

A Static Applied GE Analysis of Spain's Integration into the European Community in 1986

Kehoe-Manresa-Noyola-Polo-Sancho-Serra MEGA model of the Spanish economy: A Shoven-Whalley type model with perfect competition, modified to allow government and trade deficits and unemployment (Kehoe-Serra).

Spain's entry into the European Community in 1986 was accompanied by a fiscal reform that introduced a value-added tax (VAT) on consumption to replace a complex range of indirect taxes, including a turnover tax applied at every stage of the production process. What would happen to tax revenues? Trade reform was of secondary importance.

Kehoe-Polo-Sancho (1992) evaluation of the performance this model: Other changes besides policy changes were important!

Changes in Consumer Prices in the Spanish Model (Percent)

sector	data 1985-1986	model policy only	model shocks only	model policy&shocks
food and nonalcoholic beverages	1.8	-2.3	4.0	1.7
tobacco and alcoholic beverages	3.9	2.5	3.1	5.8
clothing	2.1	5.6	0.9	6.6
housing	-3.3	-2.2	-2.7	-4.8
household articles	0.1	2.2	0.7	2.9
medical services	-0.7	-4.8	0.6	-4.2
transportation	-4.0	2.6	-8.8	-6.2
recreation	-1.4	-1.3	1.5	0.1
other services	2.9	1.1	1.7	2.8
weighted correlation with data		-0.08	0.87	0.94
variance decomposition of change		0.30	0.77	0.85
regression coefficient <i>a</i>		0.00	0.00	0.00
regression coefficient <i>b</i>		-0.08	0.54	0.67

Measures of Accuracy of Model Results

1. Weighted correlation coefficient.
2. Variance decomposition of the (weighted) variance of the changes in the data:

$$\mathit{vardec}(y^{data}, y^{model}) = \frac{\mathit{var}(y^{model})}{\mathit{var}(y^{model}) + \mathit{var}(y^{data} - y^{model})}.$$

- 3, 4. Estimated coefficients a and b from the (weighted) regression

$$x_i^{data} = a + bx_i^{model} + e_i.$$

Changes in Value of Gross Output/GDP in the Spanish Model (Percent)

sector	data 1985-1986	model policy only	model shocks only	model policy&shocks
agriculture	-0.4	-1.1	8.3	6.9
energy	-20.3	-3.5	-29.4	-32.0
basic industry	-9.0	1.6	-1.8	-0.1
machinery	3.7	3.8	1.0	5.0
automobile industry	1.1	3.9	4.7	8.6
food products	-1.8	-2.4	4.7	2.1
other manufacturing	0.5	-1.7	2.3	0.5
construction	5.7	8.5	1.4	10.3
commerce	6.6	-3.6	4.4	0.4
transportation	-18.4	-1.5	1.0	-0.7
services	8.7	-1.1	5.8	4.5
government services	7.6	3.4	0.9	4.3
weighted correlation with data		0.16	0.80	0.77
variance decomposition of change		0.11	0.73	0.71
regression coefficient <i>a</i>		-0.52	-0.52	-0.52
regression coefficient <i>b</i>		0.44	0.75	0.67

**Changes in Trade/GDP
in the Spanish Model (Percent)**

	data	model	model	model
direction of exports	1985-1986	policy only	shocks only	policy&shocks
Spain to rest of E.C.	-6.7	-3.2	-4.9	-7.8
Spain to rest of world	-33.2	-3.6	-6.1	-9.3
rest of E.C. to Spain	14.7	4.4	-3.9	0.6
rest of world to Spain	-34.1	-1.8	-16.8	-17.7
weighted correlation with data		0.69	0.77	0.90
variance decomposition of change		0.02	0.17	0.24
regression coefficient <i>a</i>		-12.46	2.06	5.68
regression coefficient <i>b</i>		5.33	2.21	2.37

Changes in Composition of GDP in the Spanish Model (Percent of GDP)

variable	data 1985-1986	model policy only	model shocks only	model policy&shocks
wages and salaries	-0.53	-0.87	-0.02	-0.91
business income	-1.27	-1.63	0.45	-1.24
net indirect taxes and tariffs	1.80	2.50	-0.42	2.15
correlation with data		0.998	-0.94	0.99
variance decomposition of change		0.93	0.04	0.96
regression coefficient <i>a</i>		0.00	0.00	0.00
regression coefficient <i>b</i>		0.73	-3.45	0.85
private consumption	-0.81	-1.23	-0.51	-1.78
private investment	1.09	1.81	-0.58	1.32
government consumption	-0.02	-0.06	-0.38	-0.44
government investment	-0.06	-0.06	-0.07	-0.13
exports	-3.40	-0.42	-0.69	-1.07
-imports	3.20	-0.03	2.23	2.10
correlation with data		0.40	0.77	0.83
variance decomposition of change		0.20	0.35	0.58
regression coefficient <i>a</i>		0.00	0.00	0.00
regression coefficient <i>b</i>		0.87	1.49	1.24

Public Finances in the Spanish Model (Percent of GDP)

variable	data 1985-1986	model policy only	model shocks only	model policy&shocks
indirect taxes and subsidies	2.38	3.32	-0.38	2.98
tariffs	-0.58	-0.82	-0.04	-0.83
social security payments	0.04	-0.19	-0.03	-0.22
direct taxes and transfers	-0.84	-0.66	0.93	0.26
government capital income	-0.13	-0.06	0.02	-0.04
correlation with data		0.99	-0.70	0.92
variance decomposition of change		0.93	0.08	0.86
regression coefficient <i>a</i>		-0.06	0.35	-0.17
regression coefficient <i>b</i>		0.74	-1.82	0.80