

The Impact of Fiscal Policy on Profits

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Abstract

This paper investigates the impact of fiscal policy on profits using a sample of 19 OECD countries during the period 1975 – 2000. We estimate a profit equation in which profits depend on a set of fiscal variables. Our empirical method is based on a consistent treatment of the government budget constraint, and we try to disentangle the effects of different spending and taxation items. On the expenditure side we distinguish between productive and unproductive spending. Our results that are robust to several changes in data decomposition indicate that capital expenditure has a positive impact on profits while the coefficient on current expenditure is statistically insignificant. Direct and indirect taxation seem to decrease profits. However, a more detailed decomposition of direct taxation suggests that certain items such as social security contributions have a neutral effect on profits.

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1. Introduction

A large number of policy making decisions rely on the key macroeconomic question of the nature of fiscal policy's impact on the economy. Therefore, it is not surprising that the impact of fiscal policy on macroeconomic aggregates has been extensively studied in the empirical literature.¹ However, some of the transmission channels between fiscal policy and the macroeconomic aggregates have not been thoroughly investigated; the one relatively under-investigated channel that is the subject of the present paper is the effect of fiscal policy on profits.

The role of profits as a key driving force of capital accumulation and economic activity has been of paramount importance in economic thinking since the time of Adam Smith and David Ricardo. More recently, Abel and Blanchard (1986), Phelps (1994), Alesina et al. (2002) and Garcia-Penalosa and Turnovsky (2007) have provided models in which profits play a central role as a determinant of investment and growth. Given the importance of profits in shaping macroeconomic developments, it is surprising that – to the best of our knowledge - the only existing empirical study that investigates the influence of fiscal policy on business profits and investment is the one by Alesina et al (2002). The authors find that an increase in government spending has a negative impact on business profits and investment especially if the spending involves increases in the government's wage bill.

This paper aims at investigating the impact of fiscal policy on profits while taking into account the structure of fiscal policy for a sample of 19 OECD countries during the period 1975 – 2000. Our empirical evidence indicates that only 'productive' expenditure such as capital expenditure has a positive impact on profits. Regarding tax revenue, we find that a rise in both direct and indirect taxation will have a negative impact on profits, whereas a further decomposition of direct taxation reveals that revenue from social security contributions has no impact on profits.

¹ For the impact of fiscal policy on growth see the references in the next section. For the "Keynesian" and "non-Keynesian" impact of fiscal policy see Beetsma (2008) and Hemming et al. (2000). Blanchard and Perotti (2002), Perotti (2005) and Fatas and Mihov (2001) find empirical results that support the Keynesian view of a positive government spending effect on consumption, while Burnside et al. (2003) find evidence for the RBC model's prediction of a negative government spending effect on consumption. For a review of studies that investigate the impact of taxation on the cost of capital see Hassett and Hubbard (1996) and Chirinko (1993).

Our approach differs from Alesina et al. (2002) in two aspects, namely the way the government's budget constraint is decomposed and the method we use for its specification. Following Aschauer (1989) and Devarajan et al. (1996), the literature dealing with the growth impact of fiscal policy recognized that one should make a distinction between 'productive' and 'unproductive' public spending. In general, government expenditure components are classified as productive, if they are included as arguments in the private production function and as unproductive if they are not. Similarly, taxation items can be classified either as direct (distortionary) taxation, if they affect the investment decisions of individuals or as indirect (non-distortionary) taxation if they do not affect the saving/investment decision [see Kneller et al. (1999)]. Given that allowing for a decomposition of the government budget constraint along these lines seems to be a promising way forward in the empirical literature on fiscal policy and growth and despite the fact that the classification of certain budget items can be debatable [see Kneller et al. (1999)], we try - as much as data availability allows us- to adopt this approach in our analysis. This implies that we use a different decomposition of government's budget constraint than the one used by Alesina et al. (2002) - their method is explained in the following section.

Moreover, following the approach of Kneller et al. (1999) and Bleaney et al. (2001) our empirical method is based on a consistent treatment of the government's budget constraint. Kneller et al. (hereafter KGB) show that incomplete specification of the budget constraint results in substantial biases in parameter estimates. This implies that neglecting the budget constraint of the government may have led to the literature's ambiguous predictions as for the effect of fiscal policy on economic growth. We briefly review this literature in the next section. Moreover, KGB point out that omitting an element of the government budget (including the deficit) to avoid perfect collinearity alters the interpretation of the 'new' coefficients of the remaining elements. Specifically, KGB show that the 'new' coefficients on each remaining fiscal category are equal to the deviation of the 'real' coefficients from the coefficient of the omitted category. As a result, the standard hypothesis test of a zero coefficient is in fact testing the null hypothesis that the deviation of each fiscal element's coefficient from the coefficient of

the omitted element is zero. This implies that only financing elements with insignificant coefficients should be omitted from the regression.

The remainder of the paper is organized as follows. In Section 2, we present a review of the relevant empirical literature. The empirical analysis is presented and discussed in section 3. The last section concludes.

2. Review of the literature

The existing literature on the impact of fiscal policy on economic activity is quite rich and dates back to the mid 80's [see among others, Aschauer (1989), Barro (1991), Kormendi and Mequire (1985), Engen and Skinner (1992), Levine and Renelt (1992), Agell et al. (1997) and Widmalm (2001)]

Despite the large existing literature on the impact of fiscal policy on growth, the empirical research on the impact of fiscal policy on possible determinants of growth such as the level of profits is quite limited. Alesina et al. (2002) provide – according to our knowledge - the only empirical work that investigates the possible effects of fiscal policy on profits. In their investigation, they use data from OECD Economic Outlook, and their sample includes 18 countries covering the period 1960-96. As for the fiscal variables, government spending is disaggregated into three categories: the government wage component of spending, the purchase of goods and services and the transfers to households. Moreover, tax revenues are disaggregated into labor income taxes, indirect taxes and business taxes. The authors show that an increase in government spending and especially in government wage bill can reduce profits and investment. This effect takes place because an increase in the wage bill of the public sector leads to an increase in wages in the private sector and consequently reduces profits and investment.² Regarding the effects of taxation, labor taxation seems to have a sizeable negative effect on profits and investment. This effect might be explained by the fact that an increase in labor taxes raises the cost of work relative to leisure, leading to a fall of labor supply and a reduction

² See e.g., Finn (1998) for perfectly competitive labor markets and Ardagna (2007) for unionized labor markets.

in profits and investment. It is worth noting that the effects of government spending on profits and investment are larger than those of taxation.

An interesting issue that is not, however, addressed by Alesina et al. (2002) is whether the so-called quality of fiscal policy instruments matters. The existing literature on the quality of fiscal policy instruments and growth is quite rich and still growing. Devarajan et al. (1996) were the first that looked into the issue of the composition of public expenditure and the empirical linkage with economic growth. In their approach, they use two different samples, one consisting of 43 developing countries and one consisting of 21 high income OECD countries during the period 1970-90. Public expenditures are disaggregated into capital and current expenditures. Moreover, they evaluate the quality of various expenditure components such as defense, health, education and transport - communication expenditures. As expected, for the sample of developed (developing) countries the results show that capital and transport - communication expenditures have a growth enhancing (retarding) effect, while current expenditures have a growth retarding (enhancing) effect. As for the transport - communication expenditures, the same result has also been supported by Easterly and Rebelo (1993).

KGB and Bleaney et al. (2001), moving one step forward, addressed the issue of respecting the government's budget constraint when estimating the fiscal policy impact on growth. According to KGB, neglecting the budget constraint of the government may have led to the ambiguous predictions as for the effect of fiscal policy on economic growth in the previous studies. Moreover, one should be extremely careful as for the choice of the budget constraint items that are to be excluded from the regression. Suppose that including all elements of the budget constrained the coefficient for a certain fiscal variable X included in the regression is γ_j and that in order to avoid perfect collinearity, we omit another variable with coefficient γ_m . This implies that the estimated coefficient for variable X will now equal $\gamma_j - \gamma_m$, so that the standard hypothesis test of a zero coefficient of X is in fact testing the hypothesis $(\gamma_j - \gamma_m) = 0$ rather than $\gamma_j = 0$. This implies that one should omit from the regression only the fiscal variables with negligible effect on growth. Moreover, building upon Barro (1990), KGB classify government expenditures as productive, unproductive and other, whereas they classify tax revenues as distortionary, non- distortionary and other according to their expected effect on economic

growth.³ In their investigation, they use a sample of 22 high income OECD countries over the period 1970- 95 and aggregate the data into 5 year averages. The results reveal a positive effect of productive expenditures, other expenditures and budget surplus on economic growth, but a negative effect of distortionary taxation on economic growth. More recently, an interesting extension of KGB paper is the study of Angelopoulos et al. (2006), where instead of using distortionary and non- distortionary taxation, effective tax rates are used, as have been calculated by Martinez – Monqay (2000), and statutory tax rates on corporate and individual income. Their results - for a sample of 23 high income OECD countries during the period 1970-2000 - show that the share of productive government expenditures over GDP is associated with higher growth, while tax rates on labour and corporate income are associated with lower growth.

Concluding, it is clear that the existing literature on economic growth and the quality of fiscal policy can provide us with some very useful methodological insights and tools. Our goal is to borrow the tools developed by this literature in order to examine the effect of fiscal policy on profits while respecting the budget constraint of the government. In other words, we will follow the methodology of KGB, with some modifications that will be explained thoroughly in the next section, in an attempt to untangle the impact of fiscal policy on profits.

3. Empirical analysis

3.1. Fiscal data

In this paper we explore the relationship between the quality of fiscal policy instruments and the profit share of output in 19 high income OECD countries during the period 1975 – 2000.⁴ Two small OECD countries, Iceland and Luxemburg are excluded from our sample, together with New Zealand, due to data problems. Moreover, Greece has also been excluded as an outlier (see figure 1), since the high profit share

³ Surplus (deficit) is also included in the regressions. This implies that revenues, expenditures and surplus add up to zero.

⁴ Our choice of country and time period of our sample is restricted by the (un)availability of data.

approximated by the gross operating surplus as a percentage of GDP in Greece reflects mainly the high share of self employment in total employment.

We follow KGB methodology by respecting the government's budget constraint so that only implicit financing elements are omitted from the regressions in order to obtain unbiased estimators. Our specification, however, differs from KGB approach in the following ways:

First, instead of using productive and unproductive expenditures we classify expenditures as capital and current. We use this broader classification due to data availability considerations. Moreover, this method is less arbitrary compare to the classification of expenditure as productive and unproductive. For example, the justification for classifying defense expenditures as productive and economic services expenditures as unproductive isn't self evident. On the other hand, treating capital expenditures as being productive can less easily be disputed. Thus, we construct the variables *capital expenditures* and *current expenditures* defined as the ratio of capital and current expenditures, respectively, over GDP.

Second, in order to extract more information from our available data, we proceed into disaggregating a number of fiscal variables. Regarding expenditures, we disaggregate current expenditures into interest payments (*interest payments*), goods and services expenditures (*goods and services*) and other current expenditures (*other current*).⁵ Regarding the tax variables we apply the methodology of KGB and classify them as direct (distortionary) taxation (*direct taxation*), indirect (non-ditortionary) taxation (*indirect taxation*) and other revenues (*other taxation*). Later on, we will disaggregate variable *direct taxation* into taxation on income and profits (*income taxation*) and other direct taxation (*other direct taxation*). In many cases, variable *other direct taxation* consists entirely of social security contributions. Finally, in our regressions we include the budget surplus (*surplus*).⁶ The summation of total

⁵ Other current expenditures are current expenditures other than interest payments and goods and services expenditures. Other current expenditures include all unrequited, nonrepayable transfers on current account to private and public enterprises, and the cost of covering the cash operating deficits of departmental enterprise sales to the public by departmental enterprises.

⁶ Overall budget surplus is current and capital revenue and official grants received, less total expenditure and lending minus repayments. It is worth noting that in our regressions we do not include the very small component grants for the side of revenues and the very small component lending minus repayments for the

expenditures, total revenues and budget surplus add up to zero, so that in order to avoid perfect collinearity, at least one element of the budget constraint must be omitted. As we have already mentioned, we have to choose the omission of neutral financing elements with negligible profits effect, so that we can derive unbiased coefficients.

Our fiscal data are from the *IMF* Government Financial Statistics (*GFS*) database since, according to our knowledge, this is the most complete database for fiscal elements that compose total government expenditures and total revenues. All fiscal variables are expressed as a percentage of GDP.

3.2. The profit equation

Our dependent variable is the 5 year average of gross operating surplus, defined as GDP less compensation of employees and taxes (minus subsidies) on imports and production, as a share of GDP, and denoted as *profits*. We follow the standard approach of constructing 5-year period averages so as to minimize business cycle effects.⁷ We obtain this series from *AMECO* database (see Appendix for details on data sources and descriptive statistics).

Our estimated profit equation has the form:

$$\text{profits}_{i,t} = \beta_m M_{i,t} + \beta_z Z_{i,t} + \mu_i + \lambda_i + \varepsilon_{i,t}, \quad (1)$$

where *M* is a set of fiscal variables, *Z* is the set of “other” variables that we use to control for country – specific profits related characteristics. Finally, μ_i and λ_i are country and time specific fixed effects and $\varepsilon_{i,t}$ is the error term. Our *Z* set of ‘other’ variables includes: (a) *An indicator of the development of labour cost relative to labour productivity*. Instead of using a measure of unit labour cost we construct an excessive wage indicator that we borrow from Malley and Moutos (2006). We obtain excessive wages by estimating the regression:

side of expenditures. This happens for two reasons, first, because these elements reduce our sample significantly and second because when we include them in our regressions, they turn out insignificant.

⁷ Apart from the last observation that we aggregate over a six years period.

$$\ln (W_t) = a_0 + a_1 \ln (P_t) + \varepsilon_t, \quad (2)$$

for each country using annual data obtained from OECD Economic Outlook database. In the estimated equation, W_t is the real total compensation per employee and P_t is the index of productivity (2000=100). The residuals, ε_t , estimated from the above regression are the excessive wage (*excessive wage*) indicator that we apply in our regressions.⁸ However, our results do not alter, when later on we use actual (and not generated) data as an alternative measure of excessive wages.

(b) *The state of demand*. As a measure of demand, we use the growth rate of final consumption (*consumption*), obtained from World Bank's "World Development Indicators" (*WDI*).

(c) *A measure of competitiveness*. We include in Z the real effective exchange rate index (2000=100) (*reer*) obtained by deflating the nominal effective exchange rate with price indices. According to the definition of the International Monetary Fund (*IMF*), the real effective exchange rate is computed as the weighted geometric average of the price of the domestic country relative to the prices of its trade partners. An increase in the index for each country indicates deterioration of competitiveness and vice versa.

(e) *The unemployment rate*. Unemployment may affect profits through its impact on non-wage labour cost. For example, the cost of searching for a workforce with the appropriate skills may depend on how "tight" the labour market is. Our *unemployment* variable is obtained by *OECD Economic Outlook* database.

3.3. Empirical Strategy

In this section, we want to check which estimator is the most appropriate for our approach using a variety of specification tests proposed by modern econometric analysis for panel data.

⁸ Pagan (1984) has shown that using residuals in a two step estimator produces consistent estimates, as long as $\text{cov}(X, \varepsilon) = 0$. Where X is the set of control variables used in the second step. Because our variable is a generated regressor, we use for its construction the wider time range the database allows for each country.

We start by estimating the Breusch and Pagan (1980) Lagrange Multiplier test (see test N_1 in tables 1-6) for random effects. The LM test is a test on the variance of the presence of country specific effects, with the null hypothesis indicating no unobserved heterogeneity ($\mu_i = \mu$ in eq.1) and the pooled OLS estimator as the most appropriate approach. The test statistic associated with the Lagrange Multiplier is distributed asymptotically as a chi-square (χ^2) with degrees of freedom equal to the number of restrictions being tested, here one. In our model, the null hypothesis of no unit specific random effects cannot be accepted, which means that we cannot ignore the presence of unobserved heterogeneity.

Next, in order to check if among Fixed Effects model and Random Effects model one is superior to the other, the Hausman (1978) test (N_2) is performed.⁹ The null hypothesis of the Hausman test is that regressors and the unobservable country-specific random error are uncorrelated. The test statistic is distributed as a Chi-square (χ^2) with M degrees of freedom, where M is the number of regressors. The Hausman test does not clearly indicate which estimator is the most preferable for our approach. So, in the next section we report results for both models. It is worth noting, however, that fixed effects are a reasonable way to proceed with panel data, as they always give consistent results, yet they may not be efficient. Baltagi (2005) argues that fixed effects model is an appropriate specification for panel data analysis, when focusing on a specific set of individuals, which fits in our case of 19 high income OECD countries.

It is also important to check, with an F-test (N_3), whether time fixed effects should be included in our estimated model. Results strongly suggest the inclusion of time dummies in our regressions.¹⁰ So, the inclusion of country and time - specific effects in our estimations give us an additional advantage of controlling for a large part of omitted variable bias.

When the length of the panel, T, is small it is very difficult to investigate the presence of groupwise heteroskedasticity and serial correlation in a panel data model. For this reason we perform different specification tests in order to extract as much information as possible from our panel data. Hence, our model is tested by performing a likelihood ratio test (N_4), as proposed by Green (2000), of the null hypothesis of

⁹ The stata command *xtoverid* is used as proposed by Schaffer and Stillman (2006), rather than the default stata command *hausman*, because we face some computational difficulties.

¹⁰ Additionally, we cannot accept the joint insignificance of country - specific characteristics (Prob>F=0.000).

homoscedasticity versus the alternative hypothesis of heteroscedasticity across groups.¹¹ The test statistic is distributed as a Chi-square (χ^2) with $(G - 1)$ degrees of freedom, where G is the number of regressors. The null hypothesis cannot be accepted, indicating the presence of heteroskedasticity. In addition, Baltagi (2005) LM₅ test for serial correlation, assuming fixed individual effects, is performed.¹² Additionally, since the within transformation wipes out the individual effects whether fixed or random, one can also test for serial correlation in the random effects model. The null hypothesis is either that $\rho=0$, if residuals follow an AR(1) process (eq. 3), or that $\lambda=0$, if residuals follow an MA(1) process (eq. 4) :

$$u_t = \rho u_{t-1} + \varepsilon_t \quad (3)$$

$$\varepsilon_t = u_t + \lambda u_{t-1} \quad (4)$$

The test statistic is distributed as a Chi-square (χ^2) with one degree of freedom. The value of the LM₅ test suggests that in all cases we can't reject the hypothesis of no serial autocorrelation. Therefore, in our estimation procedure we use Huber-White standard errors to correct for heteroskedasticity.

It is worth noting that after the inclusion of robust standard errors in our regressions we repeated Hausman test. The results support Fixed Effects approach even strongly. Specifically, we reject the null hypothesis of not systematic difference between RE and FE models in all but three regressions.

Finally, an alternative specification of our model would be to include the lagged dependent variable in equation (1). This would imply estimating our model with dynamic panel data techniques such as the Arellano-Bond (1991) GMM estimator. In order to test whether we should estimate a dynamic version of our model we first run the FE model and get the residuals. Then, we construct the lagged residuals, which we add into the original FE model specification. We obtain the estimates and test whether the coefficient

¹¹ Alternatively, we test our model with a modified Wald statistic for groupwise heteroskedasticity in the residuals of a fixed effect regression model, following Greene (2000).

¹² We had considered an alternative of performing a test for serial correlation as proposed by Wooldridge (2002) and Drucker (2003). However, this test may need larger samples sizes in the presence of heteroskedasticity. In addition, we use stata command *xtbac*, as proposed by Nunziata (2002), to check for serial correlation in the Random Effects model and we obtain the same results.

on lagged residuals is significant. The F-test accepts the null hypothesis that the lagged residuals have no significant effect. Therefore, the inclusion of the lagged dependent variable is not justified by the data.

3.4. Results

We begin by omitting all fiscal variables from our regressions. The first two columns of table 1A show the estimating effects of “other” variables on profits using Fixed Effects and Random Effects. *Excessive wage* variable is negative and statistically significant at the 1% significance level. This is an expected result since an increase in *excessive wage* tends to increase the cost of production in business sector putting a downward pressure in the profit share. The coefficient of *consumption* variable is positive and statistically significant indicating that, as expected, a rise in demand has a positive impact on profits. The coefficient of *reer* variable is negative and statistically significant at the 1% level. So, an increase in the *reer* index that is caused by a deterioration of competitiveness for the home country has the expected effect and is associated with a fall in the profit share.¹³ Finally, *unemployment* variable is positively related with profits, suggesting that in a “tight” labour market profits will fall.

In the third and fourth column of table 1A, we model profits as a function of fiscal variables along with the control variables. As we have already explained, we have to omit one element of the budget constraint in order to avoid perfect collinearity. Similarly to Alesina et al. (2002), we choose to omit the budget surplus (deficit). Our results indicate a neutral effect of total expenditures on the profit share. On the other hand, an increase in taxation is negatively related with the profit share at the 1% level. In comparison with Alesina et al. (2002) results, we observe that although the coefficient of revenue turns out statistically significant and has the same effect on the profit share, expenditures don't seem to deteriorate profits.

¹³ We attempted to introduce in our regressions two additional variables, imports of goods and services as a share of GDP (*imports*) and exports of goods and services as a share of GDP (*exports*), as a control variable for country's openness. These two variables were insignificantly related with profits when variable *reer* was included in our regressions. On the other hand, when variable *reer* was dropped from regressions, variables *imports* and *exports* became statistically significant without introducing any qualitative difference in our results.

However, these aggregate results are not very informative, since, as stated in the introduction, theory predicts that different expenditure and revenue items may have a different effect on profits. The impact of fiscal policy on the marginal product of capital depends on various factors such as the assumption made regarding the production function, the precise form of fiscal expansion, the way that the expansion is financed and the characteristics of the labour market [see among others Baxter and King (1993), Finn (1998), Fatas and Mihov (2001) and Ardagna (2007)]. Thus, the insignificant coefficient on expenditure does not rule out the possibility that some expenditure component (e.g. productive expenditures) have a positive impact on profits.

Next, in the fifth and sixth column of table 1A, we omit from our regression *expenditures*, which seem to be a neutral financing element, while we introduce variable *surplus*. Results for variable *revenues* remain unaffected, while in line with our initial assumption, the coefficient of variable *surplus* is highly statistically insignificant. In the seventh and eighth column of table 1A, we exclude from our regression variables *expenditures* and *surplus*, while *revenues* still have the same effect on profits. Finally, in the last two columns of table 1A, we attempt to mis-specify the budget constraint in order to check the importance of omitting from our regressions only elements with a neutral effect on profits. As can be seen, the coefficients of variables *expenditures* and *surplus*, when financed by increased taxation, are negatively biased and statistically significant, which suggests that we should be extremely careful as for the budget items we exclude from our regressions.

Table 1A here

As a second step in our analysis, we decompose in more detail expenditures and revenues, into *capital expenditures* and *current expenditures*, *direct taxation*, *indirect taxation* and *other taxation* as described in section 3.1. As can be seen from the results in the first two columns of table 1B, variable *capital expenditures* is positive and statistically significant at the 1% level. So, an increase in capital expenditures financed by deficit, that we have assumed to be a neutral element, can cause an increase in profits. This result is consistent with several models that show that fiscal expansion in the form

of a rise in public investment will increase the marginal product of capital either directly by shifting the private marginal product schedules or indirectly by correcting market failures that led to the underinvestment of the private sector in the market for infrastructure. [see among others Murphy et al. (1989), Baxter and King (1993) and Fatas and Mihov (2001)].

In Baxter and King (1993) capital expenditures are considered an input in the production function of the private sector with a direct impact on the marginal product of labour. Furthermore, investment in infrastructure which is a large share of public investment corrects the existence of market failures with positive externalities for the productivity of the public sector. As emphasized by Murphy et al. (1989) “...*infrastructure can be a particularly appealing area for state intervention. First, coordination issues are especially important since the infrastructure serves many sectors simultaneously. Second, the projects tend to be large and time-consuming, so that capital market constraints and substantial uncertainty can deter private participation. Third, projects are fairly standard, and hence “local knowledge” (Hayek 1945), which is perhaps the main advantage of private entrepreneurs over government, is not as essential as in other activities.*

Table 1B here

The *current expenditures* variable, that in many countries consists almost the 90% of total expenditures, seems to be negatively but insignificantly related with profits. This may explain our previous result of a statistically insignificant coefficient on aggregate expenditure. In the next subsection, we will decompose current expenditures into three different expenditure categories, in order to see if any particular type of these expenditures has an effect on profits. For this reason, we will postpone the discussion of this result until the next subsection.

As for the tax variables, in line with Alesina et al. (2002), *direct taxation* is negative and statistically significant at the 1% level. An increase in direct taxation, that raises the cost of work relative to leisure (intra-temporal effect) and induces individuals to work more, when taxes are low (inter-temporal effect), will reduce labor supply and the marginal product of labour in a perfectly labour market. In an imperfectly competitive

labour market, the pre-tax real wage may rise with a negative impact on profits [see Alesina et al. (2002)]. Moreover, in contrast with the findings of Alesina et al. (2002), we find that *indirect taxation* has a negative and statistically significant impact at the 5% level. This result is more consistent with the presence of imperfect competition in the product market, since firms “markup” will depend negatively on the level of an ad valorem indirect tax [see Anderson et al. (2001)]. This implies that indirect taxation will have a negative impact on profits. Finally, the coefficient of variable *other taxation* that consists of international trade revenues, non-tax revenues and other tax revenues is negative and statistically significant at the 5% level.

Moving one step forward, in the third and fourth column of table 1B, we still consider budget surplus as a neutral element of the budget constraint, but now, we extract international trade revenues from variable *other taxation* and add them on variable *indirect taxation*, in order to generate variable *indirect taxation 2*.¹⁴ The main reason behind this modification is the common effect of these two different taxation categories on prices. Results are consistent with those reported in the first two columns. As can be seen, the coefficient of variable *indirect taxation 2* is negative and statistically significant at the 1% level. At the same time, variable *other taxation 2* loses part of its significance, while all other variables retain the same effect on the profit share.

In the next two columns of table 1B, we omit fiscal variable *current expenditures*, that seem to have an insignificant impact on the profit share, and we introduce variable *surplus* in our regression, in order to test our implicit assumption that the coefficient on *surplus* is insignificant. The results once again remain unaffected for variables *capital expenditures*, *direct taxation* and *indirect taxation 2* that seem to have a significant relation with the profit share, while on the other hand variable *surplus* is not statistically significant. Also, variable *other taxation 2* is insignificantly related with the profit share for Random Effects model, while for Fixed Effects model results reveal a non-robust relationship.

In the last two columns, in order to test the robustness of our results, we omit from our regression all neutral financing elements, namely *surplus* and *current*

¹⁴ Before that, we used international trade revenues (% GDP) as a separate variable in our model and results indicated a negative and statistical significant relation with profits at the 1% level.

expenditures. As can be seen, we still obtain statistically significant, and very similar, coefficients for variables *capital expenditures*, *direct taxation* and indirect taxation 2.

3.5. Sensitivity Analysis

In this section, we test the robustness of the results obtained in the previous section. We introduce five changes in our specification. First, we use instrumental variables to examine the exogeneity of our explanatory variables. Second, we use different measures to control for the development of labour cost relative to labour productivity and the state of demand. Then, we use a different measure for profits as dependent variable. Next, we re-estimate our regressions by dropping the 10% of our sample. Finally, we proceed into a further decomposition of the budgetary data. In order to save some space, we examine the robustness only for the decomposed fiscal variables in table 1B. For the same reason we use only the Fixed Effects model, since in comparison with the Random Effects we do not observe any significant qualitative difference in our results.

3.5.1. Instrumental variables estimation

So far we have assumed that all tax – spending variables along with the “other” control variables are strictly exogenous. In fact, averaging our data allows us to control for a large part of simultaneity in our regressions. Still, we want to test whether our results are affected if the assumption of exogeneity is relaxed. To that purpose, we estimate equation (1) with Instrumental Variables (IV).

Although is difficult to find appropriate instruments in this sort of regression, we use the initial values for each 5 year period of our sample as instruments. We start our analysis by considering only tax – spending variables as endogenous and gradually we add in endogenous regressors all control variables (except time dummies), without any qualitative difference for our results. In order to save some space, we present only the results where all explanatory variables are considered endogenous. As can be seen in table 2, results remain unaffected and very much alike with our previous Random Effects

and Fixed Effects in table 1B. One minor difference is that *indirect taxation 2* loses significance in one out of three regressions.

Next, we perform some specification tests to check whether instruments are valid and relevant or not. More specifically, we use underidentification test proposed by Kleibergen-Paap (2006). The underidentification test is an LM test of whether the equation is identified, i.e., that the excluded instruments are "relevant", meaning correlated with the endogenous regressors. Under the null, the statistic is distributed as chi-squared with degrees of freedom $(L1-K1+1)$, where $L1$ are the excluded instruments and $K1$ the number of endogenous regressors. In our model, we reject the null, indicating that the matrix is full column rank, i.e., the model is identified. Furthermore, we apply Sargan-Hansen test to examine if excluded instruments are correctly excluded from the estimated equation. Under the null, the test statistic is distributed as chi-squared in the number of $(L1-K1)$ overidentifying restrictions. In our case, we cannot reject the null, implying that the excluded instruments are correctly excluded from the estimated equation. Finally, The C statistic allows a test of a subset of the orthogonality conditions, i.e., it is a test of the exogeneity of one or more instruments. Under the null hypothesis that both the smaller set of instruments and the additional suspect instruments are valid, the C statistic is distributed as chi-squared in the number of instruments tested. Note that failure to reject the null hypothesis requires that the full set of orthogonality conditions be valid. Our results suggest that time dummies are indeed valid instruments.

Table 2 here

3.5.2. *Alternative control variables*

Next, we want to replace control variables that are related with potential bias: First, the use of a generated regressor such as *excessive wage* implies that measurement errors, e.g., for productivity, will be classified as excessive wage increases. For example, even a purely competitive economy with no excessive wages increases will give non-zero values for the variable *excessive wage*. Thus, we re-estimate our model by using

alternative measures to control for the development of labour cost relative to labour productivity, in order to test whether our results depend on using a generated regressor such as *excessive wage*. For this reason, we divide the real compensation rate index (2000=100) by the productivity index (2000=100), obtained by OECD Economic outlook database, and we construct a new variable denoted as *compensation*.

Second, although we explored the issue of endogeneity in the previous subsection, given the existing empirical literature on this issue, it is still difficult to argue that fiscal policy will not affect the growth rate of consumption. For this reason, we re-estimate our model using the initial growth rate of consumption (*iconsumption*) instead of *consumption* since on the one hand, it is highly correlated with the growth rate of consumption, and on the other hand, it is even less correlated with tax – spending variables. Note that our results regarding the impact of fiscal policy on profits would not change, if we used *iconsumption* in all our previous estimations.¹⁵

As can be seen in table 3, variable *compensation* is negatively related with the profit share at the 1% level, while the coefficient of variable *iconsumption* is, as expected, positive and statistically significant at the 10% level. As for fiscal variables, although, *indirect taxation 2* loses a large part of its significance, the other two basic fiscal variables, *capital expenditures* and *direct taxation*, retain their sign and remain statistically significant, suggesting that our results are not sensitive to this new specification.

Table 3 here

3.5.3. Alternative dependent variable

Until now, we have used gross operating surplus as a share of GDP as our dependent variable. At this point, we want to check if our results are sensitive to our definition of profits. For this reason, in this subsection we re-estimate equation (1) using net operating surplus as the dependent variable. Net operating surplus is defined as gross

¹⁵ We re-estimated regressions in table 3 by including *compensation* and *iconsumption* one at the time, while leaving all other control variables as introduced in table 1A, without any qualitative difference for our results.

operating surplus minus consumption of fixed capital, denoted as *net profits*, and obtained from AMECO database. As can be seen in table 4, results remain unaffected for all explanatory variables. Finally, although, in our model we use gross operating surplus obtained from AMECO database, when we apply the same series from OECD Economic Outlook database results again remain unaffected.

Table 4 here

3.5.4. *Outliers*

Although our sample of 19 countries is quite homogeneous, we want to check if our results are affected by outlier observations. For this reason, we re – estimate equation (1) by excluding all observations with estimated error in the upper or lower end 5 percentile range (i.e. we drop the 10% of our sample). The results in table 5 reveal that neither the sign nor the statistical significance of any of the variables has changed.

Table 5 here

3.5.5. *Decomposing budgetary data*

Finally, we proceed into decomposing further the fiscal variables presented in table 1B. More specifically, we decompose variable *current expenditures* into *interest payments*, *goods and services* and *other current*, as described in section 3.1., while variable *direct taxation* is decomposed into *income taxation* and *other direct taxation*. This decomposition of the budgetary data allows us on the one hand, to extract more information regarding the impact of fiscal items on profits, and on the other hand, to test the robustness of our results under alternative specifications of our estimated equation.

Following the same methodology as before, we omit as a neutral financing element variable *surplus*. The results are presented in the first column of table 6. Note that when variable *interest payments* is included in our regression, the misspecification tests indicate that our results are biased from the existence of an outlier observation.¹⁶ As

¹⁶ Hence, we need to drop from our regressions the 5 year average observation 1990-94 for Italy.

can be seen in the first column of table 6, including this outlier observation in our regression affect only the results for variable *interest payments*. Hence, in the second column of table 6, as far as the statistical significance of the coefficients is concerned, the results for variables *capital expenditures* and all control variables remain similar with those depicted in tables 1-5. Moreover, regarding the new fiscal variables introduced in our regressions we see that, when the outlier observation is dropped, the coefficient of variable *interest payments* is statistically significant. A possible explanation for this is that the high government debt reflected in high interest payments of the government will put an upward pressure on the level of corporate interest rates and will increase interest payments for corporate debt with a negative impact on profits. The other two components of current expenditures, *goods and services* and *other current*, in contrast with Alesina et al. (2002) results, are insignificantly related with the profit share. In Alesina et al. (2002) results the negative effect of public consumption on profits is mainly attributed to a “labour market channel”. A rise in the public sector’s wages and/or public employment will rise private sector’s wages and reduce profits.¹⁷ The main reason that our results do not support this prediction may be due to the fact that this “labour channel” may co-exist with other channels emphasized by the literature [see among others Dixon (1987), Mankiw (1988), Startz (1989), Coto-Martinez and Dixon (2003), Baxter and King (1993)] that connect fiscal policy with either a rise in monopolistic profits or with a rise in the marginal product of capital.

As for the tax variables effects, *income taxation*, as described above, is expected to distort labour and capital decisions with a negative impact on the profit share. What is surprising is that variable *other direct taxation*, although it represents a different form of direct taxation, is statistically insignificant. This result can be explained by the fact that this variable consists mainly by payments for social security contributions that may not be considered by individuals as taxation, but rather as a form of compulsory saving. Finally, *indirect taxation 2* deteriorates the profit share, since firms “markup” will depend negatively on the level of an ad valorem indirect tax [see Anderson et al (2001)], while *other taxation 2* seems insignificantly related with the profit share.

¹⁷ Before estimating our model we tested whether fiscal policy has an impact on excessive wages. Our results did not show an effect of fiscal policy on the part of wages that cannot be explained by productivity.

To sum up, in this section we attempted to check the robustness of our results by introducing five changes in our basic model of section 3.4. We can conclude that all our results presented in table 1B remain valid apart from the statistical significance of the coefficient of *indirect taxation* 2. Additionally, we managed to extract new information from our decomposed fiscal data for variables *interest payments* and *other direct taxation*.

Table 6 here

4. Conclusions

This paper aims at analyzing the impact of fiscal policy on profits. For that purpose, we estimate a profit equation that takes into account the fiscal policy of the government. In every step of our analysis, we respect the government's budget constraint, while we decompose it in a way that allows to distinguish between productive and unproductive spending on the one hand, and direct (distortionary) and indirect (non - distortionary) taxation on the other hand.

We conduct our empirical analysis for 19 OECD countries during the period 1975 – 2000. Regarding the non-fiscal variables, we find that profits depend negatively on the part of wages that is not explained by productivity and positively on the growth rate of consumption. Our main result regarding the effect of public spending on profits is that although current expenditure seems to have no impact on profits, a rise in 'productive' capital expenditure will tend to increase profits. On the revenue side, both direct and indirect taxation tend to decrease profits while a further decomposition of direct taxation reveals that certain items such as social security contributions have no impact on profits.

REFERENCES

- Abel, A.B., Blanchard, O., (1986). "The present value of profits and cyclical movements in investment", *Econometrica*, 54:2, 249--73.
- AMECO, European Commission, Economic and Financial Affairs Indicators.
- Agell, J., Lindh, T., Ohlsson, H., (1997). "Growth and the public sector: A critical review essay", *European Journal of Political Economy*, 13:1, 33--52.
- Alesina, A., Ardagna, S., Perotti, R., Schiantarelli, F., (2002). "Fiscal policy, profits and investment", *The American Economic Review*, 92:3, 571--589.
- Anderson, S. P., De-Palma A., Kreider B., (2000). "The efficiency of indirect taxes under imperfect competition", *Journal of Public Economics* 81:2, 231--251.
- Angelopoulos, K., Economides, G., Kammass, P., (2007). "Tax-spending policies and economic growth: Theoretical predictions and evidence from the OECD", *European Journal of Political Economy*, 23:4, 885--902.
- Ardagna, S., (2007). "Fiscal policy in unionized labor markets", *Journal of Economic Dynamics and Control*, 31:5, 1498--1534.
- Aschauer, D., (1989). "Is public expenditure productive?", *Journal of Monetary Economics* 23:2, 177--200.
- Baker D., Bradford Delong J., Krugman P., (2005). "Asset returns and economic growth", *Brookings Papers on Economic Activity*, 36:1, 289--315.
- Baltagi, B., (2005). *Econometric analysis of panel data*. 3rd ed. Chichester England: John Wiley & Sons.
- Barro, R., (1990). "Government Spending in a Simple Model of Endogenous Growth", *Journal of Political Economy*, 98:5, 103--26.
- Barro, R., (1991). "Economic Growth in a Cross Section of Countries", *The Quarterly Journal of Economics*, 106:2, 407--43.
- Baum, C., (2001). "xttest3: Stata module to compute Modified Wald statistic for groupwise heteroskedasticity", <http://ideas.repec.org/c/boc/bocode/s414801.html>
- Baxter, M., King, R., (1993). "Fiscal Policy in General Equilibrium", *American Economic Review*, 83:3, 315--334.
- Beetsma, R., (2008). "A survey of the effects of discretionary fiscal policy", *Studier i Finanspolitik*, No.2008/2.

Blanchard, O., Perotti, R., (2002). "An Empirical Characterization Of The Dynamic Effects Of Changes In Government Spending And Taxes On Output", *The Quarterly Journal of Economics*, 117:4, 1329--1368.

Bleaney, M., Gemmell, N., Kneller, R., (2001). "Testing the endogenous growth model: public expenditure, taxation, and growth over the long run", *Canadian Journal of Economics*, 34:1, 36--57.

Breusch, T., Pagan, A., (1980). "The Lagrange Multiplier Test and Its Applications to Model Specification in Econometrics", *Review of Economic Studies*, 47:1, 239--53.

Burnside, C., Eichenbaum, M., Fisher J., (2003). "Fiscal shocks and their consequence", NBER Working Paper., No.9772.

Chirinko, R., (1993). "Business Fixed Investment Spending: Modeling Strategies, Empirical Results and Policy Implications", *Journal of Economic Literature*, 31:4, 1875--1911.

Coto-Martinez, J., Dixon H., (2003). "Profits, markups and entry: fiscal policy in an open economy" *Journal of Economic Dynamics and Control* 27:4, 573--597.

Devarajan, S., Swaroop, V., Heng-fu Zou., (1996). "The composition of public expenditure and economic growth", *Journal of Monetary Economics*, 37:2, 313--344.

Dixon, H., (1987). "A simple model of imperfect competition with Walrasian features", *Oxford Economic Papers* 39:1, 134--160.

Dixon, H., Lawler, P., 1996. Imperfect competition and the fiscal multiplier. *Scandinavian Journal of Economics* 98:2, 219--231.

Drukker, D.M, (2003). "XTSERIAL: Testing for Serial Correlation in Linear Panel-data Models", *Stata Journal* 3, 168--177.

Engen, R., Skinner, J., (1992). "Fiscal Policy and Economic Growth", NBER Working Papers 4223.

Easterly, W., Rebelo, S., (1993). "Fiscal policy and economic growth: An empirical investigation", *Journal of Monetary Economics*, 32:3, 417--458.

Fatas, A., Mihov, I., (2001). "The effects of fiscal policy on consumption and employment: theory and evidence", CEPR Discussion Paper. No. 2760.

Finkel, S., Tuttle D., (1971). "Determinants of the aggregate profits margin source", *Journal of Finance*, 26: 5, 1067--1075.

Finn, G., (1998). "Cyclical effects of government's employment and goods purchases", *International Economic Review*, 39:3, 635--637.

Folster, S., Henrekson, M., (2001). "Growth effects of government expenditure and taxation in rich countries", *European Economic Review*, 45:8, 1501--1520.

Garcia-Penalosa, C., Turnovsky, S., (2007). "Growth, Income Inequality, and Fiscal Policy: What Are the Relevant Trade-offs?", *Journal of Money, Credit and Banking*, 39:2-3, 369--394.

Greene, W.(2000). *Econometric Analysis*. 3rd ed., Upper Saddle River, NJ: Prentice-Hall.

Hansen, L., Heaton, J., Yaron, A., (1996). "Finite Sample Properties of Some Alternative GMM Estimators", *Journal of Business and Economic Statistics*, 14:3, 262--280.

Hasett, K., Hubbard R., (1996). "Tax policy and investment", NBER Working paper No. 5683.

Hayek, F., (1945). "The Use of Knowledge in Society", *American Economic Review*, 35: 4, 519--530.

Hausman, J., (1978). "Specification Tests in Econometrics, *Econometrica*", 46:6, 1251--1271.

Heijdra, B., (1998). "Fiscal policy multipliers: the role of monopolistic competition, scale economies, and intertemporal substitution in labour supply", *International Economic Review* 39:3, 659--695.

Hemming, R., Kell M., Mahfouz S., (2000). "The Effectiveness of Fiscal Policy in Stimulating Economic Activity - A Review of the Literature", IMF Working paper No. 02/208

IMF, International Financial Statistics database, <http://www.imfstatistics.org/imf/>

IMF, (2002). *Government Finance Statistics*, CD-ROM. Washington D.C., USA.

Kleibergen, F., Paap, R., (2006). "Generalized Reduced Rank Tests Using the Singular Value Decomposition", *Journal of Econometrics*, 133:1, 97--126.

Kneller, R., Bleaney, M., Gemmell, N., (1999). "Fiscal policy and growth: evidence from OECD countries", *Journal of Public Economics*, 74:2, 171--190.

Kormendi, R., Meguire, P., (1985). "Macroeconomic determinants of growth: Cross-country evidence", *Journal of Monetary Economics*, 16:2, 141--163.

- Leamer, E., (1983). "Let's take the con out of econometrics", *The American Economic Review*, 82:1, 31--43.
- Levine, R., Renelt, D., (1992). "A Sensitivity Analysis of Cross-Country Growth Regressions", *American Economic Review*, 82:4, 942--63.
- Malley, J., Moutos, T., (2006). "Do Excessive Wage Increases Raise Imports? Theory and Evidence", *Japan and the World Economy*, 82:2, 194--220.
- Mankiw, N.G., (1988). "Imperfect competition and the Keynesian cross". *Economic Letters* 26:1, 7--13.
- Martinez-Monquay, C., (2000). "ECFIN's Effective Tax Rates. Properties and Comparisons with other Tax Indicators", *Economic Paper*, Vol. 146, European Commission, Directorate for Economic and Financial Affairs.
- Mendoza, E., Razin, A., Tesar, L., (1994). "Effective Tax Rates in Macroeconomics: Cross-Country Estimates of Tax Rates on Factor Incomes and Consumption", *Journal of Monetary Economics*, 34:3, 297--323.
- Mendoza, E., Milesi-Ferretti, G., Asea, P., (1997). "On the Ineffectiveness of Tax Policy in Altering Long- Run Growth: Harberger's Superneutrality Conjecture", *Journal of Public Economics*, 66:1, 99--126.
- Murphy, K. M., A. Shleifer and R. W. Vishny, (1989), "Industrialization and the big push", *Journal of Political Economy* 97, 1003--26.
- Nunziata, L., (2000). "HETGROT": A Stata Command for a Likelihood Ratio Test for Groupwise Heteroskedasticity. <http://www.decon.unipd.it/~nunziata/software.htm>
- Nunziata, L., (2002). "XTBAC": A Stata Command for the Baltagi Autocorrelation Test in Panel Data. <http://www.decon.unipd.it/~nunziata/software.htm>
- OECD, SourceOECD, OECD Economic Outlook Database, <http://massetto.sourceoecd.org/vl=7882792/cl=16/nw=1/rpsv/home.htm>
- Oulton, N., (1998). "PANTEST2: Stata module to perform diagnostic tests in fixed effects panel regressions", <http://ideas.repec.org/c/boc/bocode/s336601.html>
- Pagan, A., (1984). "Econometric Issues in the Analysis of Regressions with Generated Regressors", *International Economic Review*, 25:1, 221--247.
- Perotti, R., (2005) "Estimating the effects of fiscal policy in OECD countries", CEPR Discussion paper, No.4842.

Perotti, R., Kontopoulos Y., (2002). “Fragmented fiscal policy”, *Journal of Public Economics* 86:2, 191--222.

Phelps E., (1994). “Structural Slumps: The Modern Equilibrium Theory of Unemployment, Interest and Assets”. Harvard University Press.

Ravn, M., Schmitt-Grohe, S., Uribe M., (2006). “Pricing to Habits and the Law of One Price”, NBER Working Papers 12731.

Rotemberg, J., Woodford, M., (1995). “ Dynamic general equilibrium models with imperfectly competitive product markets”. In: Cooley, F.T. (Ed.), *Frontiers of Business Cycle Research*. Princeton University Press, Princeton, 243--293.

Schaffer, M., (2008). “XTIVREG2: Stata module to perform extended IV/2SLS, GMM and AC/HAC, LIML and k-class regression for panel data models”, <http://ideas.repec.org/c/boc/bocode/s456501.html>

Schaffer, M., Stillman, S., (2006). “XTOVERID: stata module to calculate tests of overidentifying restrictions after xtreg, xtivreg, xtivreg2 and xthtaylor”, <http://ideas.repec.org/c/boc/bocode/s456779.html>

Startz, R., (1989). “Monopolistic competition as a foundation for Keynesian macroeconomic models”, *Quarterly Journal of Economics* 104:4, 737--752.

Widmalm, F., (2001). “Tax Structure and Growth: Are Some Taxes Better Than Others?”, *Public Choice*, 107:3-4, 199--219.

Woodridge, J. M, (2002). “Econometric Analysis of Cross Section and Panel Data”. MIT Press, Cambridge, MA.

World Bank, “World Bank Developments Indicators”, <http://ddpext.worldbank.org/ext/DDPQQ/member.do?method=getMembers&userid=1&queryId=6>

Appendix. Data sources and descriptive statistics

Variable	Description	Obs.	Mean	Std. dev.	Min	Max	Source
profits	Gross operating surplus as a share of GDP (%)	95	37.168	4.366	27.539	47.860	AMECO
net profits	Net operating surplus as a share of GDP (%)	95	23.304	4.486	15.115	36.898	AMECO
expenditures	Total expenditures as a share of GDP (%)	93	35.915	9.897	15.888	56.700	IMF, GFS
revenues	Total revenues as a share of GDP (%)	93	32.323	9.119	9.891	51.207	IMF, GFS
capital expenditures	Capital expenditures as a share of GDP (%)	93	2.378	1.124	0.390	5.125	IMF, GFS
current expenditures	Current expenditures as a share of GDP (%)	93	33.435	9.501	12.638	51.987	IMF, GFS
goods and services	Goods and services expenditures as a share of GDP (%)	93	8.184	2.710	2.180	16.491	IMF, GFS
other current	Other current expenditures as a share of GDP (%)	93	21.648	7.251	8.462	40.338	Own calculations, data taken from IMF, GFS
interest payments	Interest payments expenditures as a share of GDP (%)	93	3.599	2.372	0.372	10.779	IMF, GFS
direct taxation	Sum of distorting taxation as a share of GDP (%)	93	19.754	6.098	7.090	34.309	Own calculations based on Kneller et al. (1999) methodology, data taken from IMF, GFS
income taxation	Taxation on income and profit as a share of GDP (%)	94	9.824	3.829	2.882	16.907	IMF, GFS

other direct taxation	Distortionary taxation, other than income and profits taxation, as a share of GDP (%)	93	9.858	5.893	0.073	20.753	Own calculations, data taken from IMF, GFS
indirect taxation	Taxation on domestic goods and services as a share of GDP (%)	94	8.993	4.285	0.710	16.484	IMF, GFS
indirect taxation 2	Sum of taxation on domestic goods and services and international trade taxation, as a share of GDP (%)	94	9.437	4.171	0.950	16.608	Own calculations, data taken from IMF, GFS
other taxation	Other revenues as a share of GDP (%)	93	3.557	1.840	0.894	9.374	Own calculations based on Kneller et al. (1999) methodology, data taken from IMF, GFS
other taxation 2	Other revenues, other than international trade revenues, as a share of GDP (%)	93	3.128	1.739	0.682	9.138	Own calculations, data taken from IMF, GFS
surplus	Surplus/deficit as a share of GDP (%)	92	-4.013	3.357	-15.042	2.157	IMF, GFS
excessive wage	We regress the log of productivity index on the log of real compensation per employee	85	0.659	2.442	-5.477	6.159	SourceOECD, OECD Economic outlook.
compensation	We divide the real compensation rate with the productivity index	85	108.871	9.666	97.495	141.167	SourceOECD, OECD Economic outlook.
consumption	Growth rate of final consumption expenditure (%)	95	2.496	1.226	-0.899	6.243	World Bank Development indicators
iconsumption	Initial growth rate of final consumption	95	2.614	1.972	-1.990	11.863	World Bank Development

reer	expenditure (%) Real effective exchange rates index	89	97.784	12.270	54.369	135.156	indicators IMF, IFS
unemployment	Unemployment rate (%)	92	6.859	3.555	0.405	16.701	SourceOECD, OECD Economic outlook.

Table 1A. Basic Results

<i>Dependent variable: profits</i>		(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Method:	RE	FE	RE	FE	RE	FE	RE	FE	RE	FE
Omitted fiscal variable:	-	-	surplus	surplus	expend.	expend.	expend., surplus	expend., surplus	revenues	revenues
expenditures	-	-	0.076 (0.94)	0.034 (0.43)	-	-	-	-	-0.118* (-1.67)	-0.206** (-2.20)
revenues	-	-	-0.251*** (-3.48)	-0.296*** (-3.69)	-0.176*** (-3.01)	-0.272*** (-3.81)	-0.199*** (-3.58)	-0.276*** (-3.86)	-	-
surplus	-	-	-	-	-0.039 (-0.54)	-0.004 (-0.08)	-	-	-0.145* (-1.75)	-0.180** (-2.32)
excessive wage	-0.329*** (-5.31)	-0.336*** (-5.05)	-0.371*** (-6.64)	-0.378*** (-6.83)	-0.349*** (-5.96)	-0.364*** (-6.39)	-0.360*** (-6.50)	-0.373*** (-6.63)	-0.327*** (-5.08)	-0.329*** (-4.97)
consumption	0.589*** (3.71)	0.548*** (3.60)	0.493*** (3.35)	0.407*** (2.83)	0.523*** (3.31)	0.414*** (2.85)	0.448*** (3.29)	0.386*** (2.96)	0.603*** (3.46)	0.515*** (3.21)
reer	-0.057*** (-3.88)	-0.60*** (-3.88)	-0.037*** (-2.73)	-0.031 (-2.11)	-0.042*** (-3.00)	-0.034** (-2.33)	-0.035*** (-2.58)	-0.030** (-2.06)	-0.051*** (-3.47)	-0.048*** (-3.35)
unemployment	0.168** (1.97)	0.142 (1.49)	0.168* (1.91)	0.191** (2.09)	0.189** (2.23)	0.203** (2.39)	0.211*** (2.94)	0.212*** (2.90)	0.191** (2.05)	0.214** (2.10)
Adjusted R ²	0.741	0.712	0.796	0.772	0.796	0.775	0.796	0.774	0.768	0.740
Observations	79	79	78	78	77	77	78	78	77	77
Specification tests										
N ₁	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
N ₂	-	0.621	-	0.314	-	0.013	-	0.486	-	0.049
N ₃	0.002	0.004	0.000	0.002	0.001	0.006	0.001	0.002	0.002	0.006
N ₄	-	0.000	-	0.000	-	0.000	-	0.000	-	0.000
N ₅	-	0.483	-	0.230	-	0.458	-	0.468	-	0.270

Notes: t-statistics, calculated using White's heteroskedasticity robust standard errors, are reported in parentheses. *** denotes significance at 1% level, ** denotes significance at 5% level and * denotes significance at 10% level. Random Effects regressions include time intercepts, while Fixed Effects regressions include country and time intercepts. For Random Effects regressions we report R².

N₁ = Breusch and Pagan LM test

N₂ = Hausman test.

N₃ = F- test time

N₄ = Wald test for groupwise heteroskedasticity

N₅ = LM₅ test statistic for serial correlation

P-values are reported for the respective tests

Table 1B. Decomposing Budgetary Data

<i>Dependent variable: profits</i>		(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Method:	RE	surplus	FE	RE	FE	RE	FE	RE	FE
Omitted fiscal variable:	RE	surplus	FE	RE	surplus	RE	FE	RE	FE
		surplus	surplus	surplus	surplus	current exp.	current exp.	current exp.	current exp., surplus
capital expenditures	0.660** (2.54)	0.557*** (3.12)	0.640*** (2.68)	0.551*** (3.24)	0.714*** (2.64)	0.616*** (3.63)	0.646*** (2.69)	0.549*** (3.23)	
current expenditures	-0.004 (-0.06)	-0.034 (-0.44)	0.010 (0.16)	-0.010 (-0.14)	-	-	-	-	
direct taxation	-0.221*** (-2.88)	-0.280*** (-2.90)	-0.228*** (-3.14)	-0.305*** (-3.56)	-0.231*** (-3.07)	-0.380*** (-4.25)	-0.222*** (-3.35)	-0.307*** (-3.64)	
indirect taxation	-0.265* (-1.90)	-0.421** (-2.59)	-	-	-	-	-	-	
indirect taxation 2	-	-	-0.383*** (-2.58)	-0.546*** (-3.01)	-0.263** (-1.95)	-0.466*** (-4.06)	-0.365** (-2.55)	-0.559*** (-3.45)	
other taxation	-0.244** (-2.38)	-0.264** (-2.54)	-	-	-	-	-	-	
other taxation 2	-	-	-0.183 (-1.56)	-0.190* (-1.79)	-0.148 (-1.11)	-0.159 (-1.59)	-0.176 (-1.46)	-0.197* (-1.95)	
surplus	-	-	-	-	0.015 (0.21)	0.044 (0.65)	-	-	
excessive wage	-0.406*** (-6.62)	-0.406*** (-7.04)	-0.414*** (-7.14)	-0.420*** (-7.57)	-0.404*** (-6.60)	-0.419*** (-7.88)	-0.411*** (-7.27)	-0.420*** (-7.68)	
consumption	0.396*** (3.03)	0.327*** (2.81)	0.389*** (3.02)	0.310*** (2.81)	0.418*** (2.89)	0.302** (2.56)	0.384*** (2.96)	0.317*** (2.93)	
reer	-0.029* (-1.94)	-0.024 (-1.34)	-0.028* (-1.91)	-0.020 (-1.30)	-0.034** (-2.11)	-0.025* (-1.68)	-0.028* (-1.93)	-0.020 (-1.32)	
unemployment	0.210** (2.43)	0.238** (2.43)	0.192** (2.18)	0.207** (2.22)	0.200 (2.42)	0.207** (2.58)	0.199*** (3.07)	0.200*** (3.05)	
Adjusted R ²	0.826	0.800	0.835	0.812	0.834	0.812	0.835	0.815	
Observations	78	78	78	78	77	77	78	78	

Table 2. Decomposed Budgetary Data.

Instrumental variables			
Dependent variable: <i>profits</i>	(1)	(2)	(3)
Method:	FE-IV	FE-IV	FE-IV
Omitted fiscal variable:	surplus	current exp.	current exp., surplus
capital expenditures	0.588*** (3.03)	0.538*** (2.77)	0.587*** (3.10)
current expenditures	0.019 (0.22)	-	-
direct taxation	-0.408** (-2.16)	-0.456** (-2.51)	-0.385** (-2.34)
indirect taxation 2	-0.527** (-2.33)	-0.341 (-1.52)	-0.503** (-2.33)
other taxation 2	-0.192* (-1.77)	-0.149 (-1.52)	-0.184* (-1.79)
surplus	-	-0.021 (-0.31)	-
excessive wage	-0.450*** (-3.71)	-0.436*** (-4.67)	-0.434*** (-3.85)
consumption	0.262 (1.39)	0.341** (2.05)	0.274 (1.43)
Reer	-0.043* (-1.81)	-0.062** (-2.51)	-0.042* (-1.79)
unemployment	0.204 (1.51)	0.185** (1.84)	0.225*** (2.60)
Adjusted R ²	0.720	0.711	0.732
Observations	78	77	78
Specification tests			
N ₁	0.051	0.035	0.007
N ₂	0.710	0.587	0.475
N ₃	0.411	0.666	0.409
N ₄	0.000	0.000	0.000

Notes: t-statistics, calculated using White's heteroskedasticity robust standard errors, are reported in parentheses. *** denotes significance at 1% level, ** denotes significance at 5% level and * denotes significance at 10% level. All regressions include country and time intercepts.

N₁ = Under - identification test (Kleibergen-Paap)

N₂ = Hansen - test of excluded instruments

N₃ = C- orthogonality test (time dummies)

N₄ = F-test time

P-values are reported for the respective tests

Table 3. Decomposed Budgetary Data**Alternative control variables**

Dependent variable: <i>profits</i>	(1)	(2)	(3)
Method:	FE	FE	FE
Omitted fiscal variable:	surplus	current exp.	current exp., surplus
capital expenditures	0.351 (1.62)	0.407* (1.68)	0.351* (1.67)
current expenditures	0.001 (0.01)	-	-
direct taxation	-0.277* (-1.85)	-0.361** (-2.58)	-0.277* (-1.90)
indirect taxation 2	-0.360 (-1.54)	-2.37 (-1.25)	-0.359* (-1.82)
other taxation 2	-0.355** (-2.25)	-0.299* (-1.91)	-0.354** (-2.35)
surplus	-	0.013 (0.16)	-
compensation	-0.211*** (-5.70)	-0.220*** (-6.37)	-0.211*** (-5.83)
iconsumption	0.159* (1.95)	0.171* (1.96)	0.159* (1.95)
reer	-0.018 (-0.86)	-0.027 (-1.38)	-0.018 (-0.87)
unemployment	0.135 (1.09)	0.119 (1.11)	0.136 (1.29)
Adjusted R ²	0.687	0.706	0.692
Observations	78	77	78
Specification tests			
N ₁	0.000	0.000	0.000
N ₂	0.000	0.001	0.001
N ₃	0.463	0.560	0.455
N ₄	0.000	0.000	0.000
N ₅	0.206	0.113	0.191

Notes: see table 1A.

Table 4. Decomposed Budgetary Data
Alternative measure as Dependent variable

<i>Dependent variable: net profits</i>	(1)	(2)	(3)
Method:	FE	FE	FE
Omitted fiscal variable:	surplus	current exp.	current exp., surplus
capital expenditures	0.655** (2.59)	0.681** (2.55)	0.666*** (2.75)
current expenditures	0.053 (0.57)	-	-
direct taxation	-0.336*** (-2.67)	-0.376*** (-2.85)	-0.327** (-2.61)
indirect taxation 2	-0.479** (-2.01)	-0.336 (-1.61)	-0.415** (2.00)
other taxation 2	-0.373** (-2.45)	-0.295** (-2.12)	-0.339** (-2.41)
surplus	-	-0.002 (-0.03)	-
excessive wage	-0.381*** (-5.86)	-0.372*** (-5.83)	-3.78*** (-5.85)
consumption	0.607*** (4.43)	0.609*** (3.97)	-5.73*** (-4.43)
reer	-0.022 (-1.18)	-0.029 (-1.57)	-0.021 (-1.13)
unemployment	0.230* (1.76)	0.248** (2.04)	0.264** (2.44)
Adjusted R ²	0.684	0.689	0.687
Observations	78	77	78
Specification tests			
N ₁	0.000	0.000	0.000
N ₂	0.465	0.007	0.300
N ₃	0.204	0.137	0.159
N ₄	0.000	0.000	0.000
N ₅	0.344	0.457	0.439

Notes: see table 1A.

**Table 5. Decomposed Budgetary Data
Dropping outliers**

Dependent variable: <i>profits</i>	(1)	(2)	(3)
Method:	FE	FE	FE
Omitted fiscal variable :	surplus	current exp.	current exp., surplus
capital expenditures	0.595** (2.28)	0.658*** (2.76)	0.598** (2.29)
current expenditures	-0.035 (-0.43)	-	-
direct taxation	-0.281*** (-3.46)	-0.386*** (-4.22)	-0.289*** (-3.54)
indirect taxation 2	-0.525** (-2.68)	-0.469*** (-2.85)	-0.570*** (-3.19)
other taxation 2	-0.149 (-1.23)	-0.128 (-1.11)	-0.176 (-1.55)
surplus	-	0.078 (0.99)	-
excessive wage	-0.453*** (-7.37)	-0.455*** (-7.82)	-0.453*** (-7.34)
consumption	0.285** (2.33)	0.259* (2.56)	0.309** (2.62)
reer	-0.021 (-1.32)	-0.026* (-1.70)	-0.022 (-1.34)
unemployment	0.252** (2.45)	0.249*** (2.88)	0.229*** (3.31)
Adjusted R ²	0.827	0.836	0.829
Observations	72	71	72
Specification tests			
N ₁	0.000	0.000	0.000
N ₂	0.044	0.022	0.027
N ₃	0.004	0.011	0.005
N ₄	0.000	0.000	0.000
N ₅	0.093	0.311	0.087

Notes: t-statistics, calculated using White's heteroskedasticity robust standard errors, are reported in parentheses. Regressions are estimated by excluding all observations with estimated error in the upper or lower end 5.0 percentile range. *** denotes significance at 1% level, ** denotes significance at 5% level and * denotes significance at 10% level. All regressions include country and time intercepts.

N₁ = Breusch and Pagan LM test

N₂ = Hausman test.

N₃ = F- test time

N₄ = Wald test for groupwise heteroskedasticity

N₅ = LM₅ test statistic for serial correlation

P-values are reported for the respective tests

**Table 6. Decomposed Budgetary Data
Full Decomposition**

Dependent variable: <i>profits</i>	(1)	(2)	(3)	(4)
Method:	FE	FE	FE	FE
Omitted fiscal variable :	surplus	surplus	goods and ser., other current, other direct.	goods and ser., other current, other direct., surplus
capital expenditures	0.486*** (2.75)	0.382** (2.13)	0.369** (2.28)	0.388** (2.25)
goods and services	-0.008 (-0.04)	-0.096 (-0.052)	-	-
other current	0.043 (0.48)	0.091 (1.10)	-	-
interest payments	-0.129 (-0.79)	-0.292** (-2.33)	-0.252** (-2.11)	-0.241* (-1.96)
income taxation	-0.304*** (-3.09)	-0.303*** (-3.38)	-0.297*** (-3.20)	-0.285*** (-3.14)
other direct taxation	-0.187 (-1.14)	-0.042 (-0.32)	-	-
indirect taxation 2	-0.327*** (-2.77)	-0.626*** (-3.76)	-0.508*** (-3.19)	-0.555*** (-3.53)
other taxation 2	-0.205* (-1.82)	-0.164 (-1.46)	-0.131 (-1.33)	-0.158 (-1.61)
surplus	-	-	-0.021 (-0.36)	-
excessive wage	-0.434*** (-6.94)	-0.454*** (-7.55)	-0.423*** (-7.88)	-0.428*** (-8.03)
consumption	0.329** (2.65)	0.357*** (2.91)	0.410*** (3.63)	0.367*** (3.37)
reer	-0.024 (-1.55)	-0.031* (-1.99)	-0.033** (-2.17)	-0.027* (-1.81)
unemployment	0.199 (1.90)	0.238** (2.37)	0.234*** (2.84)	0.252*** (3.43)
Adjusted R ²	0.809	0.836	0.835	0.835
Observations	78	78	77	77
Specification tests				
N ₁	0.000	0.000	0.000	0.000
N ₂	0.060	0.006	0.004	0.194
N ₃	0.001	0.001	0.001	0.000
N ₄	0.000	0.000	0.000	0.000
N ₅	0.386	0.238	0.381	0.171

Notes: column 1, see table 1A.

Columns 2-4: Regressions are estimated by excluding the 5 year average observation 1990-94 for Italy.

Figure 1: Average gross operating surplus (% of GDP)

