

5. SIMULATIONS

In Chapter 4 the behavioural equations are presented and explained individually. In this chapter we can see how these equations work, if they are combined to a macro model. For the illustration of the model's properties, several standard simulations are carried out. For this purpose five exogenous variables are subjected to a dramatic level shift in 1993 and the effects on key variables, such as GDP at constant prices, the price level (measured with the GDP deflator), employment and key demand variables, such as private consumption or investment into machinery and equipment are analysed. Each time the model solution is presented in levels. The baseline simulation is used as a benchmark for comparison. Deviations from the baseline are given in %. Results are presented graphically.

A striking feature of the model is that the real economy reacts much more sharply to any shocks than prices. Price effects in the model are actually very weak, which may not be realistic.

5.1 Increase of Total Demand in the United States of America

The first simulation exercise assumes a permanent increase of total demand in the United States of America by ten percent. Although the U.S. accounts for only about five percent of Spain's exports, there is a significant effect even on the GDP, especially in the short run, when exports overshoot significantly. However, the long run effect on the GDP is hardly felt, which is due to the negative effect of price increases on competitiveness and rising imports.

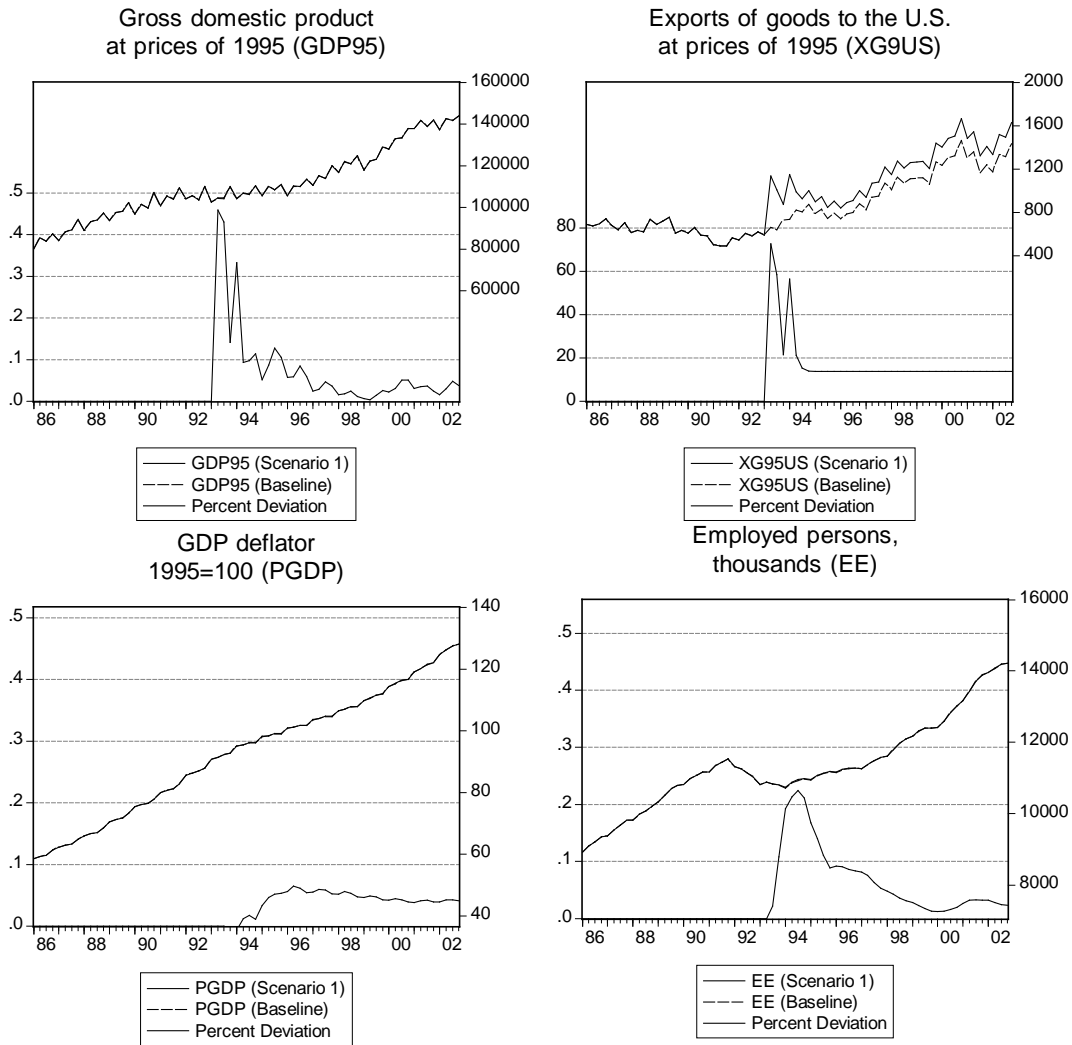


Figure 5.1: Simulation results of 10% permanent increase in US total demand

5.2 Increase of Total Demand in the Euro Area

An increase of total demand in the euro area by ten percent would have a sizeable effect on the Spanish economy. Exports to the euro area would surge by almost 40% above baseline and GDP would exceed the baseline by more than 3% in the short run. However, in the medium term part of the expansionary effect will be lost due to higher prices and higher imports.

We have to be careful, when we analyse the results of the model simulations. As third countries like the U.S. are also affected by the sharp increase of the euro area demand, they should also import more from abroad - including from Spain. This means

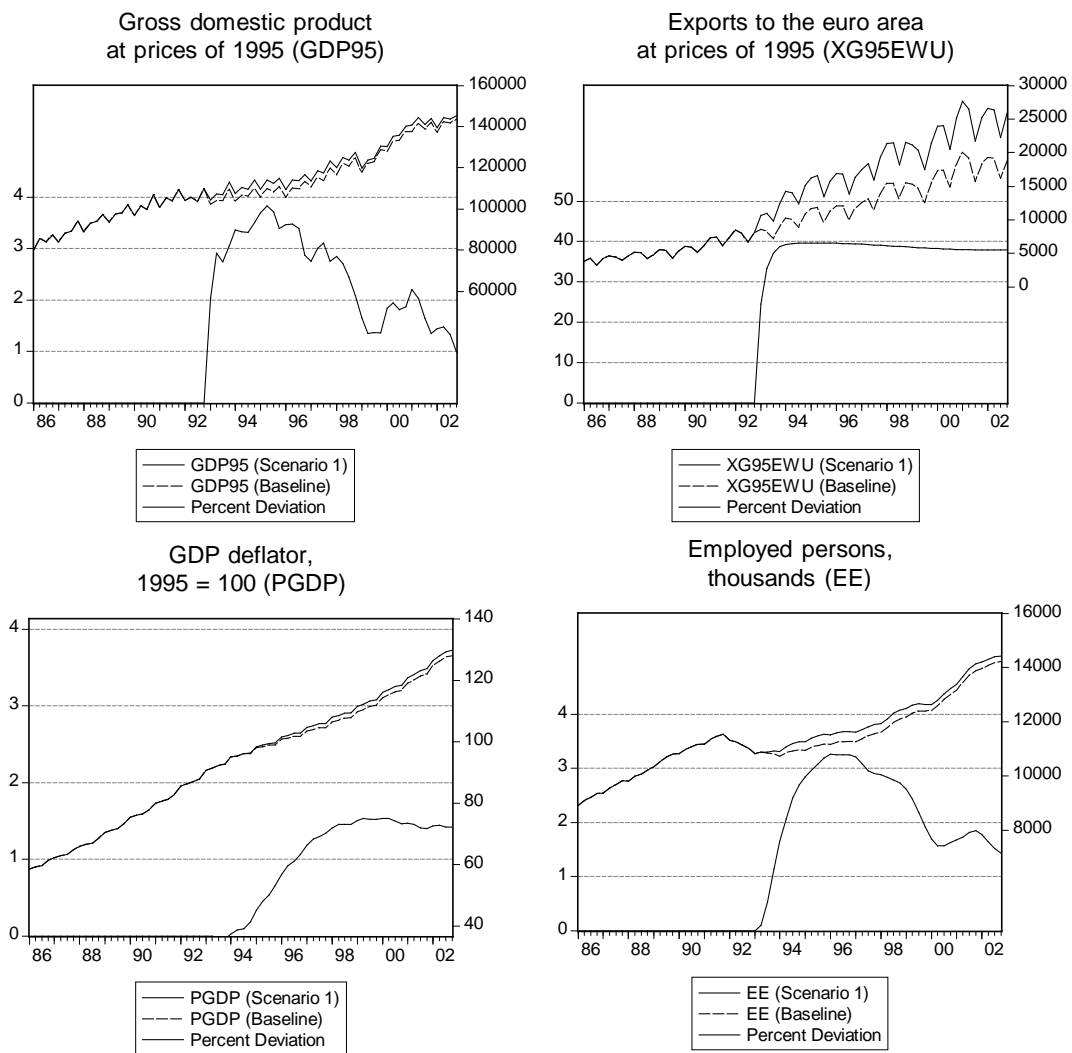


Figure 5.2: Simulation results of 10% permanent increase in the total demand of the euro area

that the model underestimates the true total effect of the assumed boom in the euro area.

5.3 Real Appreciation vis-à-vis the Rest of the Euro Area

What would happen in Spain, if Germany slipped into a deflation, can be assessed in the next simulation. It analyses the consequences of a permanent decrease of the German CPI by 10%. The change in the German price level has a direct effect on Spain's real effective exchange rate. Spain's competitiveness deteriorates and exports to the euro area end up more than 2% below baseline in the long run. There is an immediate loss of GDP growth of 0.5%, but in the long run Spain regains some of its competitiveness via lower inflation rates due to lower demand and a slower increase of imports.

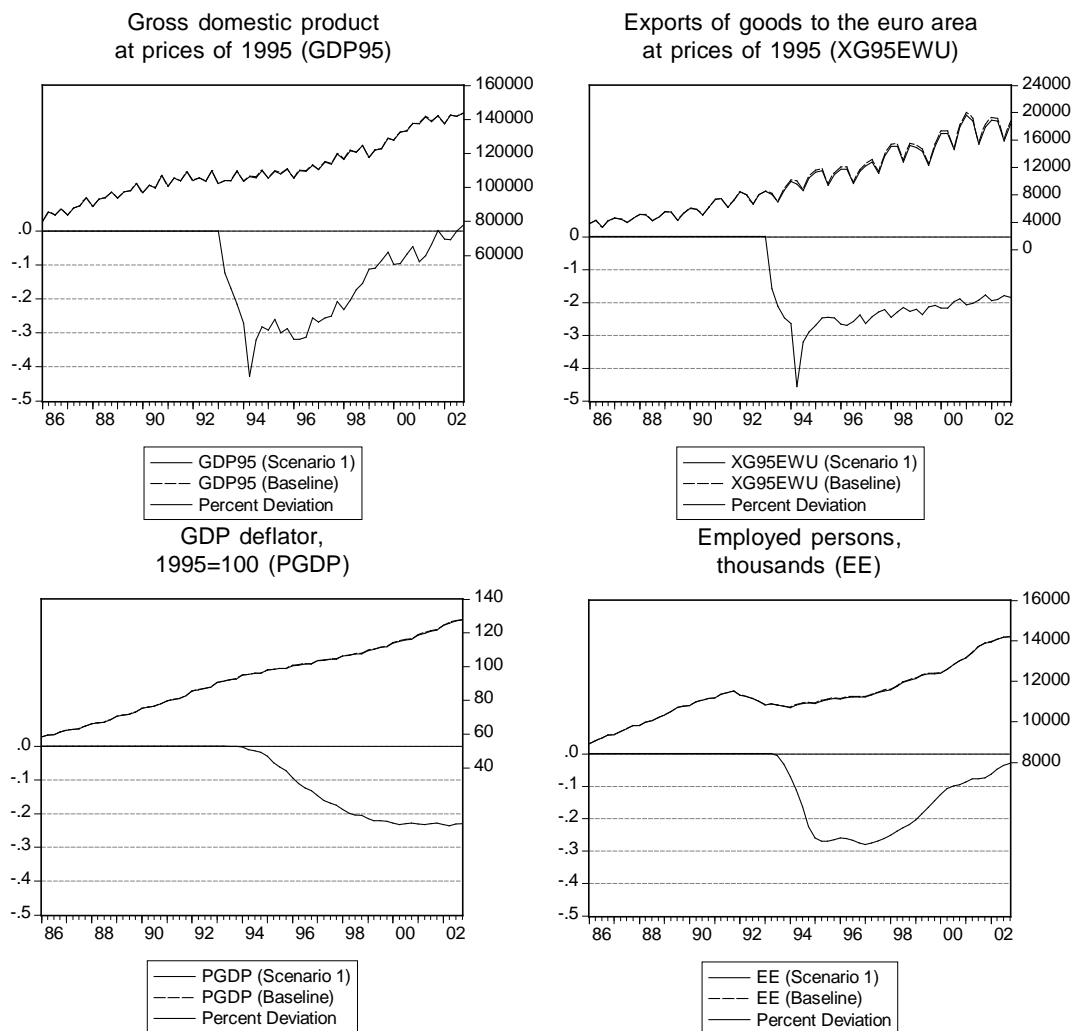


Figure 5.3: Simulation results of 10% permanent decrease of the German price level (CPI)

5.4 Increase of the Short Term Interest Rate

An increase of the interest rate by 100 base points would have a very strong effect on economic activity in Spain, because not only investment, but also private final consumption expenditure depend on the interest rate level. Consumption and investment demand would therefore remain significantly below the baseline and losses of GDP growth would amount to about 1.2 %. Therefore, employment would expand much more slowly and the inflation rate would decline.

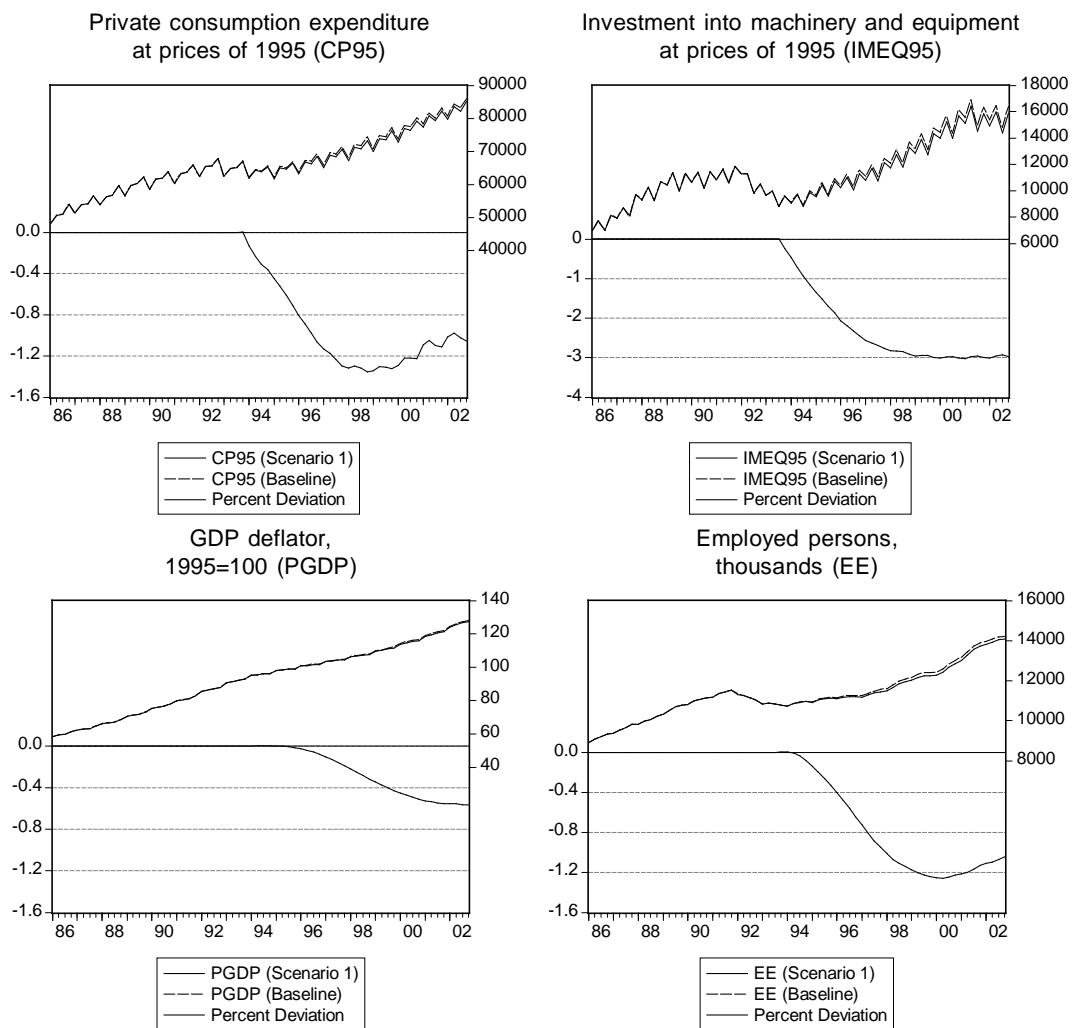


Figure 5.4: Simulation results of permanent decrease of the short term interest rate by 100 basis points

In the context of the monetary union the overall effect would be stronger than the simulation shows, because the other euro area countries would equally suffer losses of

demand, which would negatively affect Spain's exports¹.

5.5 Increase of Public Investment

The fifth simulation is a fiscal policy shock. It assumes a permanent increase of public construction investment by 10%. In the short run GDP would grow by an extra 0.8%, but the effect would not be permanent due to an increase in the price level and corresponding loss of competitiveness. Therefore, GDP would only be about 0.3% higher in the long run. The effect is similar for employment.

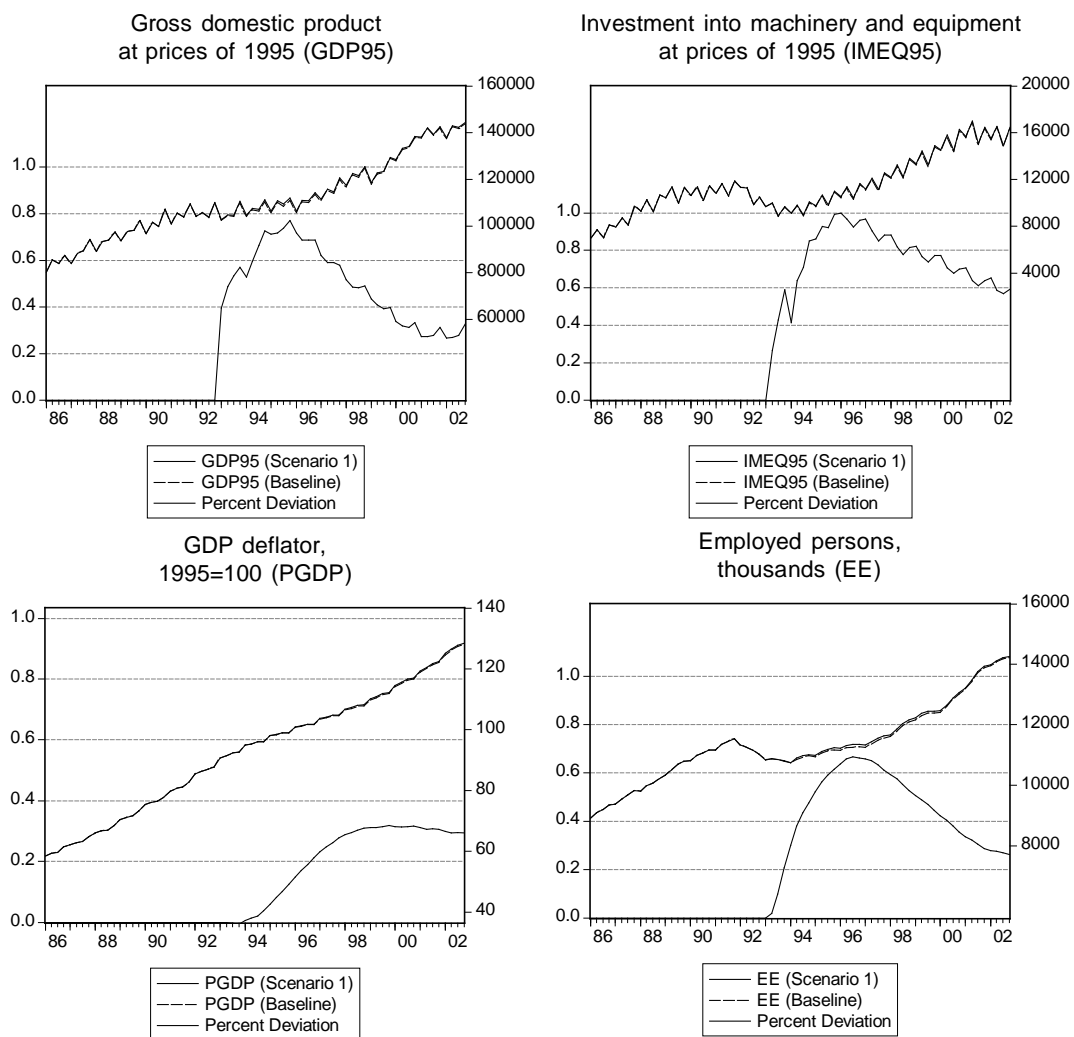


Figure 5.5: Simulation results of a 10% permanent increase of public construction investment

¹ If Spain is analysed in isolation exports to all regions actually increase due to increased competitiveness. The fact that inflation rates also decrease in the remaining euro area countries is not taken into account in a single country model.