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NEW FEATURES OF THE INTIMO MODEL

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ITALY

1. The current stage

INTIMO model has made its first steps. At present, the real side is characterized by investments equations (including a macro equation), import shares equations and labour productivity equations. Personal Consumption Expenditure equations is the next set of equations to be introduced in the model. Basically, the real side is close to reach a satisfactory model structure. The price side is still "empty".

This paper reports information about the data base built on the ESA95 system. Some problems concerning measurement in purchasers' and basic prices among make and use matrices and available time series related to group of commodities or to industries are outlined. The size of the loss in the accounting identities due to the introduction of chain indexing is analyzed for Personal Consumption Expenditure by COICOP groups of expenditures and Investments by investors.

Besides the estimation of labour productivity equations, the impact of the Employment European Strategy and the reforms in the labour market institutions is analyzed to point out a likely bias in the decline of the Italian labour productivity.

Investments and capital stock data are used to investigate the replacement ratios attributed to investors. The replacement ratio time trends and the Istat (the Italian Central Statistical Bureau) Methodological Guide suggest to use a non constant replacement ratio whereas capital stock is computed from investments according to the perpetual inventory principle.

2. Accounting framework

Istat has published a time series of supply, use and import flows matrices for the years 1995-2003. These matrices are built according to the Eurostat format based on ESA95. The European detail is based on 60 sectors; the Italian matrices consider 59 sectors both for industries and products (the last one, which refers to extra-territorial units, is omitted). The supply matrices are built at basic prices; use matrices are available at purchasers' and basic prices.

Istat has made available a set of matrices for year 2000. Besides the supply and use matrix at basic prices, a set of other matrices is provided: a matrix of non deductable VAT, a matrix of excise taxes and a matrix of trade and transport margins. This special windfall of matrices has led to the choice of year 2000 as the base year of the new INTIMO, INTIMO2000.

The supply matrix is moderately sparse. The construction of a product-to-product matrix has been obtained by means of the Almon's algorithm which has been applied to the domestic as well as imports flows intermediate matrices. The procedure has been completed balancing the value added sector.

ESA95 framework considers national macroeconomic accounts, institutional accounts and input-output tables as part of a single system of accounts. It makes it easy to construct data bases for macroeconomic and in particular for multisectoral models which requires aggregate as well as sectoral (industries, commodities and institutions) data.

The maximum detail of Personal Consumption Expenditure, Total Output and Employment time series is available from year 1992; Stock of Capital time series begins at 1980; Investments time series preserves the maximum detail since 1970. The reconstruction of the time series goes back to year 1970, but only for few subtotals. Exports, Imports, Inventory Change (and Total Intermediate Consumption) time series are available at the use matrix detail (59 sectors) for the time interval of these matrices, precisely years 1995-2003.

Total Output and Employment are available for 45 sectors corresponding to industries. Investment and Stock of Capital are related to 29 groups of investors. Personal Consumption Expenditure are related to 56 items. Bridge matrices link the items of Personal Consumption Expenditure and the Investments to the 59 commodities of the corresponding vectors in the final demand of the use matrix.

3. The chain index drawback

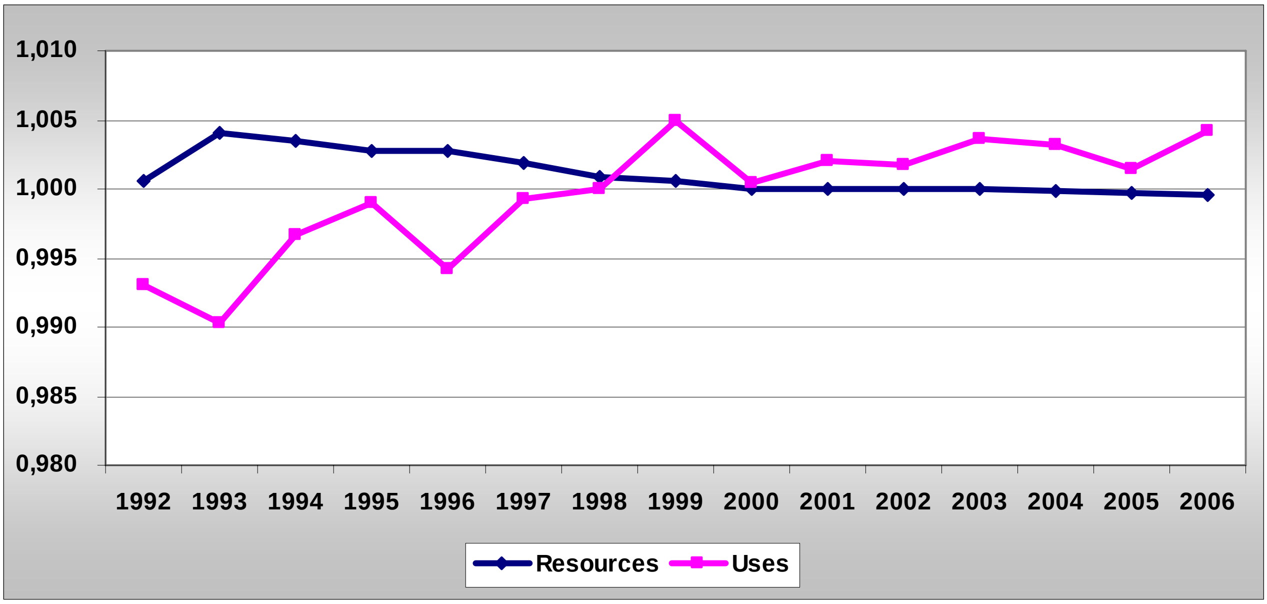
Unfortunately, in ESA95 the use of chain indexes does not allow us to preserve the accounting identities whereas the variables are measured in constant values. This is a serious handicap for macroeconomic model builders as far as variables in constant terms are required. Of course, a multisectoral model builder must necessarily tackle the problem concerning time series used to construct the real side of the model.

Personal Consumption Expenditure, Investment, Stock of Capital, Exports, Imports and Total Output are all used in the real side of the multisectoral model. Then, they are required at constant prices. The chain index permits to compare real values of two adjacent years: a variable deflated by means of a price index computed applying weights of the mix of the year before may be compared in real terms just with the variable of the previous year. The idea of the chain index allows us to compare only observations belonging to successive years. However, changes in price and quantities between non adjacent periods are obtained cumulating the “short-term” variations. This procedure leads to the so-called “chain indices”. These may be used to deflate the time series in current value obtaining time series in volume within the chain-linking system. Istat has fully adopted the chain-linking system which now replaces the previous fixed-base methodology. Now, the time series in volume are named “chained”, no longer “in constant value”; this is to remind us that time series in volume incorporate pros and contras of the chain index system. Among the disadvantages, the loss of additivity represents a serious drawback for a macroeconomic model builder. Almon (2005) (who already experienced the introduction of the chain index system in the USA National Accounts) showed that there is no elegant analytical method to circumvent the problem. It is up to the model builder to provide a way to overcome the loss of additivity.

First of all, the loss of additivity appears comparing total with subtotals. A total may be a subtotal of other aggregated macroeconomic variables. For example, the sum of the 56 “chained” Personal Consumption Expenditure purposes is not equal to its “chained” total. In turn, total Personal Consumption Expenditure is not equal to the “chained” series in the Resources and Use Account. Furthermore, the “chained” Uses in the Resources and Use Account do not sum up to the corresponding total of the “chained” Uses.

For the purpose of INTIMO2000, in order to recover additivity, a spread procedure is adopted. It is possible to apply a bottom up approach as well as a top down one. Here, a top-down procedure is adopted. The choice is suggested by the priority given to the Resources and Uses macroeconomic account as benchmark of the data base. In this account the Total Resource are equal to Total Uses chained values. The total of Resources items, that is to say GDP and Imports, and total of Uses items are both different to their common chained total. Then, different correction factors are applied to them.

Figure 1 – Factor correction



The Figure 1 shows the spread factor applied to the aggregates of Resources and Uses account in the years 1992-2006. The Resources correction factor is smoother than the Uses one; while the Resources correction factor ranges between 1.004 and .99995, the Uses correction factor is a bit more erratic and reaches a deviation of about 1 per cent in year 1993, revealing the impact of the heavy currency devaluation which took place the year before. The Table 1 contains the percentage values (equal to 100*(correction factor -1)) of the difference between the aggregate values for Resources and Uses (as shown in Figure 1), for Personal Consumption Expenditure and Investments.

Table 1 – Percentage discrepancies between Totals and Sub-totals.

Years	Resources	Uses	PCE	CAP
1992	0,059	-0,697	0,010	-0,046
1993	0,401	-0,971	0,013	-0,104
1994	0,344	-0,326	0,008	-0,059
1995	0,269	-0,100	0,005	0,005
1996	0,280	-0,580	0,009	-0,008
1997	0,189	-0,079	0,002	-0,004
1998	0,087	-0,005	0,001	0,003
1999	0,055	0,488	-0,004	-0,005
2000	0,000	0,044	0,000	0,000
2001	0,000	0,202	-0,002	0,000
2002	-0,001	0,179	-0,001	0,006
2003	-0,004	0,364	-0,003	0,000

2004	-0,018	0,318	-0,002	-0,005
2005	-0,032	0,142	0,001	
2006	-0,048	0,420	0,000	

4. Employment, Labor productivity and labour market structural changes

The sectoral Labour productivity equations largely follow the so-called “Verdoorn’s Law” which states that empirical evidence supports “*fairly constant relation over a long period between the growth of labour productivity and the volume of industrial production*”.

This statement may be supported with a number of arguments: a) in a rapidly growing sector, investments may embody technical progress which improves labour productivity; b) an increase of industrial production may give room to economies of scale; c) a sudden important technological innovation can seriously raise the competitiveness which in turn leads to an increase of output.

At present, sectoral labour productivity equations are determined by the sectoral output dynamic and a time trend. These equations have a very simple analytical structure. Other structures designed to explain total factor productivity indexes (which consider, at least, capital stock and labour as production factors) have been estimated in the past. Good fittings and reliable estimated parameter structures at level of single equation performance put out of sight untrustworthy model behaviour. Gratifying sectoral total factor productivity equation estimates were abandoned and a simple labour productivity equation was maintained where, as mentioned above, the reciprocal of labour productivity (employment over output) is explained by the output rate of growth and a time trend.

In the multisectoral model, labour productivity equations play a double role. On the one hand, they determine the cost of labour (together with capital in the case of total factor productivity) per unit of output; on the other hand, employment is the by-product of these equations. Two statistics of labour are available:[1] labour force and labour employed; the last one has a twofold measurement: employment and Unit of Labour (UL).

The amount of labour in a unit of time (for example, hours worked per employee per year) is the appropriate input to measure labour productivity. UL, which defines the “number of full-time equivalent employees by industry”, is the close estimate of the amount of labour in unit of time available from the Italian statistics. The full-time equivalent employee is computed considering the “amount of labour in hour per week” from the prevailing contract in the country labour market. The

[1] Recently, Istat has published “Total hours worked” for about 30 industries. The labour productivity equations are estimated by using employment statistics available for 45 industries

ratio between “full time-equivalent employee” and “man-hour per unit of time” is not constant over time. It may vary but smoothly, so that UL can be a good proxy of the labour input related to “employees by industry”.

Employment statistics include overtime, full-time, part-time and a variety of workers who time by time may statistically pop up or sink because changing rules concerning the labour market. Table 2 shows the employment/UL ratio (%) in the market sectors. A ratio above 100 is evidence of a number of employed greater than their measure in term of UL. The first row shows the ratio relative to total employment; secob row refer to employees and the third one to self-employed. From the series relative to the period 1990-2006, employees turn out to be very close their UL measure. Self-employed workers work about 15-20 per cent more than an employed worker. While self-employed shows the ratio employment/UL constant over time, this ratio has a smooth positive trend for employees.

Table 2 – Employment over UL in the market sector, (%).

1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
94,35	94,94	94,91	95,40	94,58	94,30	94,26	94,07	94,01	94,68	94,82	95,31	95,29	95,59	95,73	96,37	96,61
99,88	100,54	100,88	101,63	100,70	100,42	100,54	100,16	100,10	101,02	101,10	101,80	101,64	102,17	102,29	102,84	103,14
85,09	85,66	85,04	84,91	84,24	84,04	83,88	83,89	83,74	83,81	83,99	83,86	83,82	83,87	84,11	84,18	84,13

First row: Total, Second row: employees. Third row: self-employed.

Figure 2 – Growth rates of Employment.

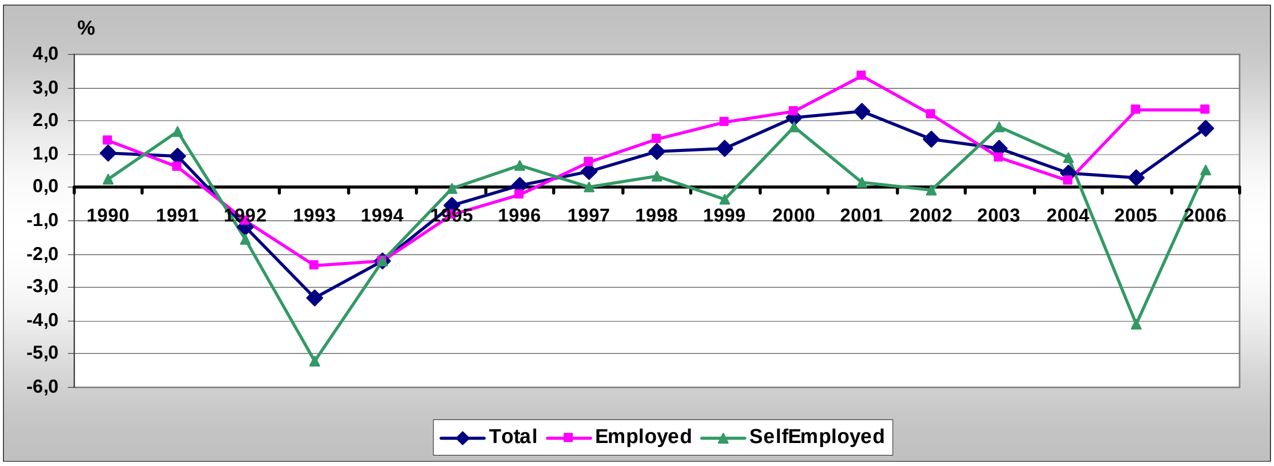


Figure 3 – Growth rates of UL.

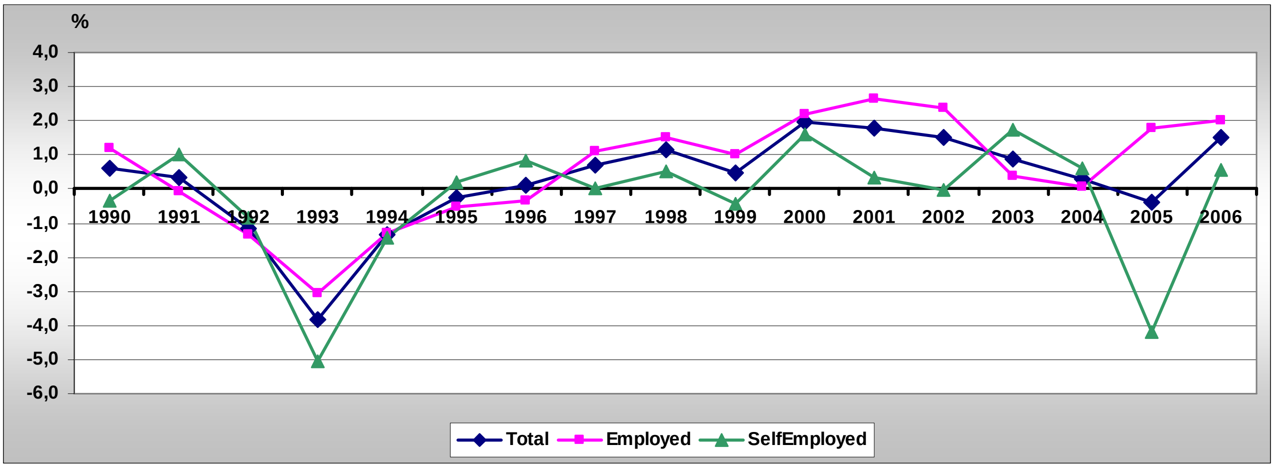
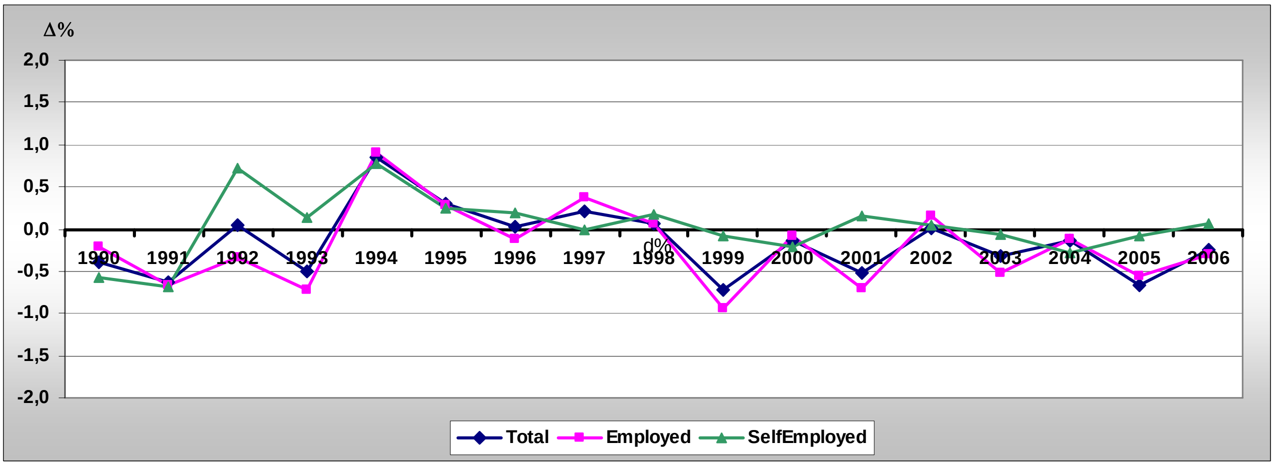


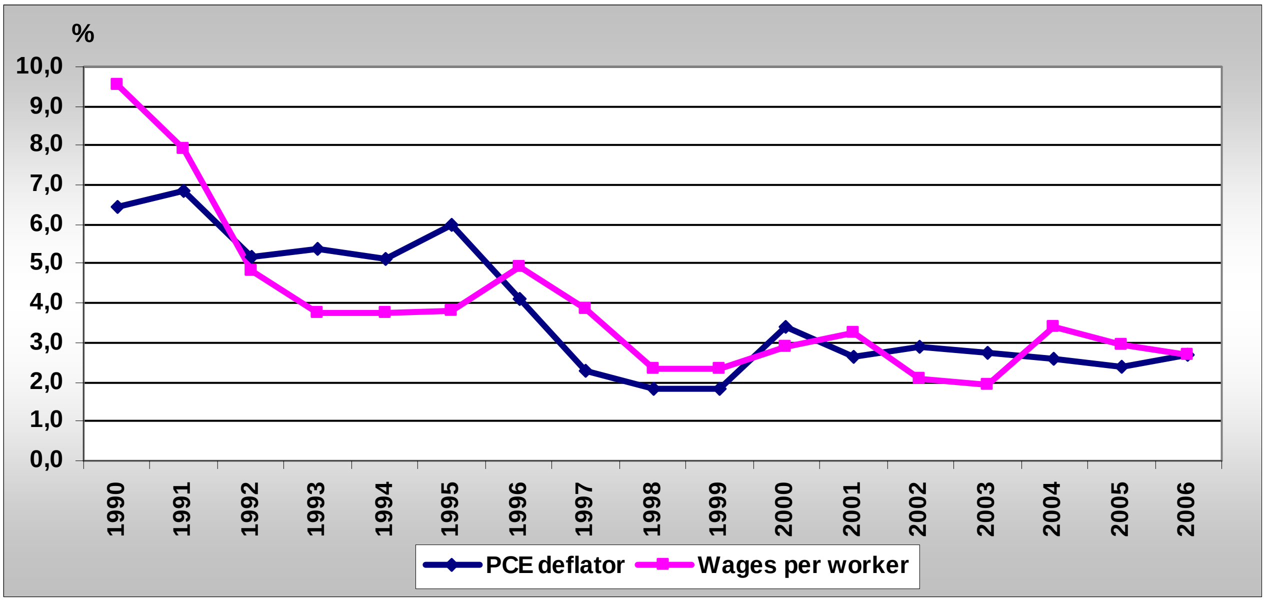
Figure 4 – Differences of rates of growth. UL versus Employment.



In the early years of the 1990’s while the pace of the European integration accelerated in various fields, the Union realized not to have adequate tools to prevent and to tackle persistent high unemployment levels present in many European countries. The accurate beginning of the examination of the employment at the European Union level came about in 1993 with the “White Book” on Growth, Competitiveness and Employment prepared by the President of the European Commission, Jacques Delors. Inspired by this book, the European Council in Essen in December 1994 agreed in five keys objectives to be pursued by the Member States to fight against unemployment. Two of them were concerning the promotion of moderate wage policies and the improvement of the efficiency of the labour market institutions.

In Italy, the effect of moderate wage policies is shown in Figure 5. In 1990 and 1991 wages per worker grew much faster than the PCE deflator. In 1992 the Italian currency was hit by a serious financial crisis which led to its devaluation of about 25 per cent. The economy went on a recession with negative GDP rate of growth in 1993. For three years wages grew at a rate of 4 per cent; PCE deflator grew at 5-6 per cent so that real wages decreased.

Figure 5 – PCE deflator and wages per worker, growth rates.



Since 1992, the European Member States economic policies were submitted to the multilateral surveillance defined in the Maastricht treaty. The introduction of a common currency was the objective; a set of indicators were used to monitor the Member State performance to be eligible in the currency area. The rate of inflation was among these indicators. Surprisingly, Italy, with a past of high inflation, performed very well. The inflation rapidly fell at a rate of 2 per cent. Worker shared the cost of matching the so-called Maastricht criteria. Figure 5 shows that the wage dynamic followed the inflation path in the last decade with no perceivable improvement in real term.

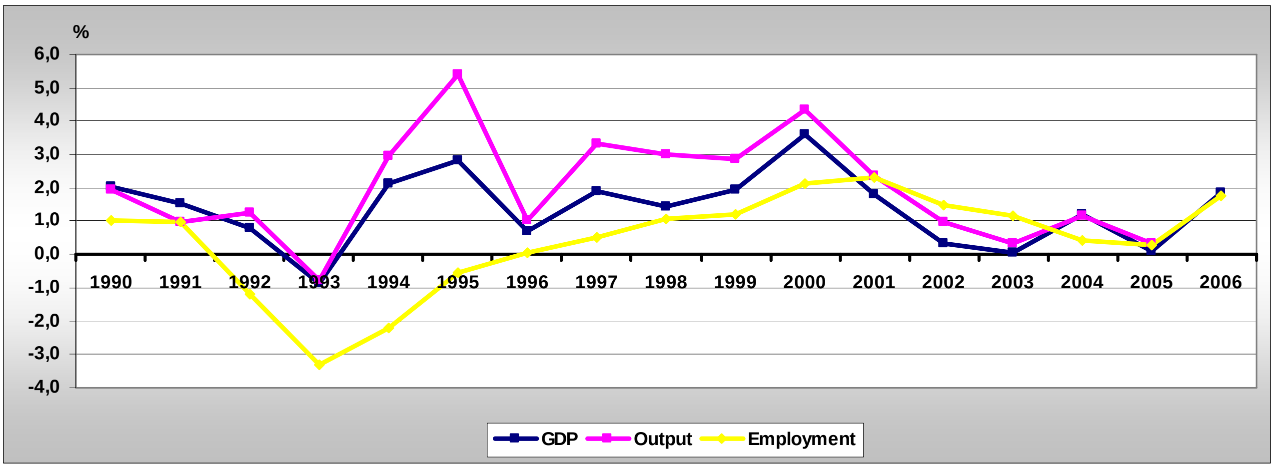
The path toward a common currency forced European Member States to look for a better co-ordination of their social-economic policies. The Treaty of Amsterdam (1995) gives evidence of this concern. It contains a new Title dedicated to the actions to foster employment. In 1996 a permanent Employment and Labour Market Committee was created and in 1997 an Employment European Strategy was launched. The Treaty of Amsterdam emphasizes that employment is an issue of common concern and the Member States committed themselves to co-ordinate their employment policies.

Within this European policy strategy, two reforms of the labour market institutions were introduced in Italy: respectively in 1997 and 2003. These reforms basically introduce a variety of new types of labour contracts aimed at to remove the demand-supply mismatch which was considered the main cause of the high level of unemployment. The effect of these reforms may be seen in Figure 6.

The recession provoked by the 1992 Italian financial crisis is anticipated by negative employment rates of growth. Despite a remarkable increase of total output, the recovery in 1994 and 1995 took place with a declining employment. In 1997, with the introduction of the first reform, employment begins to grow and the rates of growth remain positive for a decade. In this period, the GDP (and total output) and employment dynamic do not show any production function approach in their background. In other words, the reduction of the unemployment rate has worsened the labour productivity. Figure 6 shows that the UL rates of growth have been largely greater than the employment one.

However, the sectoral employment over sectoral output ratio shows in general the expected negative trend and the Verdoon's law inspired model is still performing quite well from the fitting point of view. The impact of the labour market reforms have surely contributed to lower labour productivity which could follow a better trend when the 'new' structural unemployment rate will be accomplished.

Figure 6 – Growth rates of GDP, Output and employment.



5. Capital stock and capital investment

Within ESA95 system, Istat has recently published new time series of investments, capital stock and amortization. These time series cover the time interval 1970-2003 for investments and 1980-2003 for capital stock (gross and net) and amortization. The time series are available for 29 investors. A bridge matrix to link these investors to producers is available for the year 2000. The row sum and column sum of this matrix match the investment both in the time series and in the use matrix at the year 2000.

Capital stock and investments time series for 29 investors has made possible a simple investigation about the replacement rates which relate them.

By using the formula $K_t = I_t + (1 - \alpha) * K_{t-1}$, the replacement rate applied to the perpetual inventory system turns out to be rather variable among the investors and along the time as shown in Table 3. Figure 7 shows some investors who have faced a replacement rate with a positive trend (Agriculture, Fishery, Mining non energetic materials, Food and Beverages industry and Textile and clothes industry); Figure 8 shows replacement rates slightly constant over time for Chemicals, Construction, Health services, Real Estate and Government); in Figure 9 two sectors (Mining of energetic raw materials and Coke and oil products) present a declining replacement rate but well over the average value of the aggregate.

Table 4 shows the composition of capital stock at the beginning and at the end of the time interval and, in the third column, the differences between them. Real estate, Financial services and Government decline from more than 46 per cent of total investment to in 1980 to 37 per cent in 2003. Investment in Transports and Comunications reach a share of 12.73 per cent in year 2003 starting from a 7.39 per cent in year 1980.

The far right column in Table 4 shows the average replacement rates. These averages span from 2.31 per cent of Real estate up to 10.27 per cent for Fishery. The replacement rate used to compute capital stock from capital investment (applying the perpetual inventory criterion and used as explanatory variable in the shares equations in BTM) is (or was) 8 per cent. This replacement rate was considered much more weighty than the one ‘behind’ the capital stock time series and it was used to emphasize the influence of the youngest capital investment in order to stress the content of embodied technical progress. Unexpectedly, 20 out of 29 replacement rates in Table 4 are greater than 8.00 per cent. This means that the decay of capital stock is higher than the depreciation used in the BTM share equations. The replacement rate applied to each investor is determined by the capital investment mix and by the capital investment average life used by Istat (see Table 5).

In Table 4, the average value and the maximum and minimum value of the replacement rates are shown. The last column reports the difference between the maximum and the minimum replacement rate per investor. Real Estate, Government, Education, Health services and Other services mark a difference less than 1; since the replacement rates appear to be rather constant over time, we can assume that the variability may be due considered just a random component. This is not the case of Fishery, Mining of non energetic materials, Leather and leather products, Wood and furniture, Paper and paper products, Chemicals, Rubber and plastic, Metal products, Mechanical machinery, Electrical machinery, Other industries, Electricity, gas, water and Transport and communication, mark differences not less than 2 percentage points. Large differences together with plain trends may generate significantly different capital stock forecast. While Education capital stock shows different but common trends according to lower, average a maximum replacement rate, Other manufacturing industries may even have positive or negative within the range of the observed sectoral replacement rate.

Figure 7

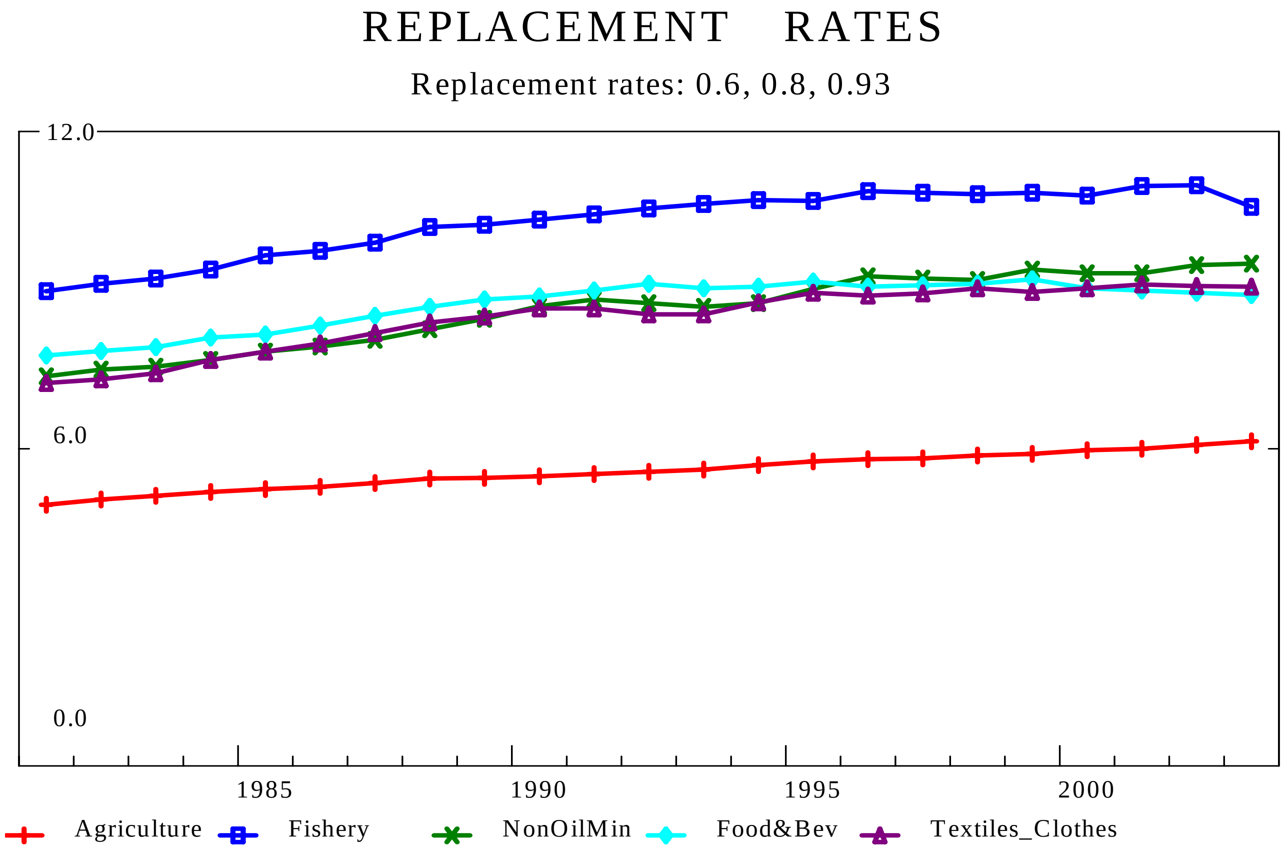


Figure 8

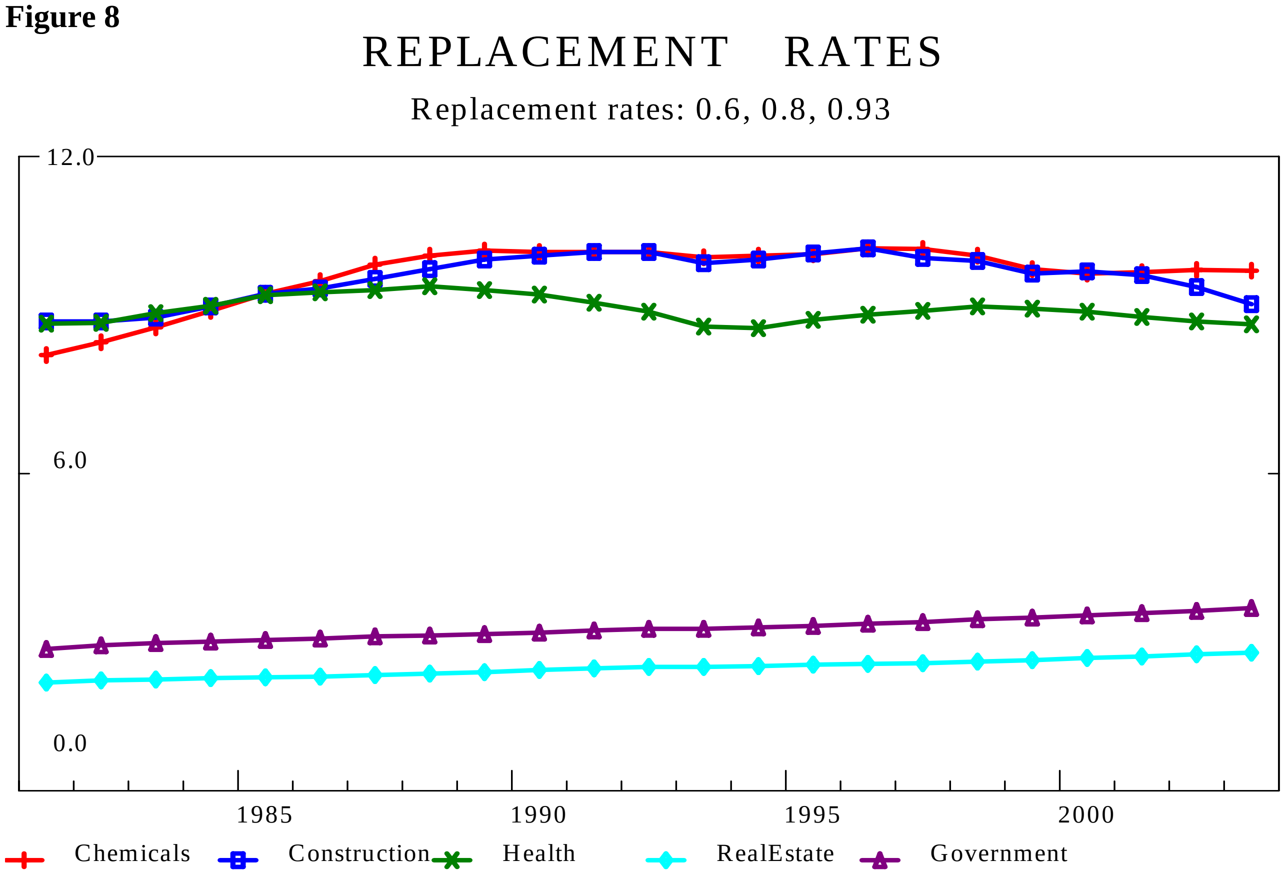


Figure 9

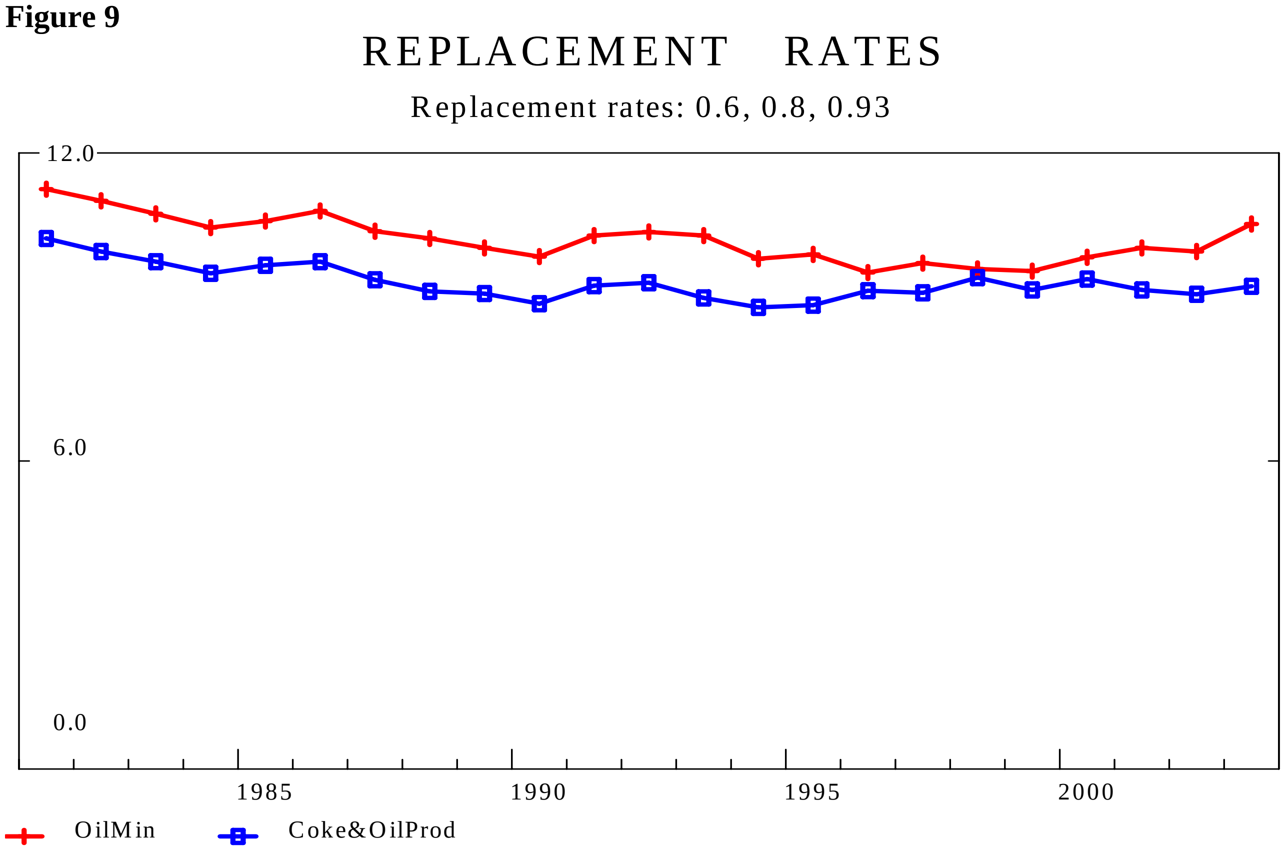

REPLACEMENT RATES
Replacement rates: 0.6, 0.8, 0.93
12.0
6.0
0.0
1985
1990
1995
2000
OilMin
Coke&OilProd

Table 3 – Replacement rates

		YEARS																						
	INVESTORS	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
1	Agriculture	4,9	5,0	5,1	5,2	5,2	5,3	5,4	5,4	5,4	5,5	5,5	5,6	5,6	5,7	5,7	5,8	5,8	5,9	5,9	6,0	6,0	6,1	6,1
2	Fishery	9,0	9,1	9,2	9,4	9,6	9,7	9,9	10,2	10,2	10,3	10,4	10,5	10,6	10,7	10,7	10,9	10,8	10,8	10,8	10,8	11,0	11,0	10,6
3	Energetic mineral	11,3	11,1	10,8	10,5	10,7	10,9	10,5	10,3	10,1	10,0	10,4	10,5	10,4	9,9	10,0	9,7	9,8	9,7	9,7	10,0	10,1	10,1	10,6
4	Non energetic mineral	7,4	7,5	7,6	7,7	7,8	7,9	8,0	8,2	8,5	8,7	8,8	8,8	8,7	8,8	9,0	9,3	9,2	9,2	9,4	9,3	9,3	9,5	9,5
5	Food beverage industry	7,8	7,8	7,9	8,1	8,2	8,3	8,5	8,7	8,8	8,9	9,0	9,1	9,0	9,0	9,2	9,0	9,1	9,1	9,2	9,0	9,0	8,9	8,9
6	Textiles & Clothes	7,2	7,3	7,4	7,7	7,8	8,0	8,2	8,4	8,5	8,7	8,7	8,5	8,5	8,8	8,9	8,9	8,9	9,0	9,0	9,0	9,1	9,1	9,1
7	Leather and products	7,4	7,5	7,7	7,8	8,0	8,2	8,4	8,6	8,8	8,9	9,1	9,2	9,2	9,5	9,7	9,7	9,6	9,8	9,7	9,8	9,7	9,7	9,3
8	Wood and furniture	6,7	6,9	7,0	7,2	7,4	7,6	7,8	7,9	8,0	8,1	8,2	8,3	8,3	8,4	8,6	8,6	8,7	8,7	8,8	8,7	8,6	8,7	8,6
9	Paper, paper products	7,3	7,4	7,6	8,0	8,2	8,5	8,7	8,8	8,9	9,0	9,2	9,2	9,2	9,4	9,7	9,5	9,5	9,6	9,4	9,6	9,4	9,3	9,3
10	Coke, oil products	10,3	10,1	9,9	9,6	9,8	9,9	9,5	9,3	9,3	9,1	9,4	9,5	9,2	9,0	9,0	9,3	9,3	9,6	9,3	9,5	9,3	9,2	9,4
11	Chemicals	8,2	8,5	8,8	9,1	9,4	9,6	9,9	10,1	10,2	10,2	10,2	10,2	10,1	10,1	10,1	10,3	10,2	10,1	9,9	9,8	9,8	9,8	9,8
12	Rubber & Plastic	7,4	7,6	7,7	8,0	8,1	8,5	8,7	8,9	9,0	9,0	9,1	9,1	9,1	9,3	9,5	9,4	9,4	9,5	9,5	9,5	9,4	9,4	9,4
13	Non metallic minerals	7,3	7,4	7,6	7,8	7,9	8,1	8,4	8,6	8,8	8,8	8,8	8,9	8,8	8,9	9,2	9,1	9,2	9,1	9,2	9,1	9,1	9,2	9,1
14	Metal products	7,4	7,6	7,8	8,0	8,2	8,4	8,7	9,0	9,1	9,1	9,2	9,2	9,1	9,4	9,6	9,7	9,5	9,6	9,7	9,6	9,5	9,3	9,1
15	Mechanical machinery	7,1	7,3	7,4	7,7	7,9	8,1	8,3	8,6	8,8	8,8	8,8	8,7	8,7	9,0	9,2	9,1	9,0	9,1	9,0	9,1	9,1	9,2	9,1
16	Electrical machinery	8,3	8,4	8,6	8,9	9,0	9,3	9,5	9,7	9,9	10,0	10,0	9,8	9,8	10,0	10,3	10,2	10,2	10,1	10,2	10,8	10,6	10,2	10,2
17	Motor vehicles	8,3	8,6	8,6	8,7	8,7	9,0	9,5	9,6	9,5	9,7	9,8	9,9	9,7	9,5	9,6	9,5	9,6	9,7	9,8	10,0	10,0	10,1	10,1
18	Other industries	6,2	6,4	6,6	6,8	7,0	7,2	7,4	7,6	7,9	8,1	8,2	8,4	8,6	8,7	9,0	9,0	9,1	9,1	9,2	9,3	9,2	9,2	9,0
19	Electricity, gas, water	5,5	5,5	5,4	5,4	5,4	5,4	5,4	5,4	5,5	5,6	5,9	6,2	6,2	6,3	6,4	6,5	6,6	6,8	6,9	7,0	7,2	7,3	7,5
20	Construction	8,9	8,9	8,9	9,1	9,4	9,5	9,7	9,9	10,0	10,1	10,2	10,2	10,0	10,0	10,2	10,2	10,1	10,0	9,8	9,8	9,8	9,5	9,2
21	Trade	5,9	6,0	6,1	6,2	6,2	6,3	6,3	6,5	6,6	6,6	6,7	6,6	6,6	6,6	6,7	6,8	6,8	6,9	6,9	7,0	7,1	7,2	7,0
22	Hotels & Restaurants	4,0	4,1	4,2	4,3	4,4	4,5	4,6	4,7	4,8	4,8	4,8	5,0	5,0	5,1	5,2	5,2	5,3	5,5	5,6	5,7	5,7	5,7	5,8
23	Transport, Communic.	8,0	8,1	8,2	8,4	8,4	8,5	8,7	8,8	8,9	9,1	9,2	9,3	9,3	9,4	9,5	9,7	9,9	9,9	10,0	10,0	9,9	9,8	9,7
24	Financial services	3,3	3,5	3,7	3,9	4,0	4,2	4,4	4,5	4,7	4,8	4,8	4,8	4,6	4,6	4,6	4,6	4,6	4,6	4,6	4,7	4,8	4,9	5,0
25	Real Estate	2,0	2,1	2,1	2,1	2,1	2,2	2,2	2,2	2,2	2,3	2,3	2,3	2,3	2,4	2,4	2,4	2,4	2,4	2,5	2,5	2,5	2,6	2,6
26	Government	2,7	2,7	2,8	2,8	2,9	2,9	2,9	2,9	3,0	3,0	3,0	3,0	3,1	3,1	3,1	3,2	3,2	3,2	3,3	3,3	3,4	3,4	3,4
27	Education	4,3	4,3	4,3	4,3	4,3	4,4	4,4	4,4	4,4	4,3	4,3	4,3	4,2	4,2	4,2	4,3	4,3	4,4	4,4	4,5	4,4	4,6	4,6
28	Health services	8,8	8,9	9,0	9,2	9,4	9,4	9,5	9,5	9,5	9,4	9,2	9,0	8,8	8,7	8,9	9,0	9,1	9,2	9,1	9,1	9,0	8,9	8,8
29	Other personal services	6,0	5,9	5,8	5,8	5,8	5,8	5,9	5,9	5,9	6,0	6,0	6,0	6,0	6,1	6,2	6,3	6,4	6,4	6,5	6,5	6,6	6,6	6,6

Table 4 – Capital Stock composition and Replacement rates

	Investments			Replacement rates			
Years	1981	2003	diff	period 1981-2003			
				average	minimum	maximum	difference
Agriculture	4,84	4,00	-0,84	5,57	4,93	6,14	1,21
Fishery	0,21	0,14	-0,07	10,27	8,97	10,97	2,01
Mining of energetic Raw Mat	0,13	0,42	0,29	10,31	9,67	11,28	1,61
Mining non energetic materials	0,32	0,19	-0,13	8,60	7,36	9,50	2,14
Food beverage industry	2,17	2,19	0,01	8,72	7,76	9,20	1,44
Textiles & Clothes	2,29	1,47	-0,82	8,46	7,24	9,10	1,86
Leather and products	0,49	0,34	-0,15	8,92	7,41	9,77	2,36
Wod and furniture	0,90	0,53	-0,37	8,07	6,71	8,79	2,09
Paper, paper products	0,86	1,45	0,59	8,90	7,28	9,66	2,38
Coke, oil products	0,41	0,46	0,05	9,47	8,98	10,33	1,35
Chemicals	2,06	1,79	-0,28	9,76	8,24	10,26	2,02
Rubber & plastic	1,15	1,25	0,11	8,90	7,43	9,51	2,08
Non metallic minerals	1,32	1,69	0,37	8,62	7,31	9,21	1,90
Metal products	4,12	3,71	-0,41	8,95	7,42	9,66	2,24
Mechanical machinery	2,75	2,16	-0,59	8,58	7,13	9,21	2,08
Electrical machinery	1,38	1,66	0,28	9,74	8,26	10,75	2,50
Motor vehicles	1,61	1,61	0,00	9,45	8,30	10,10	1,80
Other industries	0,93	0,73	-0,19	8,13	6,20	9,32	3,12
Electricity, gas, water	4,29	4,42	0,13	6,14	5,37	7,46	2,09
Construction	3,38	4,06	0,67	9,71	8,87	10,25	1,38
Trade	4,75	8,04	3,29	6,60	5,91	7,17	1,26
Hotels & Restaurants	1,65	2,61	0,96	4,96	4,02	5,80	1,77
Transport, comunic.	7,39	12,73	5,34	9,16	8,01	10,01	2,00
Financial services	4,22	1,92	-2,31	4,43	3,26	4,99	1,72
Real Estate	31,39	27,01	-4,38	2,31	2,04	2,61	0,57
Government	10,77	8,11	-2,66	3,05	2,68	3,45	0,77
Education	0,86	0,74	-0,13	4,35	4,20	4,57	0,38
Health services	1,49	1,74	0,25	9,10	8,74	9,53	0,79
Other personal services	1,86	2,84	0,98	6,13	5,79	6,65	0,85
Total	100,00	100,00					

Table 5 – Average life of Capital stock.

INVESTORS	INVESTMENT GOODS								
	Machinery and equip.	Office machinery	Telecommunication equip.	Furniture	Land transport	Other transport	Construction	Software	Other goods and services
Agriculture	18	7	7	16	10	18	51	5	34
Fishing	18	7	7	16	10	18	35	5	34
Mining Energetic Raw Material	18	7	7	16	10	18	35	5	34
Mining non Energetic Materials	18	7	7	16	10	18	35	5	34
Food, Beverages and Tobacco Industries	18	7	7	16	10	18	36	5	34
Textiles and Clothes	18	7	7	16	10	18	35	5	34
Leather and Leather products	18	7	7	16	10	18	35	5	34
Wood and wood products	18	7	7	16	10	18	35	5	34
Paper, paper products and printing	18	7	7	16	10	18	35	5	34
Coke and oil products	18	7	7	16	10	18	35	5	34
Chemicals and synthetic fibers	18	7	7	16	10	18	35	5	34
Rubber and Plastic products	18	7	7	16	10	18	35	5	34
Non metallic products	18	7	7	16	10	18	35	5	34
Metal products	18	7	7	16	10	18	35	5	34
Machinery and equipment	18	7	7	16	10	18	35	5	34
Electrical machinery and optical instruments	18	7	7	16	10	18	35	5	34
Transport equipment	18	7	7	16	10	18	35	5	34
Other manufactured goods	18	7	7	16	10	18	35	5	34
Electrical energy, gas, steam and hot water	18	7	7	16	10	18	40	5	34
Construction	18	7	7	16	10	18	35	5	34
Trade	18	7	7	12	10	18	65	5	34
Hotels and Restaurant	18	7	7	12	10	18	65	5	34
Transport, storage and communications	18	7	7	16	10	18	50	5	34
Financial intermediation services	18	7	7	16	10	18	65	5	34
Real estate services, renting, computer services, research and development, other business services	18	7	7	16	10	18	79	5	34
Government	18	7	7	16	10	18	60	5	34
Education	18	7	7	16	10	18	57	5	34
Health services	18	7	7	16	10	18	35	5	34
Other services	18	7	7	16	10	18	56	5	34

Source: Istat

Figure 10

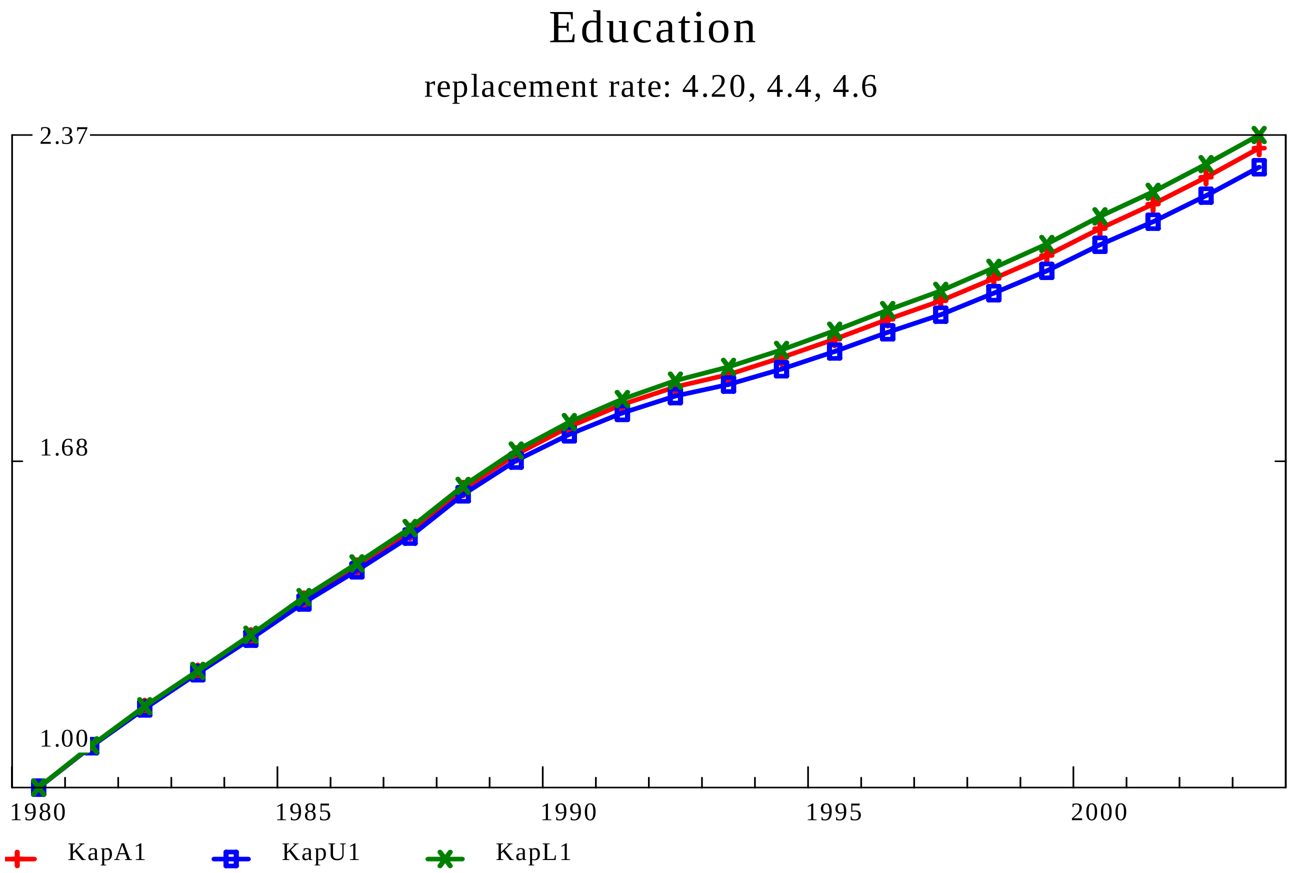
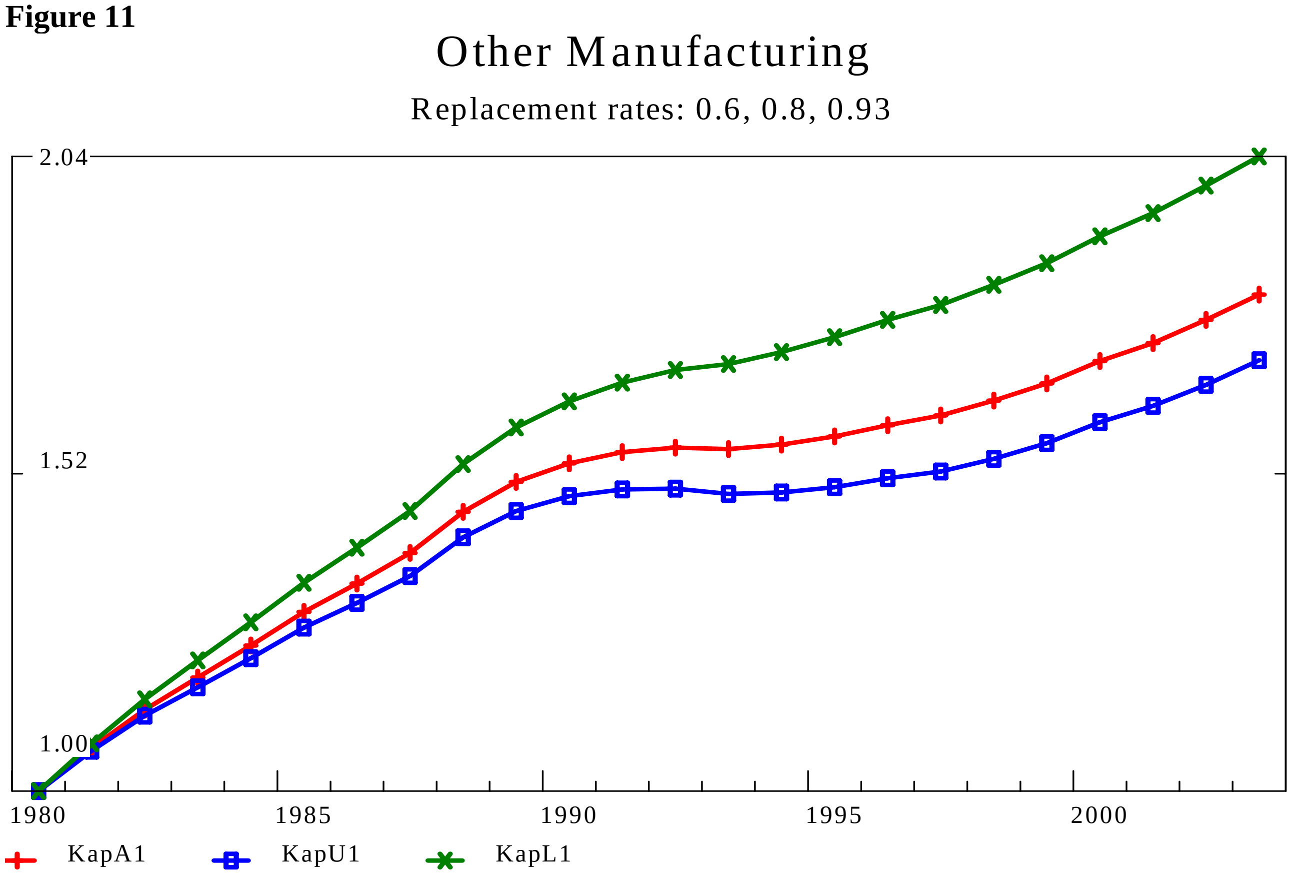


Figure 11



6. Next steps

At present, the real side implemented with PCE, investment and import share equations is ready to run. Labour productivity equations open the bridge to enter the price side. The value added components equations are close to be estimated, but the price equation analytical structure has not yet been chosen.

However, the leontievian price equation is still at hand. In general, the leontievian real side equation performs much better than the price one. Many prices generated by this equation follow unsatisfactory path and then they should be fixed. The alternative to the leontievian price equation may be a set of equations alike those found in macroeconometric models, where explanatory variables are mostly factor costs per unit of output. By the way, in multisectoral models, costs per unit of output are “computed” within the model; these factor costs may be used in a macroeconomic type price equation or in the leontievian price equation. At present, the relative advantages of the two approaches are not yet been investigated.

The production of product-to-product matrices has been realized applying Almon’s algorithm to domestic at basic prices and import c.i.f flows. Indirect taxes and margin matrices require a similar reallocation of their flows according to the product-to-product taxonomy. At present, a plain application of the Almon’s algorithm to these matrices does not seem an adequate procedure. Perhaps, the allocation of these flows should be arranged through a different approach.