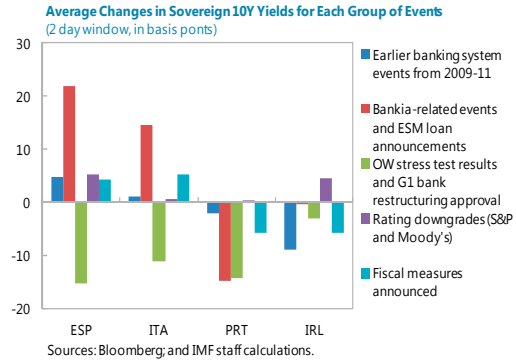
shocks on (and from) other euro area countries. IMF (2012) for example shows that core euro area banks that were more exposed to Spanish (and Italian) sovereigns experienced higher declines in stock prices and higher increase in CDS spreads when Spanish (and Italian) sovereign bond yields rose. Claeys and Vasicek (2012) find, through a GVAR framework over 2007–12, that Spanish bond spreads explained 20 percent of the variation in Italian spreads and 11 percent of variation in Greece/Ireland/Portugal spreads. In addition, they also find that the Spanish bond market has become the most systemic, both receiving and sending out shocks to other EU bond markets. Their GVAR results of bank returns also show that BBVA and Banco Santander are among the top three most systemic banks in Europe.

4. Financial market co-movement with Italy appears strong when the banking system was in the spotlight. Looking at a 2-day window of changes in asset prices, Spanish sovereign yield movements due to events in the banking system in 2012 seem to be highly correlated with Italy's yield, beyond the average correlation over time[2]. Other announcements of fiscal measures or rating downgrades did not have significant impacts on the Spanish market or abroad. However, once controlled for other common factors in a formal event study, the spillovers from these banking events in 2012 are not statistically significant.



Sources: Bloomberg; and IMF staff calculations.

5. Growth spillovers to other euro area countries through both trade and especially financial channels have indeed been significant. Poirson and Weber (2011) estimate a reduced form VAR model and find Spain to have been an important source of growth shocks for most other euro area countries. A 1 percent shock to Spain's growth increases GDP growth in Germany by 0.7 percent, in France by 0.5 percent, and in Italy by 0.3 percent. Dynamic contribution analysis also suggests that over the long run, Spain's growth had been a major source of positive growth spillovers to other European countries from 1975 to 2008, and had important negative spillovers since 2008.

References

IMF (2012), Euro Area Policies: Selected Issues

Claeys, P. and B. Vasicek (2012), "How systemic is Spain for Europe?", WP 2013/01, Research Institute for Applied Economics.

Poirson, H. and S. Weber (2011), "Growth Spillover Dynamics from Crisis to Recovery," IMF Working Paper 11/218.

[2] Banking system-related events refer to Bankia-related events as well as ESM loan events. The chart shows simple averages of changes on sovereign 10 year yields for each group of events. Earlier banking sector events include 9 events (for example, bank intervention and FROB creation). There were 6 Bankia-related events between May and July of 2012, 11 downgrades from S&P and Moody's from 2009 to 2012, and 6 fiscal measure announcements between 2010 and 2012.

SPAIN: PENSION PROJECTIONS[1]

1. The Spanish pension system has historically been efficient and well-funded. In the 2012 EC Aging Report, for example, Spain outperforms the EA17 average for pension expenditure, despite relatively high replacement of pre-retirement income. Nevertheless, a combination of unsustainable pension increases in pre-crisis years and downward population revision– critically because of working age outmigration (due in part to migrants attracted by housing related jobs) and lower birth rates – now implies a potentially unsustainable trajectory with emerging short-term fiscal pressures.

2. The population projection revision published by the Spanish National Statistical Institute (INE) in November 2012 implies a number of important changes to pension projections (see figure below). Among the most important is the declining population trend, driven in large part by a sharp revision to outmigration from Spain. If these projections materialize in the future, current pension risks are not fully captured by looking at the expenditure side of pension projections. In particular, looking at the long-term population pressures could miss the short-term impact from outmigration and unemployment driving pension deficits. Nevertheless, an upside risk also exists if current population projections extrapolate recent migration shocks that fail to materialize, rendering the current projections overly pessimistic.

3. Estimates of long-term pension balances based on the Spanish authorities' population projections, benefit formulas, and unemployment and outmigration projections, suggests the gains from the Pension Reform of 2011 have been largely eroded. In 2009, INE projected positive long-term Spanish population growth; hence, increases in the dependency ratio and in pension costs were driven by the increase in the proportion of elderly. While changing elderly population figures drove expenditure pressures, the revenue side remained stable due to a constantly replenished working population. The 2012 population projection shows a "base effect" from large observed outward migration alongside higher than expected unemployment and the ongoing recession, as well as projected long-term declines in population. This fuels pension deficits from the revenue side despite no change in the short-term dependant population (e.g., elderly).

4. In response to these pressures, in March the authorities published a reform to deter early retirement. The early retirement age increased by two years to 65 in 2012, which combined with the increases in the statutory retirement age in 2011 reform to 67, could push the effective to near 66 years, and could suggest annual savings of approximately 0.5-1 percent of GDP. To encourage later retirement, workers were also permitted to earn while receiving half their pension after the statutory retirement age, without paying further contributions other than an 8 percent tax. In addition, unemployment subsidies were reformed to incentivize greater labor participation of older workers, compensation was mandated for companies with disproportionately high layoffs of

[1] Prepared by Rafael Romeu (FAD)

older workers, and the 2012 labor market reform eliminated mandatory retirement clauses. These reforms are likely to deliver important long-term benefits.

5. A second important reform was taken in April of 2013, when the authorities announced a council of experts to design and report on the "sustainability factor". A committee of twelve experts were assigned to write a report for the "sustainability factor," i.e., the automatic adjustment that ensures the pension system is in actuarial balance. In the 2011 Pension Reform law, the design and implementation of the sustainability factor was scheduled to begin in 2027, hence this was an important positive change. The committee's make-up was inclusive of major political parties and social groups, and critically, included well-known and internationally respected academics and economists.

6. The committee's proposed sustainability factor is strong and exemplifies the type of high-quality adjustment measures Spain needs. In its June report, the committee recommended a "sustainability factor" (the annual formula for updating pensions) based on two components: (i) an intergenerational equity factor, and (ii) an annual growth factor. The intergenerational equity factor updates pension benefits for life expectancy—for a given base contribution history, an increase in the retirement period means a decline in the monthly pension benefit. The annual growth factor is a formula that determines the annual increase in pension benefits (see below). Pension benefits increase with inflation and as well as with real growth of pension system revenues—as the system becomes wealthier, benefits grow. Pension benefits decline every year as the number of persons receiving pensions increase and as the average pension increases due to new participants earning higher pensions relative to exiting participants. Finally, the annual growth in pension benefits is adjusted depending on the structural fiscal balance of the pension system (e.g. structural surpluses increase benefits). This ultimately ensures pension system solvency by adjusting pensions to balance the system.

Sustainability Factor Formula for Annual Pension Benefit Growth

Annual benefit growth	=	*Average inflation*	+	*Growth of revenues in real terms*	-	*Growth in the number of pensions*	-	*Difference of new less expiring pensions*	+	*Convergence speed*	x	*Structural surplus or deficit of system*

7. Further reforms can help alleviate pension pressures. The sustainability factor commission recommendations to link the statutory retirement age to life expectancy is welcome. Nevertheless, extending the wage history on which pension benefits are based from 25 years to 30 or 35 could also compliment this policy by improving the structural deficit and lower the substitution effect. In addition, the welcome recommendation to link the growth rate of pension to some proxy for structural pension revenues is sensible, as slowing the growth of real pension benefits from about 2 percent prior to the crisis to below real trend GDP growth will help stabilize the depletion of the pension savings fund. Notwithstanding the uncertainty of long-term projections, these reforms would help very likely stabilize costs and allow

Options for Potential Pension Savings by 2050
(annual savings in percent of GDP)

Gradually Retirement Age increase by 2 years	2
Increase reference period to 35 years	0.8

Source: Staff estimates.