IRPET Regional Institute for Economic Planning of Tuscany

The Household Consumption system in DANTE:

A PADS for Italy

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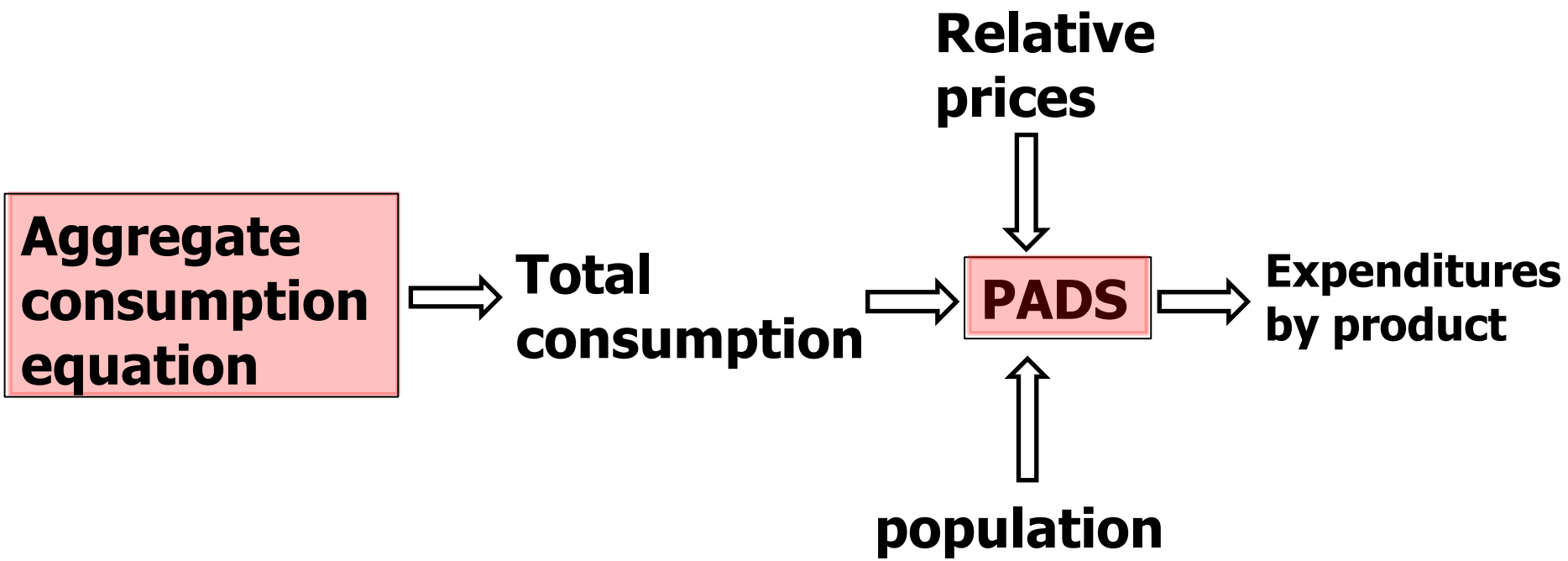
Main features of DANTE

Task: Analysis of structural changes + Policy analysis

In order to do this we decided to build a model:

1) multi-regional (3 regions);
2) multi-sectoral (30 industries; 59 commodities);
3) structural
4) econometric
5) micro-macro (households microsimulation model)

Resident Household Consumption in DANTE



The INFORUM approach to Demand System estimation

Main features of PADS:

1) A two stage approach (cross-section + time-series);

2) A functional form easy to estimate (a sparing specification);

3) Many important features:
   a) It is able to consider both complementarity and substitution effects;
   b) It is able to consider the effects of relative prices on marginal propensity to consume;
   c) It is able to consider a significant growth in real income;

Shortcomings in PADS for DANTE:

1) I worked with one population (cross-section + time-series);

2) I worked at the national level;

PADS for Italy

Some features:

1) I introduced dummy var. to control for specific events (sales incentive 97-98);

2) For some durables I used the laggeg value of the stock;

3) For some other durables I used the real interest rate:

Regression period:

I worked with time series starting in 1980. The last year is 2007

Categories of consumption:

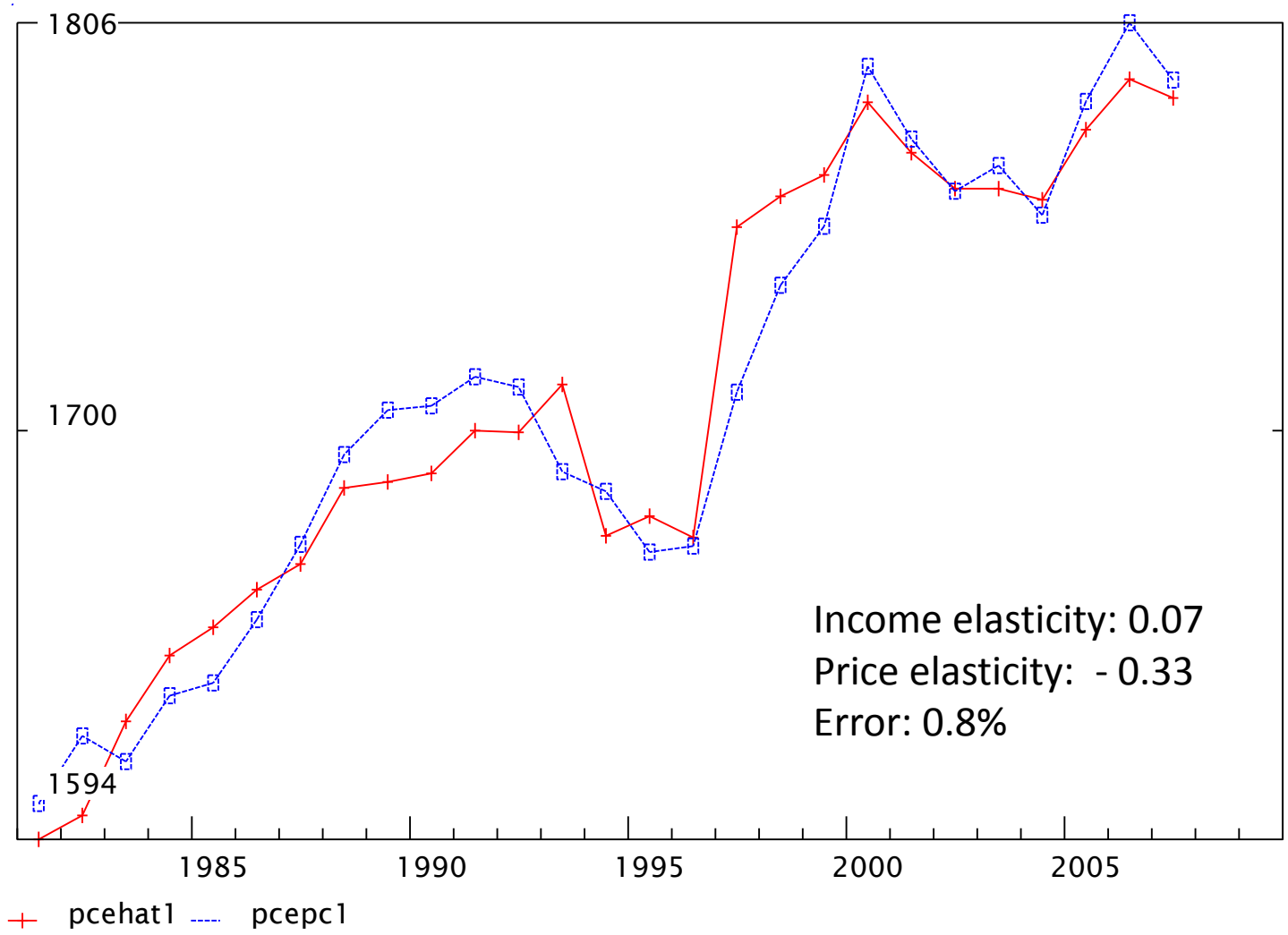
41 consumption categories (non dur + dur + services)

Categories of consumption

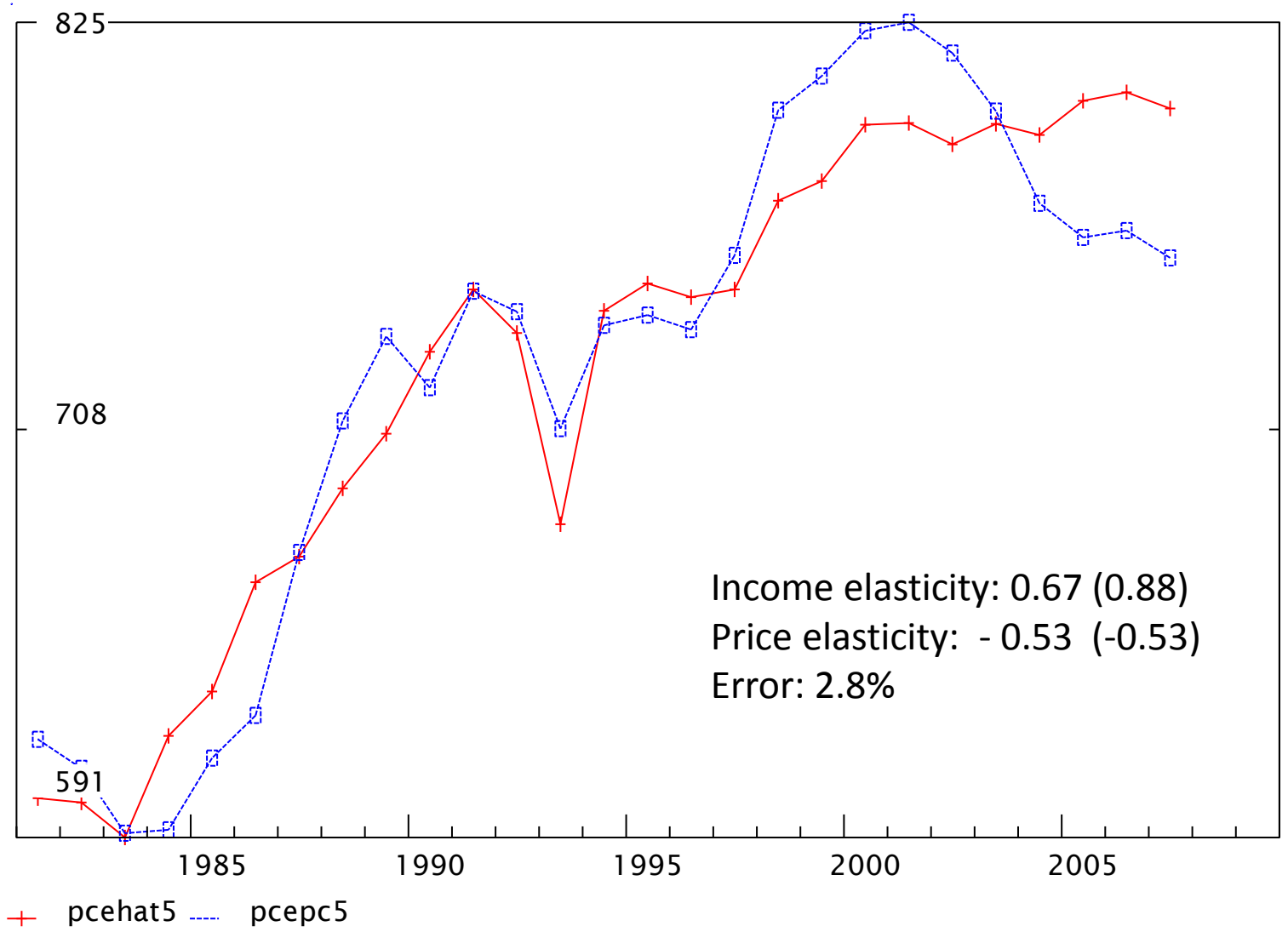
Food Non alc beverages, Coffee, Tea and Cocoa	Group 1°
Clothing Footwear and Repair	Group 2°
TV, Radio, Photo, Computers Furniture Kitchen and Household appliances	Group 3°; 2 sub-gr.
Public Transportation Vehicles Operation of Motor Vehicles	Group 4°; 2 sub-gr.
Household Linen China, Glassware and Tableware Household and garden utensils	Group 5°
Telephone and communication equipment Telephone and communication services	Group 6°
Other recreational durables Recreational equipment, flowers, plants, pets Recreational and cultural Services Books, newspaper	Group 7°; 2 sub-gr.
All inclusive holidays Bar and Restaurants Hotels & motels	Group 8°
Personal Care equipment Personal care items n.e.c.	Group 9°
Insurance Financial Services	Group 10°

Alcoholic Beverages Tobacco Rents Tenant Occupied Rent House maintenance Water and other household services Electricity, gas, and other fuels Other NonDurables Drug Preparation, Sundries and orthopedic equi Physicians, Dentists, Other Medical prof Hospitals, Nursing Homes Postal services Education Social services Other Services n.e.c.	No group

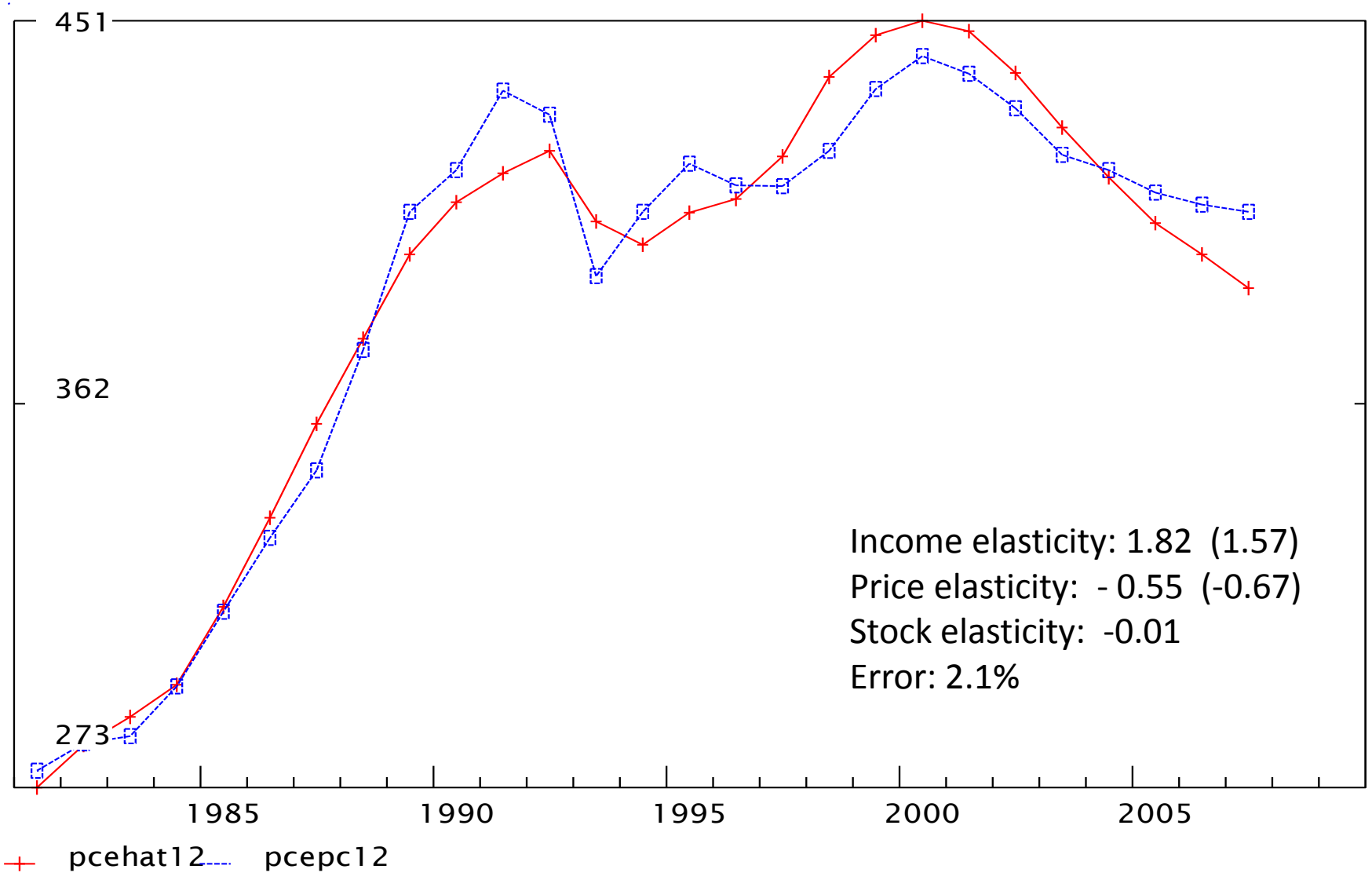
Food


1806
1700
1594
1985
1990
1995
2000
2005
Income elasticity: 0.07
Price elasticity: - 0.33
Error: 0.8%
pcehat1
pcepc1

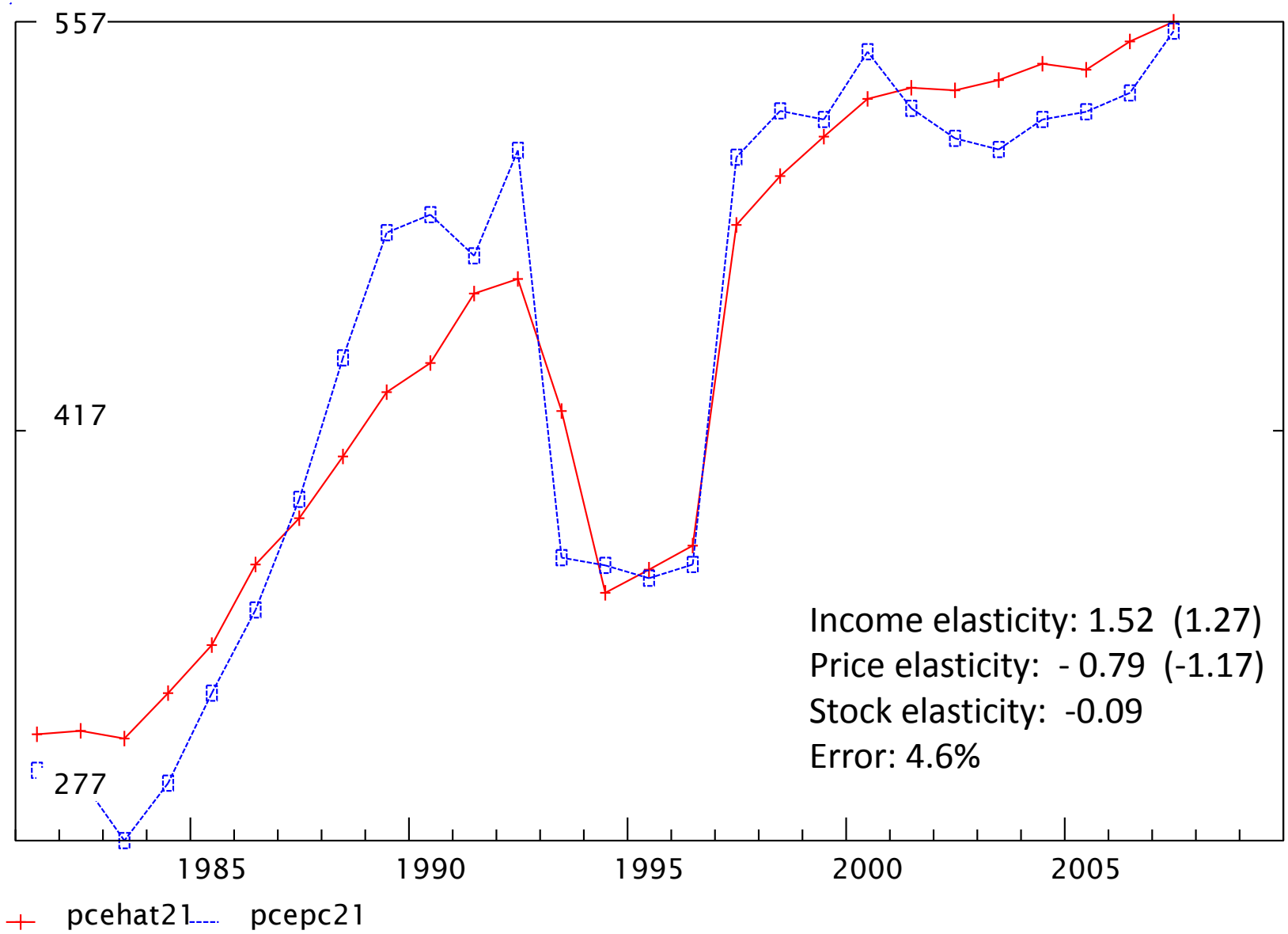
Clothing


825
708
591
1985
1990
1995
2000
2005
pcehat5
pcepc5
Income elasticity: 0.67 (0.88)
Price elasticity: - 0.53 (-0.53)
Error: 2.8%

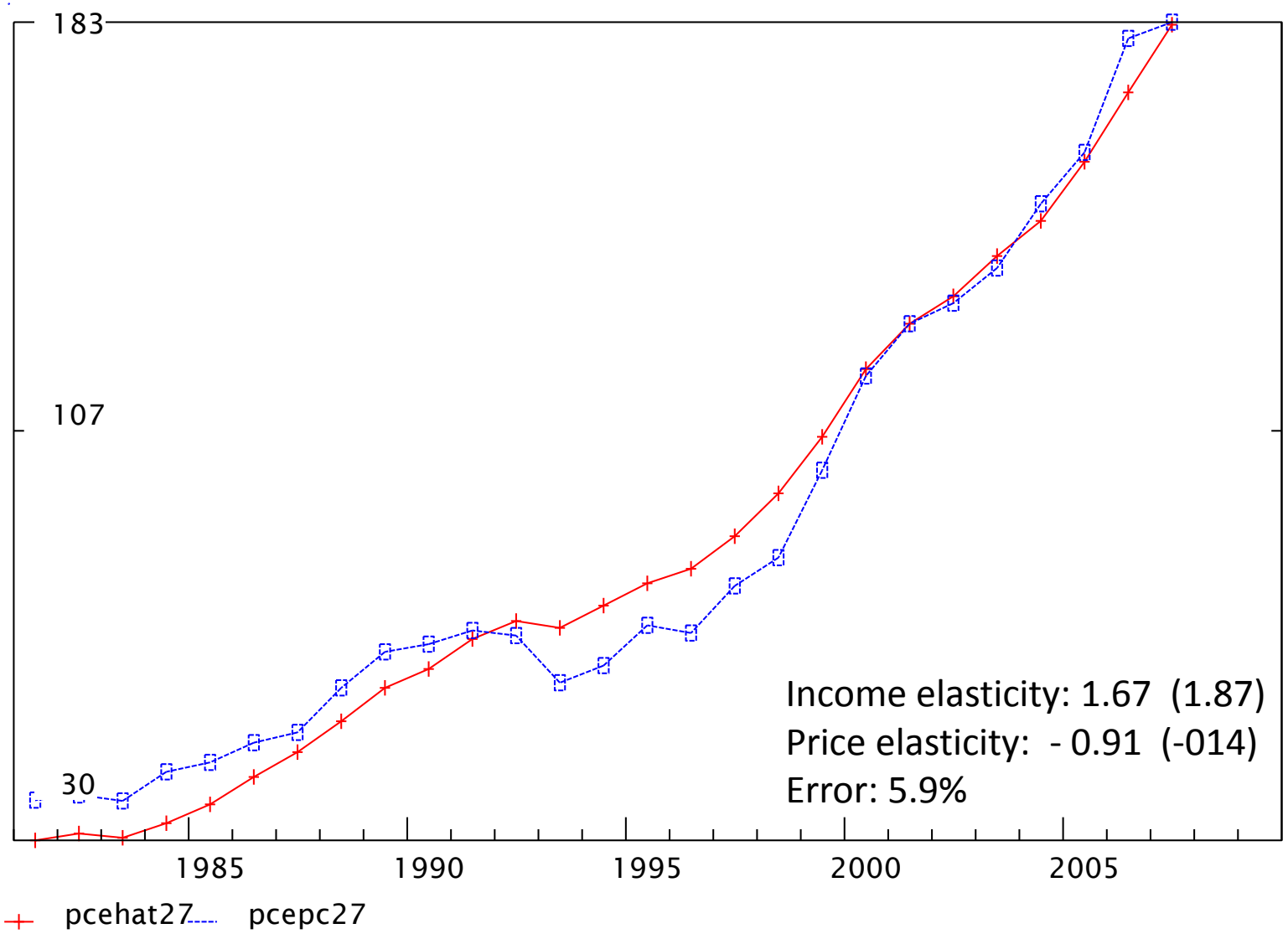
Furniture


451
362
273
1985
1990
1995
2000
2005
Income elasticity: 1.82 (1.57)
Price elasticity: - 0.55 (-0.67)
Stock elasticity: -0.01
Error: 2.1%
pcehat12
pcepc12

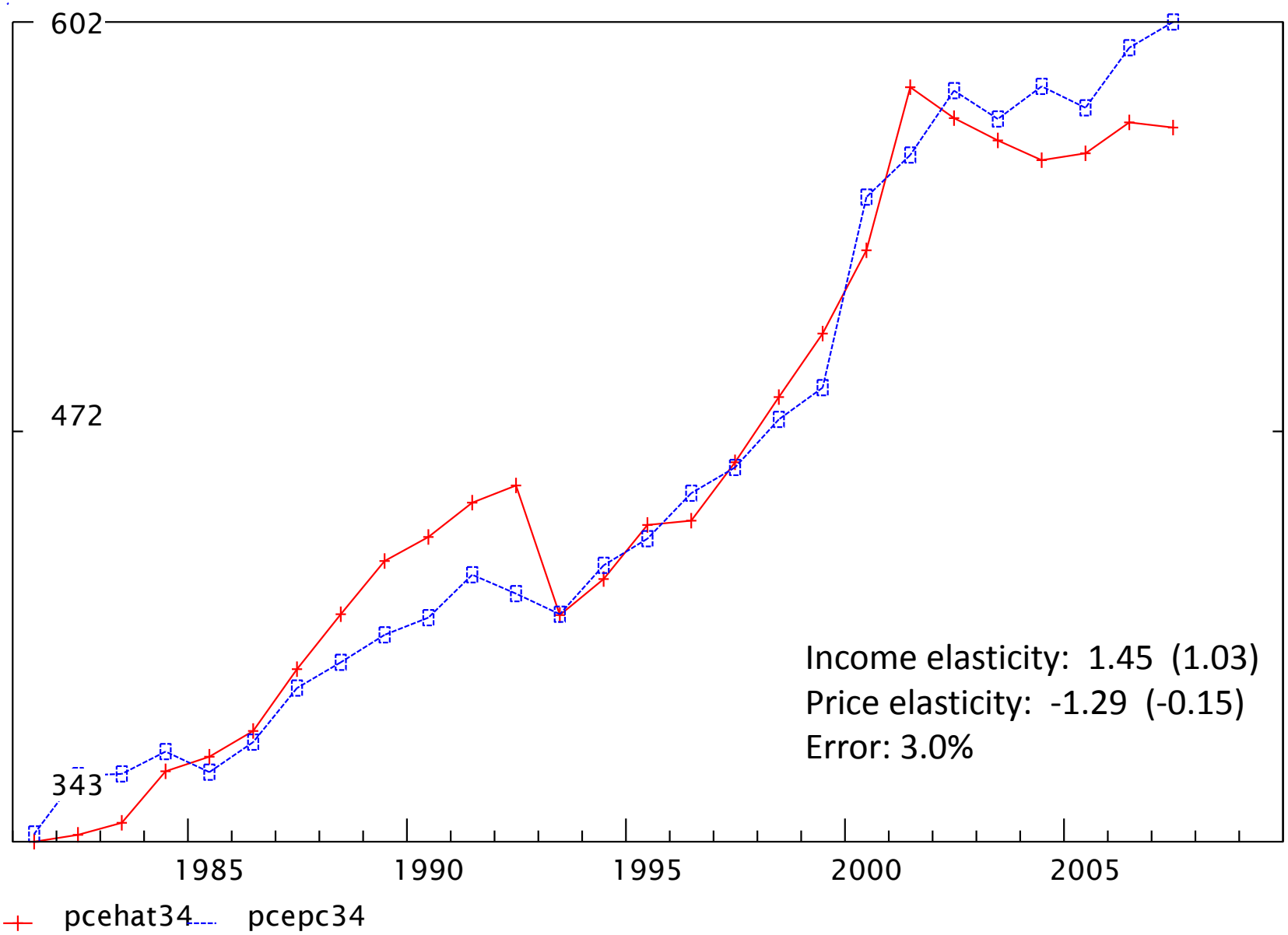
Vehicles


557
417
277
1985
1990
1995
2000
2005
Income elasticity: 1.52 (1.27)
Price elasticity: - 0.79 (-1.17)
Stock elasticity: -0.09
Error: 4.6%
pcehat21
pcepc21

TV, Radio and personal computer



Bar and Restaurants



Aggregate Consumption Equation

Life Cicle Hypothesis:

1) Income;

2) Real interest rate;

3) Net financial wealth;

Error Correction Model:

1) Long Run equation; log (C)= f (log (W); log (YD); log (pop))

2) Short Run equation; D.log (C)= f (Dlog (Y); D(r); log (residul_LR))

Aggregate Consumption – step 1: Long Run eq.

Variables are in natural log

		North-Center	Tuscany	South
(1)	Constant	-13.40434	-19.73932	-18.41296
(2)	Disposable_income/Price	0.591021	0.498445	0.801311
(3)	Net_financial_Wealth/Price	0.422187	0.501555	0.211576
(4)	Population	1.200335	2.319865	1.812648
	R-squared	0.979046	0.94757	0.981099
	Adjusted R-squared	0.975903	0.942576	0.978264

According to the theory the sum of the parameters (2 + 3) should be equal to one.

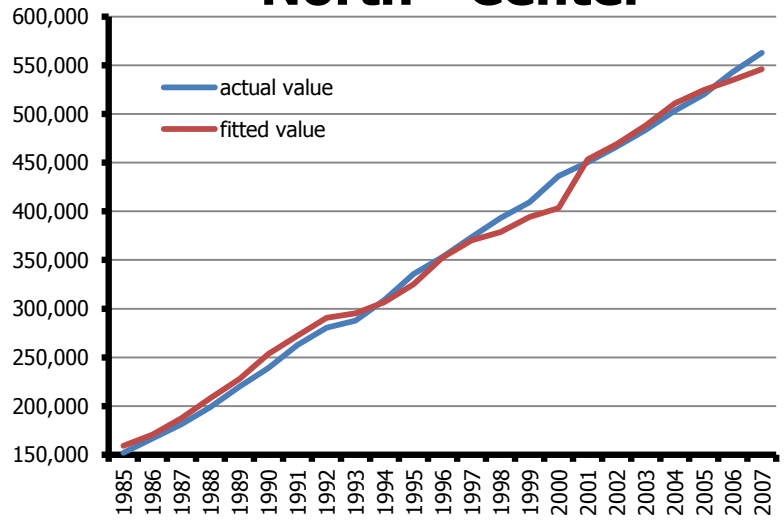
Constrained to be equal to 1

Problem with population.

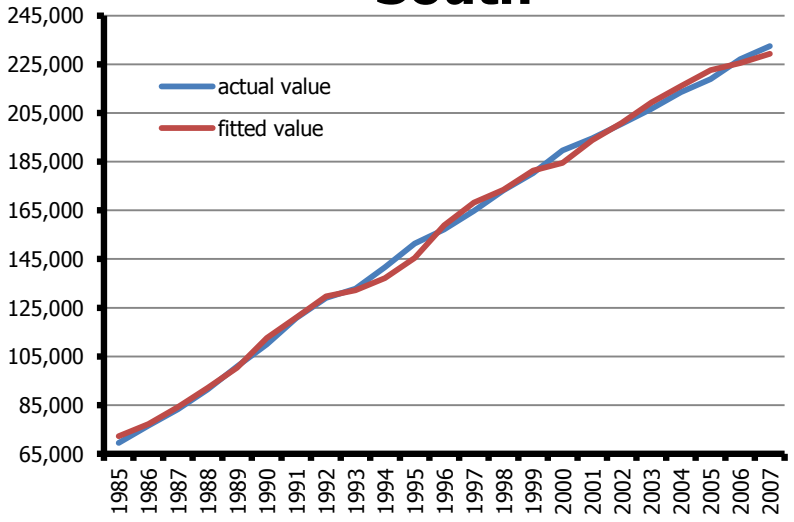
	North-Center	Tuscany	South
Constant	-0.605	-0.651	-0.227
Disposable_income/Price	0.691	0.624	0.818
Net_financial_Wealth/Price	0.308	0.375	0.181
R-squared	0.9484	0.9173	0.9757
Adjusted R-squared	0.9464	0.9142	0.9748

Aggregate Consumption – step 1: Long Run eq.

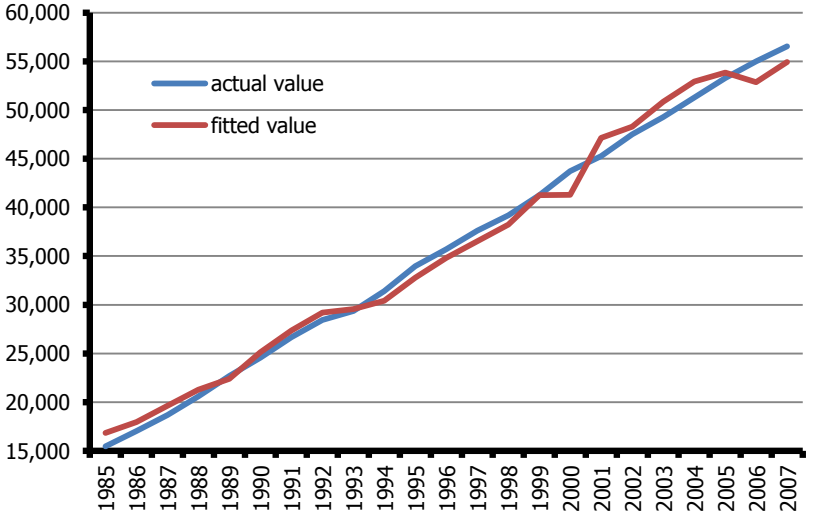
North - Center



South



Tuscany



Aggregate Consumption – step 2: Short Run eq.

	North-Center	Tuscany	South
Constant	**0.013**	**0.013**	**0.010**
Delta log (Disposable Income/Price)	**0.611**	**0.350**	**0.456**
Delta (nominal interest rate - inflation)$_{(t-1)}$	**-0.004**	**-0.005**	**-0.006**
Log (residual_LR)$_{(t-1)}$	**-0.109**	**-0.135**	**-0.367**
R-squared	**0.937**	**0.900**	**0.948**
Adjusted R-squared	**0.909**	**0.864**	**0.926**

There are some dummy variables use to control specific events:

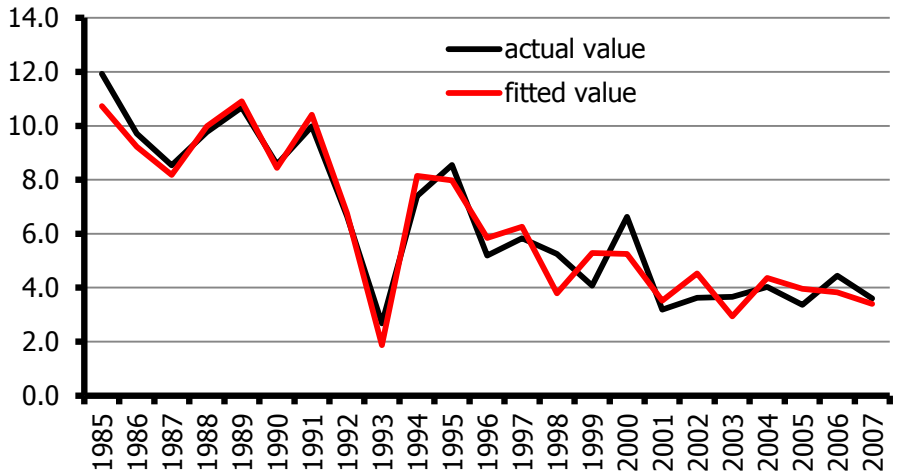
1) Introduction of Euro (I used a dummy for 2001-2004)
2) "Rottamazione" (dummy for 1998)

Aggregate Consumption – step 2: Short Run eq.

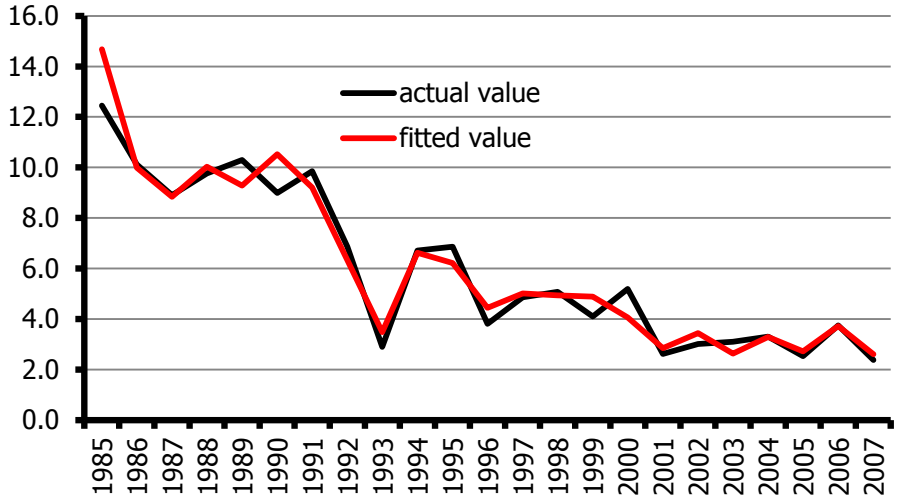
Resident Household Consumption.

Nominal term. % change

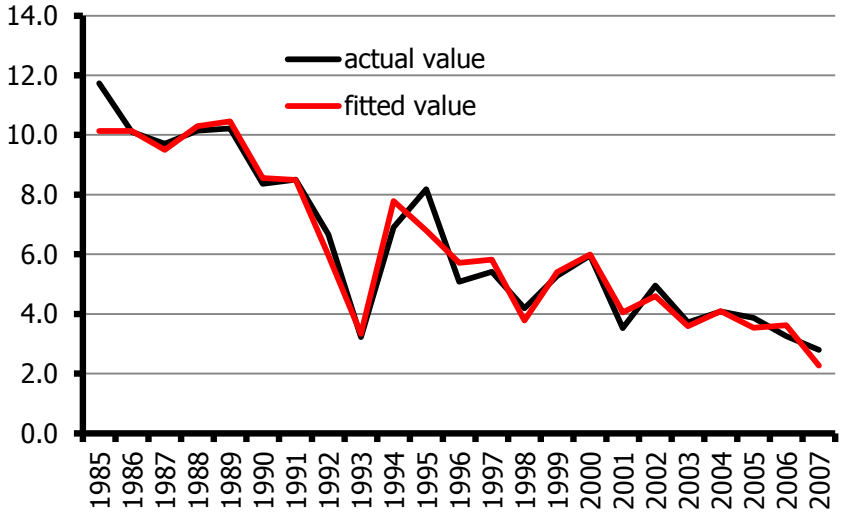
North - Center



South



Tuscany



Thanks ...

Time-series specification for PADS

$$x_i(t) = \underbrace{\left[a_i(t) + b_i \left(\frac{y}{P} \right) \right]}_{\text{Income term}} \cdot \underbrace{\left(\frac{p_i}{P} \right)^{-\lambda_0} \cdot \prod_{k=1}^{n} \left(\frac{p_i}{p_k} \right)^{-\lambda_k \cdot s_k} \cdot \left(\frac{p_i}{P_G} \right)^{-\mu_G}}_{\text{Price term}}$$

Problem with Population