to rise to only 0.8 percent.

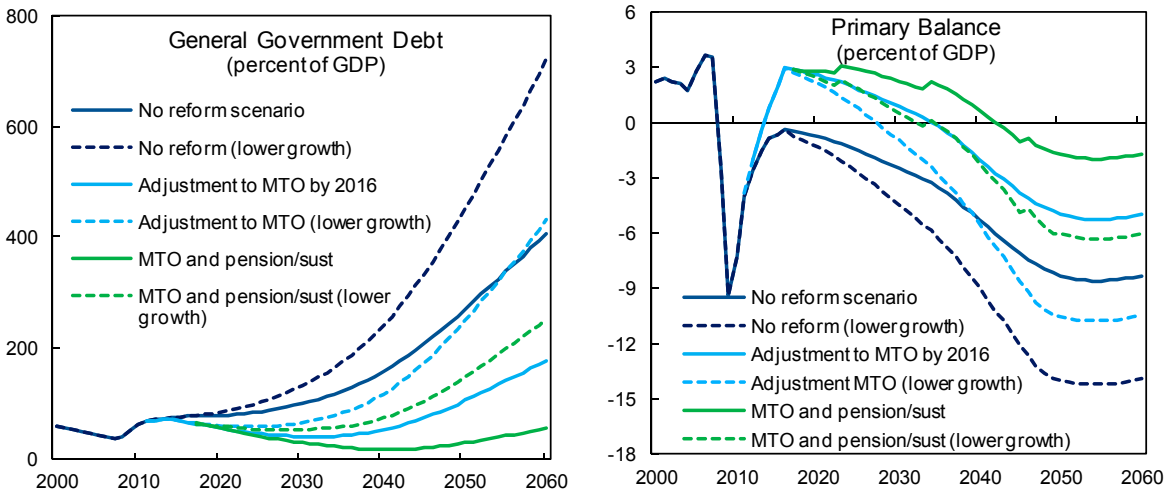
Key Macroeconomic Assumptions
(percent)

	Average 1995-07	Average 2008-10	Average 2011-16	Average 2017-60	2060
Labor productivity growth	0.3	2.4	0.9	1.9	1.7
Employment growth	3.2	-3.2	0.7	-0.3	-0.1
Real GDP growth	3.7	-1.0	1.6	1.7	1.6

Sources: 2009 Ageing Report; Eurostat; and IMF staff projections.

16. **Higher productivity is a critical ingredient for fiscal sustainability.** Assuming productivity growth of 1 percent after 2016 (instead of the 1.7 percent in the *2009 Ageing Report*) suggests that even by achieving the MTO by 2016 and including the pension reform with the sustainability factor, the debt ratio could reach 250 percent of GDP, only somewhat

lower than the projected level under the baseline with pension reform. The simple illustrative simulation suggests securing higher potential growth is essential for fiscal sustainability.[2]



Sources: IGAE; European Commission Ageing Report 2009; and IMF staff estimates.

17. **To boost potential growth over the medium-term, Spain needs comprehensive structural reform**. The pension reform would have a positive impact on the economy. Raising the retirement age would increase participation in the labor force and slow the increase in the pension system dependency ratio. In addition, reforms to promote greater competition especially in the labor market would help the Spanish economy to unlock growth potential by increasing employment and income levels.

18. **To quantify the macroeconomic effects of the recent pension reform and potential payoff from labor market reforms, a six-region version of the IMF's Global Integrated Monetary and Fiscal model (GIMF) is used**.[3] GIMF is a dynamic stochastic general equilibrium model with overlapping generations, well suited for conducting medium- to long-term policy analysis, as it incorporates rich layers of intra-regional trade, production, and demand that allow the transmission mechanism to be fully articulated.[4]

[2] Assuming wages are linked to productivity, lower productivity reduces both wages and future pensions but given that the current pensions are linked to past productivity, the impact of lower productivity would be only neutral in the long run.

[3] Six regions are Spain, Italy, Portugal, rest of the Euro area, United States, and the rest of the world.

[4] Fiscal policy aims at stabilizing the government debt-to-GDP ratio over the long term by adjusting expenditure or taxes. Public investment is productive, enhancing private sector productivity. Governments levy lump-sum taxes, a consumption tax, a labor income tax, and a capital income tax. In addition, the model incorporates a wide range of rigidities in labor and product markets, reflecting, in part, barriers to competition. Monopolistic competition in labor and goods markets implies that wages and prices are higher than they would be under a more competitive environment; wages can contain a markup over the marginal rate of substitution between

(continued)

19. **The simulations suggest that a gradual increase in the retirement age in the proposed pension reform can have an important positive effect on output especially in the long run** (Figure 1).[5] The increase in the retirement age boosts labor supply and labor income. Higher earning incomes over a longer working period reduce households' saving while increasing consumption. In addition, increased fiscal saving (lower public debt) through lower pension expenditures would lower the cost of capital and boost investment. The simulations suggest that the proposed reform would increase output by about 10 percentage points, but over a long-term horizon.

20. **While the impact of specific reforms is difficult to simulate because it depends critically on the design and implementation of the reform, and existing initial conditions, by varying the wage markups, the model can illustrate the macroeconomic implications of labor market reform**. Using the OECD indicators of employment regulation and available estimates of markups in the literature[6], the wage markup in Spain is set equal to 30 percent over the marginal cost, significantly larger than the average for the euro area. The simulations suggest that a reduction of the wage markup in Spain by 6 percentage points to the same level as the euro area average would increase output by about 2–3 percent in the medium-term, through higher with higher employment (hours worked) and a higher capital stock.

Wage Markups

Spain	1.30
Italy	1.24
Portugal	1.28
Euro area	1.24
United States	1.16
Rest of the World	1.20

Source: IMF staff estimates.

21. **There are substantial uncertainties surrounding the impact of aging on public finances.** Healthcare costs are projected to increase only by 1.7 percent of GDP by 2060 merely on demographic factors. Recent literature suggests, however, that demographic changes may not be the key driver of future health care expenditure. Taking account of the potential impact of demand and if medical costs continue to rise significantly more rapidly than overall inflation, health spending would be substantially higher than assumed in the scenarios, requiring further adjustments to ensure sustainability of public finances.

D. Policy Implications

- **In the long term, Spain's public finances face significant challenges arising from age-related spending, reflecting unfavorable demographic trends and weak growth prospects.** The draft pension reform, if fully implemented especially with the

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consumption and leisure; and prices can contain a markup over the marginal cost of production. For a complete description of the model, see Kumhof et al. (2010).

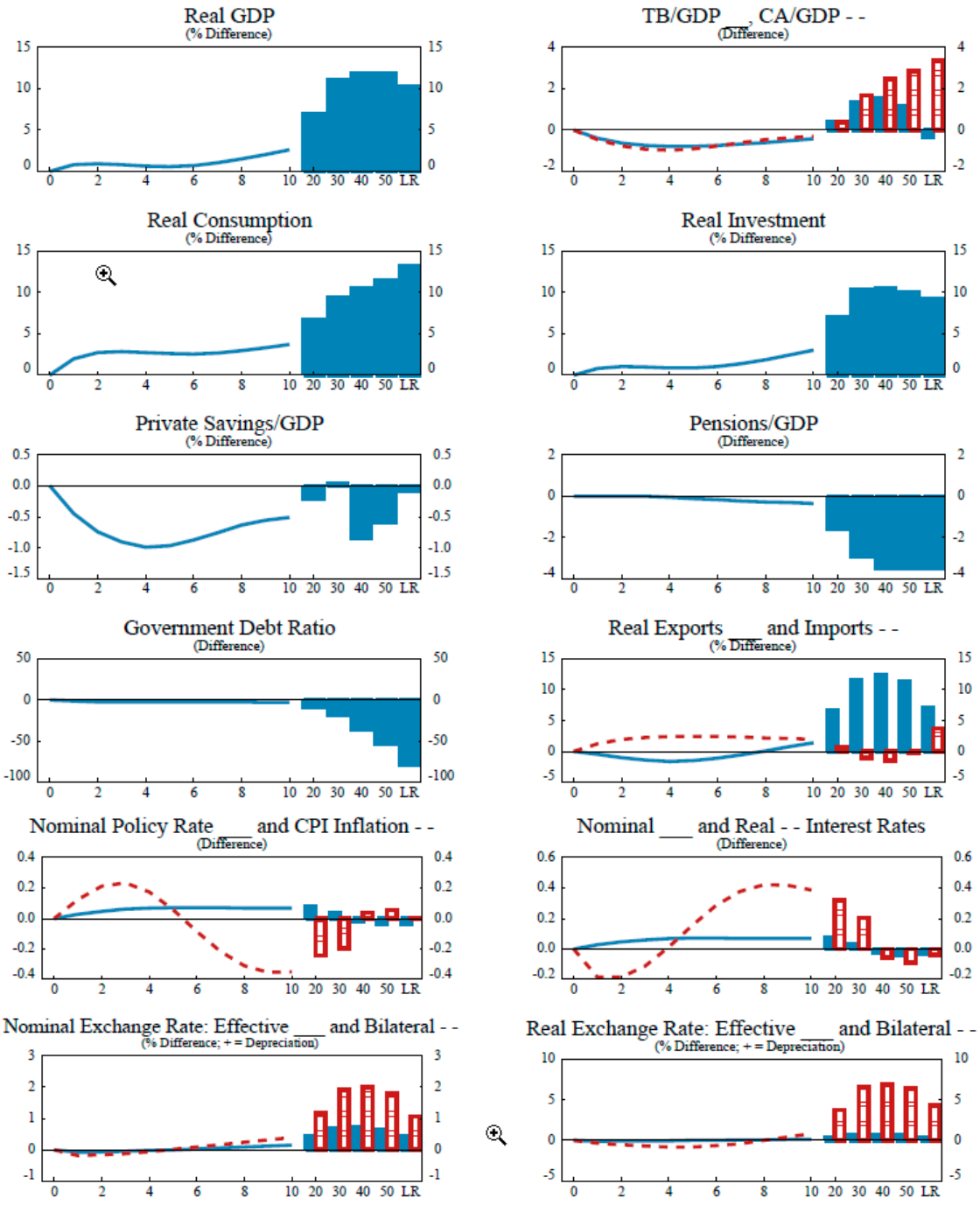
[5] An increase in retirement age in GIMF is introduced by modifying two parameters, agents' income profile over their average working life, and the population size. For more detail, see Karam et al. (2010).

[6] For example see Bayoumi et al. (2004).

sustainability factor, would significantly improve sustainability, but would not be enough by itself. Achieving the 2.1 percent budget deficit target by 2014 helps but without the pension reform or other reforms combined does not ensure sustainability. But the full pension reform combined with achieving the MTO by 2016 would keep the debt ratio below 60 percent of GDP by 2060.

- **However, this assumes labor productivity increases substantially in the longer run.** If it does not, the debt ratio could again grow unsustainably. Securing higher potential growth is thus essential for fiscal sustainability. Undertaking substantial structural reform could indeed deliver the needed increase in economic growth.

Figure 1. Increase in the Retirement Age in Spain
(Percentage deviation from the baseline)



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III. Priority Measures to Strengthen Spain's Fiscal Framework[1]

Spain's fiscal framework could be strengthened to underpin the credibility, quality and durability of the planned fiscal consolidation. Spain's fiscal framework has both strengths and weaknesses compared to its peers, with some of the latter centering on sub-national governments. Priority reforms include: strengthening the credibility of subnational budget implementation, enhancing the transparency of subnational finances; enacting a public sector-wide review of major spending programs; moving to a fully-fledged medium-term budget; establishing an independent fiscal council; and increasing disclosure of risks.

A. Background and Challenges

1. **In the decades leading up to the global financial crisis, the fiscal framework in Spain appeared broadly adequate**. This evolving framework delivered the necessary deficit reduction of the mid 1990s to meet the Maastricht criteria for EMU, as well as a declining debt to GDP ratio that reached 36 percent in 2006, from 60 percent in 1996. These results were attained partly thanks to favorable economic conditions, including eleven consecutive years (1997–2008) of strong real GDP growth averaging 3½ percent. Combined with booming real estate, this allowed both fast real expenditure growth (averaging 4.1 percent annually in this period) and moderate fiscal deficits.[2] This boom period coincided with a substantial decentralization where the provision of core public services, such as health and education, were transferred to sub-national governments (Figure 1).[3] Revenue sharing arrangements intended to support these acyclical public services returned cyclical revenue overperformance to the subnational governments annually during the boom years.

2. **But the global financial crisis and the ensuing consolidation need have strained the framework.** The recession and the resulting large stimulus package led to a general government deficit of 11.1 percent of GDP in 2009. Borrowing by the subnational governments, particularly in recent years, has made Spain one of the six largest issuers of subnational debt in the world (Figure 2). While subsovereign debt is not formally guaranteed by the central government, subsovereign ratings are highly correlated with the sovereign,

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[1] Prepared by Rafael Romeu. Thanks to James Daniel for guidance, David Vegara for helpful discussions, and Pablo Arellano, Julio Escolano, Almudena Fernández, Rocío Frutos, Luis Gordo, Borja Gracia, Pablo Hernández de Cos, Jason Harris, Keiko Honjo, Richard Hughes, Jaime Iglesias Quintana, Paulo Mauro, Javier Perez and Javier Sansa for very helpful comments.

[2] Bank of Spain (2011) details the impact of cyclical factors on that period's fiscal deficits in Spain.

[3] Extending the fiscal decentralization literature such as Brennan and Buchanan (1980) and Oates (1985) and the subsequent work is beyond the scope of this study, which in addition, is agnostic on fiscal decentralization itself, e.g. whether it helps/hurts consolidation efforts, as in Schaltegger and Feld (2009). Nonetheless, the conclusions presented are consistent with Rodden and Wibbels (2010), which find international evidence that sub-national governments face procyclical or acyclical revenue sharing/transfers.

both in Spain and elsewhere (Figure 3).[4] The revenue sharing mechanism, which granted excess revenue allotments to sub-national governments in recent years based on growth projections that failed to materialize, must now be repaid. The government has embarked on a large-scale adjustment aimed at reaching a deficit of 2.1 percent by 2014 (and indeed remains committed to achieving the Medium-Term Objective of a broadly balanced deficit). The fiscal challenge now exceeds the consolidation made in the 1990s to meet the Maastricht criteria, and the adjustment will likely not benefit from the high growth, exchange rate flexibility, and the greater centralized fiscal control of the 1990s. In particular, much of this adjustment is planned to come from regional governments, though 9 of the 17 missed their deficit targets in 2010 (Figure 4). Not all of the difficulties that have emerged since the crisis are directly related to Spain's fiscal decentralization, however. For example, some of the planned consolidation relies on as yet unidentified measures and the macroeconomic assumptions underlying the fiscal adjustment are optimistic compared to staff's.

B. How Does Spain's Fiscal Framework Compare?

3. **While much of Spain's fiscal framework is strong relative to peers, there are also some areas for improvement.** The international evidence suggests that compliance with a well-designed rules-based fiscal framework can help in building policy credibility, lower sovereign spreads and ultimately boost economic growth while reducing volatility. Comparative studies on Spain's public financial management have found a number of considerable strengths relative to European and other peers while also finding some weaknesses, many of which center on sub-national governments.[5]

4. **Spain's fiscal framework has some considerable relative strength.** Most prominently, a strong top-down orientation to expenditure, comprehensive below-the-line surveillance of liabilities, comprehensive accounting of tax expenditures and program budgeting at the central government level:

- The budget process is initiated with an aggregate expenditure level, which then imposes limits on the individual expenditure items of the general government.

[4] Spanish sub-sovereigns whose ratings exceed its sovereign rating are the common regimes of the Basque Country and Navarre, which under the foral regime, have stronger fiscal autonomy than the other autonomous communities.

[5] See Bank of Spain (2011) as well as IMF (2010a), and Kopits (2007) on international evidence supporting the benefits of a strong fiscal framework. Among other studies, the European Commission (2009) finds that Spain has adequate public financial effectiveness in the size and composition of expenditure, but less effectiveness in areas such as research or education investment.

- On reporting of liabilities, the Bank of Spain publishes comprehensive below-the-line coverage through an intricate surveillance system of budgets, bank liabilities, a bond issuance database, and the Net International Investment Position data (Figure 5).

- Spain also prepares a comprehensive annual report on tax expenditures in the central government budget and, through its fiscal statistics office (IGAE), keeps a set of performance budgeting indicators across 26 program categories which track the efficiency and efficacy of expenditure at the central government ministries (though more for management than expenditure rationalization purposes).

5. **Nonetheless, Spain's fiscal framework could also be strengthened in some areas.** These include the lack of a binding medium-term fiscal budget orientation, transparency and robustness of macroeconomic assumptions, fiscal reporting at the sub-national level, enforcing the budget, and documenting and containing sub-national risks.

- The annual budgeting process constrains Spain's crisis response to largely short-term concretely identified measures, while long-term measures are less concretely identified, which to some extent weakens the credibility of the necessary long-term adjustment. There is no binding budget document that spells out a detailed medium-term fiscal adjustment plan.[6] There is no institutionalized and periodic comprehensive review of expenditure effectiveness and efficiency across the whole public sector. General government expenditure rationalization by the central government is hampered by the decentralization of major expenditure mandates. Assessing relative performance across regional governments (CCAA) requires currently unavailable homogenized performance indicators. Comparisons across CCAA are also complicated by idiosyncratic spending profiles and modalities for carrying out public services (Figure 6).[7]

- Timely and comprehensive fiscal reporting by reporting of the sub-national governments could be improved. Central Government budget reporting and budget scenarios are based on national accounting (which includes, among other things, the deficits and debt of dependent public sector enterprises) whereas CCAA accounts are based on budgetary/cash accounting. The central government fiscal reporting is largely consistent with best practice. Ideally, the general government consolidated fiscal balance should be disaggregated in a centralized database showing a detailed

[6] For example, in the UK medium-term budgeting system, ministries are told every three years what budgets they are to receive for the coming three years (other than in respect to a subset of uncertain expenditure covered under the so-called Annually Managed Expenditure), hence there is a legal commitment given to ministries about medium-term funding which is largely lacking from, for example, the annual SGP updates reported by the Spanish government to the European Commission.

[7] E.g., private sector participation in healthcare differs greatly between Cataluña, Madrid and Andalucía.

above-the-line current and historical fiscal outturn on a quarterly or monthly national accounts basis for each autonomous community, social security, and central and local administrations. The timeliness and transparency of contingent liabilities stemming from state-owned enterprises and PPPs at all levels of government could be also be improved.[8]

- While the annual budget preparation is straight-forward, its execution at the sub-national levels of government is subject to risk. CCAA require authorization of debt issuance depending on the compliance of the previous years' mutually agreed (with the CPFF) deficit target, and this authorization is done in three tranches.[9] Regions that miss their targets or do not have their rebalancing plans approved by the Fiscal and Financial Policies Council (CPFF) face progressive restrictions on their debt authorizations. This mechanism did not deliver the sub-national deficit target in 2010 (either individually or in aggregate), and it will likely be tested in 2011.[10]

C. Priority Measures to Strengthen Spain's Fiscal Framework

6. **Improving Spain's fiscal framework could boost the prospects and quality of the planned consolidation.** Within existing constitutional constraints, several steps could be taken immediately to support the fiscal adjustment, including by mandating a higher level of transparency; building on this higher transparency to strengthen the credibility of sub-national budget implementation; enacting a public-sector-wide expenditure review using existing institutions; begin implementing medium-term budgeting; and develop an independent fiscal council (perhaps building on existing institutions).

- **Immediately increase the level of transparency in (subnational) fiscal accounts**.[11] The central government transparency standards are strong, the Bank of Spain's reporting of outstanding liabilities of all levels of government is exemplary, and recent steps to improve the transparency of sub-national accounts are welcome.

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[8] IMF ROSC 2006 details the treatment and fiscal implications of the PPPs in Spain.

[9] The disbursements schedule for 2011 is divided into initial authorization of up to 0.65 percent of regional GDP, followed by an additional 0.40 percent for regions compliant budgetary execution in the first semester and a final 0.25 percent after compliance in the second semester.

[10] In October 2008, the CPFF exonerated all CCAA from the need to submit a re-alignment plan for running a deficit of 0.75 of regional GDP in either 2008 or a budget showing such a deficit in 2009, and allowed an additional 0.25 percent of regional GDP for productive/capital expenditure. Six out of thirteen regions requiring realignment plan approval in 2011 after failing to meet 2010 targets had not gained this approval by May 2011.

[11] In a concurrent study, Bank of Spain (2011) recommends improving subnational reporting at the Autonomous Community level and also recommends further publication of the IGAE data cited here for the main municipalities in Spain.

Nonetheless, reporting individual regional fiscal outturns on a cash and national account basis within thirty days of the end of each quarter should be an immediate goal, and in the short-term, sub-national accounts should be available monthly, with the same coverage as provided by the central government. With prompt quarterly reporting, regional rebalancing plans should be quickly finalized and published (e.g. the first quarter of the following year). This is feasible since Spain's public accounts agency (IGAE) records all non-financial statistics of the public administrations and reports quarterly above-the-line statistics on a national accounts basis for the European Commission. For CCAA and municipalities, IGAE regulates and collects above-the-line information from standardized electronic quarterly questionnaires. These data reflect most of the CCAA fiscal outturn at the quarterly frequency in national accounts basis and should be immediately published.[12]

- **Strengthen the credibility of sub-national budget implementation**. Restricting debt issuance affects sub-national deficits only ex-post – while expenditure may be cut as debt authorization is restricted, this could also result in arrears or potentially in the extreme, default. Either of the latter is costly for the center, the other regions, and the economy as a whole, and hence consideration should be given to increasing ex-ante compliance.[13] First, the CPFF should strictly apply existing policy levers for regions missing their targets, including restricting debt authorizations. For regions that neither meet agreed targets nor agree with the CPFF on a rebalancing plan, short-term financing should also be brought under the control of the central government, as

[12] In Canada, financial statements consolidate all government-controlled budget entities and include a balance sheet with comprehensive coverage of both financial and non-financial assets, which are certified and published within six months of the year-end. The federal statistics office of Germany reports the balances of all the Länder and the Federation and maintains a historical downloadable database of revenues, transfers and expenditures. Brazil publishes a bi-monthly review of its fiscal targets providing information on project performance and explanations cases where targets are not met, objectives modified, and changes made to initial estimates of income and spending. A Budget Execution Report is produced monthly and federal agencies have to submit information on budget execution, procurement contracts, and relevant internal legislation. A thrice-yearly Fiscal Management Report provides a wide range of consolidated data covering debt and credit, social security, and human resource allocations. The Consolidated Fiscal Accounts Report is produced annually in the first half of the year, covering the prior fiscal year and a Fiscal Risks Annex to the budget documents the contingent liabilities of all levels of government, and the government must offer an assessment as to whether or not contingent liabilities will become actual ones. Contingent liabilities arising from the pension system are also disclosed and the budget includes operations of all nonfinancial public institutions, quasi-fiscal operations by SOEs, and federal subsidies to these are detailed as explicit annual budget transfers.

[13] Brazil's fiscal responsibility law, for example, includes stringent ex-ante controls, sets minimum standards for state budgeting, personnel management, and debt management, and ensures that annual sub-national budgets are consistent with its multiyear budget plan and with the federal fiscal and monetary program. It systematizes and reinforces the restrictions on personnel spending, deficits and debt that were in the debt rescheduling agreements and other earlier measures. It also contains specific provisions for authorities in their final year in office. See Webb (2004) and Liu and Waibel (2010).

envisaged. Second, only collective adjustments such as public sector wage cuts or VAT increases are currently available to the central government. Looking ahead, the CPFF should try to develop ex-ante measures that allow targeting of individual CCAAs. Withholding discretionary matching transfers for regions that fail to meet deficit targets and/or cannot agree on a re-alignment plan is a good first step and options for strengthening this mechanism could be considered. The possibility of agreeing standardized "prior actions" between the CPFF and regions (such as wage cuts) to be automatically imposed to deal with slippages could also be explored.[14] Back-up plans for scenarios where regions still fail to control their finances should also be developed.

- **Enact and institutionalize a public-sector-wide review of major expenditure programs using existing institutions.** Past comparative studies across public sector have been done by the working groups that emerged from the "Conference of Presidents," and the *Ministerio de Política Territorial y Administración Pública*, and the *Agencia de Evaluación de Políticas Públicas* also work to varying degrees towards analyzing the effectiveness of public sector expenditure.[15] These institutions should be strengthened and focused on areas such as public sector employment, education, non-health and non-education expenditure. These institutions could not only identify inefficiencies and relatively good performers across regions (Figure 7), but also develop mechanisms to coordinate and monitor the implementation of past recommendations, such as healthcare co-payments. Homogenous indicators of performance budgeting across all 17 CCAA should be produced to regularly evaluate expenditure efficiency with a view to incentivizing poor performers and to influence shared revenue allocation.[16]

- **The annual budgets, the SGP updates, and the regional rebalancing plans, could be developed into a full-fledged rolling medium-term budget framework.** The current updates to the SGP and the three-year regional rebalancing plans are a first important step in building such a framework, which should eventually give a concrete and detailed scenario on how multi-year policy initiatives and targets will be met. This should include multi-year projections for main revenue categories and for expenditures disaggregated on the existing program classification.

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[14] Bank of Spain (2011) also points out the limitations within Spanish legal framework for increasing the automaticity of sanctions related to the fiscal rule, while nevertheless citing the benefits of developing these.

[15] In addition, the Bank of Spain's recently published study (Bank of Spain (2011)) details areas of long-term fiscal risk for Spain, including in healthcare, pensions, and public sector employment.

[16] Italy and India have adopted this short-term strategy by implementing selective expenditure reviews through special agencies/commissions in lieu of regular expenditure reviews within the budget process (best practice) for targeted expenditure categories.

- **An *independent fiscal council* (perhaps building on the CPFF or other institutions) could help in a number of areas**, such as, provide the macroeconomic parameters for the budget and estimating the costs of new policy initiatives and of multiyear programs in budget documents, and generally act as a watchdog over public finances;[17] provide long-term fiscal projections including the mandated quinquennial parametric adjustments that ensure actuarial balance of the public pensions; lend technical assistance to subnational governments (e.g. for annual revenue estimation); help homogenize and compare fiscal performance across regions; and publish research (e.g. on public sector contingent liabilities) to widen understanding of Spain's economy.[18]

- **Increase the quantification of fiscal risks in budget documents**. The Bank of Spain's reporting of all outstanding public sector liabilities means the possibility of unreported liabilities of any significance (including arrears) is remote. Nevertheless, projections of potential future liabilities could be improved, for example, contingent liabilities arising through potential financial sector intervention.[19] The monitoring and timely reporting on the scope and commitments of PPPs and fiscal agencies in CCAA and local governments and the fiscal risks they pose could also be improved.[20]

7. **Over the medium term, existing national fiscal rules could be enhanced and a spending rule adopted.**[21] Regulating the deficit based on growth rates rather than the output

[17] In the United States, for example, both the Office of Management and Budget (OMB) and the nonpartisan Congressional Budget Office (CBO) prepare budget projections for nine years past the upcoming budget year. OMB projections are presented on an unchanged policies basis and a policy-on basis (i.e., assuming the President's policies are adopted). Both OMB and CBO publish updated medium-term projections in the mid-session budget review and both also regularly prepare long-term projections, for 75 years, with a comprehensive range of alternative scenarios.

[18] The functions enumerated here fall within what Bank of Spain (2011) characterizes as advisory council. The recently created the *Oficina Presupuestaria de las Cortes Generales*, may serve as such a technical advisory office, however its role in the advising of the budget process is still not fully developed.

[19] The United States, for example, discusses fiscal risks of major contingent liabilities and quantifies the risk-adjusted subsidy costs of the various programs, and go as far as including the Troubled Assets Relief Program and the balance sheet of the Federal Reserve for federal financial sector interventions.

[20] Additionally, the treatment of PPP as private investments in situations where the private sector bears most of the construction and performance or demand risks do not make clear potential budgetary costs such as shadow toll arrangements, minimum guarantees to the concessionary or subsidized borrowing.

[21] The Budget Stability Law of 2007 establishes deficit targets based on annual growth of real GDP, with growth above 3 percent implying surpluses in all administrations, though no target is specified and capital and certain other investment related expenditures can be deducted, so that a complying deficit is feasible. Growth is between two and three percent implies balanced budgets, and below two percent, the deficit is limited to 0.2 percent of GDP for the central government, 0.25 percent for the CCAA, and 0.05 percent for the local

(continued)

gap may not be optimal, for example, it could lead to situations of procyclicality over the business cycle. A new rule on deficits, if credible and well-designed, may help the consolidation, but is likely to be more useful in cementing the consolidation once it is achieved rather than achieving the consolidation in the first place. The proposed spending rule should help keep spending growth contained during more positive macroeconomic periods, though again it is critical that it be well-designed, for example, by guarding against overly-optimistic assumptions on real growth. Nonetheless, the CPFF should work to gain its acceptance by the regional governments to complement its impending adoption by the central and municipal governments.

D. Conclusions and Policy Implications

8. **Spain's is embarking on a large-scale consolidation. Strengthening the fiscal framework could help achieve this consolidation, and to improve its quality, credibility and durability**. Spain's fiscal framework has both strengths weakness compared to its peers, some of which center on subnational governments. In staff's view, the priority reforms include:

- Strengthen the credibility of subnational budget implementation. Existing tools should be fully used. And measures need to be adopted beyond the threat of withholding debt authorization to ensure that regional public finances stay on the agreed fiscal path.
- Enhancing the transparency of subnational finances. For example, IGAE should immediately publish quarterly accounts on a national accounts basis for each CCAA.
- Enact a public-sector wide spending review of major expenditure programs and public employment levels. This would help expenditure reduction to focus less on across-the-board and more on targeted efficiency gains in the major drivers of expenditure across the country.
- Build on the current updates to the SGP and rebalancing plans to publish along with the annual budget, a medium-term budget spelling out how multi-year targets will be met.

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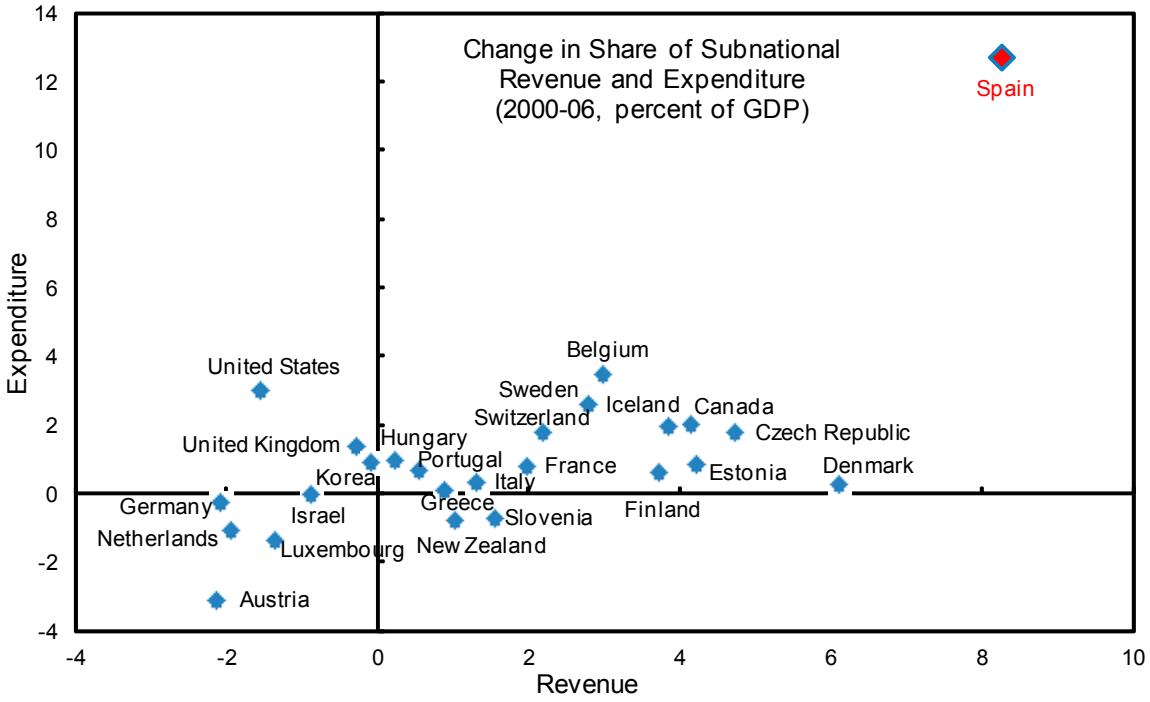
governments, though 0.5 percent of GDP in investment related expenditures do not count here either. Balance targets are defined in the aggregate and individual targets for CCAA are negotiated bilaterally with the central government.

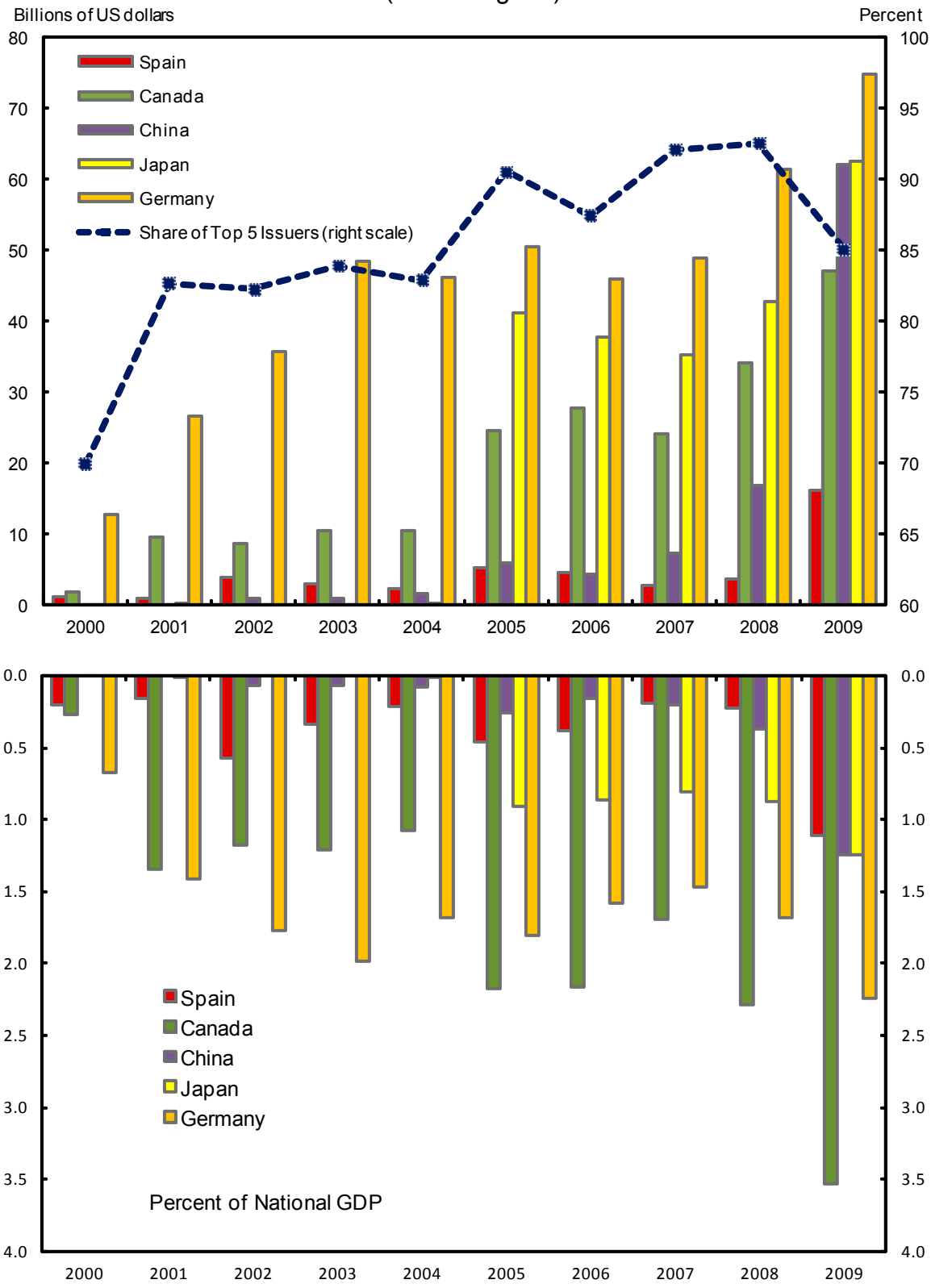
- Increase the quantification of risk in the budget. More timely and detailed reporting of the fiscal commitments made through state owned enterprises, the pension fund, and public private partnerships would be a welcome step.

Figure 1. Fiscal Decentralization from 2000 to 2006



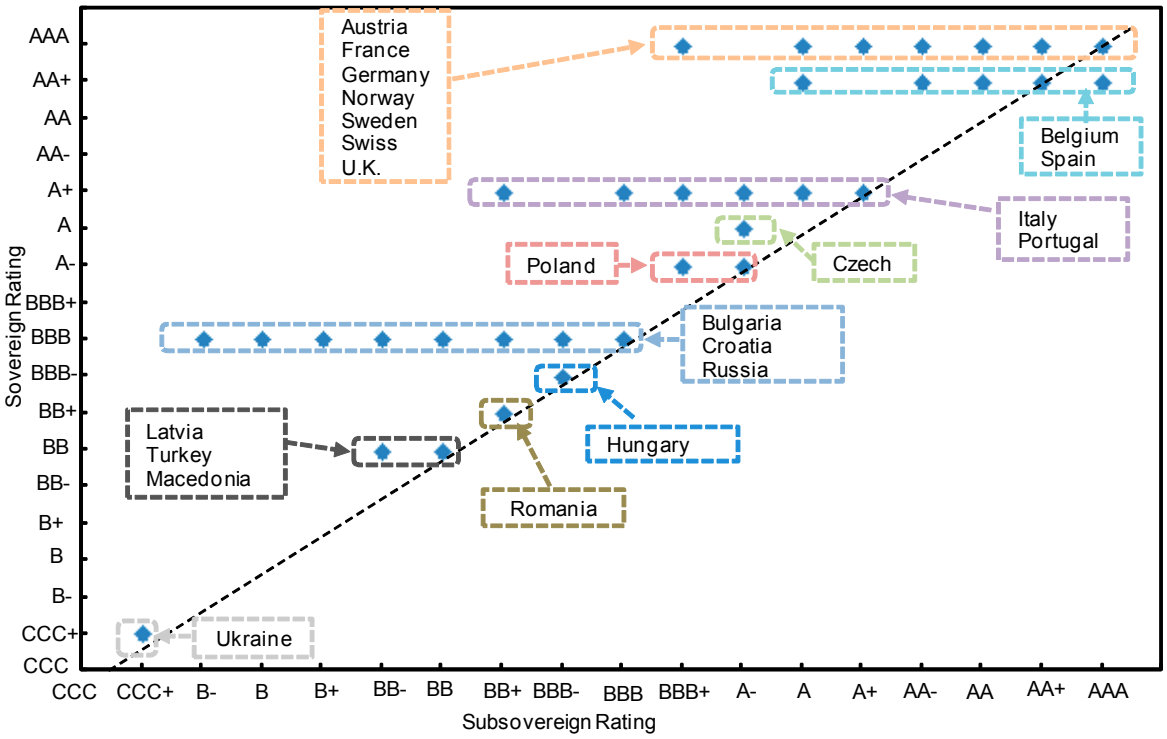
Source: OECD Decentralization Database.

Figure 2. Top 5 Countries in Issuing Subnational Bonds 2000-2010
(Excluding US)



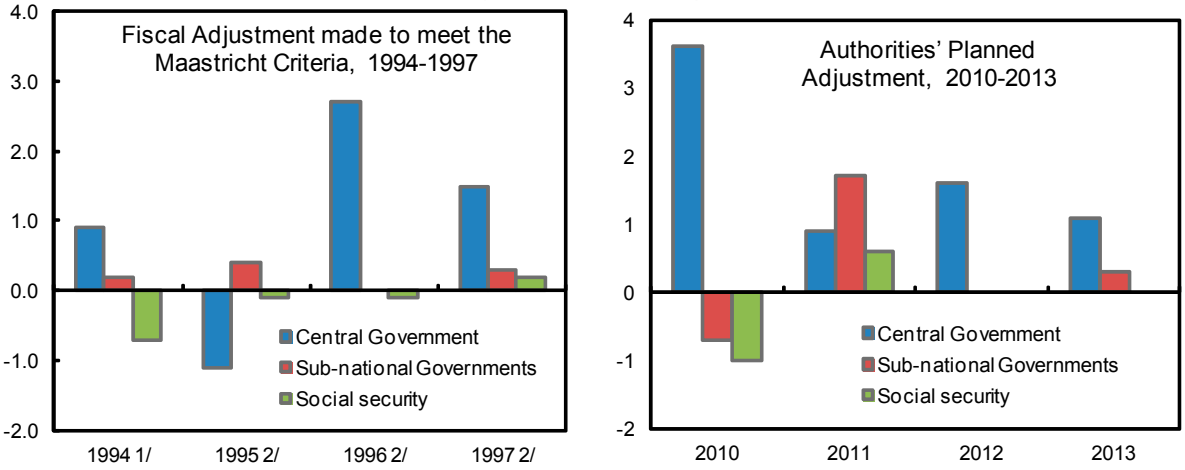
Sources: Canuto and Liu (2010); and DCM Analytics.

Figure 3. Correlation between Sovereign and Subsovereign European Ratings



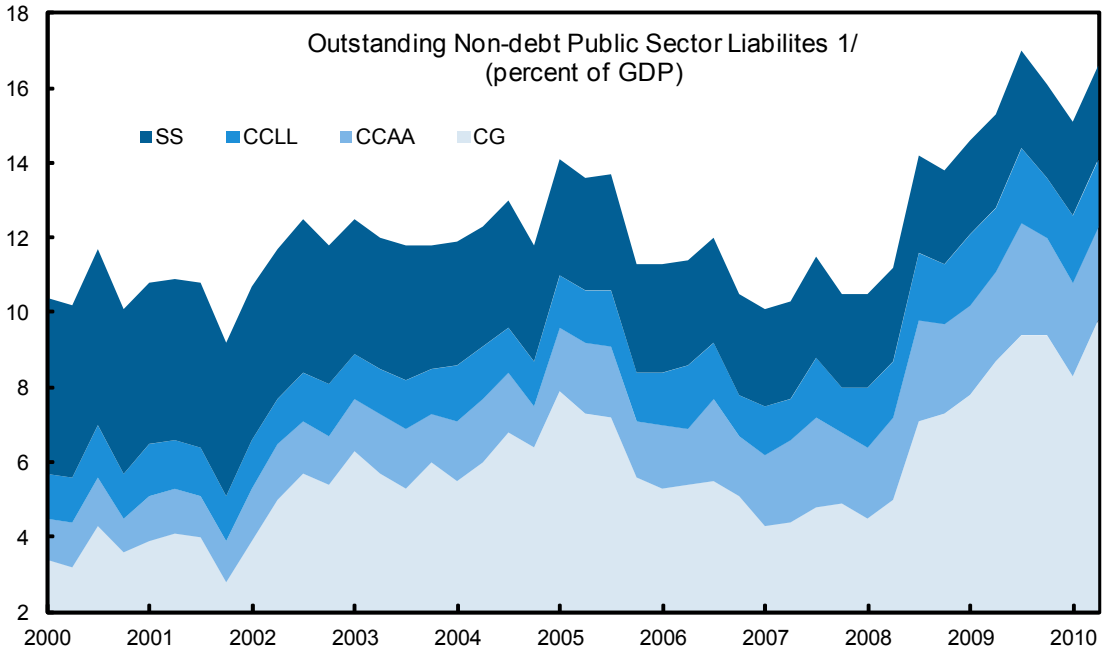
Source: Canuto and Liu (2010). Data from Standard & Poor's - ratings used as of February 23, 2010.
1/ The sample size is 141 subsovereign governments from 22 European countries. One dot could represent multiple subsovereigns because many of them share the same sovereign and subsovereign ratings. The subsovereigns shown with ratings exceeding the sovereign are the Basque Country and Navarre (the red encircled dot below/right of the 45° line).

Figure 4. Spain: Fiscal Adjustment by Level of Government, 2010s and 1990s (Percent of GDP)



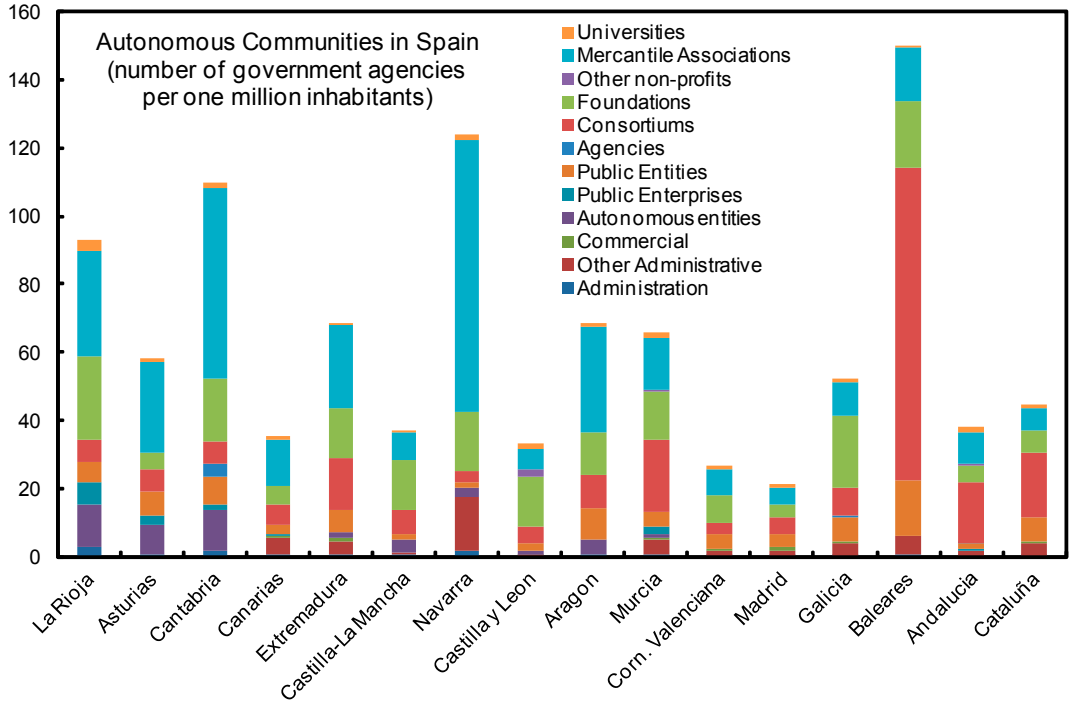
Sources: Spanish authorities; and IMF staff estimates.
1/ Data from SM/98/51 Spain - Staff Report for the 1998 Article IV Consultation.
2/ Data from SM/99/131 Spain - Staff Report for the 1999 Article IV Consultation.

Figure 5. Spain: Public Sector Liabilities Beyond ESA Reported Debt



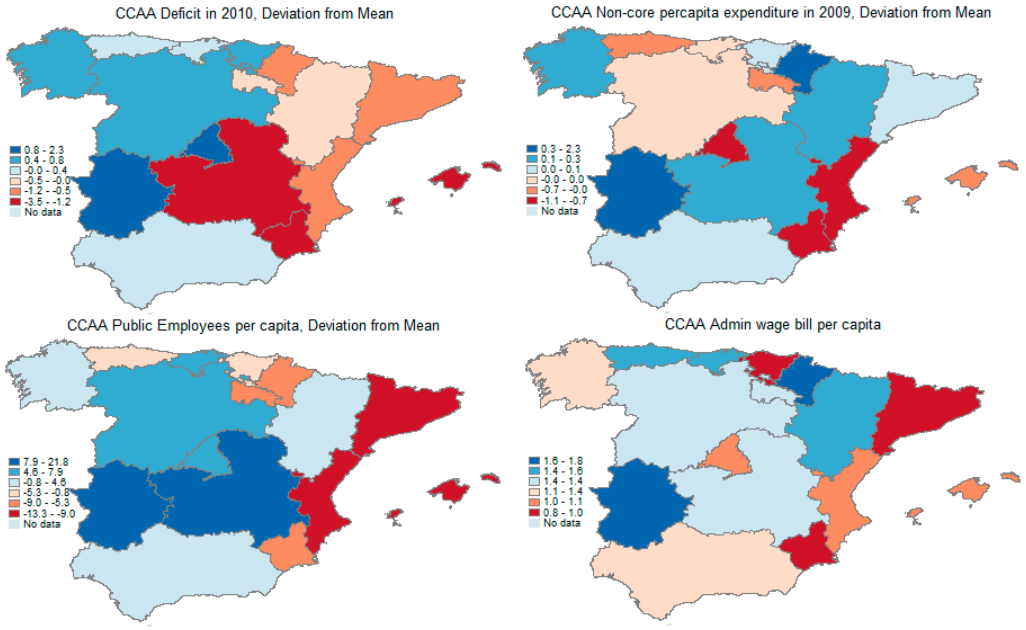
Source: Bank of Spain; and IMF staff estimates.
1/ Outstanding liabilities beyond reported debt are shown by public sector type. These are calculated as the difference between total outstanding liabilities (at market value) and reported debt (at face value) by public sector type for each category of public sector entity. The totals are expressed in percent of total stock of reported public sector debt at face value.

Figure 6. Spain: Agencies of the CCAA Per Capita



Sources: Spanish Authorities; and IMF staff estimates.

Figure 7. Spain: Map of Regional Fiscal Indicators



Source: Spanish Authorities, Fund Staff Estimates.
Notes: The upper left compare the regional deficits in 2010 (in percent of regional GDP, deviation from the mean regional deficit) with regional non-health, non-education per capita expenditure (deviation from the mean, 2009) in the upper right, regional public employees per capita on the lower left (2010 Q1, deviation from the regional mean) and the regional wage bills per capita for administrative employees (2009).

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IV. Will the Savings Bank Mergers Increase Efficiency? A Non-Parametric Analysis[1]

A significant consolidation and restructuring process of the Spanish savings bank sector is underway. Although this process is still ongoing, a non-parametric Data Envelopment Analysis is used to analyze whether the new configuration of the sector can be expected to improve the efficiency of the banking sector as a whole. The study tries to infer the potential impact of the ongoing integration process on bank efficiency based on pre-consolidation bank data. Since the present analysis constitutes only a partial assessment of the current, more complex and far-reaching reorganization of the savings bank sector, the results ought to be considered with caution. They can be considered as a benchmark case that, compared with the future observed efficiency frontier based upon actual data, will inform on the sources of efficiency changes. The results suggest that while the bulk of the mergers can be expected, ex ante, to produce significant efficiency gains, some mergers among small institutions do not seem best configured to deliver significant efficiency gains. This underscores the need, as planned, for substantial restructuring, reorganizing, and downsizing that could also prompt a second round of integration.

A. Introduction

1. **The purpose of this note is to provide an overview of the ongoing consolidation process that has fundamentally reshaped the savings bank sector in Spain**. Through a number of mergers and joint-ventures—the so-called Institutional Protection Schemes (*Sistemas Institucionales de Protección,* SIP) — the number of institutions has been reduced from 45 to 18 and their legal status transformed.[2] This note uses a non-parametric analysis to assess whether the newly created institutions could potentially enhance the efficiency of the Spanish banking sector. Since the present analysis constitutes only a partial assessment of the current, more complex and far-reaching reorganization of the savings bank sector, the results ought to be considered with caution. They can be considered as a benchmark case that, compared with the future observed efficiency frontier based upon actual data, will inform on the sources of efficiency changes.

2. **The note is organized as follows**: section B provides a brief overview of the reform process that is re-shaping the Spanish savings bank sector; section B explains the

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[1] Prepared by A. Giustiniani. I am grateful to Kevin Ross for his comments and technical help. All the flaws and errors remain mine.

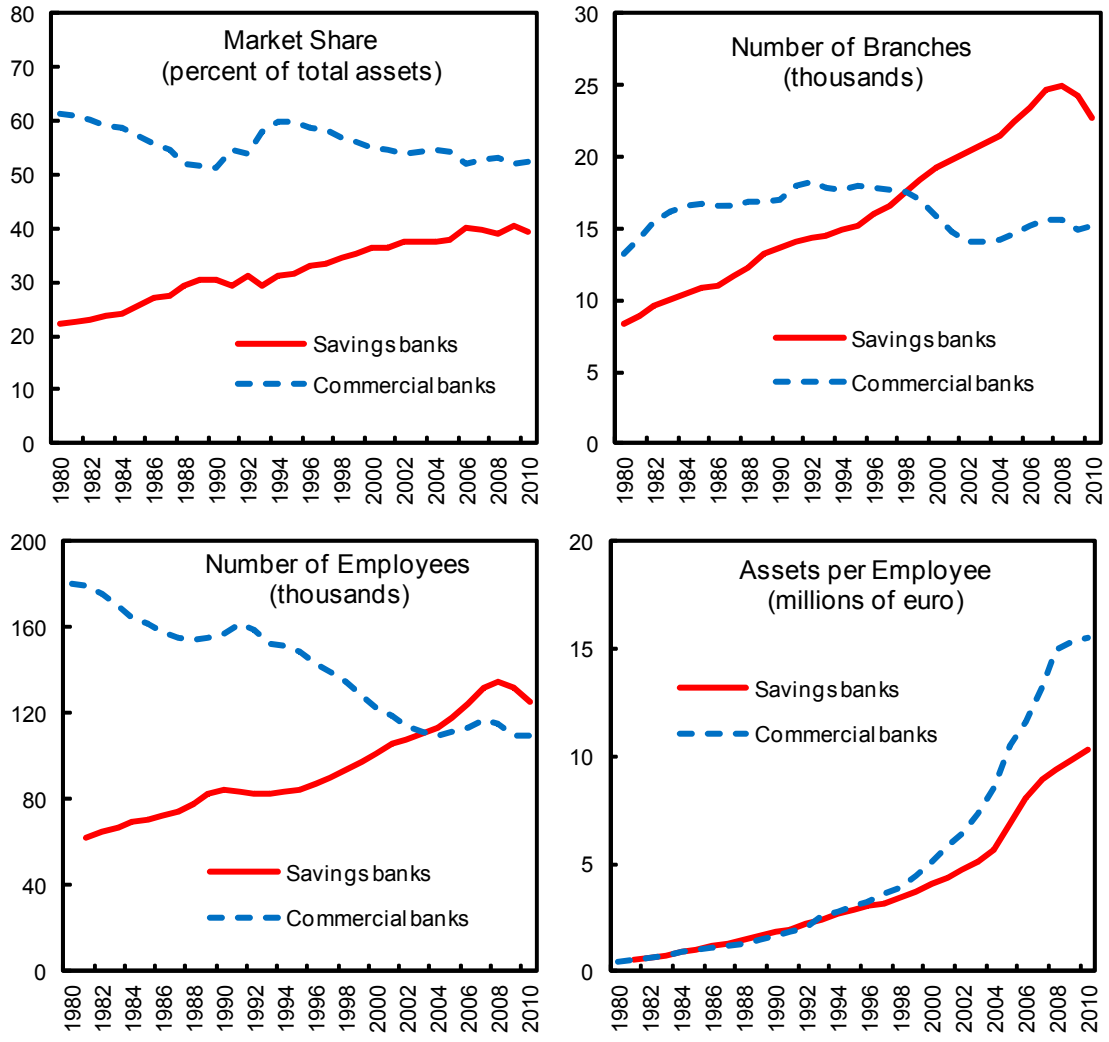
[2] A SIP, also called "cold-merger," is a sort of joint-venture in which participating savings banks pool resources (e.g., capital, liquidity, risk management) with a central entity while maintaining some practical some practical and legal independence. In the note, especially in the empirical section, the term "merger" will be used indistinctively.

methodology used to estimate the potential efficiency gains and the main results of the analysis; section C draws some conclusions.

B. Background

3. **By the end of 1980s, all the institutional barriers, including geographic constraints, limiting the business activities of savings banks were lifted**. Over time, savings banks gradually expanded beyond their "home" regions, broadened their range of activities, built extensive branch networks, and increased their staff, thereby becoming solid competitors of commercial banks (Figure 1).[3]

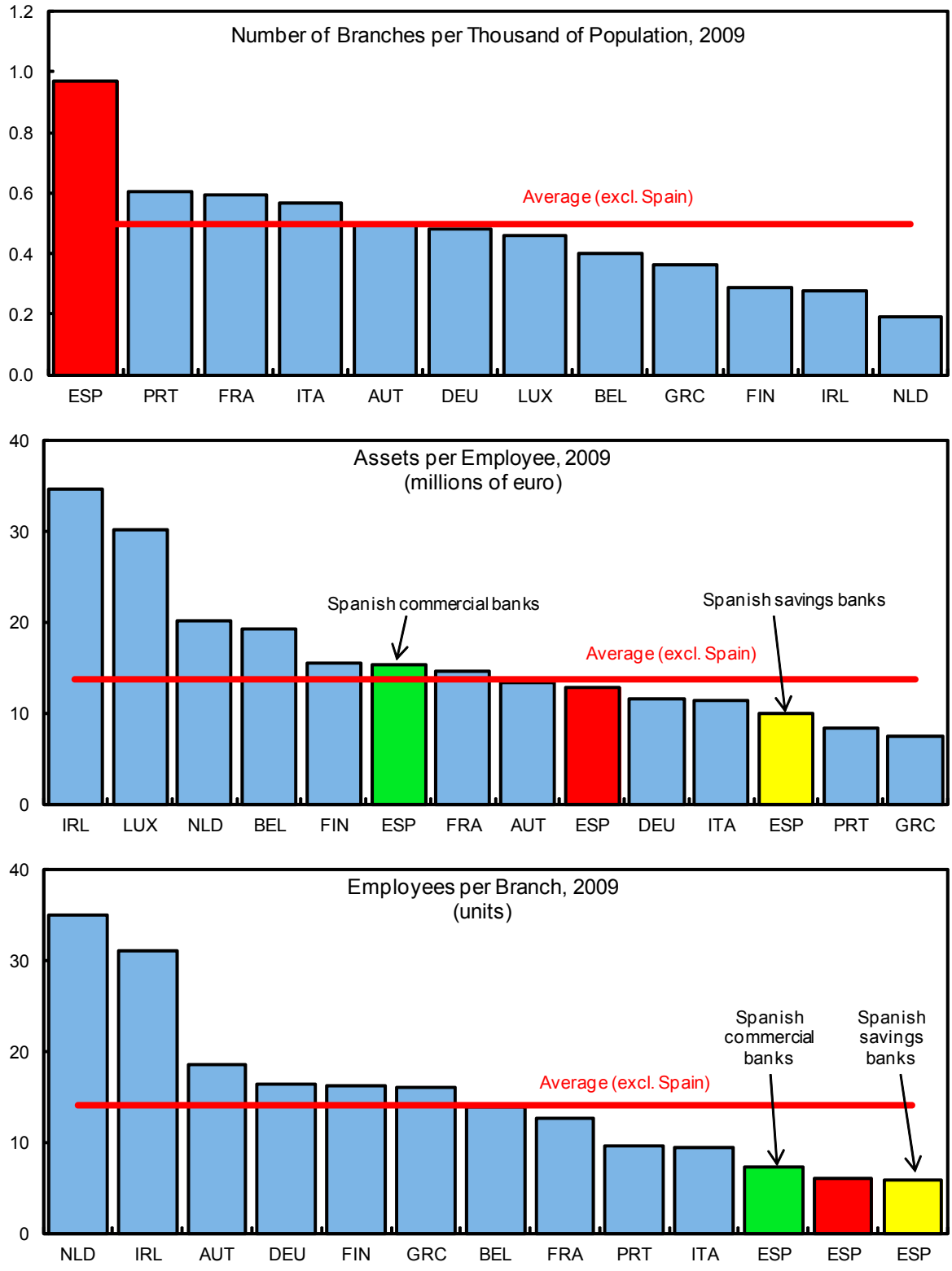
Figure 1. Spain: Commercial and Savings Banks Indicators



Sources: Banco de España; and IMF staff estimates.

[3] International Monetary Fund (2010).

Figure 2. Banking Sector's Selected Structural Indicators



Sources: European Central Bank; Banco de España; and IMF staff estimates.

4. **The other side of the coin has been the build-up of excess capacity in the system**. As of end-2009, there was almost 1 branch every 1,000 inhabitants in Spain, almost twice the density of the euro-area average (Figure 2). The extreme capillary of the branch network is confirmed by the low number of employees per branch compared with other European banking systems. Spanish savings banks, in particular, do not compare favorably in terms of assets-per-employee with euro-area average. Roughly speaking, reaching a dimension broadly in line with the average banking sector in the euro-area would imply the need for Spanish savings banks to reduce their staff by almost 30 percent (more than 37,000 positions) and halve the number of branches. It is worth noting that progress is already being made, with the number of branches down 14 percent since the peak in 2008 and employees down 7 percent for the system as a whole.

5. **With the financial crisis, the business model of the Spanish banks came under pressure, which was particularly acute in the case of savings banks**. On the asset side, banks were hit by the collapsing real estate sector, to which they have been traditionally exposed. On the liability side, wholesale markets, which had become a primary source of funding, dried up. The prospect of more demanding Basel III capital requirements put additional pressure especially on the savings bank sector. Strong headwinds, reflecting the weak operating environment and the increase in non-performing assets, were expected to significantly reduce the internal generation capacity of many savings banks. And savings banks' particular ownership structure severely limited their capacity to tap financial markets to bolster capital levels.[4]

6. **The restructuring of the sector thus became urgent and it occurred relatively rapidly in three phases**.

- The *first phase* started with the creation of the Fund for Orderly Bank Restructuring (*Fondo de Reestructuración Ordenada Bancaria* – FROB) in June 2009. The main purpose of this fund is to assist and foster the reorganization of the Spanish banking industry as well as to provide a rapid and effective solution for ailing institutions. In May and June 2010, the Bank of Spain (BdE) approved seven mergers or acquisitions and five SIPs, some of which requested financial support from the FROB (Table 1).[5]

[4] IMF (2010).

[5] Recently one of the original SIP (Banco Base) broke up. While one of the participating savings banks (Caja del Mediterraneo) is currently seeking a new partnership, the other savings banks decided to form a new SIP (Effibank). Moreover, the three Basque savings banks (Kutxa, BBK, and Vital) are negotiating a possible merger.

Table 1. Spain: Deposit Insurance and FROB Support

New institution	Cajas de Ahorros	Region	Rank 1/	Deposit insurance (millions of euro)	FROB 1 (millions of euro)	FROB 2 (millions of euro)	Starting Core Tier 1 Capital (millions of euro)	FROB 1 + FROB 2 (percent of CT1 = 10%)
BdE intervention								
	Caja Castilla La Mancha *(Integrated in Banco Liberta - owned by Cajastur - in exchange of 25% of its capital)*	Castilla La Mancha	12	€ 1,300 (capital injection) € 2,500 (asset protection) € 350 (bridge financing)				
	Cajasur *(assets and liabilities transferred to savings bank BBK)*	Andalucía	19		€ 392 (asset protection)			
Mergers								
Unicaja	Unicaja	Andalucía	8				€ 2,450	
	Caja de Jaén	Andalucía	43					
España	Caja España	Castilla y León	13		€ 525	€ 463	€ 2,062	39.1
	Caja Duero	Castilla y León	16					
Unnim	Caixa Sabadell	Cataluña	24		€ 380	€ 568	€ 1,150	55.2
	Caixa Terrassa	Cataluña	25					
	Caixa de Manlleu	Cataluña	41					
CatalunyaCaixa	Caixa Catalunya	Cataluña	5		€ 1,250	€ 1,718	€ 3,148	61.0
	Caixa Tarragona	Cataluña	28					
	Caixa Manresa	Cataluña	36					
Caixa	La Caixa	Cataluña	1				€ 16,083	
	Caixa de Girona	Cataluña	33					
NovaCaixaGalicia	Caixa Galicia	Galicia	6		€ 1,162	€ 2,622	€ 2,851	69.1
	Caixanova	Galicia	11					
Institutional protection system								
Banca Cívica	Caja Navarra	Navarra	18		€ 977	€ 847 3/	€ 3,687	40.2
	Caja de Burgos	Castilla y León	26					
	Caja Canarias	Canarias	21					
	Caja Sol	Andalucía	9					
	Caja Guadalajara (merged)	Castilla-La Mancha	42					
Banco Financiero y de Ahorros-Bankia	Caja Madrid	Madrid	2		€ 4,465	€ 5,775 2/	€ 14,125	51.5
	Bancaja	Comunidad Valenciana	3					
	Caixa Laietana	Cataluña	32					
	Caja Insular	Canarias	30					
	Caja de Avilla	Castilla y León	35					
	Caja Segovia	Castilla y León	37					
	Caja Rioja	La Rioja	40					
Mare Nostrum	Caja Murcia	Murcia	15		€ 915	€ 637 3/	€ 3,343	39.0
	Caixa Penedès	Cataluña	14					
	Sa Nostra	Islas Baleares	23					
	Caja Granada	Andalucía	22					
Caja 3	Caja Inmaculada	Aragón	27				€ 1,150	
	Caja Circulo	Castilla y León	38					
	Caja Badajoz	Extremadura	39					
Base	Caja Mediterráneo	Comunidad Valenciana	4		€ 1,493			
	Cajastur	Asturias	20					
	Caja Cantabria	Cantabria	29					
	Caja de Extremadura	Extremadura	34					
→	Caja Mediterráneo	Comunidad Valenciana	9			€ 2,800	€ 3,879	41.9
	Cajastur	Asturias	26					
→ **Effibank**	Caja Cantabria	Cantabria	35			€ 519	€ 2,703	16.1
	Caja de Extremadura	Extremadura	40					
Total				€ 4,150	€ 10,066	€ 15,949		

Sources: Banco de España; Confederación Española de Cajas de Ahorros; and IMF staff estimates.

1/ Based on market share, defined in terms of Spanish credit institutions' total assets (as of end-December 2009).

2/ In case of successful IPO (at least 20 percent of its share capital is floated), the minimum additional amount needed to reach 8 percent core capital would be at least €1,795. Subsequently, BFA-Bankia reconfigured their corporate structure and FROB 1 is only a liability of BFA.

3/ IPO resolution passed; it must place at least 20 percent of its share capital.

And in July 2010, the legal and regulatory framework of savings banks was fundamentally reformed. In particular, the new law gives savings banks a menu of options: (1) to maintain their existing structure but removing a number of legal impediments to the issuance of equity-like instruments (*cuotas participativas*); (2) to operate through a bank; (3) to become part of a SIP; or (4) to change their legal nature and become a foundation and a (potentially minority) shareholder of the bank to which it transfers its business. The corporate governance structures has been also enhanced by: (1) reducing the maximum voting rights for public entities' from 50 percent to 40 percent; (2) prohibiting elected officials to be members of governing bodies; and (3) strengthening reputation and experience criteria for members of the Boards.

- The *second phase* was marked by the Irish crisis (November/December 2010) that brought the Spanish banking sector under the market spotlight again. To signal the commitment to a fully-fledged restructuring, the five SIPs, decided to increase their mutual support to 100 percent of capital and liquidity compared to a legal minimum of 40 percent.

- In the *third phase*, to further strengthen market confidence on the Spanish banking system, in February 2011, the government adopted a series of measures including strengthening the level and quality of minimum capital requirements. In addition to the usual Tier 1 and capital adequacy ratio, a new solvency ratio was added, a "principal capital" ratio, where the definition of "principal capital" is an approximation of common equity Tier 1 under Basel III. The base requirement of 8 percent is raised to 10 percent for those credit institutions (primarily savings banks) that heavily rely upon wholesale funding (more than 20 percent) and have not placed a significant share of their capital (20 percent) with third parties. Reflecting the more demanding capital requirements and the new rules governing the FROB, the SIPs as well as some savings banks decided to spin-off their banking business to newly created commercial banks and started the process of listing these new entities on the stock exchange. [6] [7]

[6] The FROB has been authorized to acquire stakes in banks' share capital for a limited period of time (no longer than 5 years) to strengthen their own funds. The beneficiary institutions have to implement a recapitalization plan, approved by the BdE. In case of a savings bank or an SIP, the lending activity has to be transferred to a bank by the mechanisms stipulated by the law (indirect exercise of financial activity or conversion into a foundation owing a bank).

[7] In spinning-off their banking business, two institutions so far (BFA-Bankia and Caixa) have segregated their impaired real-estate assets in a separate company (either credit institution or other financial entity) together with other profitable assets to compensate for the low income stream of the former group of assets.

C. Assessing the Mergers

7. **Mergers can be a powerful tool to restructure ailing institutions**. They aim at achieving three main objectives:[8]

- Rationalize the "production" (cost-saving);
- Exploit economies of scale and scope;
- Reduce internal inefficiencies (so called "X-inefficiency").

8. **While mergers tend also to be associated with lower competition, reduced credit availability and higher prices, this is less of a concern in the Spanish context given the substantial overcapacity of the sector**.[9] Consolidation is also critical to create more robust financial institutions that can compete in a tougher environment (also from a regulatory point of view). On the other hand, consolidation may exacerbate moral hazard in the system by generating larger and more complex financial institutions, which in turn intensify systemic risk.

9. **The question in the Spanish context is more whether the envisaged mergers can be expected to enhance efficiency**. There are some negative a priori considerations, especially that all savings banks have broadly the same business model; therefore, in principle, opportunities for economies of scope are rather limited. Economies of scale could be still at play, although the objective is to downsize the sector and to rationalize costs.

10. **Although the consolidation process is still ongoing, a simple analysis can be performed to investigate whether the new configuration of the savings bank sector could represent a potential improvement in the efficiency of the sector**. To this end, a non-parametric Data Envelopment Analysis (DEA) is used to determine the efficiency of Spanish savings and commercial banks before the starting of the restructuring process. Then, based on these ex-ante results, savings banks have been "virtually" merged following the actual grouping of institutions to evaluate potential changes in efficiency.

The DEA methodology

11. **DEA is a non-parametric linear programming methodology used to measure best practice technology and relative technical efficiency of decision making units (DMUs), in this case banks, using the same inputs and outputs (see Appendix)**. In this context, DEA can determine the set of banks that make up the technically efficient production frontier and others which lie within interior, inefficient points below the frontier. To identify the efficient frontier, an input- or an output-oriented model can be used: in the former, inputs are minimized while satisfying at least the given output levels; in the latter, output is maximized without requiring more of any of the observed input values. Each DMU

[8] L.Röller, J. Stenneck, and F. Verboven (2000).

[9] Group of Ten (2001); R. Ayadi and G. Pujals (2005).

will be associated with an "efficiency score" that ranges between 0 (inefficient) and 1 (efficient).

12. **The main advantage of DEA is that, unlike typical regression analysis, no a priori model specification is required**. Instead, DEA constructs a non-parametric envelopment frontier over the sample data such that observed points lie on or below the "efficient" production frontier. However, as DEA looks at relative efficiency within a particular sample of DMUs, the results cannot say anything about the absolute efficiency of Spanish banks vis-à-vis other countries' banking sector. It also does not allow for random errors.

Empirical analysis

13. **To model bank behavior, two approaches are usually considered: the production and the intermediation approach**.[10] In the former, banks are regarded as using labor and capital to generate deposits and loans. In the latter, banks are regarded as intermediaries in raising funds (deposits and other funds) and lending those funds in the form of loans or other investment to generate earnings.

14. **This paper follows the intermediation approach to define input and output variables**. Specifically, following Avikran (2006) and Banker, Chang and Lee (2010), inputs are represented by interest expenses and non-interest expenses, while outputs are represented by interest and non-interest income.[11] Since the main objective of the ongoing restructuring process is to reduce operating costs and downsize the sector, the study assumes an input-oriented model.[12]

15. **The sample of credit institutions comprises 43 savings banks (the two institutions that were intervened—CCM in 2009 and Cajasur in 2010—were excluded)—and 7 commercial banks**. Both the input and the output variables were averaged over the 2008–09 period.

16. The results are reported in Table 2 (Figure 3) in which savings banks have been already grouped according to actual mergers and SIPs.[13] The efficiency scores (θ_{CRS}) under

[10] T. Kohers, M. Huang, and N. Kohers (2000); M. Sathye (2001); N. Avkiran (2006); B. Casu, C. Girardone, and P. Molyneux (2004); D. Holod and H. F. Lewis (2011).

[11] Given the context, perhaps the number of branches and employees would have been more direct variables to consider. Unfortunately, those data were not available for all credit institutions in the considered period. Other specifications of the model comprising flow and balance sheet variables have been tested without significant improvements.

[12] The DEA program by Cook and Zhu (2005) has been used in this study.

[13] The analysis does not take into account the recent breakdown of the SIP at the basis of Banco Base as well as the potential merger between Basque savings banks.

Table 2. Spanish Banks: Pre-M&A Efficiency Scores

Inputs	**Outputs**			
Interest expenses	Interest income			
Non-interest expenses	Non-interest income			
DMU	Input-Oriented CRS Efficiency	Returns to scale	Input-Oriented VRS Efficiency	Scale score
Savings banks				
Group 1				
Savings bank 1	0.58086	Increasing	0.58305	0.99625
Savings bank 2	0.57157	Increasing	0.73559	0.77701
Group 2				
Savings bank 3	0.61625	Increasing	0.62033	0.99342
Savings bank 4	0.60032	Increasing	0.60610	0.99046
Group 3				
Savings bank 5	0.73024	Increasing	0.82070	0.88977
Savings bank 6	0.60496	Increasing	0.61431	0.98477
Savings bank 7	0.58528	Increasing	0.59253	0.98777
Group 4				
Savings bank 8	0.58094	Decreasing	0.80847	0.71857
Savings bank 9	0.69896	Increasing	0.73186	0.95504
Savings bank 10	0.77580	Increasing	0.79965	0.97018
Group 5				
Savings bank 11	0.65457	Increasing	0.67964	0.96310
Savings bank 12	0.68343	Decreasing	0.94653	0.72204
Group 6				
Savings bank 13	0.60838	Decreasing	0.74668	0.81478
Savings bank 14	0.63711	Increasing	0.63751	0.99938
Group 7				
Savings bank 15	0.70134	Increasing	0.71562	0.98004
Savings bank 16	0.54339	Increasing	0.54703	0.99334
Savings bank 17	0.52788	Increasing	0.63309	0.83381
Savings bank 18	0.60944	Increasing	0.61551	0.99015
Savings bank 19	0.62174	Increasing	0.63356	0.98135
Group 8				
Savings bank 20	0.69997	Increasing	0.70689	0.99021
Savings bank 21	0.60221	Increasing	0.61700	0.97604
Savings bank 22	0.55906	Decreasing	0.57925	0.96514
Savings bank 23	0.53111	Increasing	0.56013	0.94819

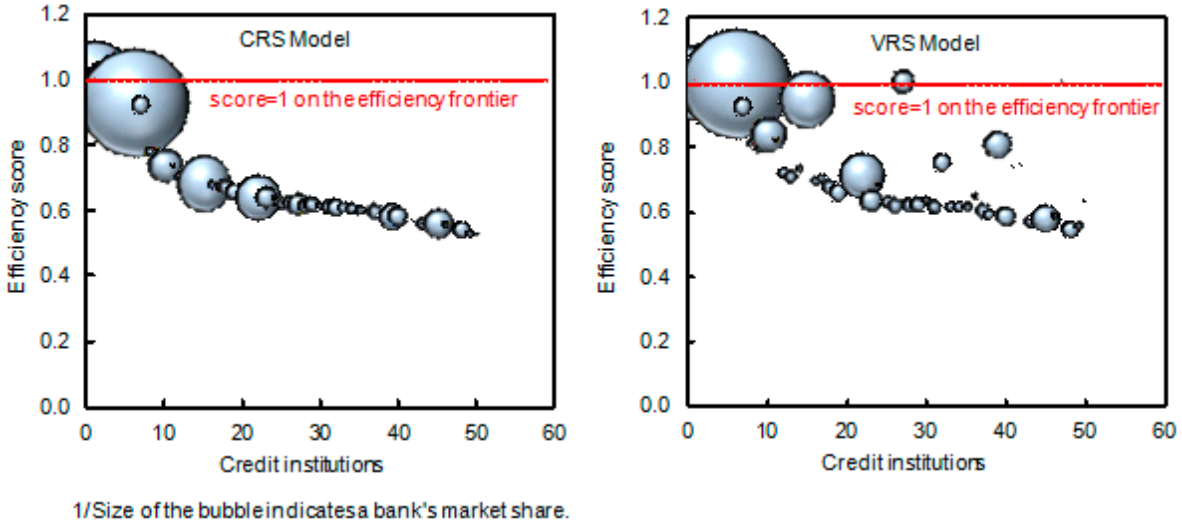
(continued)

Table 2. Spanish Banks: Pre-M&A Efficiency Scores (continued)

DMU	Input-Oriented CRS Efficiency	Returns to scale	Input-Oriented VRS Efficiency	Scale score
Group 9				
Savings bank 24	0.63699	Increasing	0.68523	0.92961
Savings bank 25	0.63799	Decreasing	0.71581	0.89128
Savings bank 26	0.68049	Increasing	0.69493	0.97922
Savings bank 27	0.67688	Increasing	0.70091	0.96572
Savings bank 28	0.64273	Increasing	0.66624	0.96471
Savings bank 29	0.73875	Decreasing	0.83605	0.88361
Savings bank 30	0.61188	Increasing	0.63581	0.96237
Group 10				
Savings bank 31	0.55967	Increasing	0.56855	0.98439
Savings bank 32	0.67196	Increasing	0.67616	0.99380
Savings bank 33	0.56183	Increasing	0.56913	0.98718
Savings bank 34	0.62119	Increasing	0.62266	0.99764
Group 11				
Savings bank 35	0.60206	Increasing	0.65297	0.92204
Savings bank 36	0.55787	Increasing	0.59055	0.94466
Savings bank 37	0.60803	Increasing	0.61744	0.98476
Savings bank 38	0.57086	Increasing	0.74147	0.76990
Savings bank 39	0.55225	Increasing	1.00000	0.55225
Savings bank 40	0.61903	Decreasing	1.00000	0.61903
Savings bank 41	0.65643	Increasing	0.65690	0.99929
Savings bank 42	0.78323	Increasing	0.81237	0.96413
Savings bank 43	0.61843	Increasing	0.62178	0.99461
Commercial banks				
Commercial bank 1	0.93046	Decreasing	1.00000	0.93046
Commercial bank 2	1.00000	Constant	1.00000	1.00000
Commercial bank 3	1.00000	Constant	1.00000	1.00000
Commercial bank 4	0.93810	Decreasing	0.93833	0.99976
Commercial bank 5	1.00000	Constant	1.00000	1.00000
Commercial bank 6	0.92179	Increasing	0.92395	0.99767
Commercial bank 7	1.00000	Constant	1.00000	1.00000
Average total sample	0.67447		0.72916	0.92500
Average savings banks	0.62636		0.68828	0.91003
Average commercial banks	0.97005		0.98033	0.98952

the assumption of constant returns to scale (CRS) are reported in the second column, while the results (θ_{VRS}) of the variable returns-to-scale (VRS) model are listed in the fourth

Figure 3. Spanish Banks: Efficiency Scores 1/



1/Size of the bubble indicates a bank's market share.

column. The CRS results indicate that the efficient frontier is dominated by the commercial banks. There is indeed a significantly large efficiency gap between the two sets of banks: the savings banks' average efficiency score is less than 2/3 of the commercial banks' average. About three-quarters of savings banks (33 out of 43), including one of the largest, mark an efficiency score below the overall sample average. All the largest savings banks, but also two commercial banks, seem to operate under decreasing returns to scale. In the VRS model, savings banks' performance improves marginally: two entities, the size of which in terms of market share is small, are accorded efficient status and the average efficiency score of the savings bank group is about 70 percent the average efficiency score of commercial banks. Nonetheless, 31 savings banks mark a below-sample-average efficiency score.

17. **The CRS score is called the (global) technical efficiency (TE) since it measures efficiency without taking into account scale effects, while the VRS score expresses the (local) pure technical efficiency (PTE) under variable-return-to-scale circumstances**. It is possible to decompose the TE score into two components, one due to scale inefficiency and one due to "pure" technical efficiency. The ratio between the CRS and the VRS score provides a measure of scale efficiency:

(1) $$SE = \frac{\theta_{CRS}}{\theta_{VRS}}$$

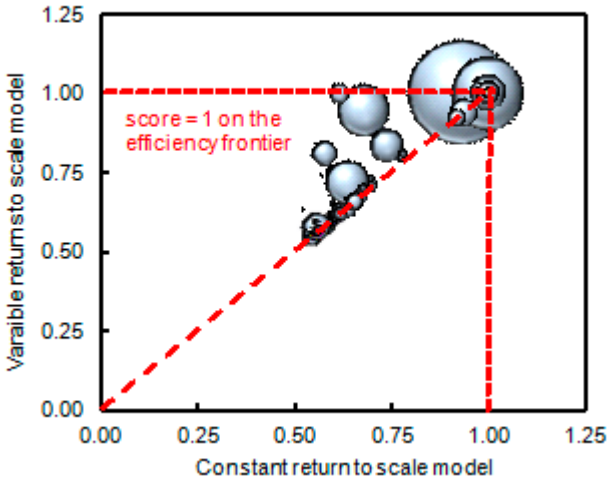
therefore, rearranging the terms:

(2) $$\theta_{CRS} = \theta_{VRS} \times SE$$

That is, the CRS technical efficiency measure is decomposed into "pure" technical efficiency and scale efficiency.

18. **This is graphically represented in Figure 4, where the CRS and VRS efficiency score are reported on the horizontal and vertical axis, respectively; while the size of the bubble represents a bank's market share**. In the sample considered, four commercial banks are estimated to operate at the most productive scale size since they are fully efficient both under the CRS and the VRS model (their respective bubbles lie on the (1,1) corner); another large commercial bank marginally underperforms this group of institutions. Two savings banks are "locally" but not "globally" efficient (full VRS

Figure 4. Spanish Banks: Pre-M&A Efficiency Scores



efficiency but low CRS score) due to their scale inefficiency (while one institution is estimated to operate at decreasing returns to scale, the other one seems characterized by increasing returns to scale). The majority of savings banks lie along (or very close to) a 45 degree ray since they exhibit similar efficiency scores under the CRS and the VRS model. In other terms, their respective scale score is equal (or very close) to 1.[14] Therefore, their low total efficiency (as measured by the CRS model) seems to be caused by inefficient operations rather than scale inefficiency. On the other hand, for a group of savings banks that lie above the 45 degree ray, scale inefficiencies contribute to explain their relatively low total efficiency score. This group comprises almost all the largest savings banks, whose scale inefficiency is due to decreasing returns to scale. In the case of the remaining savings banks of the group, which have small market shares, the existence of (unexploited) increasing returns to scale explains their scale inefficiency.

[14] Geometrically, the scale score would be represented by the cotangent of the angle formed by the ray joining the axes origin with the bank-data-point.

19. **As mentioned above, mergers can be a powerful instrument to restructure credit institutions**. The Inefficient Management Hypothesis suggests that inefficiently managed "target" banks provide a potential for wealth gains for "bidder" banks if the consolidated banks are transformed into well-managed banks.[15] Although in the case of the consolidation process of the Spanish savings banks is difficult to "identify" what institution is the target and what institution is the bidder, Table 2 shows that in the grouping it is hard to find an outstanding "leader" in terms of efficiency (though there are clear cases of leadership in terms of size).

20. **The Low Efficiency Hypothesis may fit the Spanish case better**. According to this theory, the merger works as a "wake-up call" for the target bank's management, which could use the merger as an opportunity to implement substantial corporate restructuring and to improve the efficiency of the consolidated bank, even though either or both the target and the bidder bank do not compare favorably with their industry peers.

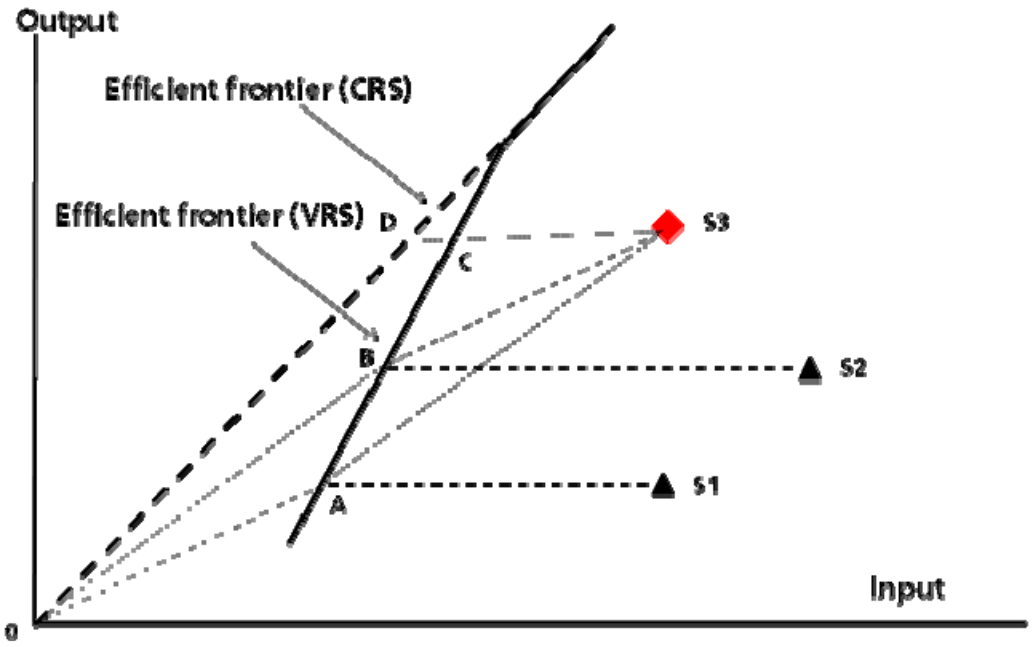
21. **To evaluate whether the new configuration of the Spanish banking sector that emerged by this wave of M&A can potentially help improve efficiency in the system, a test based on "virtual mergers" has been carried out**. Although the grouping of institutions is the actual one, the mergers are "virtual" since are based on pre-merging information. As shown in Table 2, in most case, the merging institutions show a blend of decreasing and increasing returns to scale. The test will allow whether in the new environment overall efficiency would improve, whether scale factors continue to play a role, and whether the new institutions exhibit increasing or decreasing returns to scale.

22. **To this end, the new "virtual" institutions have been constructed based on the assumption that each participating savings bank is locally efficient, that is it lies on the efficient frontier determined by the VRS model**. In other words, the inputs and outputs of the new "virtual" institutions are given by the sum of the inputs and outputs of merging institutions should they lie onto the efficient frontier (the computer program provides the input and output that would correspond to such a situation).[16] This sort of projection of the merging entities onto the efficiency frontier (calculated under the VRS model) would mimic the impact of the ongoing restructuring and reorganization process. To illustrate the process, Figure 5 shows it in the case of single input and single output.

[15] T. Kohers, M. Huang, and N. Kohers (2000).

[16] Cooper, Seiford, and Tone (2007).

Figure 5. Virtual Merger Representation



23. **In this simple example, S1 and S2 are two locally inefficient savings banks since they are positioned within the efficient frontier**. The restructuring process brings them to position onto the efficient frontier (point A and B, respectively). S3 is the new "virtual" institution that is created by the merger of the two savings banks.

24. **In this new "virtual" environment, however, a new efficient frontier would prevail and the DEA exercise is hence run again on the new set of institutions**. The results of this exercise are reported in Table 3 and illustrated in Figure 6.

25. **In this new hypothetical setting, the efficiency frontier remains dominated by commercial banks but almost all the new "virtual" institutions show a sizeable increase in their technical efficiency, as indicated by CRS efficiency scores much closer to 1**. The average CRS efficiency score for savings banks is much closer to the commercial banks' average. However, two groups formed by relatively small savings banks underperform the other mergers in terms of efficiency score while presenting a scale score equal or very close to 1. This result indicates that these two mergers, which involve savings banks from within the same region, may be ex ante expected, ceteris paribus, to continue to perform less efficiently due to their inefficient operations rather than scale inefficiency. Furthermore, a

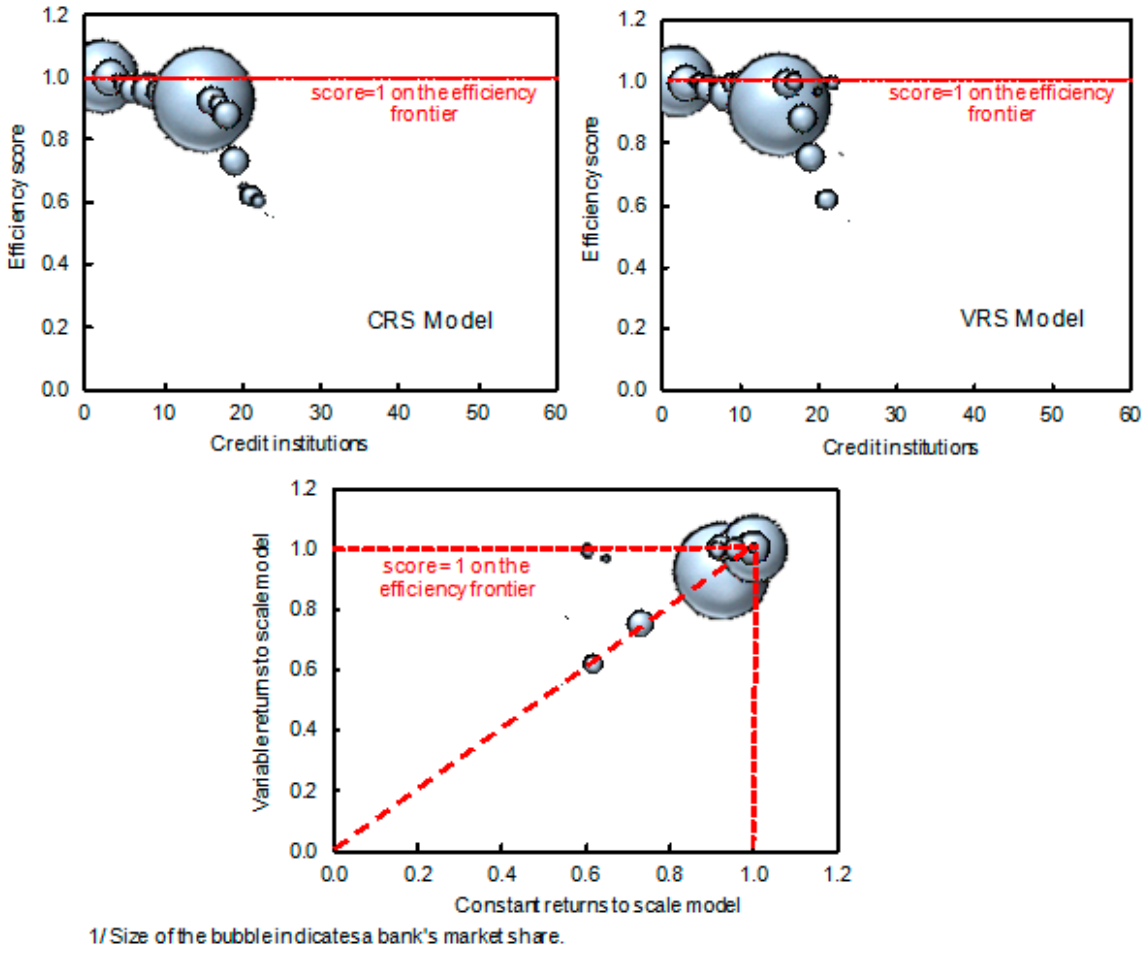
number of the new entities continue to operate at decreasing returns to scale and hence they have the possibility to improve their efficiency by scaling down their activities.[17]

Table 3. Spanish Banks: Post M&A Efficiency Scores

Inputs	**Outputs**			
Interest expenses	Interest income			
Non-interest expenses	Non-interest income			
DMU name	Input-Oriented CRS efficiency	Returns to scale	Input-Oriented VRS efficiency	Scale score
Savings banks				
Group 1	0.97323	Increasing	0.99603	0.97710
Group 2	0.95749	Increasing	0.99757	0.95983
Group 3	0.94764	Increasing	0.99512	0.95229
Group 4	0.73200	Decreasing	0.75617	0.96803
Group 5	0.93024	Decreasing	0.93516	0.99473
Group 6	0.88112	Decreasing	0.88112	1.00000
Group 7	0.95367	Decreasing	0.99693	0.95661
Group 8	0.95980	Decreasing	0.95980	1.00000
Group 9	0.93583	Decreasing	0.93583	1.00000
Group 10	0.96227	Decreasing	0.97562	0.98632
Group 11	0.96165	Increasing	0.99425	0.96721
Savings bank 38	0.55792	Increasing	0.76433	0.72995
Savings bank 39	0.54509	Increasing	0.54509	1.00000
Savings bank 40	0.61903	Decreasing	0.61903	1.00000
Savings bank 41	1.00000	Constant	1.00000	1.00000
Savings bank 42	0.64780	Increasing	0.96980	0.66797
Savings bank 43	0.60334	Increasing	0.99394	0.60702
Commercial banks				
Commercial bank 1	0.92710	Decreasing	0.92710	1.00000
Commercial bank 2	1.00000	Constant	1.00000	1.00000
Commercial bank 3	1.00000	Constant	1.00000	1.00000
Commercial bank 4	0.92400	Increasing	0.99986	0.92413
Commercial bank 5	0.95438	Decreasing	0.99967	0.95469
Commercial bank 6	0.91402	Increasing	0.99745	0.91635
Commercial bank 7	1.00000	Constant	1.00000	1.00000
Average total sample	0.87032		0.92666	0.93920
Average commercial banks	0.95993		0.98915	0.97045
Average savings banks	0.83342		0.90093	0.92507

[17] As for the other results, one savings bank, BBK, is now fully efficient under the CRS and the VRS model; while the other two savings banks from the Basque region (Vital and Kutxa) could improve their efficiency by scaling up their activities. Ibercaja and Pollensa are not locally efficient any longer and this would explain the drop in their technical efficiency, since the scale factor is equal to 1.

Figure 6. Spanish Banks: Post-M&A Efficiency Score 1/



1/ Size of the bubble indicates a bank's market share.

D. Conclusions and Challenges Ahead

26. **This study suggests that before the recent consolidation process, the savings bank sector had accumulated significant inefficiency—both of scale and operation—that the crisis has revealed**. Although the results have to be considered with caution, they suggest that the road to achieving efficiency gains may be challenging as the new groups do not seem to include a "leader" in terms of operational efficiency, though many do have a leader in terms of size. Nevertheless, the merger process could still enhance efficiency by providing a "wake-up call" to improve the management of the merged bank and by reducing the fragmentation of the sector. Modeling the "best case" scenario of the mergers, in which all the banks involved in a merger are (purely) technical efficient, a substantial improvement in overall efficiency can be obtained. However, some of the mergers among small institutions do not seem best configured, ex ante, to deliver substantial efficiency gains. This underscores the importance of achieving these efficiency gains, as planned, through substantial restructuring, reorganizing, and downsizing that could also prompt a second round of integration.

Appendix

The following provides a short description of the DEA methodology.[18] Assume that there are k inputs and m outputs for each of the n banks. For the i-th bank these are represented by the vectors $\mathbf{x_i}$ and $\mathbf{y_i}$, respectively. The k x n input matrix, **X**, and the m x n output matrix, **Y**, represent the data of all n banks. It is also assumed that banks are operating with constant returns to scale (CRS). For each bank, the purpose is to obtain a measure of the ratio of all outputs over all inputs, such as $\mathbf{u'y_i}/\mathbf{v'x_i}$, where **u** is an m x 1 vector of output weights and **v** is k x 1 vector of input weights (superscript ′ indicates transpose).

To select the optimal weights, the following mathematical programming problem has to be solved:

$$\max_{u,\,v} \ \mathbf{u'y_i}/\mathbf{v'x_i} \qquad (3)$$

$$\text{s.t.} \quad \mathbf{u'y_j}/\mathbf{v'x_j} \leq 1 \qquad j = 1, 2, \ldots, n$$

$$\mathbf{u}, \mathbf{v} \geq \mathbf{0}$$

To avoid infinite solutions to the above problem, the constraint $\mathbf{v'x_i} = 1$ is imposed, which leads to:

$$\max_{\mu,\,\nu} \ \boldsymbol{\mu}'\mathbf{y_i} \qquad (4)$$

$$\text{s.t.} \quad \mathbf{v'x_i} = 1$$

$$\boldsymbol{\mu}'\mathbf{y_j} - \mathbf{v'x_j} \leq 0 \qquad j = 1, 2, \ldots, n$$

$$\boldsymbol{\mu}, \mathbf{v} \geq \mathbf{0}$$

where the notation of the weights has changed from u and v to μ and ν, respectively, in order to reflect the transformation.

Using the duality in linear programming, an equivalent envelopment form of the above problem can be derived:

$$\min_{\theta,\,\lambda} \ \theta \qquad (5)$$

$$\text{s.t.} \quad -\mathbf{y_i} + \mathbf{Y}\boldsymbol{\lambda} \geq 0$$

$$\theta\mathbf{x_i} - \mathbf{X}\boldsymbol{\lambda} \geq 0$$

$$\boldsymbol{\lambda} \geq \mathbf{0}$$

[18] Coelli (1996).

Where θ is a scalar and $\boldsymbol{\lambda}$ is a n x 1 vector of constraints. The value of θ is the efficiency score for the i-th bank, which ranges between 0 and 1. Therefore the problem has to be solved n times, one for each bank, in order to have the full picture.

However, the CRS assumption is rather restrictive. A number of factors, including imperfect market competition, may cause a bank to be not operating at optimal scale, i.e. along the flat portion of the long-run average cost curve. To allow variable returns to scale (VRS), it is necessary to add to the problem in equation (4) the convexity constraint:

$$\mathbf{I}'\boldsymbol{\lambda} = 1 \qquad (6)$$

where $\mathbf{I}$ is n x 1 vector of ones.

The difference between the efficiency scores calculated under the VRS and the CRS assumptions provides an indicator of scale inefficiency. In other words, the difference between the two efficiency scores indicates the additional gain in efficiency that could be achieved if banks were operating at the long-run equilibrium CRS.

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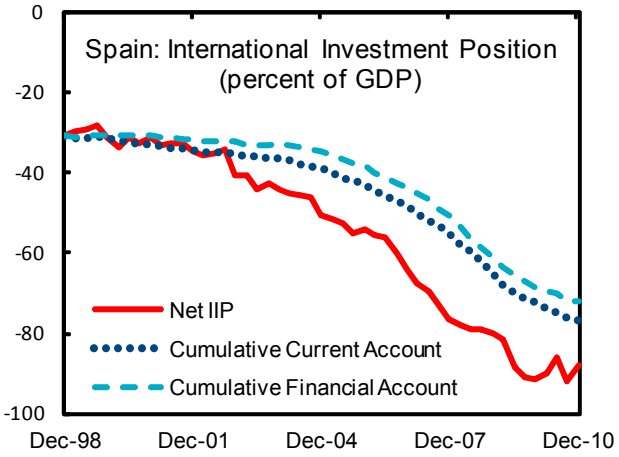
V. Spain's External Sustainability[1]

Spain's balance sheet with the rest of the world is in highly negative territory. Although the current account has improved sharply, the deficit remains significant and the net asset position is only likely to stabilize in the near term. This calls for a more rapid improvement of the current account. Ideally external adjustment can be achieved via greater productivity. But this is likely to require support from other policies to enhance price competitiveness.

A. Introduction

1. **Assessing external sustainability is a key element of Article IV surveillance.** External sustainability analysis contributes to underpin the macroeconomic outlook, as well as to the discussion of risks around the baseline. In that respect, it is both a complement to fiscal sustainability analysis and a source of guidance for policy advice. In the case of an advanced economy like Spain, the need for such an assessment is particularly important due to recent financial account developments and the persistently large, negative, net international investment position (IIP).

2. **Euro membership as enabled the Spanish economy to run a large and persistent current account deficit since 1999.** Since the launch of the monetary union, the availability of external finance has allowed this deficit to swell, reaching 10 percent of GDP in 2007-08. While this deterioration was driven by the trade deficit, the resulting growth in external debt, and deterioration in the IIP, has fed back into a growing income balance deficit (around 3 percent of GDP in 2007-09). Spain's current account has started to adjust, however, as the trade deficit was cut on the back of adjustment in domestic investment and trade contraction in 2009. It has remained contained in 2010 in spite of a higher energy deficit as exports rebounded strongly. While staff projects some further improvement in the medium run, the current account deficit is expected to remain around 4 percent of GDP in 2011–12, with the net IIP stabilizing around 90 percent of GDP. This particularly large negative position makes net income dynamics, and therefore current account projections, especially sensitive to interest rate assumptions.



Sources: Bank of Spain; and IMF staff calculations.

[1] Prepared by Edouard Vidon (SPR)

3. **Why do external imbalances matter in Euro area economies?** It is sometimes argued that current account developments in individual countries are of little importance in a monetary union. To be sure, membership of the euro area entails a high degree of financial integration, as it allows for seamless cross-border financing of the banking sector in particular. However, the economics of external imbalances remain: their importance in the euro area has been highlighted by academics as well as in previous staff work, and has been acknowledged by policy makers.[2] The rationale is threefold:

- *Solvency.* While the monetary union protects its member states from a currency crisis, it does not lift the inter-temporal budget constraint of individual countries: in the absence of intra-euro area fiscal transfers, accumulated liabilities have to be matched by expected future surpluses (or liquidation of assets) at the country level.

- *Liquidity.* As long as solvency is assured, one could expect to always be able to secure funding with a sufficient risk premium. Financing of short-run payment imbalances through financial markets however takes the absence of borrowing constraint for granted. Belonging to a monetary union allows using domestic assets to face external liabilities without currency risk. In particular, Euro area membership allows banks to refinance their domestic assets with the ECB. But it also implies that alternative euro denominated instruments are available to investors, so that financial integration may effectively suffer setbacks.

- *Adjustment.* Within the euro area competitiveness gains are difficult because of sticky prices/wages and limited labor mobility. Adjustment requires a combination of competitive disinflation and convergence driven by productivity growth in the tradable sector.

4. **What is external sustainability?** In the context of the Fund's work on member countries, sustainability has been defined as a situation whereby an entity's (external) liability position "satisfies the present value budget constraint without a major correction in the balance of income and expenditure given the costs of financing it faces in the market"[3] Sustainability is thus a broader concept than solvency: because the cost of financing is a key determinant of the present value budget constraint, sustainability involves both solvency and liquidity aspects.

5. **Assessing a country's sustainability requires a close examination of its international balance sheet position.** Such an exercise is required to form a view of how the IIP, and in particular its outstanding stock of liabilities, is likely to evolve over time. In the aggregate, external sustainability depends on the balance sheets and revenue-expenditure

[2] See in particular Jaumotte and Sodsriwiboon (2010), Giavazzi and Spaventa (2010), Trichet (2011)
[3] International Monetary Fund (2002)

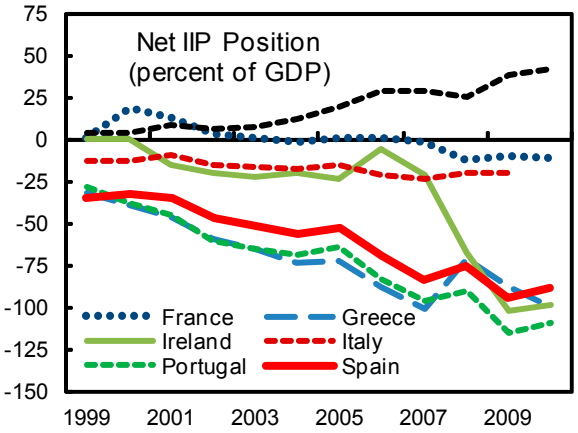
balances of the different sectors of the economy: the general government, the financial sector, non-financial corporations and households. A country can only be found insolvent if at least one sector of the economy is so. Conversely, insolvencies in one sector do not imply overall un-sustainability.

6. **The rest of this paper is organized as follows:** Section B provides some stylized facts on Spain's IIP and external debt. Section C outlines the results of the external DSA. Section D discusses scenarios of current account and IIP adjustment. Section E concludes.

B. Assessing Spain's External Position

Spain's International Investment Position

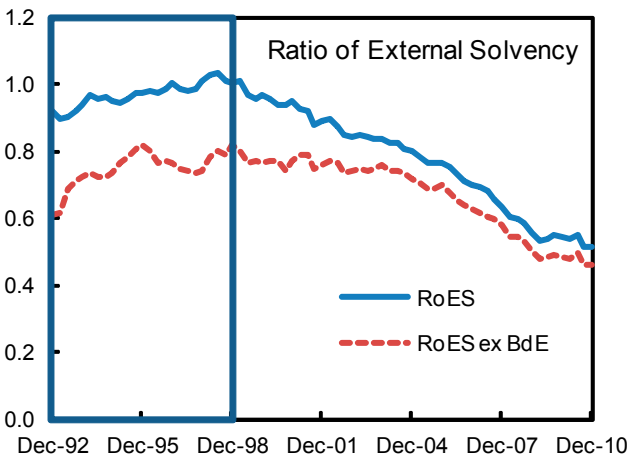
7. **Spain's large net negative IIP is an indicator of potential external vulnerability.** The size of Spain's net IIP reflects the consistent accumulation of large current account deficits over the last decade, as well as valuation effects that have proved unfavorable on average. To the extent that net external liabilities translate into an income balance deficit, they result in a durable drag on the external accounts. In addition, the deterioration of Spain's external position until 2009 has been similar to that of euro area economies that have been hit by severe market turmoil (Greece, Ireland and Portugal). Apart from these countries, Estonia (which joined the euro in 2011) and Finland (a special case driven by valuation effects) are the only other euro area economies that have seen such large negative external positions since 1999. Outside of the euro area, negative IIP of that magnitude are also rare in the recent history of advanced economies (Iceland, and New Zealand). As a summary statistic of past imbalances, the net IIP is an important indicator to monitor for signs of stabilization, as seen in 2010, and possibly rebalancing of the economy.



Sources: IFS; WEO; and IMF staff calculations.

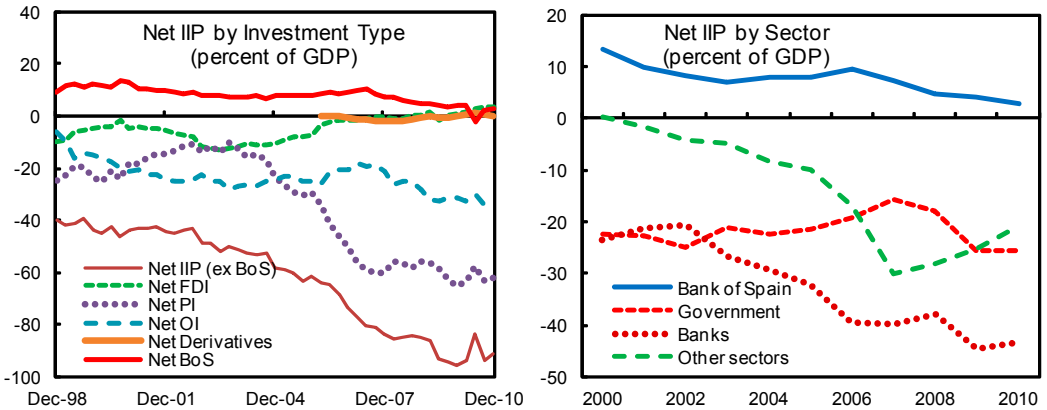
8. **The breakdown of the IIP by instruments and sectors provides more insight into the source of external vulnerabilities.** The nature of Spain's external assets and liabilities (debt or equity, public or private, etc.) sheds light on the sources of vulnerability in the country's balance sheet. While the allocation of external assets shows an increasing bias in favor of FDI, the composition of (increasing) liabilities has remained more stable in terms of the main categories, with a predominance of portfolio investment liabilities. These trends are mechanically reflected in:

- *The deterioration in the ratio of external solvency* (RoES).[4] This ratio - defined as the sum of portfolio and other[5] investments abroad divided by the sum of non-equity portfolio and other investments in Spain provides a metric for the structure of the balance sheet (regardless of its size). The RoES halved from its pre-EMU peak, above and beyond the initial decline in Bank of Spain NFA holdings.



Sources: Bank of Spain; and IMF staff calculations.

- *The net IIP position by type of investment* indicates that the main contribution is coming from the negative net portfolio investment position. The portfolio investment component has however stabilized in recent years while the negative net "other investment" position continued to grow, driven by bank flows. The FDI position has been improving and is broadly balanced.



Source: Bank of Spain.

- *The decomposition of the net IIP by sector* of the economy shows the dominant contribution of banks in channeling to the Spanish economy the increasing call on

[4] The RoES is sometimes defined as the sum of portfolio investment abroad, other investment abroad and the central bank's net foreign assets, divided by the sum of portfolio investment and other investment in the country. The trend decline of that ratio for Spain has been described by Cabrero et al. (2007), as well as Parisi-Capone, Menegatti and Roubini (2010). The ratio presented here is similar, except that equity investment in Spain is taken out of the denominator. It is therefore a proxy measure of (relatively) liquid external assets divided by external debt.

[5] In balance of payment terminology, "other investments" are financial flows that are neither portfolio investments, nor FDI, and consist primarily in bank loans.

foreign savings. In recent years, the public sector contribution to net external borrowing has surged past the non-bank private sector, whose net position is consolidating.

9. **Spain maintains a net asset position in foreign currency.** According to the Bank of Spain, as of June 2010, 42 percent of external assets, but only 17 percent of foreign liabilities, were denominated in foreign currencies. As a result, an appreciation of the euro generates negative valuation effects.

10. **The geographical distribution of the gross IIP is also of interest.** What foreign assets Spain is exposed to, and which countries are Spain's creditors, are relevant questions in assessing external sustainability, as shocks to other economies may be transmitted through negative valuation effects and cross-border deleveraging. IIP data may not give an adequate geographical breakdown, as information is provided on the basis of the first known non-resident counterparty. However, in addition to information provided by the central bank, data on bilateral financial linkages can be gathered from BIS, CPIS and OECD statistics.[6]

- *Bank exposures* (from BIS consolidated banking statistics) are not strictly comparable to IIP other investments, but point to the prevalence of German and French banks claims (respectively a quarter and a fifth of foreign claims at end 2010); other exposures (including derivatives) from U.S. banks are also significant. Conversely, consolidated Spanish banks' claims are focused on Europe (50 percent of total, two-third of which on the U.K.), but are also significant in the U.S., Brazil and Mexico.

- *Portfolio holdings* estimates as of end-2009 show the continued predominance of France (22 percent of total) and Germany (18 percent) in foreign portfolio investment in Spain[7]. Foreign portfolio investment by Spain is somewhat more diversified geographically, although still focused on Europe (with France, Italy, the Benelux and Germany together accounting for close to 50 percent of total).

- *Foreign direct investment* positions in Spain (also assessed at end-2009) are largely held by the Netherlands, Luxemburg, France and the U.K. Spanish FDI holdings abroad, which are concentrated in the financial sector, are significant in particular in the U.K., the Netherlands, the U.S. and Brazil.

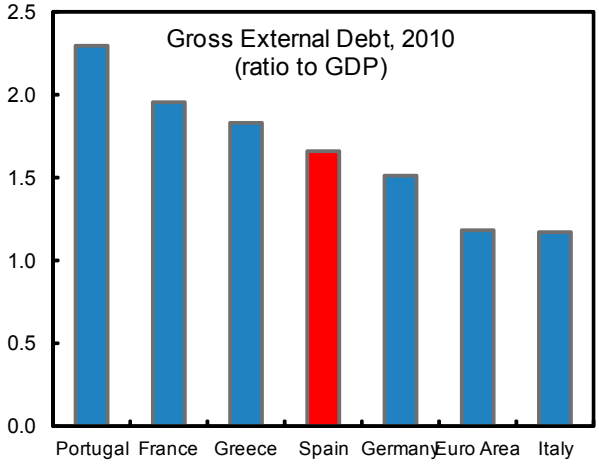
[6] External investment positions among EU countries as of 2008 has been documented in Waysand et al. (2010)

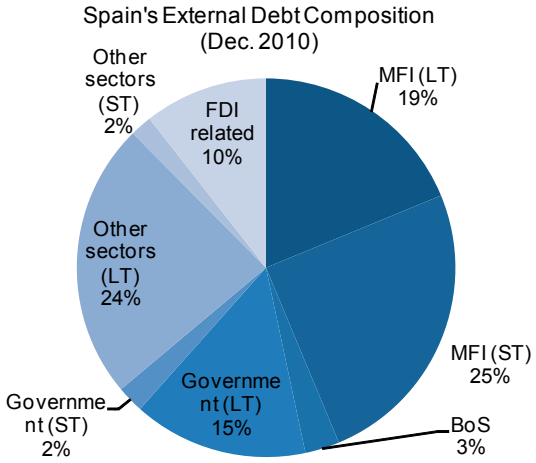
[7] More recent data regarding non-resident holders of Spanish government debt confirms the prevalence of French investors (26 percent as of March 2011)

11. In sum, although Spain's liabilities are primarily held by core European economies, the composition of external assets and liabilities (in terms of sectors and instruments) does not suggest any particular factor to significantly mitigate the assessment of the IIP.

Spain's External Debt in Perspective

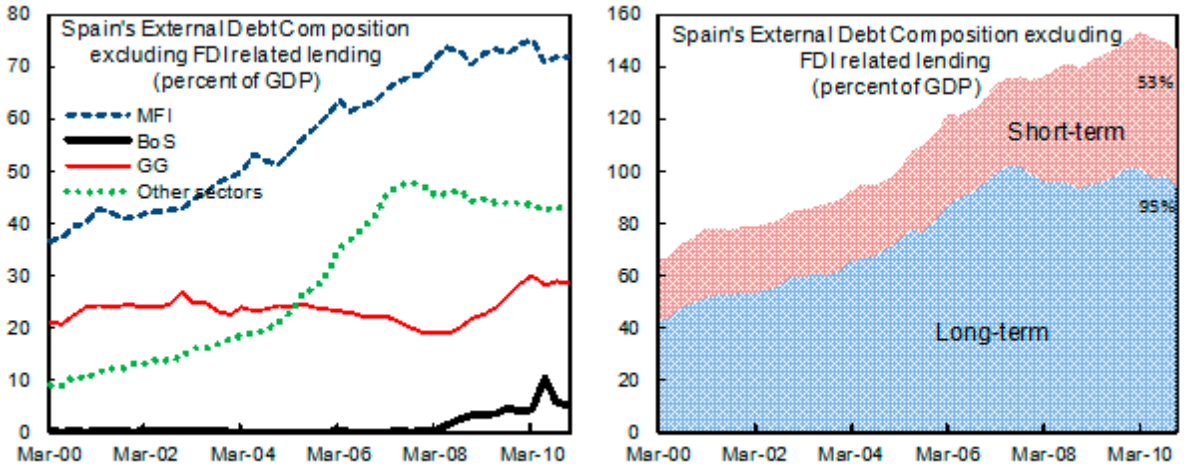
12. **Spain's gross external debt to GDP ratio has doubled since 2002, peaking at 170 percent in the first quarter of 2010**. While Spain's external debt has grown fast, its current level is not out of line with European peers. Relative to GDP, Spain is more externally indebted than Germany or Italy, but less than France, and much less than financial hubs. Banks, until early 2008, and non-bank corporates, until late 2007, have been responsible for the surge in external debt during the boom years. By contrast, public sector external indebtedness has picked up during the crisis years, i.e., 2009 and (in the case of the Bank of Spain) 2010. Total external debt stabilized in 2010, and has even been slightly declining relative to GDP since the first quarter of last year, as some external deleveraging took place.





Sources: Bank of Spain; IFS; and IMF staff estimates.

13. **Banks remain responsible for the largest share of Spain's external debt**, with a greater part of short-term debt. Overall however, long term debt predominates (close to 100 percent of GDP), as both corporate and government external liabilities are primarily long term. The share of public debt and bank debt is lower than in France or Germany, but the share of non-banks corporate (including financial corporations such as SPVs) is higher.



Sources: Bank of Spain; and IMF staff estimates.

C. External Debt Sustainability Analysis

14. **Looking forward, debt sustainability analysis (DSA) provides a standard framework to assess external sustainability**. The standard DSA framework is limited by its medium-term horizon and relatively mechanistic assumptions, but can provide useful insight. In particular, if the (gross) debt to GDP ratio is shown to be on a non-explosive path, the solvency condition is deemed to be automatically satisfied.

15. **Baseline scenario.** The consolidation of external liabilities observed in 2010, and the gradual narrowing in the current account deficit that is projected to continue, both contribute to stabilizing Spain's external debt. In light of these favorable developments, the gross debt to GDP ratio is expected to stabilize, and start to gradually decline by the end of the projection horizon, while related financing needs would remain high (some 70 percent of GDP annually). The automatic debt dynamics is initially unfavorable, against the background of a sluggish growth recovery, and higher nominal interest rates. In outer years however, growth is expected to have reached potential, while the current account ex-interest payment would exhibit an increasing surplus, putting a the ratio of gross external debt to GDP on a downward path as long as foreign asset accumulation does not proceed too fast.

16. **Alternative scenarios for external sustainability.**

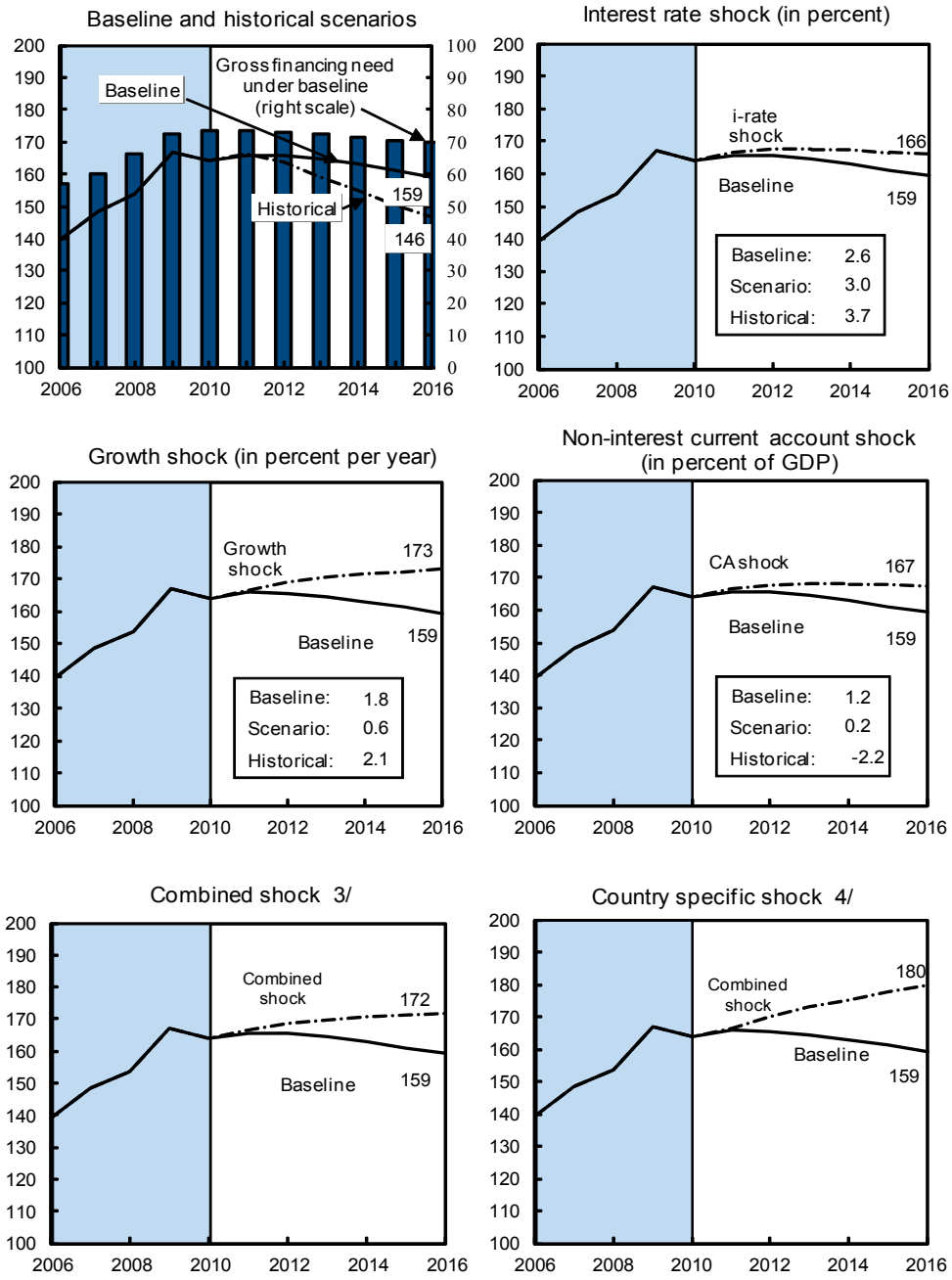
- *Interest rate.* The impact of a permanent ½ standard deviation shock to the effective interest rate for all outstanding external debt — a 40 b.p. increase from a baseline external interest rate of about 2½ percent for 2012–16– would increase debt compared to the baseline by roughly 7 percentage points of GDP by 2016.
- *Growth shock.* A permanent ½ standard deviation shock to the projected real growth rate (1.8 percent on average for 2012–16) —corresponding to a prolonged period of

anemic growth of 0.6 percent on average — would increase debt compared to the baseline by roughly 14 percentage points of GDP by 2016.

- *Combined shock*. A permanent ¼ standard deviation shock applied to the projected interest rate, real growth rate and current account balance would increase debt compared to the baseline by about 13 percentage points of GDP by 2016.
- *Country specific shock*. Given Spain specific circumstances, a tail-risk scenario is also examined, where a permanent one standard deviation shock is applied to the interest rate – 80 b.p. above the baseline-, and a ½ standard deviation shock to the growth rate. In this stress-test, by 2016 external debt would rise significantly compared to the baseline, by about 21 percentage points of GDP.

17. **In sum, while baseline projections suggest external debt stabilization, alternative stress scenarios suggest debt may not stabilize.** Although the general equilibrium effects of combined shocks to interest rates and growth are not modeled (in practice such shocks would likely result in current account adjustment, and possibly external deleveraging), these stress scenarios suggest that external debt stabilization could be hindered by adverse outcomes.

Figure 1. Country: External Debt Sustainability: Bound Tests 1/ 2/
(External debt in percent of GDP)



Sources: International Monetary Fund, Country desk data, and staff estimates.
1/ Shaded areas represent actual data. Individual shocks are permanent one-half standard deviation shocks. Figures in the boxes represent average projections for the respective variables in the baseline and scenario being presented. Ten-year historical average for the variable is also shown.
2/ For historical scenarios, the historical averages are calculated over the ten-year period, and the information is used to project debt dynamics five years ahead.
3/ Permanent 1/4 standard deviation shocks applied to real interest rate, growth rate, and current account balance.
4/ Permanent 1 standard deviation shock applied to real interest rate and 1/2 standard deviation shocks applied to growth rate.

Table 1. Country: External Debt Sustainability Framework, 2006-2016
(percent of GDP, unless otherwise indicated)

	Actual							Projections						
	2006	2007	2008	2009	2010			2011	2012	2013	2014	2015	2016	Debt-stabilizing non-interest current account 5/
Baseline: External debt	139.2	148.4	153.7	166.9	164.1			**165.7**	**165.6**	**164.5**	**162.9**	**161.0**	**159.2**	**-3.3**
Change in external debt	13.3	9.2	5.2	13.2	-2.8			1.6	-0.2	-1.0	-1.6	-1.9	-1.8	
Identified external debt-creating flows (4+8+9)	5.2	1.6	3.1	10.4	4.0			0.9	-0.8	-1.7	-2.2	-2.2	-2.2	
Current account deficit, excluding interest payments	4.8	4.6	3.7	0.7	0.7			0.3	-0.3	-0.9	-1.3	-1.6	-1.8	
Deficit in balance of goods and services	6.2	6.5	5.5	1.6	1.8			1.3	0.6	0.0	-0.5	-0.9	-1.2	
Exports	26.5	27.1	26.7	23.9	26.8			30.1	31.1	32.0	33.1	34.2	35.4	
Imports	32.7	33.6	32.2	25.5	28.6			31.4	31.7	32.0	32.5	33.3	34.2	
Net non-debt creating capital inflows (negative)	6.0	2.1	-0.5	-1.0	-0.2			-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	
Capital account	0.6	0.4	0.5	0.4	0.6			0.6	0.6	0.6	0.6	0.6	0.6	
Net foreign direct investment, equity	-4.7	-3.7	0.1	0.0	-0.1			0.6	0.5	0.4	0.4	0.4	0.4	
Net portfolio investment,equity	-1.9	1.1	-0.1	0.6	-0.3			0.8	0.9	1.0	1.0	1.0	1.0	
Automatic debt dynamics 1/	-5.6	-5.1	-0.1	10.7	3.6			2.7	1.5	1.1	1.1	1.3	1.6	
Contribution from nominal interest rate	4.2	5.4	5.9	4.4	3.8			3.9	4.0	4.1	4.2	4.2	4.3	
Contribution from real GDP growth	-4.6	-4.3	-1.2	6.2	0.3			-1.3	-2.5	-2.9	-3.1	-2.9	-2.7	
Contribution from price and exchange rate changes 2/	-5.1	-6.2	-4.8	0.0	-0.5			-3.8	-2.8	-2.7	-2.8	-3.0	-2.9	
Residual, incl. change in gross foreign assets (2-3)	8.1	7.6	2.1	2.8	-6.8			4.5	3.4	3.3	3.3	3.3	3.3	
External debt-to-exports ratio (in percent)	525.9	546.8	575.3	697.3	612.9			551.1	533.1	513.5	492.6	470.9	449.6	
Gross external financing need (in billions of Euros) 3/	559.0	633.2	718.4	761.5	781.4			800.5	822.7	843.5	864.3	886.0	907.3	
in percent of GDP	56.8	60.1	66.0	72.3	73.5	10-Year	10-Year	73.5	73.2	72.4	71.5	70.6	69.7	
Scenario with key variables at their historical averages 4/								**166.3**	**163.6**	**159.1**	**154.7**	**150.5**	**146.5**	**-8.5**
Key Macroeconomic Assumptions Underlying Baseline						Historical Average	Standard Deviation							
Real GDP growth (in percent)	4.0	3.6	0.9	-3.7	-0.1	2.1	2.4	0.8	1.6	1.8	1.9	1.8	1.7	
GDP deflator (change percent)	4.1	3.3	2.4	0.6	1.0	3.2	1.4	1.6	1.7	1.7	1.8	1.9	1.9	
Nominal external interest rate (in percent)	3.6	4.5	4.4	2.6	2.2	3.7	0.8	2.6	2.5	2.5	2.6	2.7	2.8	
Growth of exports (Euro terms, in percent)	11.2	9.8	1.6	-13.2	12.8	4.8	7.3	23.7	6.9	5.9	6.2	6.5	6.6	
Growth of imports (Euro terms, in percent)	14.6	10.1	-1.0	-23.3	12.9	4.8	11.3	20.9	4.6	3.8	4.4	5.4	5.5	
Current account balance, excluding interest payments	-4.8	-4.6	-3.7	-0.7	-0.7	-2.2	1.9	-0.3	0.3	0.9	1.3	1.6	1.8	
Net non-debt creating capital inflows	-6.0	-2.1	0.5	1.0	0.2	-0.4	2.4	2.0	2.0	2.0	2.0	2.0	2.0	

1/ Derived as [r - g - r(1+g) + ea(1+r)]/(1+g+r+gr) times previous period debt stock, with r = nominal effective interest rate on external debt; r = change in domestic GDP deflator in US dollar terms, g = real GDP growth rate, e = nominal appreciation (increase in dollar value of domestic currency), and a = share of domestic-currency denominated debt in total external debt.

2/ The contribution from price and exchange rate changes is defined as [-r(1+g) + ea(1+r)]/(1+g+r+gr) times previous period debt stock. r increases with an appreciating domestic currency (e > 0) and rising inflation (based on GDP deflator).

3/ Defined as current account deficit, plus amortization on medium- and long-term debt, plus short-term debt at end of previous period.

4/ The key variables include real GDP growth; nominal interest rate; dollar deflator growth; and both non-interest current account and non-debt inflows in percent of GDP.

5/ Long-run, constant balance that stabilizes the debt ratio assuming that key variables (real GDP growth, nominal interest rate, dollar deflator growth, and non-debt inflows in percent of GDP) remain at their levels of the last projection year.

D. Current Account and International Investment Adjustment

18. **While there are no clear norms for the IIP, large negative IIPs, such as Spain's, should probably be improving at a significant rate**. The IMF's External Sustainability (ES) approach of the CGER methodology had typically focused on the current account balance that would stabilize the net foreign asset (NFA) position of the country at some benchmark level.[71] For instance the Fall 2010 CGER estimates for Spain, considering that at end-2009 negative NFA stood at 94 percent of GDP, concluded that a current account deficit around 3 percent of GDP would stabilize NFA. With the current account then projected at around 3¾ percent of GDP, this translated into a REER gap of only 3-4 percent. However, stabilizing the NFA position at such a negative level would imply delaying indefinitely satisfaction of the inter-temporal budget constraint and continued substantial gross financing from the rest of the world. Empirical evidence suggests risks increase significantly when net foreign liabilities exceed 50 percent of GDP and 200 percent of exports. Recognizing this, the Spring 2011 CGER assessment based the ES estimate on a benchmark NFA position that assumes that euro area member countries with large net liability positions would reduce them by half over the course of 20 years. This translates into the requirement of a balanced current account over this period and a REER gap of 18 percent.

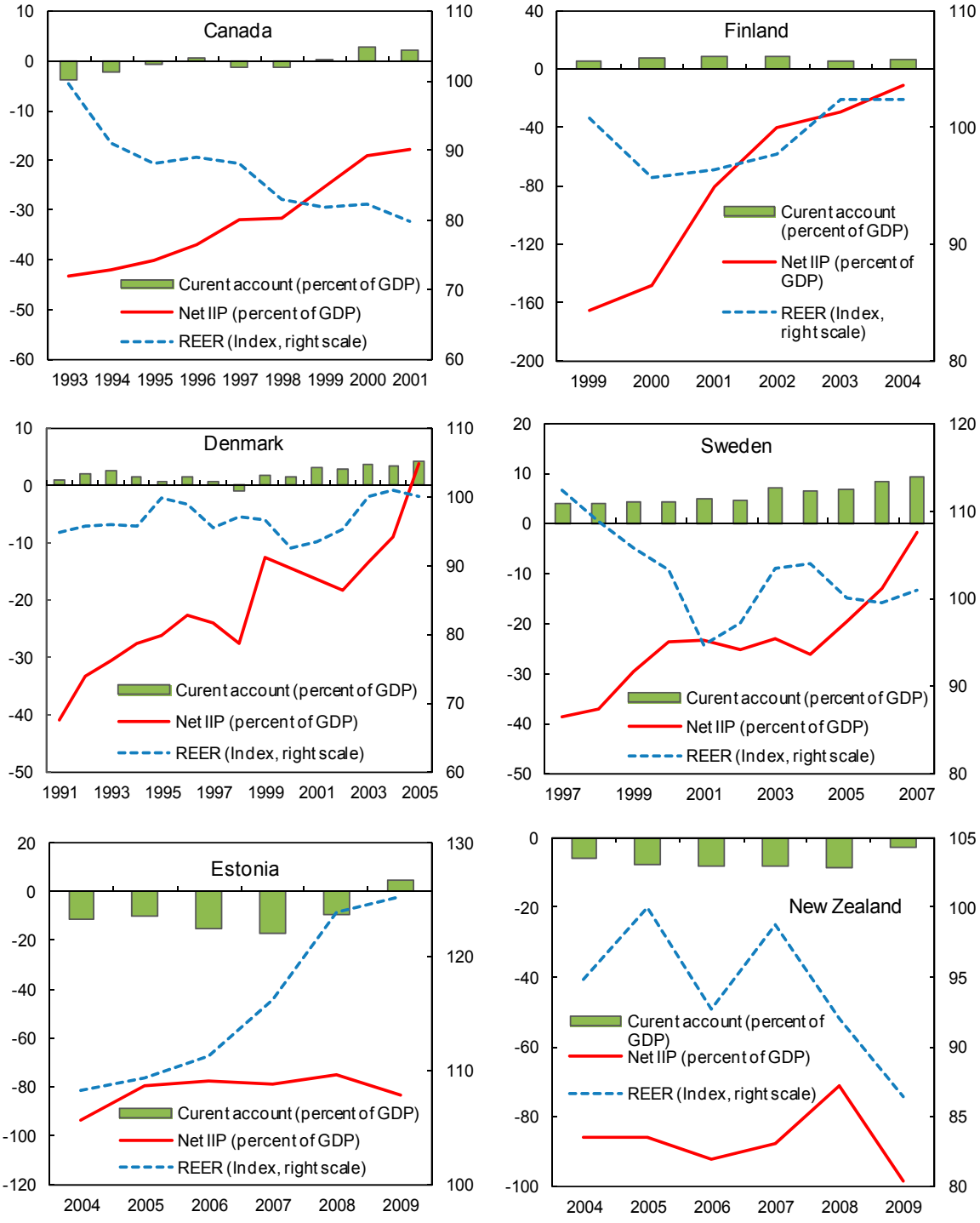
19. **Historically, there are relatively few cases of advanced economies with large negative net IIP and rigid exchange rate regimes having been able to adjust smoothly**. Euro membership may have allowed sustaining larger net external liabilities, but most Euro area economies that had similarly large external positions have been undergoing forced adjustment through crisis-driven deleveraging and domestic adjustment. Examples of smoother adjustment are to be found in cases where the magnitude of the external position was relatively moderate to begin with, and where the nominal exchange rate was flexible. Reductions of the negative external position were characteristically made possible by strong export-driven growth. In Canada in the nineties, or in Sweden more recently, the adjustment was facilitated by sustained competitiveness gains, on the back of large real and nominal effective exchange rate reductions. In Finland, swings in the net IIP were largely driven by equity valuation effects, yet did also benefit from strong export-driven growth. Denmark is a special case where a current account reversal was accomplished without exchange rate depreciation in the late 1980s, as monetary tightening compressed domestic demand at the cost of very low growth.[72] Finally, New Zealand (and to a lesser extent Australia) provide

[71] $CA^* = (g+\pi)/(1+g+\pi)$ NFA. The difference between that current account norm and the actual current account balance is then translated (using macroeconomic balance elasticities) into the real exchange rate adjustment that would bring the current account in line with its NFA-stabilizing level.

[72] Canada and Denmark, among 25 examples of sustained adjustment, are discussed by Freund (2000).

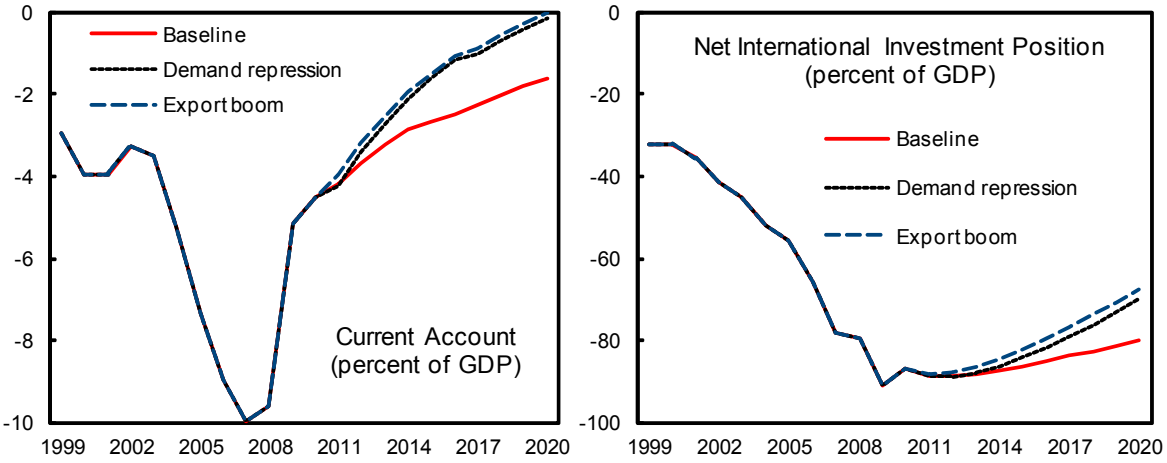
interesting contrasting examples of persistently large negative net IIP in spite of flexible nominal exchange rates, possibly in relation with their commodity-exporting status.

Selected Countries: External Adjustment



Sources: IFS; and WEO.

20. **How could Spain's external adjustment work?** Under baseline projections, it would take 10 years to bring the net IIP back to 80 percent of GDP. Beyond that, what could accelerate the adjustment? A (partial) reversal of negative net valuation effects is of course a possibility, as seen in 2010. Yet based on the historical experience for Spain there is little reason to expect systematic gains on that front. Unlike in many international episodes of adjustment, nominal exchange rate depreciation is not an option, and half of Spain's good exports go to Euro area trading partners anyway. In principle, further improving the current account balance, and eventually the net external position, will require reducing domestic demand and/or switching production towards tradables. To illustrate this point, we compare two stylized scenarios that involve exogenous shocks to either domestic demand growth, or export growth, compared to the baseline, for 2011-20. Scenarios are calibrated so that they both result in a similar trajectory for the current account (reaching balance in 2020): domestic demand growth is cut by 30 percent for 5 years in the first scenario, while export growth is accelerated by 20 percent in the second scenario (effectively gaining export shares, but with export acceleration also feeding back into higher imports[73]). Clearly, total growth outcomes are quite different, with 0.4 percent higher annual growth on average in the export scenario. Adjustment of the net IIP relative to GDP is also somewhat faster in that scenario, in part due to the earlier impact on the current account balance.



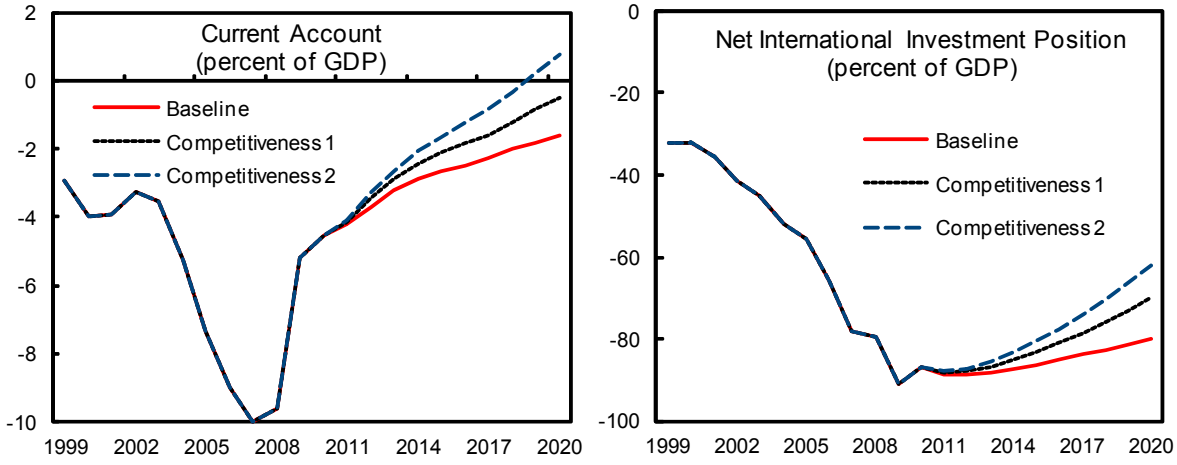
Sources: WEO; and IMF staff estimates.

21. **The best adjustment scenario would result from productivity gains in the tradable sector, but reducing labor costs is likely also necessary.** For a given growth of external demand, increasing export growth typically requires a combination of lower costs and/or higher productivity. Higher productivity would be ideal, as it can be associated with higher domestic demand and real wage growth. Yet even in the best of circumstances, like

[73] Elasticities of imports to domestic demand of 1.8 and of imports to exports of ½ are used, based on estimates for Spain over the 1999-2010 period.

moving up the quality ladder or shifting sector specialization, productivity is unlikely to accelerate significantly in the nearer term. Lowering costs is thus likely the most immediate way of boosting exports. Much can be achieved by reducing non-labor costs, such as improving the business environment, enhancing financing conditions and reducing the costs of non-tradable inputs.[74] Yet labor cost, as a major input, will likely have to play a substantial role. This need not be exclusively remuneration — other labor costs, such as that of dismissal and social security contributions are also high in Spain.

22. **Moderate gains in competitiveness will only improve the IIP gradually.** What is the magnitude of competitiveness gains that Spain can reasonably hope to achieve? The ECB inflation objective on the one hand and nominal rigidities on the other hand suggest that relative price gains of up to 2 percent annually may be seen as a sanguine estimate for the purpose of calibrating the pace competitiveness gains under the current policy settings. Simulations are therefore performed with 1 percent and 2 percent annual REER depreciation respectively. The competitiveness impact on export and import growth is computed year by year using CGER elasticities relative to the baseline. These being long-term elasticities, competitiveness gains should be interpreted here in average annual terms, and the overall impact assessed over the full simulation period. As before, country specific effect of export acceleration on import demand, above and beyond what is already imbedded in CGER elasticities, is also taken into account by altering the import response at the margin[75].



Sources: WEO; and IMF staff estimates.

[74] On the effect of structural reform gaps on external imbalances, see in particular Berger and Nitsch (2010)

[75] Using an elasticity of imports to exports of ½ implies that only half of the exports gains translate into net export improvement. For that reason, projections under the scenario with 2 percent annual competitiveness gains can also be read as an approximation for the impact of 1 percent annual competitiveness gains assuming export acceleration doesn't translate into faster imports.

Over time, the current account path is affected not only by the trade balance improvement, but also by a lower income balance deficit, as the net IIP starts to decline. The simulations show that even under the assumptions of competitiveness gains of 2 percent per year, adjustment would be a long-drawn-out process, with the current account in balance by 2019, and while the net IIP would be on a firmly declining path, it would only improve gradually.

E. Conclusions and Policy Implications

23. **Spain's balance sheet with the rest of the world is in highly negative territory, reflecting years of large current account deficits.** While the current account deficit has improved sharply, it remains significant and the IIP is likely to only stabilize in the near term. Sustaining such a large external position raises potential vulnerabilities and makes for a drawn-out adjustment.

24. **This calls for improving the current account at a more rapid pace.** Doing so without excessively depressing domestic demand should involve substantially increasing the competitiveness of the export sector, ideally by raising productivity and reducing non-labor costs (such as improving the business environment, enhancing financing conditions and lowering the price of non-tradable inputs). But achieving such a significant improvement in competitiveness through these channels is subject to substantial uncertainty even under the best of conditions and reducing labor costs will likely have to play a considerable role.

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VI. Determinants of Spanish Inflation: the Role of Labor and Product Market Institutions[1]

Spain needs lower inflation than elsewhere in the euro area. But its track record is poor. Econometric evidence points to a large role of Spain's labor market institutions in explaining this poor performance, especially the intermediate collective bargaining system and the high degree of employment protection. These results suggest that the reforms, such as those recently, of employment protection and collective bargaining could help improve Spain's inflation performance and contribute to achieve the needed gains in competitiveness.

A. Motivation

1. **Spain needs lower price growth than its partners.** In order to regain competitiveness and strengthen external sustainability without excessive reduction in absorption, Spain needs to keep its inflation below that of its euro area partners for some years. But since the launch of the euro, inflation has tended to be above the euro area average, leading to a cumulative price differential of about 10 percent (Figure 1). And while during the crisis the inflation differential turned briefly negative, it has now returned to positive values, despite the greater slack in economic activity in Spain than in the euro area as a whole. And while the recent high inflation reflects temporary factors, there is a risk that it may lead to second-round effects.

2. **This paper examines the role of inefficiencies in labor and product markets in keeping inflation high in Spain.** Inflation differentials are per se not always worrisome. Some inflation differentials are benign, either because they reflect a catch-up process, are part of an equilibrating mechanism, or result from temporary shocks. However, inefficiencies in domestic product, labor or other factor markets can amplify or make more persistent the impact of shocks on inflation. The paper estimates a model of the determination of inflation in ten euro area countries to measure the contribution of these various factors. Based on this analysis, it discusses which policies could be implemented in Spain to avoid the recurrence of a persistent inflation differential in periods of boom and to facilitate the currently ongoing process of internal devaluation.

B. Stylized Facts

The boom years

3. **Spain has maintained one of the largest inflation differentials with the euro area for most of the period 1999–2008.** The differential averaged 1 percentage point over this period, and was only slightly surpassed by Greece and Ireland. Portugal and Luxembourg

[1] Based on joint work by Florence Jaumotte and Hanan Morsy.

had the next largest differentials at 0.7 percentage points (Table 1).[2] The GDP deflator and core inflation show a similar picture.[3] In addition to stronger core inflation, inflation in Spain was also pushed above the euro area average by a larger contribution of food price inflation (reflecting both a higher share of food in the consumption basket and stronger food price increases) (Figure 2, Figure 3). The contribution of energy prices was not different from the euro area average.

4. **Price increases were strongest in the services sector and in construction.** Consumer price inflation in services was much stronger than in the euro area, while the differential with the euro area for inflation in goods was smaller, whether one looks at producer price inflation or prices of goods after retail trade (see Figure 3). Services in the consumption basket include items such as communication, housing, recreation and personal care, and transport. Looking at the supply side, increases in value-added prices (basic prices) were stronger than in the euro area in construction, trade/transport/communication, and to a lesser extent in industry (Figure 4).

5. **Higher Spanish inflation reflected stronger increases in both unit labor costs (ULC) and unit gross operating surplus (UGOS).** GDP deflator inflation can be decomposed into the contributions of unit labor costs, the unit gross operating surplus and unit net taxes (taxes net of subsidies). Up to 2008, ULC and UGOS contributed about equally to the inflation differential. ULC and UGOS each grew by about 15 percentage points more than in the euro area between 2000 and 2008 (see Figure 2, Figure 3). Interestingly, the ULC growth differential with the euro area was exclusively due to faster growth in labor cost per hour (rather than slower labor productivity growth per hour) (Table 2).

6. **The sectors with high ULC growth and/or high return on capital were construction and services sectors.**[4] [5] Construction, primary activities, health/social work, and trade had both strong ULC growth and rate of return on capital (Table 3). Real estate activities and transport and storage had relatively high ULC growth. Financial intermediation, hotels and restaurants had relatively high rates of return on capital.

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[2] Cyprus, Malta, Slovakia and Slovenia are excluded from the comparison since they joined the euro area much later (in or after the mid-2000s).

[3] The exception is Luxembourg where the core inflation differential was small.

[4] One exception is primary activities which has strong ULC growth and return on capital relative to the Spanish average but not a large differential on the value-added deflator relative to the euro area.

[5] The rate of return on capital is only one component of UGOS. UGOS is the product of the rate of return on capital and of the capital to output ratio (i.e. the inverse of capital productivity).

The Great Recession

7. **Inflation has moderated during the Great Recession, although not enough to start correcting substantially the accumulated inflation differential with the euro area.** Spanish inflation turned slightly negative in 2009 but returned to 2 percent in 2010. The differential with the euro area which had also turned slightly negative in 2009 returned to positive territory in 2010 due to transitory factors, in particular larger energy price increases in Spain and the increase in VAT. The inflation differential excluding changes in indirect taxes remained favorable to Spain in 2010 and early 2011 (see Figure 1). Core inflation also remained moderate relative to the euro area. This adjustment, however, is small relative to the accumulated inflation differential and no significant correction has been achieved yet (Figure 5). It is also small relative to that of Ireland and, to a lesser extent, Portugal.

8. **The adjustment during the Great Recession was mostly borne by ULC, as employment fell drastically.** ULC moderated significantly, even turning negative in 2010. They grew 3 percentage points less than those of the euro area over 2008-2010 (see Figure 2). This was due to increases in labor productivity growth, which reflected Spain's particularly sharp fall in employment, rather than stronger labor cost moderation (see Table 2). In contrast, UGOS moderated much later and less than ULC and than the UGOS of the euro area, contributing to offset the impact of the moderation of ULC on inflation. Net taxes also contributed to push the inflation differential with the euro area over these years.

C. Analysis

9. **A number of factors contribute to determine inflation, some of which are not worrisome.** Some inflation differentials are benign, either because they reflect a catch-up process, are part of an equilibrating mechanism, or result from temporary shocks.[6]

- *First*, inflation could be temporarily higher in some countries due to a catch-up from initially low price levels. The adoption of a common currency has increased market integration and price transparency, reducing the scope for deviations from the law of one price. Some studies (e.g. Honohan and Lane, 2003) find that this factor explained a large part of the inflation differentials in the euro area at the beginning of EMU.

- A *second* benign explanation often referred to is the Balassa-Samuelson effect. Countries that are in the process of catching up in living standards usually experience stronger productivity growth in the tradable sector. This leads to wage increases in the tradable sector which, if labor mobility between sectors is high, also increases wages in the nontradable sector. Given that productivity growth is usually lower in that sector, it pushes prices up in the nontradable sector, contributing to higher inflation.

[6] This review of the literature draws on de Haan (2010).

Rabanal (2009) finds little evidence of such an effect in Spain, while Beck et al. (2009) and ECB (2005) also find little support for such a relationship across broader samples of euro area countries.[7]

- A *third* explanation for inflation differentials is differences in business cycles. The output gap has been found to be a significant determinant of inflation (e.g. Honohan and Lane, 2003; Andersson et al, 2009), with a higher output gap leading to higher inflation. In this case, the higher inflation may be part of the equilibrating mechanism, though it may take time to operate in a monetary union.[8]

- *Fourth*, asymmetric supply (e.g. labor productivity shock) and demand shocks (e.g. fiscal policy shock) will lead to inflation differentials in a monetary union and these are part of the equilibrating mechanism. Common shocks to the monetary union could also lead to inflation differentials, due to different economic structures in the various countries. For instance, one common shock that has received a lot of attention is a change in the euro exchange rate. The impact on domestic inflation will differ depending on the share of consumption goods imported from outside the monetary union and indirectly, through the competitiveness channel, on the degree of openness to countries outside the monetary union. Studies in the literature have yielded conflicting evidence on the role of differences in nominal effective exchange rates, with the later studies concluding the impact is minor (see Honohan and Lane, 2003 and 2004 versus Angeloni and Ehrmann (2007) and Andersson et al. (2009)). Different specialization of the economies could also lead to an asymmetric impact of common shocks.

10. **In contrast, sources of inflation differentials that could lead to undesirable outcomes are structural inefficiencies in domestic product, labor or other factor markets.**[9] Some institutions may amplify or make more persistent the impact of shocks. For instance, intermediate coordination in wage bargaining could lead to a less efficient response of inflation to supply shocks than highly coordinated or fully decentralized systems. Indeed, in bargaining systems with intermediate coordination, unions can exert some market power on wage setting but tend to ignore the macroeconomic implications of their actions (e.g.

[7] There is more evidence that this is a relevant factor for new EU member states.

[8] Indeed, the higher inflation leads to two opposite impacts on the output gap. On the one hand, in the context of the EMU, where nominal interest rates have converged, the higher inflation tended to reduce real interest rates and hence push the output gap even higher, sustaining upward pressure on prices in countries which already had high inflation. On the other hand, the higher inflation leads to a real exchange rate appreciation which gradually reduces export demand, thereby reducing the upward pressure on price developments.

[9] Another related source of undesirable inflation differentials is rigidities affecting the price and wage formation mechanisms (e.g. low frequency of price adjustments).

Calmfors and Driffill, 1988). In contrast, in fully coordinated systems, unions recognize their market power and take into account the impact of their wage demands on inflation and unemployment. In fully decentralized systems, unions have very limited market power. Hence, second-round effects of a supply shock (e.g. oil price increase) would be stronger and lead to higher inflation and unemployment in an intermediate system of bargaining.

11. **Looking initially at where Spain stands on the various determinants, several factors could explain why its inflation was higher than the euro area average over 1999-2008**.[10] These include a relatively low initial price level (at about 87% of the euro area average in 1999) and an average output gap over the period significantly larger than in most other euro area countries (Figure 6). In addition, while employment protection and collective bargaining have been recently reformed, up to 2009 Spain's labor market was characterized by less efficient institutions, especially an intermediate coordination of collective bargaining and relatively high EPL (though this was partly offset by a low union density). In addition, there is a high degree of inflation indexation, which amplifies second-round effects of supply shocks, causes a high wage drift and reduces the sensitivity of real wages to the economic cycle. In contrast, Spain performs relatively well on product market regulation, at least as far as the overall indicator is concerned. The available indicators of product market regulation, however, miss very important elements, such as the construction sector that was crucial to explain the behavior of mark-ups in the Spanish economy, as identified above. [11]

12. **The paper examines the role of labor and product market institutions in explaining inflation developments.** In line with Bowdler and Nunziata (2007), Biroli et al. (2010) and Correa-López et al. (2010), a traditional backward-looking Phillips curve equation is augmented with structural labor and product market indicators. In this model, inflation is a function of its own lag (to capture persistence), the initial relative price level, the output gap, changes in the nominal effective exchange rate and common shocks (e.g. oil price shock, monetary policy shock captured by time dummies).[12] The model is augmented to

[10] Inflation and the output gap are from the IMF World Economic Outlook, nominal effective exchange rates from the IMF International Financial Statistics and the relative price level from Eurostat and the Penn World Tables. The indicator of coordination in collective bargaining takes the value 1 for uncoordinated systems, 2 for systems with intermediate coordination, and 3 for highly coordinated systems, and is from Bassanini and Duval (2009). Union density is the OECD measure of the share of workers affiliated to a trade union. Employment protection is measured by the OECD summary indicator of employment protection legislation. Product market regulation is measured by the OECD summary indicator of regulatory impediments to product market competition in seven non-manufacturing industries, including gas, electricity, post, telecoms, passenger air transport, railways, and road freight.

[11] Spain also fares much less well on some subcomponents of the indicator, such as administrative burdens on start-ups and the regulation of professional services.

[12] A more refined way to measure external shocks would be to control for imported good prices, distinguishing between oil and non-oil, and to interact these respectively with the share of oil-refined products in the

(continued)

look at the impact of four institutions, namely the degree of coordination of collective bargaining, union density (i.e. the number of employees registered with unions), employment protection, and product market regulation. The extent of inflation indexation could not be introduced, due to the lack of a broadly available indicator. Following other studies, these factors are allowed to affect inflation through their impact on (i) inflation persistence; (ii) the response of inflation to the output gap; and (iii) the response of inflation to common shocks.[13]

13. **The model is not without potential caveats and these will be addressed in the robustness tests.** First, survey evidence for euro area countries suggests that inflation may not depend only on lagged inflation but also on future expected inflation, as when prices are sticky, profit-maximizing firms take into account expected future developments to set prices. Second, the analysis assumes that cross-country heterogeneity in the responsiveness of inflation to its determinants is fully accounted for by differences in the considered labor and product market variables. This common elasticity assumption could be too stringent.

14. **The model is estimated over a panel dataset of 10 euro area countries over the period 1983–2007.**[14] Several estimation methods are used, including simple OLS, estimation with country fixed effects, and instrumental variable estimation (with country fixed effects) to correct for the potential endogeneity of the output gap and of the lagged inflation variables.[15] Outliers are excluded based on statistical tests; standard errors are robust; and structural variables are standardized. In a first step, we estimate a linear version of the model that excludes the interactions between common shocks and structural variables (Table 4). In a second step, we estimate the full model including the interactions between common shocks and structural variables (Table 5). Finally, specifications are reduced to eliminate insignificant variables through an iterative process in which the least significant variable is eliminated and the model is re-estimated until all variables are significant at least at the 10% level. Several results emerge from the estimations.

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consumption basket and with the degree of openness of the country. An element missing in the analysis is the role of indirect taxation and government-set prices in explaining inflation developments.

[13] Correa-López et al. (2010) follow a similar approach but with a smaller set of structural variables. Biroli et al. (2010) also investigate the impact of labor and product market variables on the inflation dynamics. However, they only test the impact of one variable at a time and do not test all channels simultaneously.

[14] The sample countries are Austria, Belgium, Finland, France, Germany, Ireland, Italy, Netherlands, Portugal, and Spain. Greece and Luxembourg could not be included because the collective bargaining indicator is not available for them.

[15] The lagged inflation, the output gap, and all their interactions with the labor and product market variables are instrumented. The set of instruments includes the second lag of inflation, the first and second lags of the output gap, and the first lag of all interaction terms. The tests of whether instruments are strong and valid are satisfied in all cases.

15. **The standard determinants of inflation are confirmed, but there is little evidence of a price convergence effect.** Inflation is positively correlated with its lag, pointing to persistence. Inflation increases with the output gap and decreases when the nominal effective exchange rate appreciates. However, the initial relative price level has no significant impact on inflation (in line with the more recent literature).

16. **Less efficient labor market institutions increase the persistence of inflation.** Inflation is more persistent when employment protection is high, collective bargaining is characterized by intermediate coordination, and union density is high. The presence of these interactions is presumably explained by the adjustment or indexation of wages to lagged inflation. High employment protection, high union density and some coordination of unions in collective bargaining give workers more market power to negotiate increases in their wages that compensate for high past inflation or high expected inflation (to the extent that future inflation is predicted based on past inflation). The relationship with the coordination in bargaining is non-linear, in the sense that both low and high coordination would lead to less inflation persistence than intermediate coordination. In the case of low coordination, workers have little market power, while in the case of very high coordination, the unions which recognize their market power take into account the effect of their wage demands on inflation and unemployment (the argument of Calmfors and Driffill, 1988). This high persistence that results from inefficient labor market institutions will lead to excessively high inflation when shocks to inflation are positive, such as during the boom in Spain or when oil prices increase. In contrast, in cases of negative shocks to inflation, inflation may remain excessively low for a period of time.

17. **Collective bargaining systems with intermediate coordination are also less suited to face supply shocks (such as oil price shocks).** Oil and raw materials price shocks are more likely to be accommodated by wage increases when the degree of coordination in collective bargaining is intermediate. The argument is similar to the one made above.

18. **There are a few noteworthy non-results as well.** *First,* product market regulation does not seem to have a robust impact on inflation dynamics.[16] Theoretically, the effect of product market regulation could be ambiguous (Aghion, 2002). Indeed, when competition is low, firms faced with an increase in their costs could decide to either use their market power to raise prices (and thereby protect their profit margins) or to absorb the shock by reducing

[16] Several studies find some impact of product market regulation on the inflation dynamics, e.g. Biroli et al. (2010), Correa-López (2010) and Andersson et al. (2010). One difference between our study and theirs is the larger set of structural variables that are introduced simultaneously in our model. For instance, when employment protection is not included (like in Correa-López, 2010), there is some evidence that product market regulation increases the persistence of inflation. However, when both variables are present, employment protection dominates product market regulation. Using the more comprehensive OECD product market variable (only available for a shorter time period) and disaggregating it into its different sub-indicators did not show a significant impact either.

their profit margins to maintain market share. When competition is high, however, profit margins are very low and firms are more likely to be forced to raise prices when faced with increases in costs. In practice, the PMR indicator used in the analysis may also be an imperfect measure of market power. *Second*, none of the interactions for the output gap turned out to have a robust impact on inflation.[17] One issue here might be the measurement of the output gap. The output gap is unobservable, notoriously difficult to measure, and its estimates are subject to frequent posterior revisions. Although the data are taken from a common source (IMF World Economic Outlook), methodologies used to estimate the output gaps may differ across countries.

19. **These results are quite robust.** The results are robust to different estimation methods, excluding outliers, dropping one country at a time, and different model specifications (linear or non-linear). A very stringent test, which tests all permutations of variables and calculates the robustness of variables by the frequency with which they appear in the best-fitting models, was implemented (through a publicly available program called "R"). Of all the variables, the most robust are the lagged inflation, the change in the nominal effective exchange rate, the output gap and the interaction of the lagged inflation with employment protection. The interaction of lagged inflation with intermediate coordination in collective bargaining and union density also appear in a good fraction of the best fitting-models, though they are not as robust as employment protection. Other variables were not robust. Including future inflation in the model and instrumenting it with lags of inflation and the output gap (as is typically done in estimations of hybrid New Keynesian Phillips curves) confirms that inefficient labor market institutions (in particular high employment protection) increase inflation persistence. The channel is through increasing the impact of lagged inflation on expected future inflation (in first-stage results). Finally, there is no evidence of residual slope heterogeneity on the macroeconomic variables for Spain after we control for their interactions with the structural variables, suggesting that the responsiveness of inflation to its determinants is fully accounted for by differences in the labor and product market variables (Table 6).[18]

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[17] While some interactions between structural variables and the output gap were marginally significant in some specifications, they usually became insignificant once the model was reduced in an iterative process to keep only significant variables. Allowing different coefficients for positive and negative output gaps did not improve the robustness of the results.

[18] Other robustness tests were conclusive, including: (i) allowing a downward trend in the impact of the output gap on inflation, reflecting the fact that the credibility of monetary policy has improved over time resulting in an anchoring of inflation expectations and a reduced sensitivity of inflation to the output gap, beyond the effect of institutional changes; (ii) testing whether the levels and changes of the structural variables affect inflation beyond their effects through interactions with macroeconomic variables (they typically do not); and (iii) re-estimating the model including the Great Recession period (2008–2009) and assuming that structural variables for which data are not available over this period remained broadly constant (see Table 6).

20. **The magnitude of the impact of institutions on inflation and inflation differentials was relatively large.** Over 1999–2009, the inflation differential of Spain relative to the 10 euro area countries that are in the estimation sample was on average 0.7 percentage points. Of this, 0.3 to 0.5 percentage points can be attributed to the specifics of the Spanish labor market, depending on the model (Figure 7). The contributions of employment protection and intermediate bargaining system were respectively 0.2 and 0.3–0.5 percentage points per year, partially offset by the low union density. These are likely underestimates though since they are a simple average of first-year effects on inflation, and do not take into account the dynamic effects of lower inflation on subsequent years. A simulation of what Spanish inflation would have been, had Spain exhibited the best possible combination of labor institutions, suggests that inflation would have hovered somewhat below 2 percent, more than 1 percentage point below the observed level.[19] Thus, as 1999-2008 was a period of boom and shocks to inflation were mostly positive, labor market institutions overall contributed to increase the inflation differential through increased persistence and amplification of supply shocks. While labor market institutions kept pushing inflation up in 2009 despite the crisis, their contribution to the inflation differential became neutral in 2010, reflecting the small lagged inflation differential in 2009. It is noteworthy however that the model does not explain very well the behavior of inflation in crisis years (e.g. in 2001 and 2009).

D. Policy Implications

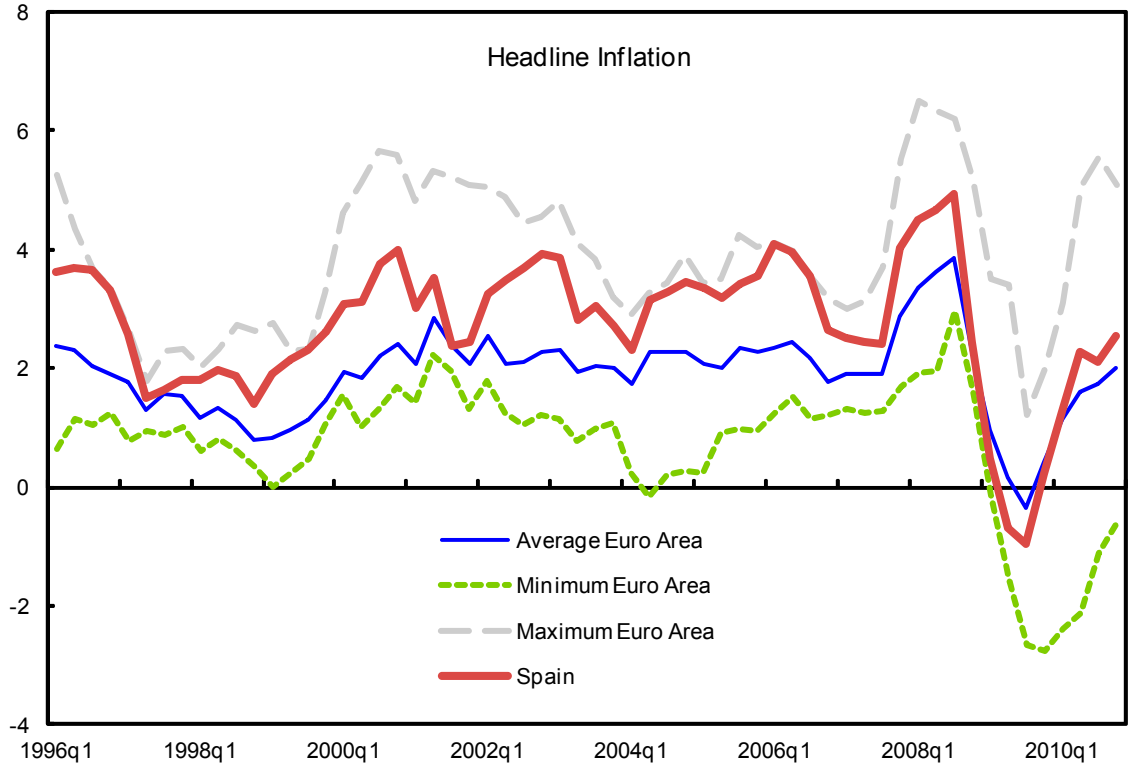
21. **These results suggest the accumulated inflation differentials during the boom years in Spain were larger and more persistent than desirable, in large part due to inefficient labor market institutions.** The impact of common (and probably asymmetric) shocks on inflation was amplified by the structure of collective bargaining which featured an intermediate level of coordination. Moreover, the shocks to inflation were made more persistent by less efficient labor market institutions than in the average of other euro area countries. Inflation persistence, as estimated by our model, is particularly high in Spain compared with other euro area countries (Table 7).

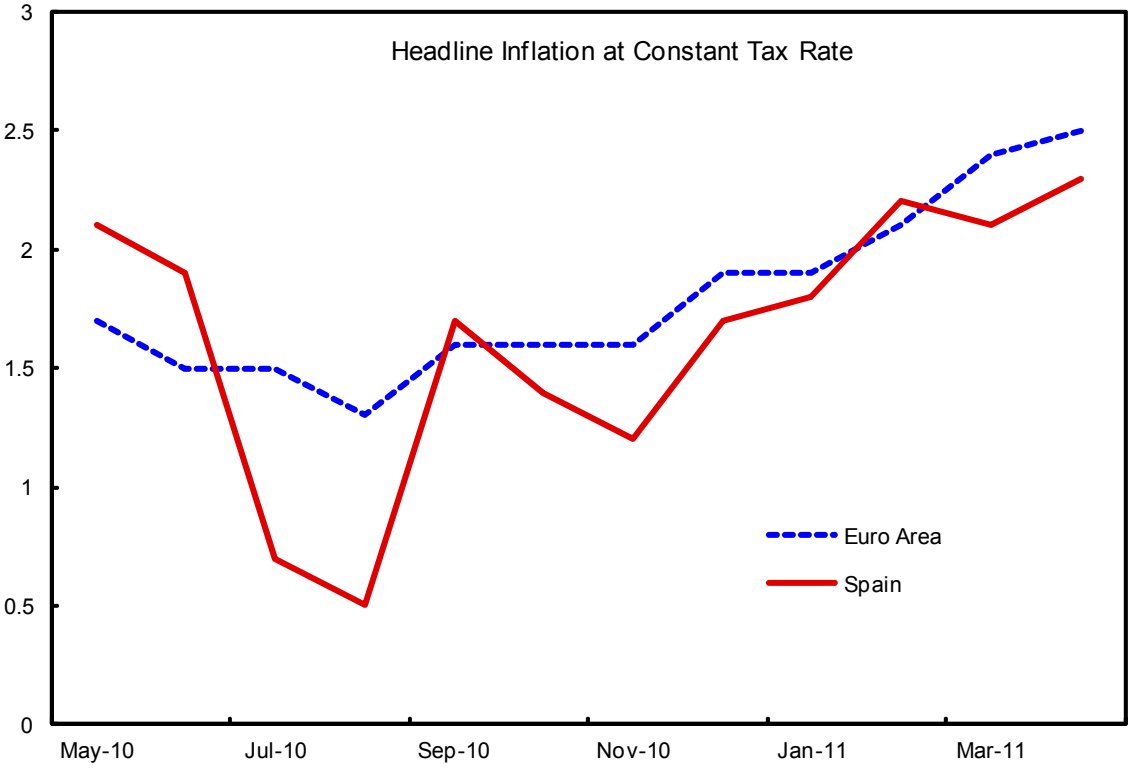
22. **These results suggest that the reforms, such as those recently, of collective bargaining and employment protection could improve inflation performance in Spain.** The 2010 reform eased dismissal costs and criteria, and granted firms greater flexibility to opt out of collective agreements. In June 2011, collective bargaining was further reformed toward greater firm-level flexibility, through establishing the prevalence of firm-level agreements, especially over provincial ones; reducing the possibility of indefinite extension of previous agreements when social partners cannot agree on a new agreement; and further

[19] This simulation is based on the linear model and takes into account the impact on inflation in subsequent years through lower lagged inflation but not through lower output gap (since we do not have a model of the output gap).

easing opt-outs of collective agreements. These reforms were first and foremost needed to improve labor market performance, as the persistent high wage growth during the Great Recession has put the burden of adjustment to the crisis on employment, pushing the unemployment rate to above 20 percent. But they could also contribute to reduce the persistence of inflation in Spain and help Spain achieve lower price growth relative to its partners to restore competitiveness without excessive contraction of absorption. If they fail to achieve these results, they will need to be strengthened.

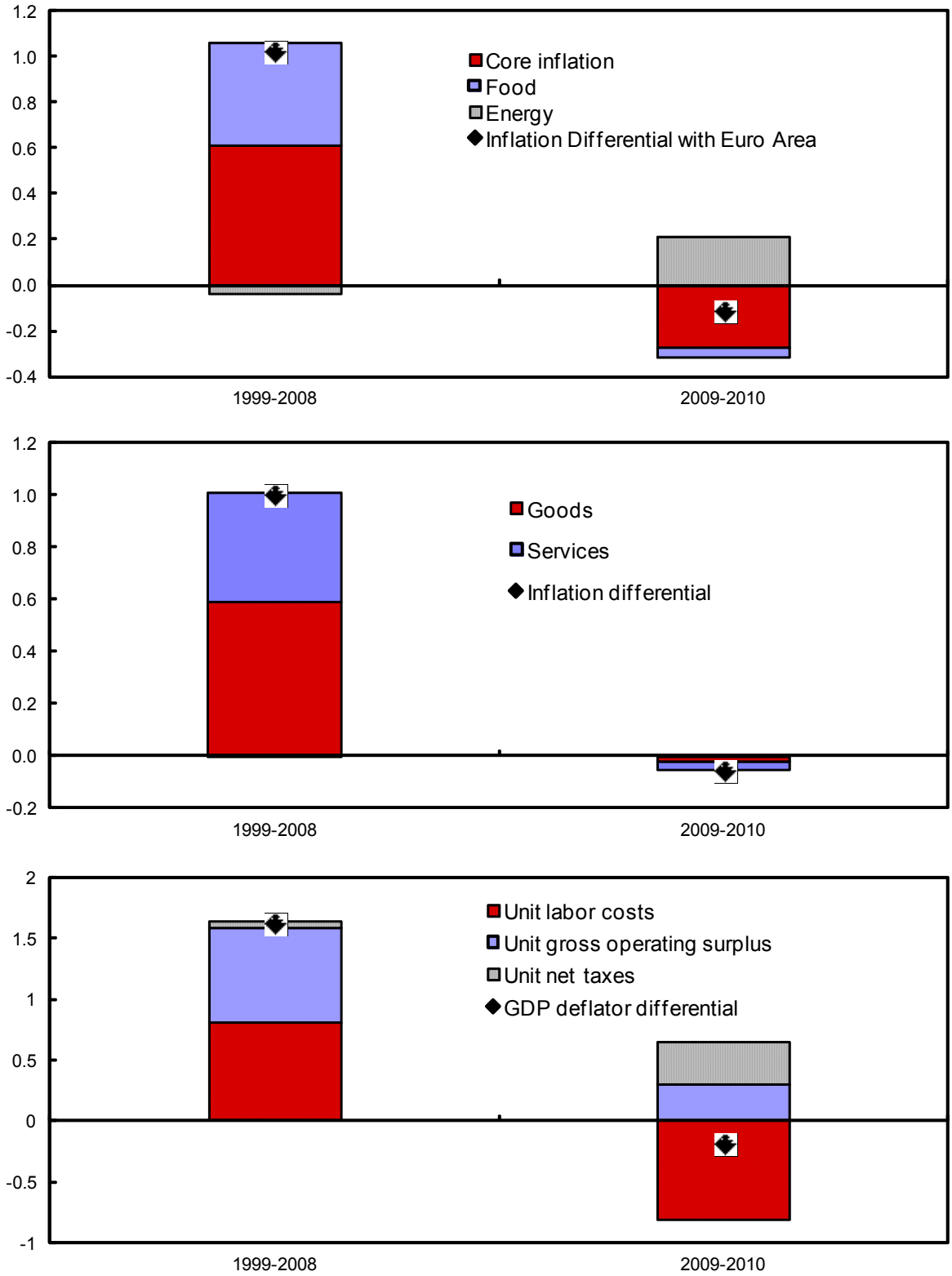
Figure 1. Spain and Euro Area: Headline Inflation
(year-on-year percent change)





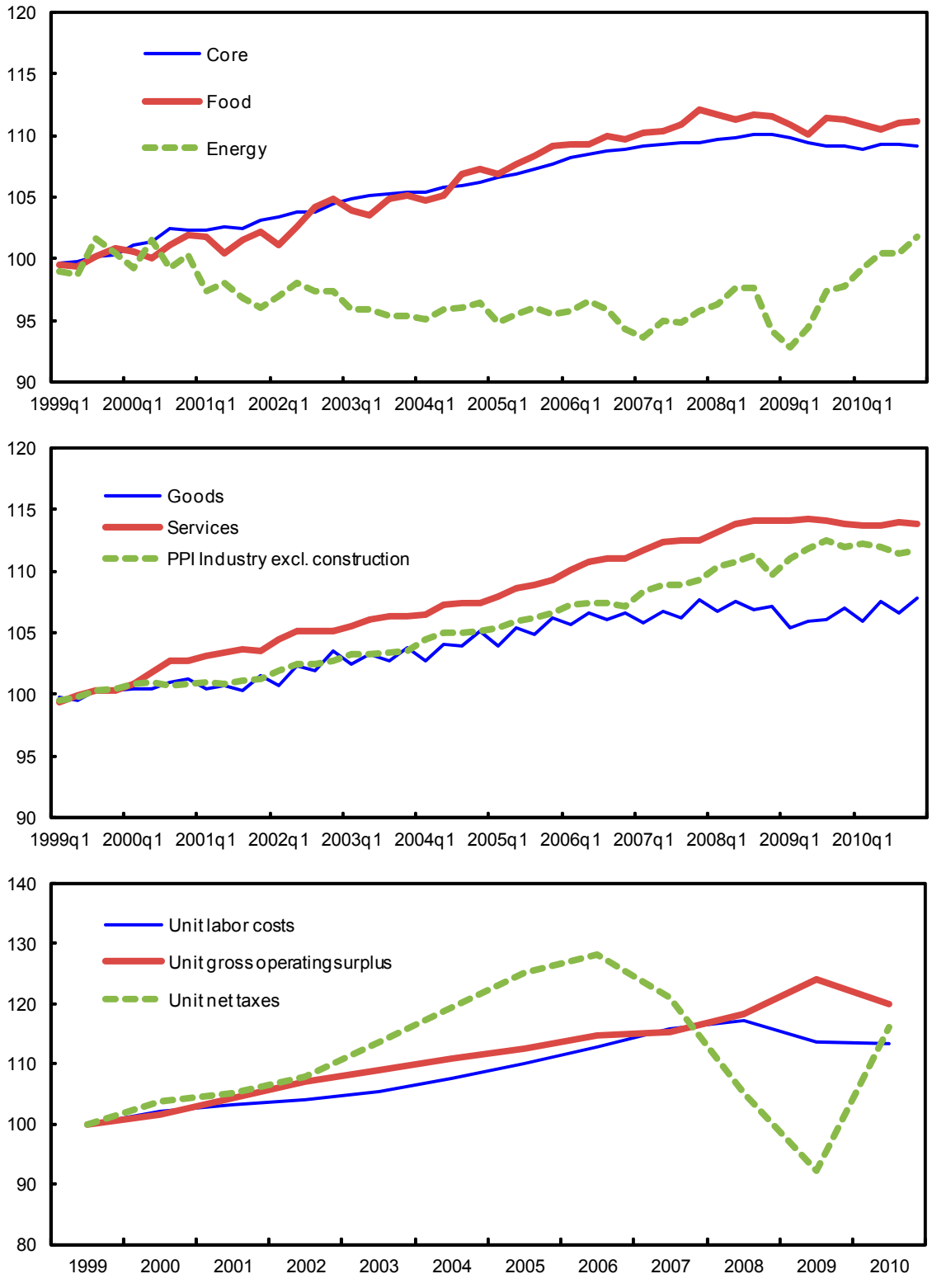
Source: Eurostat.

Figure 2. Spain: Contributions of Inflation Components to Inflation Differential with Euro Area



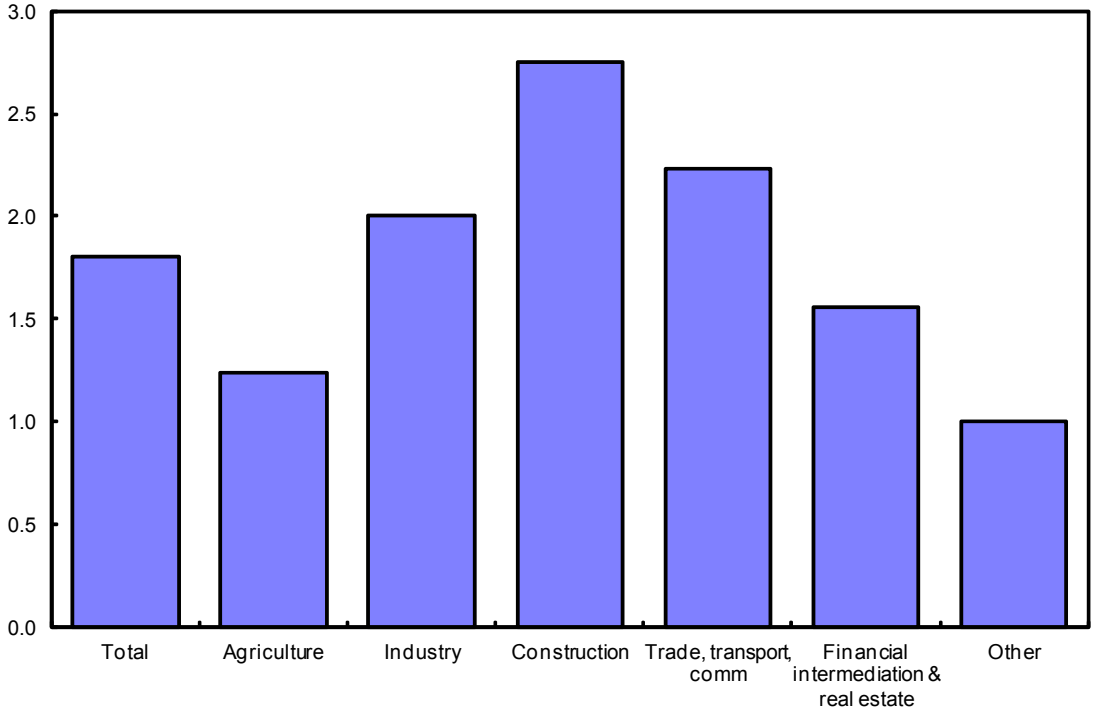
Source: Eurostat.

Figure 3. Spain: Accumulated Price Differences Relative to Euro Area
(index, 1999=100)



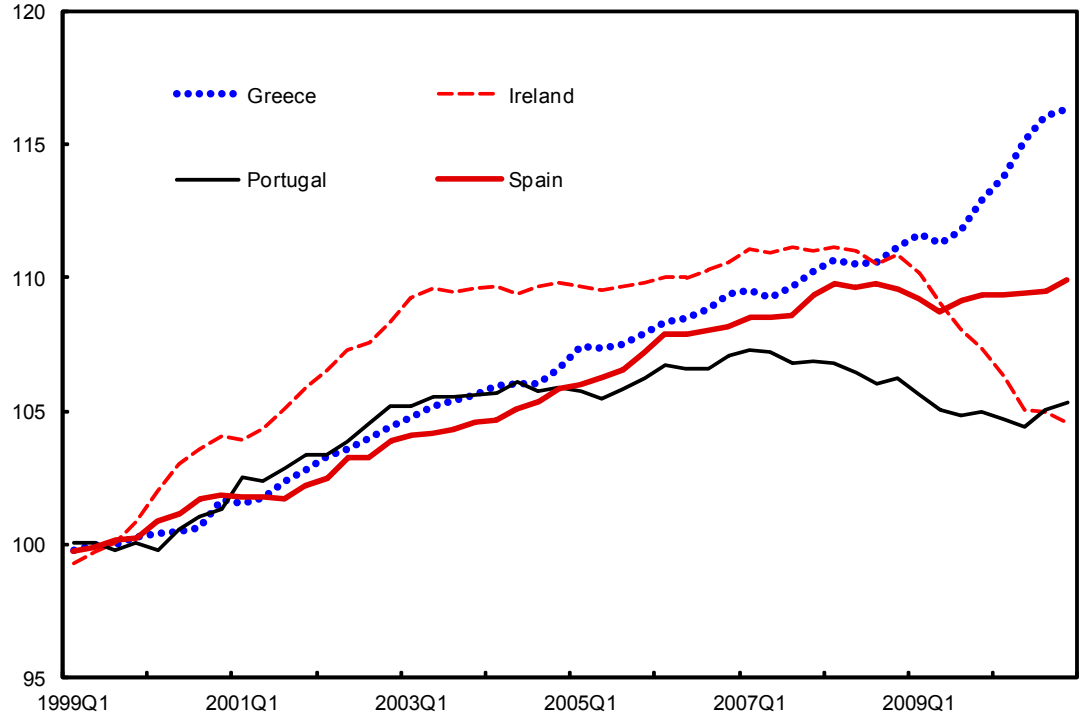
Source: Eurostat.

Figure 4. Spain: Inflation Differential with Euro Area by Value Added Sector



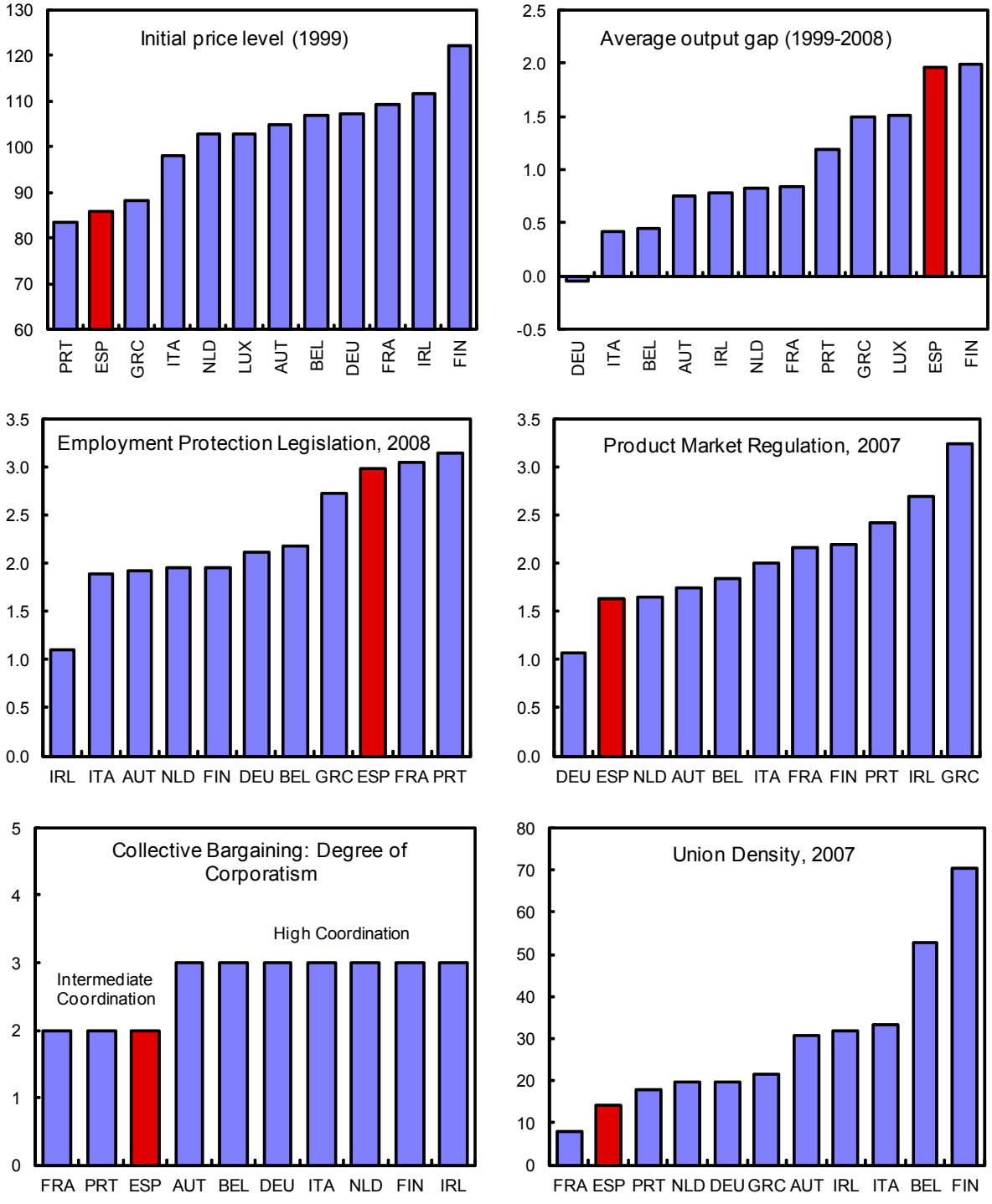
Source: Eurostat.

Figure 5. Selected Euro Area Countries: Accumulated Price Differences Relative to Euro Area, 1999-2010 (index)



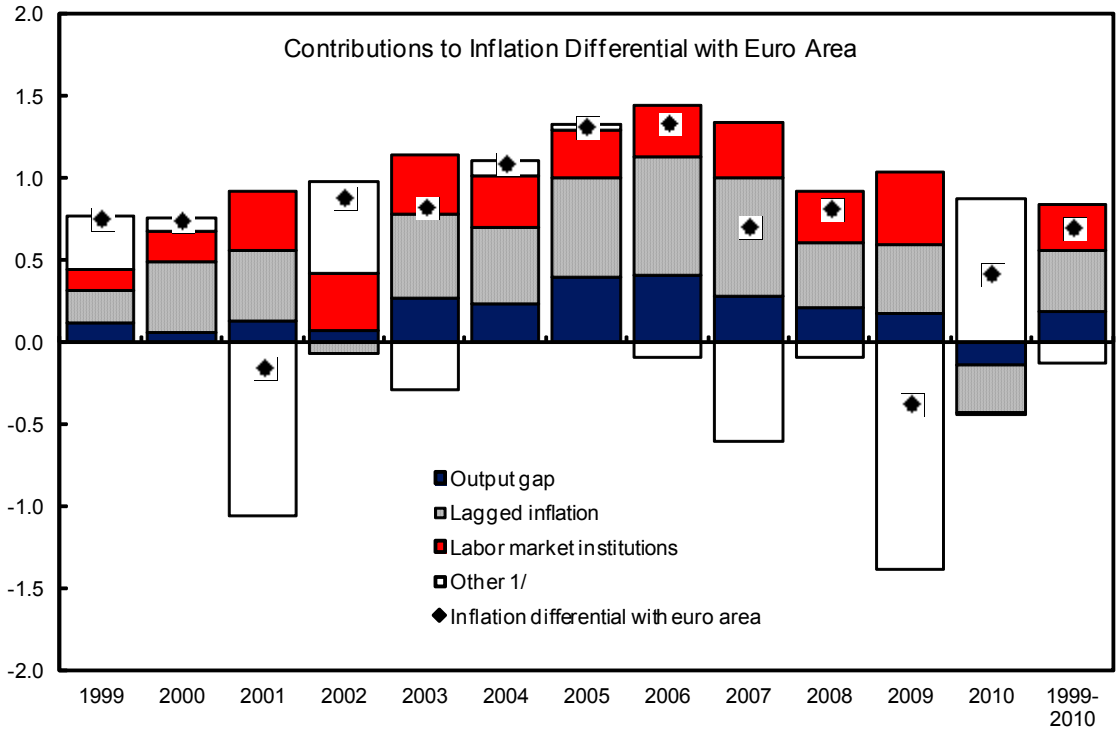
Source: Eurostat.

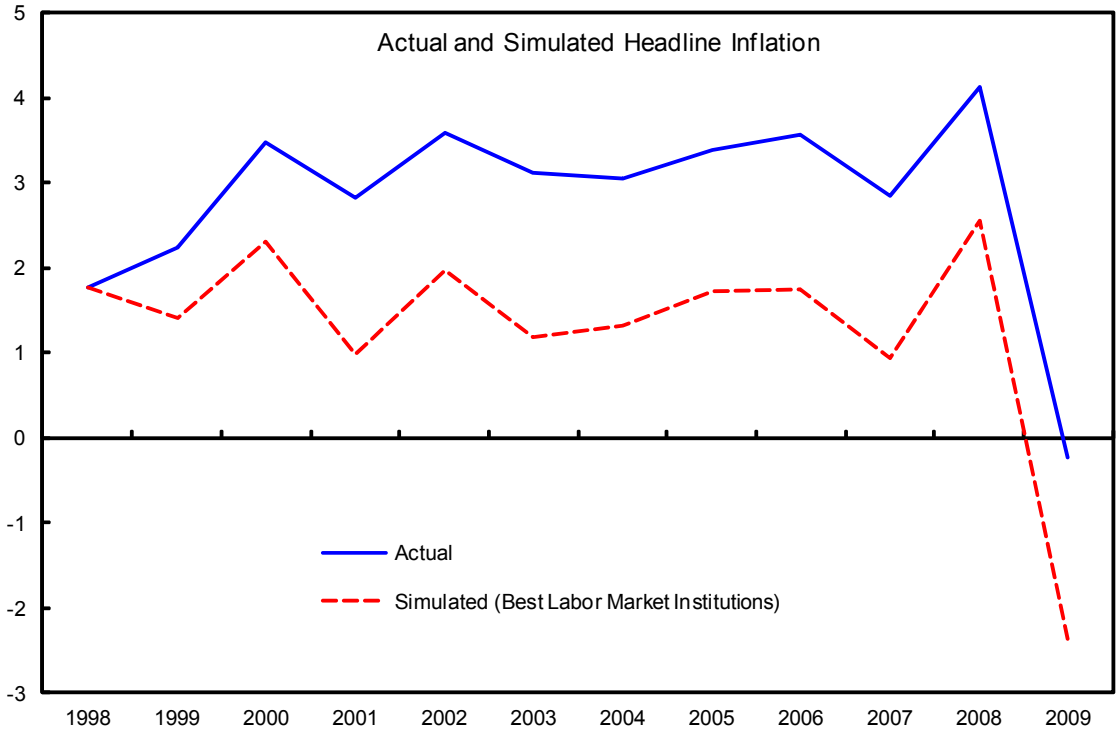
Figure 6. Spain and Euro Area: Determinants of Inflation



Sources: Eurostat; and OECD.

Figure 7. Spain: Impact of Labor Market Institutions on Inflation, 1999-2010





Source: IMF staff estimates using estimated linear model.
1/ Other includes current and lagged changes in nominal effective exchange rate, country fixed effect, and residual.

Table 1. Average Inflation Differentials with Respect to Euro Area, 1999-2008 1/2/

	Headline inflation	Core inflation	GDP deflator inflation
Austria	-0.3	-0.1	-0.6
Belgium	0.1	-0.1	-0.1
Finland	-0.4	-0.1	-0.7
France	-0.3	-0.2	-0.2
Germany	-0.5	-0.7	-1.2
Greece	1.1	1.3	1.0
Ireland	1.2	1.3	1.0
Italy	0.2	0.5	0.4
Luxembourg	0.7	0.3	1.6
Netherlands	0.2	0.2	0.6
Portugal	0.7	1.1	0.9
Spain	1.0	1.1	1.7

Source: Eurostat.

1/ 2001-2008 for Greece's GDP deflator inflation.

2/ EA11-16 for headline and core inflation; EA16 for GDP deflator inflation.

Table 2. Contributions of Labor Cost and Labor Productivity to Nominal ULC Growth

2000-2008	Euro Area	Spain
Growth in ULC	15.8	30.4
Growth in labor cost per hour	25.0	39.7
Growth in labor productivity per hour	8.0	7.2
2008-2010	**Euro Area**	**Spain**
Growth in ULC	3.3	-0.8
Growth in labor cost per hour	3.8	3.5
Growth in labor productivity per hour	0.5	4.3

Source: Eurostat.

Table 3. Spain: Sectors with High Unit Labor Cost Growth and/or High Rate of Return on Capital

	Unit labor costs			Rate of return on capital		
	Cumulative growth 2000-2007	Difference from total economy	Difference from Germany	Average 1999-2007	Difference from total economy	Difference from Germany
High unit labor cost growth and returns on capital 1/						
Construction	**49**	22	48	**33**	17	15
Agriculture, hunting, forestry, and fishing	**40**	13	48	**23**	7	29
Health and Social Work	**40**	13	47	**19**	3	13
Machinery nec and recycling	**32**	5	23	**18**	2	14
Wholesale trade	**{ 30**	{ 3	{ 32	**24**	8	0
Retail trade				**9**	-7	17
High unit labor cost growth 1/						
Real estate activities	**93**	66	106	9	-7	4
Transport and storage	**63**	36	72	7	-9	5
High returns on capital 1/						
Hotels and restaurants	12	-15	6	**31**	15	38
Financial intermediation	-23	-50	-29	**45**	29	32
Total economy	27	…	31	16	…	8

Sources: Eurostat; and EU Klems Database.

1/ Relative to average for Spanish economy and relative to Germany.

Table 4. Determinants of Inflation (linear model)

	(1) OLS	(2) Country Fixed Effects	(3) Instrumental Variables and Country Fixed Effects	(4) Instrumental Variables and Country Fixed Effects (Reduced Model)
Lag inflation	0.565***	0.479***	0.420***	0.504***
	(0.0541)	(0.0529)	(0.0744)	(0.0547)
Output gap	0.174***	0.186***	0.282***	0.223***
	(0.0406)	(0.0462)	(0.0714)	(0.0489)
Lag relative price level	-0.821	0.0448	-0.906	
	(0.5110)	(1.1560)	(1.4220)	
Change of NEER	-0.0774***	-0.0543***	-0.0658***	-0.0652***
	(0.0183)	(0.0193)	(0.0190)	(0.0169)
Lag change of NEER	-0.0307*	-0.0458***	-0.0415**	-0.0443***
	(0.0176)	(0.0162)	(0.0161)	(0.0156)
Lag inflation * union density	0.0580*	0.137***	0.151***	0.124***
	(0.0301)	(0.0267)	(0.0302)	(0.0247)
Lag inflation * EPL	0.0605***	0.118***	0.114***	0.0820***
	(0.0176)	(0.0161)	(0.0230)	(0.0168)
Lag inflation * intermediate coordination	0.0404	0.140***	0.149***	0.0983***
	(0.0287)	(0.0359)	(0.0429)	(0.0315)
Lag inflation * low coordination	0.000818	0.0202*	0.0195	
	(0.0106)	(0.0107)	(0.0167)	
Lag inflation * PMR	0.0318	-0.0840*	-0.0957	
	(0.0383)	(0.0496)	(0.0695)	
Output gap * union density	-0.00511	0.00143	-0.0374	
	(0.0262)	(0.0256)	(0.0446)	
Output gap * EPL	0.0219	0.0517	0.0497	
	(0.0391)	(0.0339)	(0.0510)	
Output gap * intermediate coordination	-0.0251	-0.0585	-0.143*	
	(0.0419)	(0.0396)	(0.0744)	
Output gap * low coordination	-0.0229	-0.0389	-0.0968	
	(0.0396)	(0.0247)	(0.0863)	
Output gap * PMR	0.0285	0.0966**	0.141**	0.122**
	(0.0400)	(0.0386)	(0.0547)	(0.0486)
Observations	242	242	242	242
Adjusted R^2	0.94	0.95	0.93	0.93

Source: IMF staff estimates.

Notes: Robust standard errors in parentheses. * denotes significance at 10% level, ** at 5% level, and *** at 1% level. All models include time dummies and outliers are excluded.

Table 5. Determinants of Inflation (nonlinear model estimated by nonlinear least squares)

	(1) 1983-2007 Full Model	(2) 1983-2007 Reduced Model	(3) 1983-2009 Reduced Model
Lag inflation	0.450***	0.501***	0.529***
	(0.0608)	(0.0473)	(0.0427)
Output gap	0.170***	0.166***	0.182***
	(0.0442)	(0.0347)	(0.0352)
Lag relative price level	0.349		
	(1.0650)		
Change of NEER	-0.0541***	-0.0613***	-0.0559***
	(0.0186)	(0.0165)	(0.0172)
Lag change of NEER	-0.0443***	-0.0328**	-0.0308*
	(0.0152)	(0.0151)	(0.0161)
Lag inflation * union density	0.155***	0.128***	0.124***
	(0.0303)	(0.0232)	(0.0218)
Lag inflation * EPL	0.132***	0.0985***	0.105***
	(0.0201)	(0.0151)	(0.0130)
Lag inflation * intermediate coordination	0.109**	0.0756**	0.0742***
	(0.0421)	(0.0299)	(0.0254)
Lag inflation * low coordination	0.023		
	(0.0144)		
Lag inflation * PMR	-0.101*		
	(0.0565)		
Output gap * union density	0.0177		
	(0.0289)		
Output gap * EPL	0.0571		
	(0.0362)		
Output gap * intermediate coordination	-0.0391		
	(0.0485)		
Output gap * low coordination	-0.0303		
	(0.0257)		
Output gap * PMR	0.0673*	0.0694**	0.051
	(0.0398)	(0.0344)	(0.0320)
Time dummy * union density	0.076		
	(0.0664)		
Time dummy * EPL	-0.0318		
	(0.0476)		
Time dummy * intermediate coordination	0.270**	0.233**	0.169**
	(0.1060)	(0.1140)	(0.0795)
Time dummy * low coordination	-0.00047		
	(0.0396)		
Time dummy * PMR	0.0588		
	(0.0661)		
Observations	242	242	261
Adjusted R^2	0.98	0.98	0.97

Source: IMF staff estimates.

Notes: Robust standard errors in parentheses. * denotes significance at 10% level, ** at 5% level, and *** at 1% level. All models include country fixed effects and time dummies and outliers are excluded.

Table 6. Determinants of Inflation: Additional Robustness Tests for Linear Model

	(1) Output gap interacted with a trend	(2) Residual slope heterogeneity for Spain	(3) With levels of structural variables	(4) With changes of structural variables	(5) Including 2008-09 in the sample Reduced Model
Lag inflation	0.425***	0.417***	0.396***	0.426***	0.549***
	(0.0743)	(0.0772)	(0.0853)	(0.0702)	(0.0534)
Output gap	0.501	0.266***	0.267***	0.281***	0.238***
	(0.324)	(0.0724)	(0.0737)	(0.0705)	(0.0477)
Lag relative price level	-1.046	-1.049	-0.518	-1.130	
	(1.541)	(1.424)	(1.507)	(1.369)	
Change of NEER	-0.0649***	-0.0674***	-0.0611***	-0.0645***	-0.0561***
	(0.0193)	(0.0196)	(0.0199)	(0.0204)	(0.0181)
Lag change of NEER	-0.0387**	-0.0450***	-0.0441***	-0.0379**	-0.0388**
	(0.0162)	(0.0160)	(0.0167)	(0.0163)	(0.0164)
Lag inflation * union density	0.146***	0.155***	0.154***	0.151***	0.119***
	(0.0297)	(0.0314)	(0.0303)	(0.0304)	(0.0251)
Lag inflation * EPL	0.113***	0.112***	0.105***	0.105***	0.0905***
	(0.0232)	(0.0243)	(0.0245)	(0.0210)	(0.0147)
Lag inflation * interm coord	0.157***	0.140***	0.151***	0.144***	0.0902***
	(0.0482)	(0.0428)	(0.0506)	(0.0427)	(0.0283)
Lag inflation * low coordination	0.0247	0.0164	0.0115	0.0177	
	(0.0217)	(0.0157)	(0.0333)	(0.0162)	
Lag inflation * PMR	-0.111	-0.0835	-0.0694	-0.0802	
	(0.0784)	(0.0760)	(0.0865)	(0.0661)	
Output gap * union density	-0.0436	-0.0331	-0.0355	-0.0443	
	(0.0431)	(0.0411)	(0.0436)	(0.0432)	
Output gap * EPL	0.0238	0.0490	0.0681	0.0278	
	(0.0737)	(0.0506)	(0.0581)	(0.0444)	
Output gap * interm coord	-0.126	-0.154**	-0.162*	-0.134**	
	(0.0865)	(0.0734)	(0.0828)	(0.0647)	
Output gap * low coordination	-0.0816	-0.0997	-0.106	-0.0780	
	(0.0987)	(0.0777)	(0.0885)	(0.0676)	
Output gap * PMR	0.0578	0.143**	0.136*	0.149***	0.0372
	(0.111)	(0.0579)	(0.0717)	(0.0548)	(0.0512)
Output gap * Trend	-0.0139				
	(0.0189)				
Lag inflation * Spain dummy		0.0811			

Table 6. Determinants of Inflation: Additional Robustness Tests for Linear Model (Contd...)

		(0.0906)			
Output gap * Spain dummy		0.132			
		(0.140)			
Union density			0.0396		
			(0.344)		
EPL			0.299		
			(0.208)		
Low coordination			0.00286		
			(0.201)		
PMR			-0.267		
			(0.365)		
Change of union density				-0.494	
				(0.844)	
Change of EPL				0.0564	
				(0.238)	
Change of low coordination				-0.121	
				(0.164)	
Change of PMR				0.464	
				(0.390)	
Observations	242	242	242	242	261
Adjusted R^2	0.93	0.92	0.92	0.92	0.92

Source: IMF staff estimates.

Notes: Robust standard errors in parentheses. * denotes significance at 10% level, ** at 5% level, and *** at 1% level. All equations are estimated using instrumental variables, and including country fixed effects and time dummies.

Table 7. Marginal Effect of a Change in Regressor on Annual Inflation over 2000-2007 1/

	Lag inflation	Output gap	Union density	EPL	PMR
Austria	0.4	0.18	0.2	0.2	0.0
Belgium	0.5	0.18	0.2	0.2	0.0
France	0.5	0.21	0.2	0.2	0.1
Germany	0.3	0.16	0.2	0.1	0.0
Italy	0.3	0.20	0.3	0.2	0.0
Netherlands	0.3	0.17	0.3	0.2	0.0
Finland	0.6	0.18	0.2	0.1	0.1
Ireland	0.3	0.21	0.4	0.3	0.1
Portugal	0.7	0.20	0.4	0.3	0.1
Spain	0.6	0.17	0.4	0.3	0.1

Source: IMF staff estimates.

1/ Includes direct and indirect effects.

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