

Supplementary Appendix. Shock Decompositions

The appendix shows historical decomposition of other series in addition to what is included in the main text.

Employment Rate

Figure S.1 shows the shock decomposition of the deviations of the employment rate, as share of total population, from its steady state. The employment share increased over the sample by almost 20 percentage points by 2007 before falling back again by more than half.¹ The contribution of the wage markup shock was negative in the first years of the estimation period but gradually reduced in size and turned into a positive contribution in 2001. It continued to boost employment up to 2007–8 but then declined.² The positive effect mainly reflects moderate wage growth and an increase in the participation rate. Other shocks that played a role are a positive contribution from the housing risk premium shock and a negative contribution from fiscal shocks.

Real Exchange Rate

The real exchange rate shows a strong appreciation trend since 2001, to a large extent driven by the positive contribution of the capital flows shock (lower interest rates), which boosted demand and inflation (figure S.2). Positive contributions also came from technology and loosening lending conditions. Lower productivity growth raised inflation in Spain and shows up as a positive contribution to the

¹The accumulated shocks and the data line show a large gap at the beginning of the sample (contribution of Others). The reason for the initial gap is the calibration of the steady-state employment rate at 60 percent, or 41 percent as share of total population, which is above the level in the beginning of the sample. We assume a higher steady-state level in the calibration, as the 1995–99 averages can no longer be considered representative for the Spanish labor market, as labor market reforms have led to a regime shift in the Spanish economy. Instead we base the calibration of labor market parameters on the full sample 1995–2011 (see section 4).

²The profile of this shock corresponds to European Commission estimates of the NAIRU for Spain that show a decline from 18 percent in 1995 to 8 percent in 2007, and a rise again since the onset of the crisis.

Figure S.1. Shock Decomposition: Employment

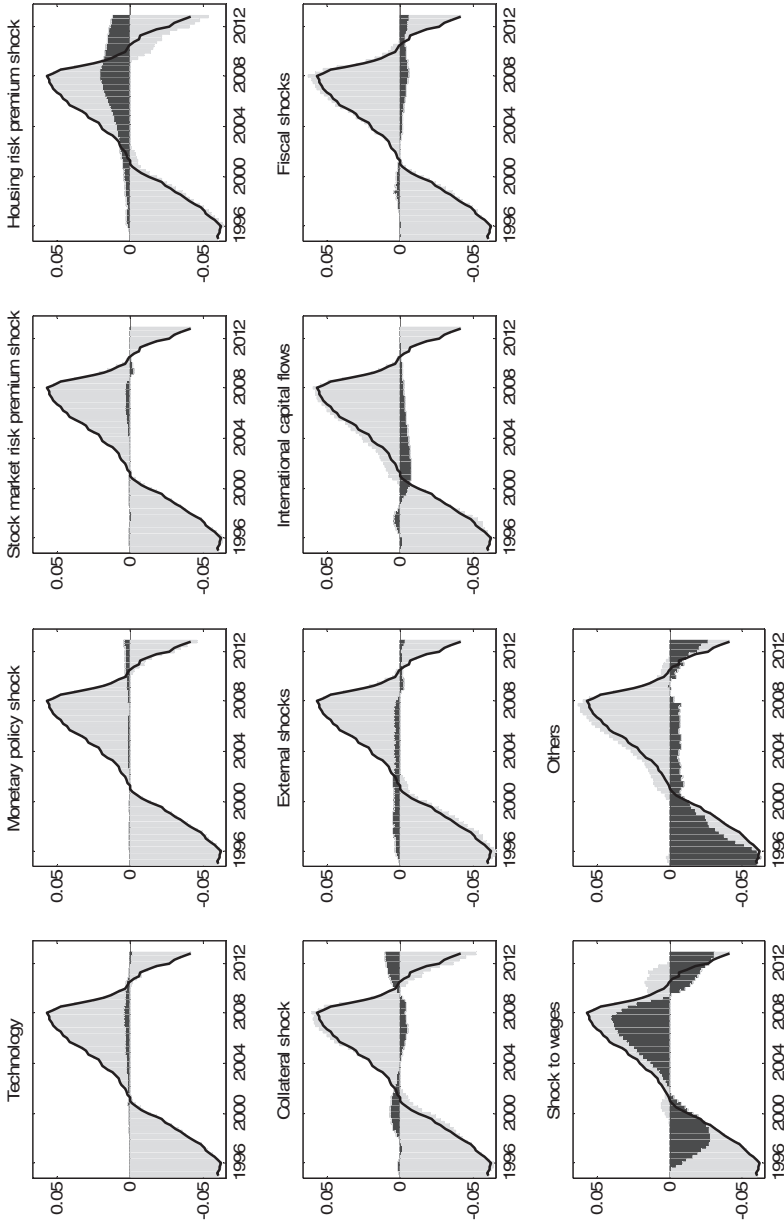
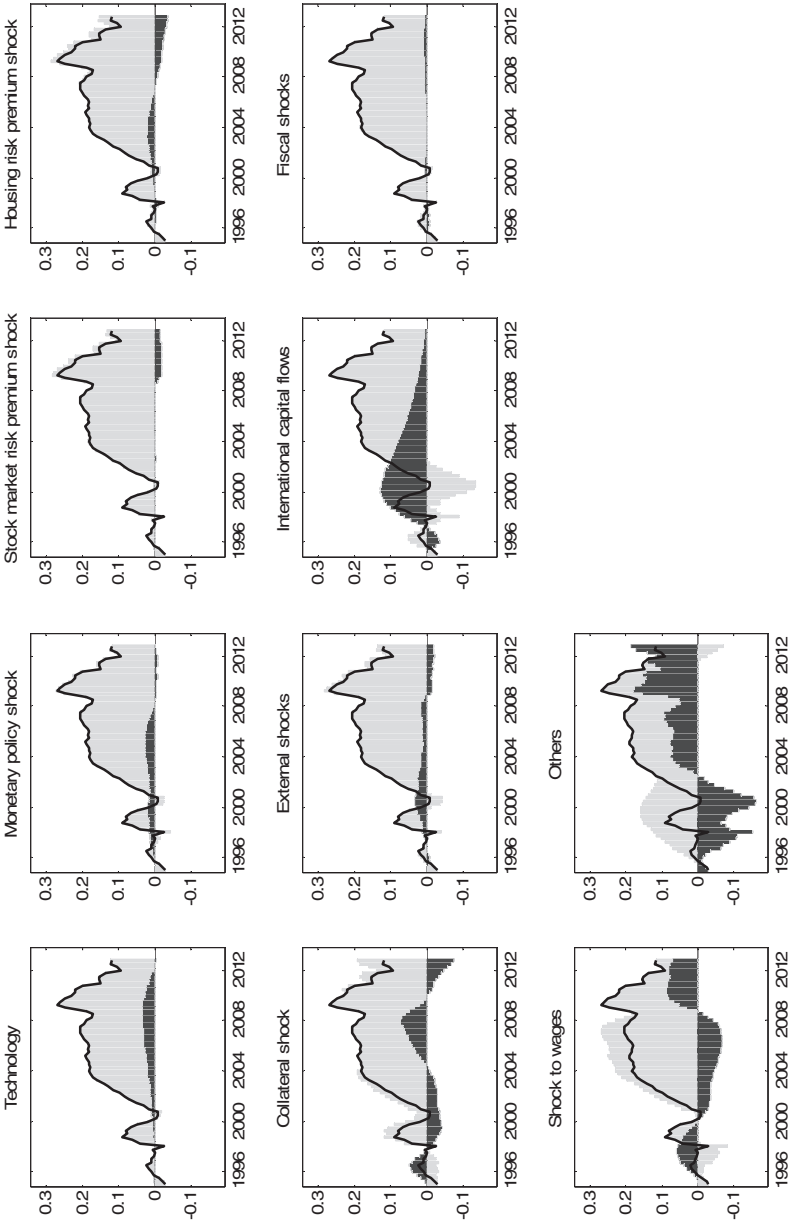


Figure S.2. Shock Decomposition: Real Exchange Rate



real exchange rate. The main negative factor reducing the appreciation trend was the labor market shock (labor market developments helped to reduce inflationary pressures in the period up to 2008). Insufficient wage flexibility in the crisis led to a further overvaluation of the real effective exchange rate. In recent years some correction has taken place, but there is still a sizable overvaluation of around 10 percent by the end of the sample period.

Unit Labor Costs

The shock decomposition of the year-on-year growth rate in unit labor costs shows, over most of the sample, no strong deviation of growth in unit labor costs from steady-state levels, reaching a peak in 2008 but falling significantly in recent years (figure S.3). The capital flows shock boosted demand and inflation and contributed to growth in unit labor costs up to 2003, and the collateral shock played a similar role in following years. The shock to wages helped to offset these two factors, but turned into a positive contribution in 2007–9. In the last years, growth in unit labor costs has been kept down by negative contributions of the technology shock and the collateral shock (tighter lending conditions), the negative stock market risk premium shock, and the external demand shock (decline in world trade).

House Prices

The shock decomposition of real house prices (deflated by the GDP deflator; figure S.4) shows that the sharp rise in house prices is mainly driven by non-fundamental factors in the model (housing risk premium shock). This house price bubble appears not to have completely burst yet, and there is still a significant positive contribution of the risk premium shock on house prices at the end of 2011. In addition, there was also a small positive contribution of the capital flows shock. Technological progress put some downward pressure on house prices, but this effect has become smaller in recent years.

Real Interest Rate

The shock decomposition of the real interest rate (figure S.5) shows the dominant effect of the financial shocks (elimination of risk

Figure S.3. Shock Decomposition: Growth of Unit Labor Cost

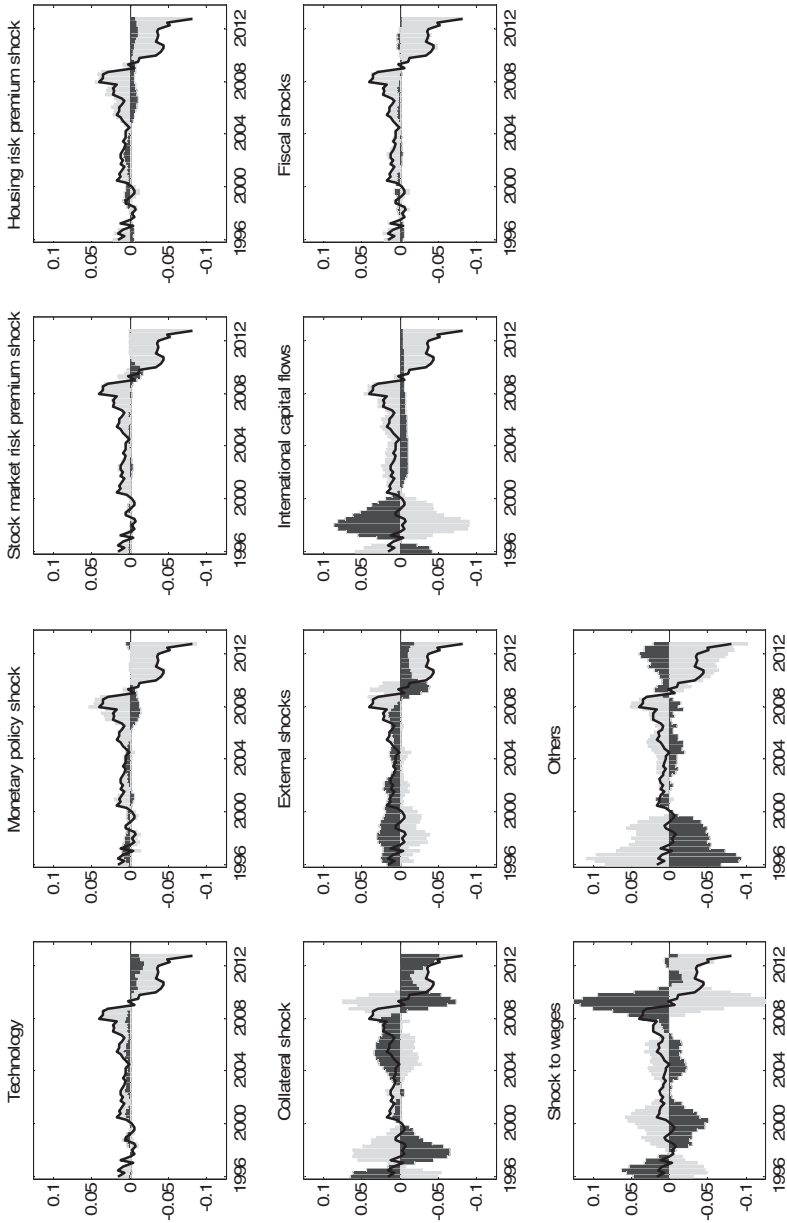


Figure S.4. Shock Decomposition: House Prices

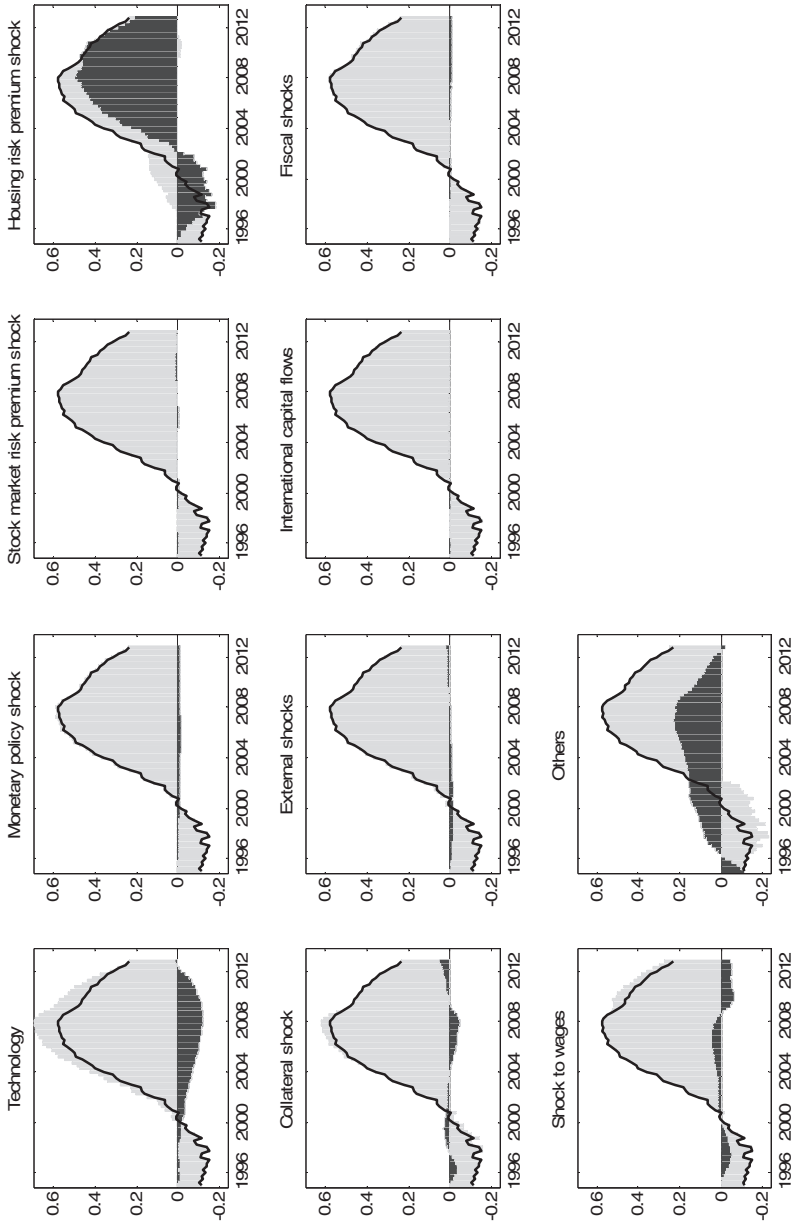
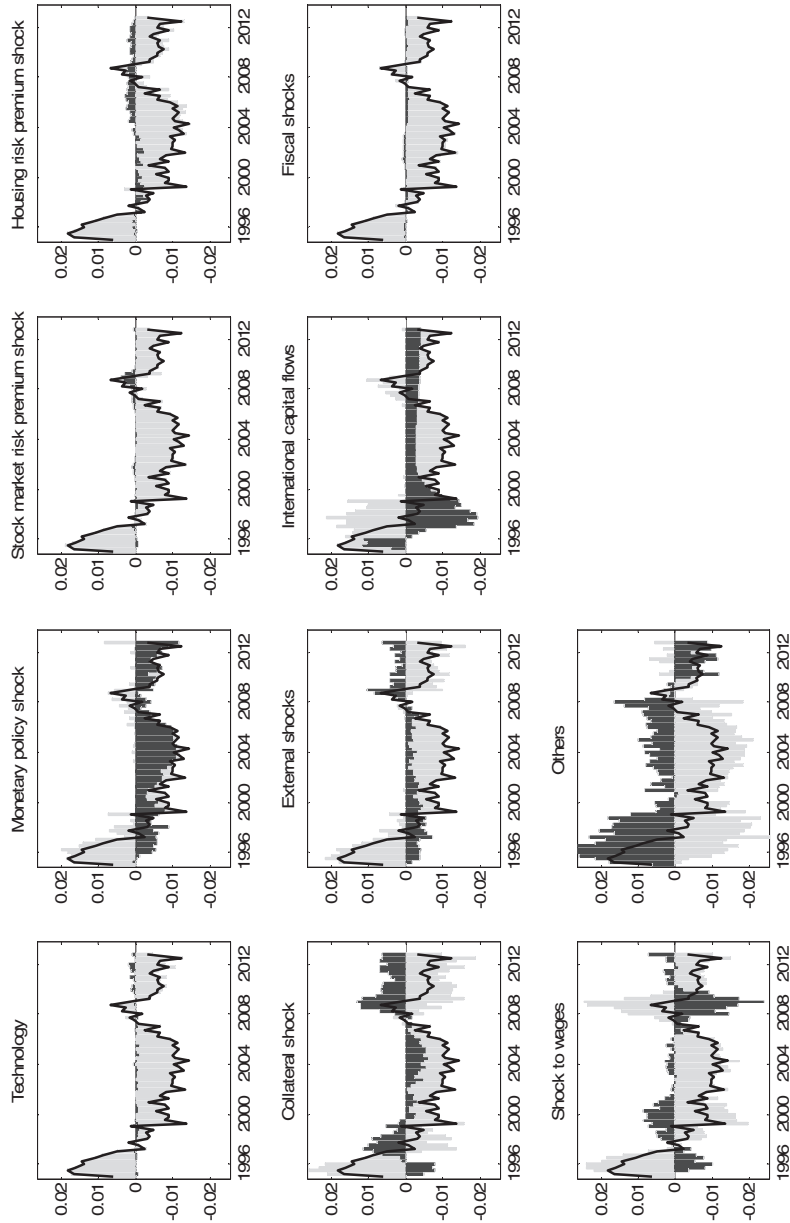


Figure S.5. Shock Decomposition: Real Interest Rate



premium in EMU and relative monetary stance). Real interest rates were below their steady-state level for most of the period since 1997, and were only briefly above it in 2008, when the ECB kept interest rates high while conditions in Spain deteriorated and Spain experienced a short period of deflation. Then, in late 2008, the ECB policy rate came down and the real interest rate declined again.