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## **Fiscal and Other Macroeconomic Effects of Privatization**

Yannis Katsoulakos and Elissavet Likoyanni

NOTA DI LAVORO 113.2002

**DECEMBER 2002**

PRIV – Privatisation, Regulation, Antitrust
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Yannis Katsoulakos, *Athens University of Economics and Business, Economics Dept.,  
and Centre for Economic Research and Environmental Strategy*

Elissavet Likoyanni, *Athens University of Economics and Business, Economics Dept.,  
and Centre for Economic Research and Environmental Strategy*

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# Fiscal and Other Macroeconomic Effects of Privatization

## Summary

This paper contains an econometric analysis using country level panel data of 23 OECD countries for the period 1990 – 2000, extending existing empirical work, and more specifically work on the impact of privatization on public deficit, the impact on public debt and the impact on other macroeconomic variables (unemployment and growth). The main results are the following:

- (i) Recent empirical work (by Jeronimo *et al.*) using data from 1990-1997 had examined whether privatization receipts have been used as a means of reducing government deficit in Spain, Greece, Italy and Portugal. Their results indicate that there is a negative and statistically significant relationship between receipts from privatization and deficit for the 1990 – 97 period for the four southern countries. Our results with an extended data set show that **privatization receipts are not significantly correlated with budget deficit** neither for the whole OECD sample, nor for the four southern countries.
- (ii) We also find that **there exists a statistically significant and negative relation between privatization receipts and public debt** for the whole OECD sample, while this does not seem to be the case for the three countries with the higher debt over GDP rates (Belgium, Greece and Italy).
- (iii) One of the most interesting results of our analysis is that current privatization receipts have a statistically significant and negative effect on the current unemployment rate and a positive effect on the previous period's unemployment rate. Intuitively this can be explained by noting that when privatization is *announced* the accompanied restructuring, which leads firms to operate more efficiently, can cause job losses, and, thus, increase the unemployment rate. On the other hand, when privatization is *implemented*, new entry in the market occurs, increasing the demand for labor and, thus, decreasing the unemployment rate.

**Keywords:** Privatization, public deficit, public debt, unemployment

**JEL:** H62, H63, J64, L33

*This paper was prepared for the CEU Project “Privatization and Financial Market Development”, and presented in the Athens Meeting on June 14, 2002.*

*Address for correspondence:*

Yannis Katsoulakos  
Athens University of Economics & Business (AUEB)  
Dept. of Economics  
76 Patission Street  
GR-104 34 Athens  
Greece  
Phone: +30-1-820 3181  
Fax: +30-1-822 6204  
E-mail: sokratis@prometheus.hol.gr, knet@hol.gr

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## ***1. Introduction***

Privatization is one of the main ingredients of public policy in the last 20 years often used by governments as a means of structural reform. In the last decade, almost one trillion US dollars (USD) worth of state-owned enterprises have been transferred to the private sector in the world as a whole. The bulk of these privatization proceeds come from the sale of assets in the OECD member countries<sup>2</sup>. Privatization schemes used in a variety of countries at various times during the last two decades have had various objectives, such as the need to reduce budget deficits, attract investment, improve corporate efficiency and liberalize sectors such as telecommunications and energy. During the 1990s, privatization activity accelerated in many countries and this led to the hypothesis that, especially among the members of the European and Monetary Union (EMU), the acceleration was due to these countries being obliged to meet the convergence criteria (concerning debt and deficit) set up in the Maastricht Treaty.

### ***1.1 Privatization Proceeds - Basic Statistics<sup>3</sup>***

Over the past decade, the privatization receipts coming from the sale of state-owned enterprises in the OECD countries amounted to 650 million USD, 60% of which was generated by the EU-members. In 2000, OECD countries accounted for approximately two thirds of global privatization revenues, while Western Europe accounted for over two thirds of privatization proceeds of the OECD countries.

During the 1990s, OECD privatization proceeds reached 3% of OECD-countries' GDP, most of which was raised in Italy, Australia, France, Spain and the United Kingdom. The impact of privatization was larger in some countries such as Hungary and Portugal, which raised 25% of GDP as proceeds from privatization. Figure 1

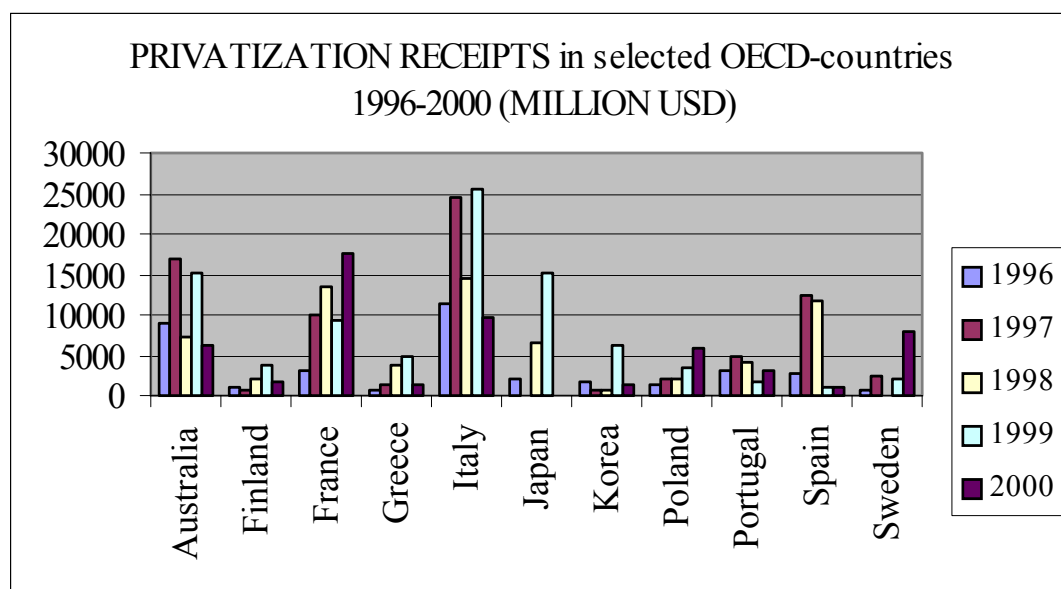
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<sup>2</sup> OECD Economic Surveys, 2000.

<sup>3</sup> The information offered in this part of the paper comes from OECD sources.

summarizes data on the absolute value of privatization proceeds (in million USD) for the OECD-countries with the larger amount (in absolute terms) raised from privatization proceeds in the years 1996-2000.

**Figure 1: Privatization Receipts in Selected OECD Countries, 1996-2000**



Source: OECD Privatization Database and World Bank.

After a decade of growth, global privatization proceeds in 2000 equaled 1000 billion USD, almost decreased by one third from the 1999-level (Table 1). Most of the decline took place in the OECD countries. Nevertheless, the OECD area continued to account for over half of global proceeds, most of which come from the EU area.

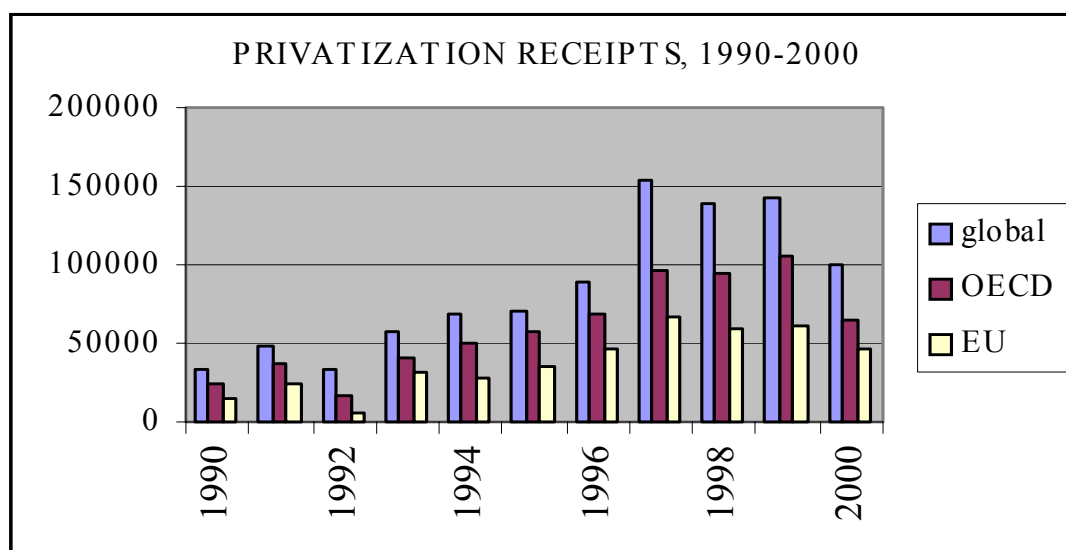
**Table 1: Global Amounts raised from Privatization, 1990-2000**

<i>Amounts raised from privatization (in million USD)</i>			
	<i>global</i>	<i>OECD</i>	<i>EU</i>
1990	33218	24724	15562
1991	48480	37402	23984
1992	33494	17396	4886
1993	58214	40294	30590

1994	68858	50884	27469
1995	70230	56684	35460
1996	89743	68250	46599
1997	153273	96175	67535
1998	139164	94011	60167
1999	141886	104780	61649
2000	100063	65063	46756

The drop of privatization activity in the OECD-area is partly attributable to a diminishing inventory of assets available for sale as privatization programs have begun to mature in many OECD-countries. In non-OECD countries, privatization receipts have been declining since their peak in 1997. According to preliminary estimates, proceeds in 2000 were slightly below 1999 levels. However, there are notable exceptions such as the strength of activity in Latin America – especially in Brazil. Figure 2 summarizes the data of Table 1.

**Figure 2: Global Amounts raised from Privatization**



During 2000, the sale of assets in the telecommunications sector continued to be a main source of privatization proceeds in the OECD area, while transportation and energy appear to have been the most important source of activity outside this area.

In the 1990s, private offerings were the dominant method of sale among many OECD countries. However, in 2000, there were few very large transactions, normally carried out through public offerings. A significant development was USD 4 billion public offering of the Brazilian oil and gas producer Petrobras, being one of the most significant transactions outside the OECD area.

Over the past decade, privatization of state-owned enterprises – along with the launch of the EMU - has assisted the development of a market for corporate control, which is evident by the activity, in the late 1990's, of former and partially state-owned enterprises. Individual cases involve the take-over battle for Telecom Italia between Olivetti and Deutsche Telecom, the bid for Elf by TotalFina, and the battle in the French banking sector. However, the development of a fully competitive market for corporate control may not be too rapid, partly due to continued state control through partial shareholdings.

## ***1.2 Scope of the Paper***

The literature on privatization has emphasized the microeconomic aspects of privatization, and in particular the efficiency gains<sup>4</sup>. However, there is less work - especially empirical - devoted on the fiscal and more general macroeconomic impact of privatization.

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<sup>4</sup> A survey of microeconomic literature is provided by Meggison W., and J. M. Netter [12], and Bos O. [4].

In this paper we make an effort to investigate the fiscal stabilization impact of privatization, as well as its impact on some macroeconomic variables. In particular, we empirically investigate the relationship between the level of government deficit and the receipts from privatization, using data on privatization and budget deficits for 23 OECD countries from 1990 to 2000. The same data is employed in order to find the relationship between privatization receipts, public debt, output growth as well as the unemployment rate.



## ***2. Fiscal Stabilization and Other Macroeconomic Effects of Privatization***

### ***2.1 Objectives of Privatization***

As already noted, the main objectives often pursued by privatization schemes are:

- achieving gains in economic efficiency, since public enterprises often lag behind in terms of economic performance, while the efforts of reforms of such enterprises were often of limited success, and
- financing fiscal deficits with the privatization proceeds, in cases of governments facing serious liquidity constraints.

The potential uses of privatization proceeds reflect their macroeconomic impact as well as the net benefit for the government. The effects of a fiscal expansion financed with privatization proceeds depend, to a great extent, on the source of these proceeds (i.e. whether the source is domestic or foreign), the degree of capital mobility and the exchange regime. In particular, if the privatization proceeds have domestic origin, the excess demand for money, resulting from the purchase of the asset by the private sector, would be expected to lead to capital inflows, which will be similar to inflows of privatization proceeds from abroad, given that there are well-functioning domestic financial markets. On the other hand, if the proceeds come from abroad, the effect would be similar to a foreign-financed increase in the fiscal deficit and are also possible to lead to pressure leading to the real appreciation of the currency<sup>5</sup>.

### ***2.2 Impact of Privatization on Government's Net Worth***

The fiscal impact of privatization reflects both the amount and the use of privatization proceeds and the impact of such proceeds on the financial flows of the budget – taxes, transfers, and dividends. The net benefit of governments due to privatization is not straightforward, since the effects of privatization have long-term implications. In

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<sup>5</sup> For further analysis, see Davis, J. *et al.* [6].

general, to the extent that private sector ownership leads to increased efficiency, there may be a net benefit for the government.

If the rate of return of an asset in the public sector equals that of the same asset after it has been sold in the private sector, then the government receives financial assets and losses net future earnings on the assets. In this case, privatization amounts to a change in the composition of the government's assets with no effects on its net worth, which means that there is no effect in the intertemporal budget constraint. However, in this case, the conditions that should hold are rather restrictive: *a.* markets should be efficient, *b.* both public and private sector should use the same discount rate, *c.* the profitability of the firm should not change significantly after the privatization, and *d.* the environment under which the firm will operate should be the same before and after the privatization<sup>6</sup>. It seems that it is not safe to assume the satisfaction of all previous conditions – for example, for condition *b.* to hold, we should assume that, among other things, there are no informational asymmetries.

On the other hand, if the private sector is expected to run the enterprise more effectively than the state, the net worth of the government would increase, provided that the government can privatize and tax efficiently. In this case, privatization would result in a permanent, positive effect on public finances. However, we should also mention that if a government faces liquidity constraints, then it might be willing to sell its assets at a price less than their economic value in order to finance its expenditures.

### ***2.3 Fiscal Implications***

The decision on the use of privatization proceeds reflect the impact on both fiscal policy and macroeconomic aggregates. As mentioned above, these effects may differ

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<sup>6</sup> For further analysis, see Hemming R. and A. M. Mansoor [9].

depending on the source of privatization receipts, the degree of capital mobility, and the exchange rate regime.

An increase in the deficit through higher spending or lower taxes, financed by privatization proceeds would have similar effects to those resulting from a fiscal expansion financed by an increase in public debt (see McKenzie, 1998): it would increase domestic demand, affecting, among other things, inflation and the external current account. These effects depend on the initial macroeconomic position of the economy as well as the composition of the increased spending in terms of imported and domestic goods and services.

The scope of a case study compiled on behalf of IMF (2000)<sup>7</sup> was to test whether privatization proceeds, transferred to the budget, are used to finance a larger deficit or to reduce other sources of financing. The results of this case study indicate that *privatization receipts are not used to finance a larger deficit*; additionally, it is also shown that *the fiscal situation tends to benefit from privatization*.

The fiscal accounts may be affected by privatization in several ways: directly, through its effect on financial flows to and from the privatized firms, indirectly, through the influence on macroeconomic environment; as a result of the decision on the use of the proceeds.

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<sup>7</sup> Davis, Ossowski, Richardson, and Barnett (2000): "Fiscal and Macroeconomic Impact of Privatization", *IMF Occasional Paper 194*. The aim of this case study was to investigate the empirical relationship between privatization and various fiscal and macro-econometric variables. The issues examined are:

whether privatization proceeds transferred to the budget are used to finance a larger deficit (i.e. are spent) or to reduce other sources of financing (saved), and

whether the total amount of privatization proceeds is correlated with changes in macroeconomic or fiscal performance.

*Taxes* paid by privatized firms will, among other things, reflect changes in efficiency. At the microeconomic level, there is evidence that privatized firms have paid higher taxes compared to the pre-privatization period.<sup>8</sup> In many countries, *gross budgetary transfers* to the public enterprise sector have tended to decline with privatization, while privatization receipts are also found to be used for *debt* reduction.

In particular, there is evidence of a positive and lasting impact of privatization on tax revenue for non-transition economies. The empirical results are consistent with the hypothesis that privatization proceeds are not used to finance larger deficit. Privatization receipts are also found to be strongly correlated with a lasting improvement in macroeconomic-performance indicators (higher growth and lower unemployment). We turn to these results in the next section.

## ***2.4 Other Macroeconomic Effects***

### ***2.4.1 Growth Implications***

Microeconomic literature strongly supports that private firms are more efficient than those run by the state. This result is supported by several studies of firm-level performance in both developed and developing countries (Davis et al., 2000) as well as in transition economies (Havrylyshyn and McGettigan, 1999).

According to Aziz and Westcott (1997), price and trade liberalization, deregulation, privatization, and protection of property rights are strongly associated with rapid expansion of economic activity. Sala-I-Martin (1997) finds that growth tends to be more rapid in economies with higher share of the private sector in GDP. According to the empirical findings of Davis et al. (2000), there is a strong, positive relationship between privatization and growth rates, which seems to be more pronounced in non-transition countries.

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<sup>8</sup> See Galal A., *et al.* [7].

### ***2.4.2 Labor Market Implications***

State-owned enterprises that may be protected through a ‘soft’ budget constraint are likely to be overstaffed and pay excessive wages and benefits. Privatization of such enterprises may lead to significant adjustments to employment conditions. A number of empirical studies<sup>9</sup> suggests that privatization is not associated with large-scale job losses. According to Davis et al. (2000), privatization tends to be associated with a reduction in both contemporaneous and lagged unemployment rates. It should be mentioned that these results might stem from combined effect of many policies encouraging growth and reducing unemployment.

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<sup>9</sup> See Meggison, W., *et al.* [12], Boubakri, N, and J-C. Cosset [3].

### ***3. Empirical Considerations***

#### ***3.1 Privatization and Fiscal Discipline***

The restriction placed by the European Union monetary unification on debt and deficit ratios over Gross Domestic Product (GDP) for the member states and the problems faced by the governments in order to meet these criteria has created a question as to whether member states have used privatization receipts as a means of financing their deficits.

Specifically, the ability of countries to join the European Economic and Monetary Union (EMU) depended on the satisfaction of some fiscal criteria, most important of which were the following two:

- debt should not exceed 60% of GDP, and
- deficit should not exceed 3% of GDP.

Clearly, governments would be tempted to use privatization receipts as a means of reducing debt or deficit and, therefore meet the convergence criteria. In such a case, privatization would serve short-run objectives (financing a country's budget, for political purposes) instead of promoting long-run goals, such as increasing productivity. We should also note that the inability of a country to fulfill the particular criteria, and thus, the failure to participate in EMU, would create short-run as well as long-run negative economic and political effects, per se.

##### ***3.1.1 Impact of Privatization on Public Deficit***

At this point we should note that Jeronimo V. *et al.* [10] have also empirically estimated the relationship between receipts from the privatization of state-owned enterprises and government deficit. Using country-level panel data for OECD countries from 1990 to 1997, they empirically analyze whether privatization receipts

have been used as a means of reducing government deficit in Spain, Greece, Italy and Portugal. Their results indicate that there is a negative and statistically significant relationship between receipts from privatization and deficit for the 1990 – 1997 period for the four southern states. One of the main objectives of our empirical analysis is to examine these results using a more recent and thus more extensive data set covering the period until the year 2000. We collected data for 23 OECD countries for the time period 1990-2000. The country-level data set on budget deficit and government debt come from the *OECD Economic Surveys*, 2000, while data on GDP growth and unemployment rates come from *National Accounts for OECD countries*, 2002. The country-level data on privatization receipts come from *OECD Financial Market Trends*, 2001.

### **3.1.1.1 Structure of the Model**

The estimated random-effects equation intends to find the connection between the budget deficit level (as a percentage of GDP) of country  $i$  in year  $t$  – denoted as  $(DEF/GDP)_{it}$  to the value of privatization receipts (as a percentage of GDP) corresponding to the same year – denoted as  $(PRIRE/GDP)_{it}$ .

The estimated model has the following form:

$$DEF / GDP_{it} = a + bPRIRE / GDP_{it} + cDUM_{it} + d(DUM)(PRIRE / GDP)_{it} + e_{it},$$

$$i = 1, \dots, N; t = 1, \dots, T. \quad \text{Model 1a}$$

where  $e_{it}$  is the error term. We assume that  $e_{it} \sim iid(0, \sigma_e^2)$ .

$DUM_{it}$  is a dummy variable taking the value of 1 for Spain, Portugal, Greece and Italy and zero for any other country in the sample. Coefficient  $b$  is expected to be statistically insignificant in the case that privatization receipts are not related to budget deficits for OECD countries other than Spain, Portugal, Greece and Italy. The sign and significance of coefficient  $c$  depends on the relative size of deficit over GDP ratios of the four countries relative to the corresponding ratios of the other OECD

countries. Finally, a negative and statistically significant sign for coefficient  $d$  would indicate that all or some of the four countries have partly used privatization receipts to cover budget deficits.

### 3.1.1.2 Empirical Results

Table 3a presents the empirical results of Model 1a. The equation estimated is of linear form. We provide evidence of the OLS estimation as well as of the random-effects estimation.

**Table 3a: Estimation Results for Model 1a<sup>\*</sup>**

Dependent Variable: DEF/GDP	
	OLS Linear Equation
Constant	1.100348 <sup>a</sup> (0.208089)
PRIRE/GDP	0.343326 (0.209878)
DUM	0.497945 (0.621350)
(PRIRE/GDP)*(DUM)	0.077938 (0.371444)
R <sup>2</sup>	0.084823

<sup>\*</sup> standard errors in parentheses.

<sup>a</sup> implies statistical significance at one per cent level.

The estimates indicate that there is no statistically significant correlation between privatization receipts and budget deficits from 1990 to 2000 for either the whole sample (coefficient  $b$ ) or the four-country sample (coefficient  $d$ ). In all cases the coefficients are positive. The four countries do not seem to have significantly higher budget deficits to GDP than the other OECD countries. Thus, the results of Jeronimo

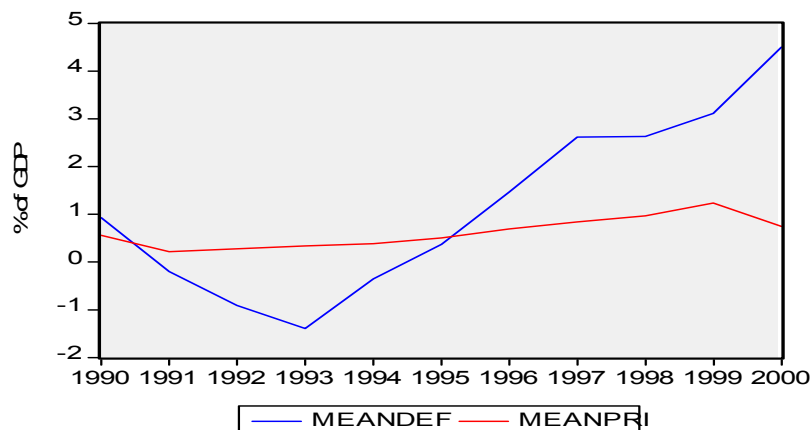


*et al.* [10] are not confirmed when we extend the period under examination from 1997 to 2000.

Figures 3 and 4 present the development of budget deficits and privatization receipts along the time period 1990 – 2000. It is evident that neither in the whole sample of the 23 OECD countries (figure 3), nor in the four-southern-countries sample is there a systematic relationship between the change of the two variables.

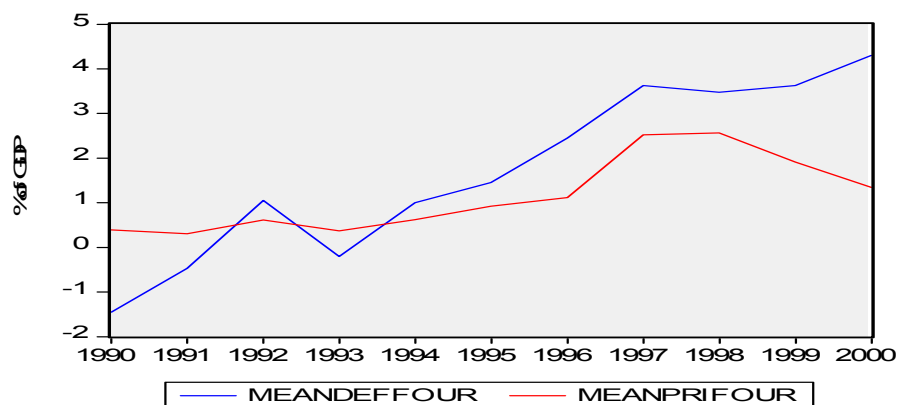
*Figure 3*

MEAN VALUES OF DEFICIT - MEAN VALUES OF PRIVATIZATION RECEIPTS



*Figure 4*

MEAN of BUDGET DEFICIT - MEAN of PRIVATIZATION RECEIPTS for GREECE, ITALY, PORTUGAL, SPAIN



Additionally, we have constructed a model investigating the impact of privatization proceeds of both the current and the previous period on public deficit, using the same sample:

$$\begin{aligned}
 (\text{DEF/GDP})_{it} = & \\
 & a + b\text{PRIRE} / \text{GDP}_{it} + c((\text{PRIRE} / \text{GDP})_{-1})_{it} + \\
 & + d\text{DUM}_{it} + g(\text{PRIRE} / \text{GDP})_{it} * (\text{DUM})_{it} + f((\text{PRIRE} / \text{GDP}) * (\text{DUM})_{-1})_{it} + e_{it}, \\
 & i = 1, \dots, N; t = 1, \dots, T.
 \end{aligned}$$

Model 1b

The results are summarized in Table 3b.

**Table 3b: Estimation Results for Model 1b<sup>\*</sup>**

Dependent Variable: DEF/GDP	
	OLS Linear Equation
constant	0.807013 <sup>a</sup> (0.197399)
PRI/GDP	0.318928 (0.209540)
PRI/GDP (-1)	0.317969 <sup>b</sup> (1.832267)
DUM	0.092704 (0.160366)
(PRIRE/GDP)*(DUM)	0.157584 (0.436190)
(PRIRE/GDP)*(DUM)(-1)	-0.016214 (0.423180)
R <sup>2</sup>	0.094534

<sup>\*</sup> standard errors in parentheses.

<sup>a</sup> implies statistical significance at one per cent level, and

<sup>b</sup> implies statistical significance at ten per cent level,

Privatization receipts of the current period seem again to have no impact on current public deficit. However, coefficient  $c$  indicates that there seems to be a positive correlation between previous year's privatization receipts and current public deficit for the whole sample. Coefficients  $g$  and  $f$  also indicate that there is no correlation between public debt and current or past year's privatization receipts for the four southern countries for the years 1990-2000.

In the previous model, when using as independent variables the first lag of the same explanatory variables, we find similar results: a positive correlation between previous year's privatization receipts and current public deficit is evident for the whole sample, while this does not seem to be the case for the four southern countries alone.

Figure 5 shows that there is a weak positive correlation between the mean of budget deficits and the mean of past year's privatization receipts for the whole sample. However, figure 6 shows that this is not the case in the four-southern-countries sample.

*Figure 5*

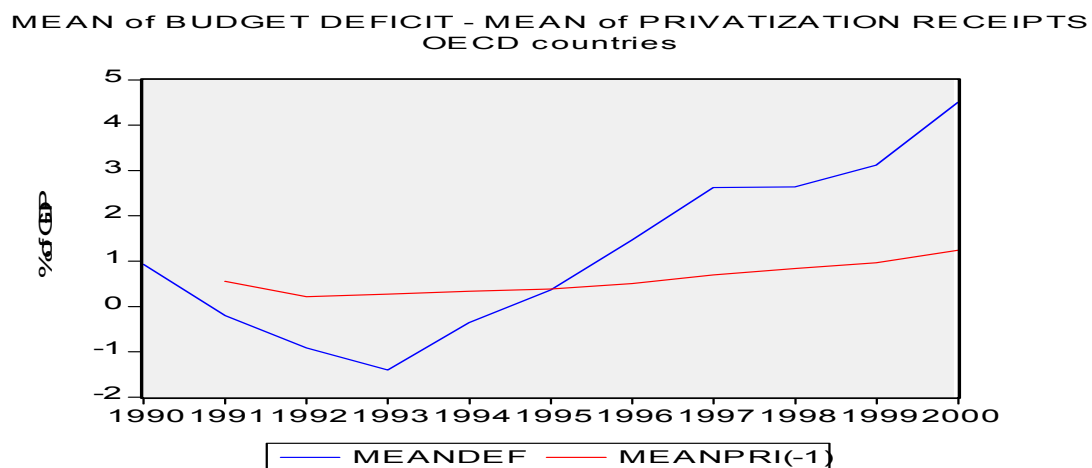
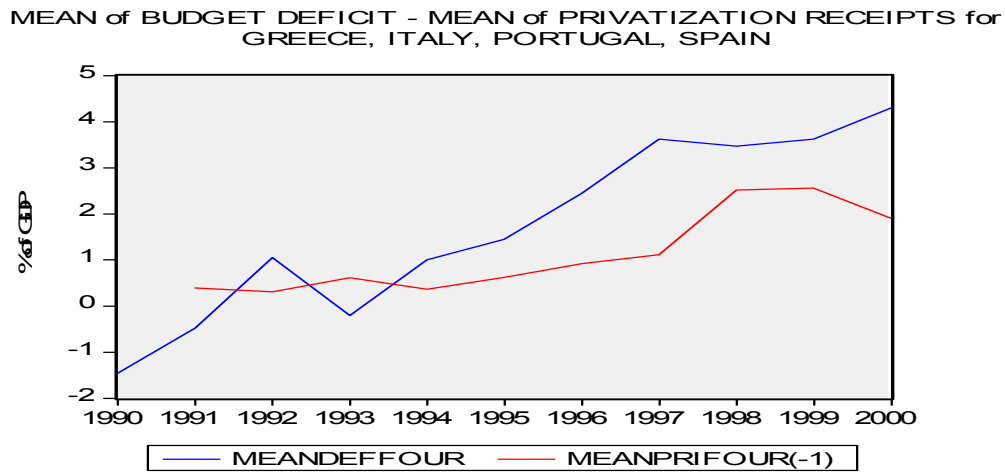


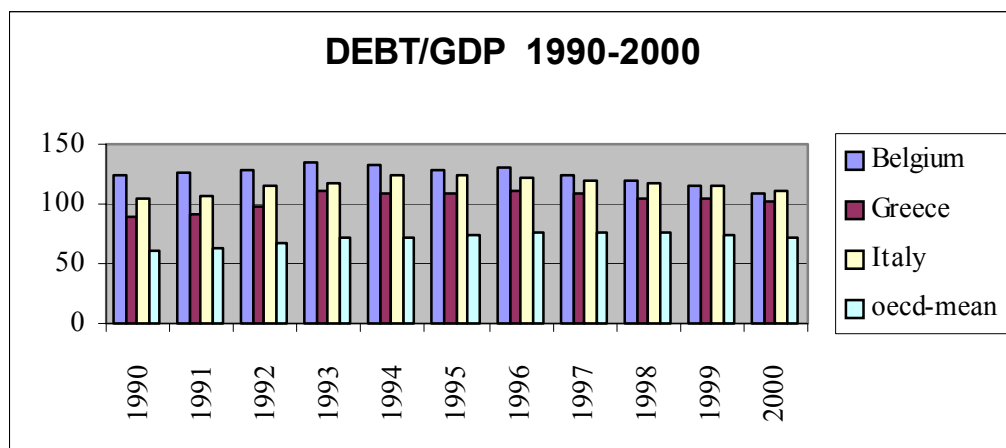
Figure 6



### 3.1.2 Impact of Privatization on Public Debt

Governments facing long-lasting debt may use privatization proceeds in order to reduce public debt. A reduction in public debt permanently lowers the fiscal deficit through a decline in net interest payments. During the last decade, Belgium, Greece and Italy have exhibited the higher percentages of debt in GDP.

Figure 7



### 3.1.2.1 Structure of the Model

The estimated equation intends to find the connection between the level of public debt (as a percentage of GDP) of country  $i$  in year  $t$  – denoted as  $(\text{Debt}/\text{GDP})_{it}$  to the value of privatization receipts (as a percentage of GDP) corresponding to the same year – denoted as  $(\text{PRIRE}/\text{GDP})_{it}$ .

The estimated model has the following form:

$$\begin{aligned} (\text{DEBT} / \text{GDP})_{it} = & \\ & a + b(\text{PRIRE} / \text{GDP})_{it} + c((\text{PRIRE} / \text{GDP})_{-1})_{it} + d\text{DUM}_{it} + \\ & + g(\text{PRIRE} / \text{GDP})_{it} * (\text{DUM})_{it} + f((\text{PRIRE} / \text{GDP})_{-1})_{it} * (\text{DUM})_{-1})_{it} + e_{it}, \\ & i = 1, \dots, N; t = 1, \dots, T. \end{aligned} \quad \text{Model 2}$$

where  $e_{it}$  is the error term. We assume that:  $e_{it} \sim \text{iid}(0, \sigma_e^2)$ .

### 3.1.2.2 Empirical Results

Table 4 presents the empirical results of Model 2. The equation estimated is of linear form. We provide evidence of the OLS estimation.

**Table 4: Estimation Results for Model 2\***

Dependent Variable: DEBT/GDP	
	OLS Linear Equation
Constant	60.81516 <sup>a</sup> (1.029445)
PRIRE/GDP	- 0.442773 (0.905131)
PRIRE/GDP(-1)	-1.702029 <sup>b</sup> (0.937875)
DUM	56.53251 <sup>a</sup>

	(2.405108)
(PRIRE/GDP)*DUM	1.978952 (2.398254)
(PRIRE/GDP)*(DUM(-1))	- 0.653760 (2.333956)
R <sup>2</sup>	0.416798

*\* standard errors in parentheses.*

*<sup>a</sup> implies statistical significance at one per cent level.*

*<sup>b</sup> implies statistical significance at ten per cent level.*

Coefficient *b* is negative but it is not statistically significant indicating that there is no correlation between current privatization proceeds and the current level of public debt for all the OECD countries of the sample. However, coefficient *c* is statistically significant and negative indicating a negative correlation between privatization receipts of the previous period and current public debt, for the whole sample. As expected, coefficient *d* is statistically significant and positive, since Belgium, Greece and Italy are indeed the countries with the higher level of public debt among the OECD countries. The results also indicate that, there is no statistically significant impact in the public debt due to privatization of the current or the previous time periods in the three countries. This suggests that the three countries do not seem to have used privatization proceeds of the current or of previous year as a means of reducing public debt.

We should also note that the same model, when estimated without any lagged variable, gives statistically insignificant coefficients except for coefficient *c*, which is found to be statistically significant and positive, suggesting that the three countries have high ratios of debt over GDP relative to all the other countries of the sample.

### 3.2 Privatization and Macroeconomic Performance

According to several studies, evidence seems to suggest that privatization contributes to higher growth rates<sup>10</sup>. Moreover, privatization is also found associated with a reduction in both contemporaneous and lagged unemployment rates<sup>11</sup>. Subsection 3.2.1 provides evidence on the relationship between unemployment rate and privatization receipts.

#### 3.2.1 Structure of the Model

The estimated random-effects equation intends to find the connection between the unemployment rate of country  $i$  in year  $t$  – denoted as  $(UNEMPL)_{it}$  to the value of privatization receipts (as a percentage of GDP) corresponding to the same year – denoted as  $(PRIRE/GDP)_{it}$ . The growth rate of GDP as well as  $(GDPGR)_{it}$  and the first lag of unemployment rate  $(UNEMPL(-1))_{it}$  are also used in the same equation as explanatory variables of the unemployment rate.

The estimated model has the following form:

$$UNEMPL_{it} = a + bPRIRE / GDP_{it} + cGDPGR_{it} + d(UNEMPL_{-1})_{it} + e_{it},$$

$i = 1, \dots, N; t = 1, \dots, T.$  Model 3a

where  $e_{it}$  is the error term. We assume that:  $e_{it} \sim iid(0, \sigma_e^2)$ .

##### 3.2.1.1 Empirical Results

Table 5 presents the empirical results of Model 3. The equation is estimated using feasible generalized least squares applied to an unbalanced panel. A positive and statistically significant coefficient  $b$  would indicate a positive relationship between

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<sup>10</sup> See Davis *et al.* [6].

<sup>11</sup> See Meggison, W., et al. [12], Boubakri, N, and J-C. Cosset [3].

unemployment rates and privatization receipts. Coefficient  $c$  is expected to be statistically significant and negative. The sign of coefficient  $d$  is as expected to be positive.

**Table 5a: Estimation Results for Model 3a\***

Dependent Variable: UNEMPL	
	OLS Linear Equation
Constant	
PRIRE/GDP	-0.133414 <sup>c</sup> (0.082693)
GDPGR	-0.035123 <sup>a</sup> (0.009273)
UNEMPL(-1)	1.004226 <sup>a</sup> (0.10752)
Adjusted R <sup>2</sup>	0.9211853

\* standard errors in parentheses.

<sup>a</sup> implies statistical significance at one per cent level.

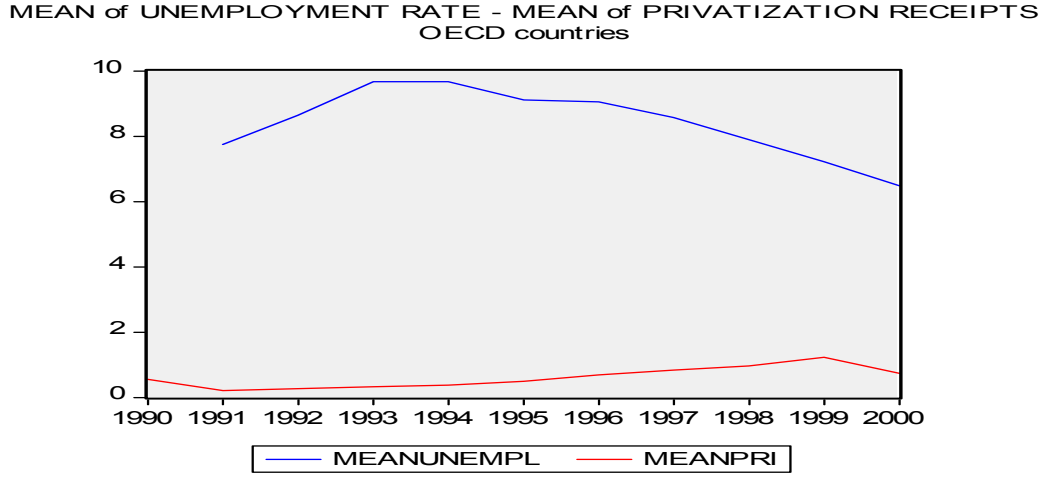
<sup>b</sup> implies statistical significance at five per cent level.

<sup>c</sup> implies statistical significance at ten per cent level.

As expected, the growth rate has a significant negative impact on unemployment. The estimation results also indicate that there is a statistically significant correlation between unemployment and privatization proceeds. In particular, privatization proceeds are found to have a negative impact on the unemployment rate. Although it is often argued that the privatization of state-owned firms being “protected” through ‘soft’ budget constraints will increase unemployment, several studies suggest that privatization is not associated with large-scale job losses – see Megginson, *et al.* [11] and Boubakri *et al.* [3]. In particular, privatization, when accompanied by deregulation, can lead to new-business generation, which, in turn, increases the employment levels.



Figure 8



Indeed, figure 8 demonstrates a negative relation between current unemployment rate and privatization receipts, especially for the period 1990 – 1999.

However, it is often argued that unemployment may also be affected by expectations of future privatizations. Therefore, it is interesting to investigate the relationship between current unemployment rate and privatization receipts received in the near future. The model we employed for such an investigation has the following form:

$$(UNEMPL_{-1})_{it} = a + bPRIRE / GDP_{it} + c((GDPGR)_{-1})_{it} + e_{it},$$

$$i = 1, \dots, N; t = 1, \dots, T. \quad \text{Model 3b}$$

where  $e_{it}$  is the error term with  $e_{it} \sim \text{iid}(0, \sigma_e^2)$ .

The estimation results of model 3b are presented in Table 5b.

**Table 5b: Estimation Results for Model 3b<sup>\*</sup>**

Dependent Variable: UNEMPL(-1)	
	OLS Linear Equation
Constant	8.364892 <sup>a</sup> (0.190822)
PRIRE/GDP	0.388895 <sup>a</sup> (0.136408)
GDPGR(-1)	-0.042885 <sup>a</sup> (0.016542)
Adjusted R <sup>2</sup>	0.852565

<sup>\*</sup> standard errors in parentheses.

<sup>a</sup> implies statistical significance at one per cent level.

The estimation results indicate the following: coefficient  $b$  is statistically significant and positive leading to the conclusion that privatization receipts are positively correlated to previous year's unemployment rate; the anticipation of future privatizations seems to increase unemployment. This is consistent to theoretical models<sup>12</sup>, arguing that the announcement of privatization schemes urges firms to operate more effectively which is often accompanied with job losses. As expected, it is also found that there is statistical significant and negative correlation between the unemployment rate and GDP growth rate.

### 3.2.2 Growth Rates

The equation presented in this subsection intends to correlate GDP growth rate with privatization proceeds. The exact equation has the following form:

$$GDPGR_{it} = a + b((PRIRE / GDP_{-1}))_{it} + e_{it},$$

$i = 1, \dots, N; t = 1, \dots, T.$                       Model 4

where  $e_{it}$  is the error term. We assume that:  $e_{it} \sim \text{iid}(0, \sigma_e^2)$ .

### 3.2.2.1 Empirical Results

Table 6 presents the empirical results of Model 4. The equation is estimated using feasible generalized least squares applied to an unbalanced panel.

**Table 6a: Estimation Results for Model 4\***

Dependent Variable: GDPGR	
	OLS Linear Equation
Constant	3.488486 <sup>a</sup> (0.694401)
PRIRE/GDP(-1)	- 0.789710 (0.596428)
Adjusted R <sup>2</sup>	0.08453

\* *standard errors in parentheses.*

<sup>a</sup> *implies statistical significance at one per cent level.*

The OLS-model results indicate that there is no statistically significant relation between GDP growth rates and privatization proceeds of the previous period. In a model estimating the impact of current privatization proceeds and GDP growth rate of the previous period it is also found statistically insignificant relation.

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<sup>12</sup> See, for example, Christodoulakis N. and Y. Katsoulakos [5].

### 3.3 Conclusions

According to the estimation results, privatization receipts are not found to be significantly correlated with budget deficit neither for the whole OECD sample, nor for the four southern countries, in contrast to Jeronimo *et al.* where privatization receipts are found to have statistically significant and negative relation to budget deficits for the four countries.

As it is expected, the estimations also indicate that there exist a statistically significant and negative relation between privatization receipts and public debt for the whole OECD sample, while this does not seem to be the case for the three countries with the higher debt over GDP rates.

The estimation results also indicate that current privatization receipts have statistically significant and negative effect on the current unemployment rate and positive effect on previous period's unemployment rate. Considering this result we can note that when privatization is *announced* the accompanied restructuring, which urges firms to operate more efficiently, can cause job losses, and, thus, increase the unemployment rate (justifying the positive effect of privatization on previous period's unemployment rate). On the other hand, when privatization is *implemented*, new entry in the market occurs, increasing the demand for labor and, thus, decreasing unemployment rate (explaining the negative effect of privatization receipts on current period's unemployment rate).

The correlation between GDP growth and current or past period's privatization receipts are statistically insignificant for the whole OECD sample.

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- (xlv) This paper was presented at the International Workshop on "New Ports and Urban and Regional Development. The Dynamics of Sustainability" organised by the Fondazione Eni Enrico Mattei, Venice, May 5-6, 2000.
- (xlvii) This paper was presented at the Sixth Meeting of the Coalition Theory Network organised by the Fondazione Eni Enrico Mattei and the CORE, Université Catholique de Louvain, Louvain-la-Neuve, Belgium, January 26-27, 2001
- (xlviii) This paper was presented at the RICAMARE Workshop "Socioeconomic Assessments of Climate Change in the Mediterranean: Impact, Adaptation and Mitigation Co-benefits", organised by the Fondazione Eni Enrico Mattei, Milan, February 9-10, 2001
- (xlviii) This paper was presented at the International Workshop "Trade and the Environment in the Perspective of the EU Enlargement", organised by the Fondazione Eni Enrico Mattei, Milan, May 17-18, 2001
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- (lii) This paper was presented at the International Conference on "Economic Valuation of Environmental Goods", organised by Fondazione Eni Enrico Mattei in cooperation with CORILA, Venice, May 11, 2001
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- (liv) This paper was presented at the Seventh Meeting of the Coalition Theory Network organised by the Fondazione Eni Enrico Mattei and the CORE, Université Catholique de Louvain, Venice, Italy, January 11-12, 2002
- (lv) This paper was presented at the First Workshop of the Concerted Action on Tradable Emission Permits (CATEP) organised by the Fondazione Eni Enrico Mattei, Venice, Italy, December 3-4, 2001
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