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Fiscal Policy Regimes and Household Consumption*

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Abstract

In this paper, we study the effects of fiscal policy during different fiscal policy regimes. More specifically, we investigate how different factors, such as size, duration and composition of fiscal changes, can alter the effects of fiscal policy on private consumption. Using an unbalanced panel of 19 OECD countries during the period 1960-2000, we find that transfer changes are believed to be permanent during fiscal contractions. Hence, it is more likely that an expansionary fiscal contraction will occur if the government cuts transfers. Our results highlight the importance of accounting for specific circumstances, such as the debt and deficit position, when studying expansionary fiscal contractions. The results also indicate that expansionary fiscal contractions are likely to come at a considerable social cost.

Keywords: Panel data; Household consumption; Fiscal policy; Non-Keynesian effects.
JEL classification: C23; E21; E62; H31.

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1 Introduction

Ever since the seminal work by Keynes (1936), fiscal policy has played a central role within the area of Macroeconomics. Demand stimulating policies, to meet business cycle fluctuations and maintain low unemployment, was the reigning view of fiscal policy of many governments up until the end of the 1980's. The fiscal path followed by the government authorities led an overwhelming debt situation for many countries. To maintain a sustainable budget situation, extensive fiscal contractions had to be performed in these countries during the last two decades of the 20th century. The Keynesian paradigm raised the fears of the economic consequences following such contractions. An economic slow-down, with huge unemployment as a consequence, was the scenario facing the countries embarking in the fiscal contractions. The fiscal contractions during the 1980s and 1990s were carried through with considerable economic and social costs. However, some effects that weren't predicted by the Keynesian theory occurred. A well-documented example is the effects of the German contraction during the first half of the 1980s (see e.g. Fels and Froehlich, 1987, and Hellwig and Neumann, 1987). The fiscal consolidation in Germany was primarily brought about by a decrease in public expenditure. In spite of this, private consumption expanded during and after the fiscal contraction. Hence, the Keynesian view, that a government expenditure cut should induce a private consumption fall-back, was discarded. Instead it was argued that the cut in public expenditure lowered the expectation of future taxes and hence increased the expected future disposable income. Instead of a decrease in private consumption, an increase was observed due to the favorable change in the present value of disposable income. The empirical evidence of fiscal contractions that weren't contractionary on income and private consumption gave room for a new view, called 'the German view'. Also, a new hypothesis was adopted. It was to be denoted 'the expansionary fiscal contraction hypothesis'.

The unexpected effects of the fiscal contractions led to a great interest in the inherent mechanisms of fiscal policy during different fiscal regimes. The traditional Keynesian theory of fiscal policy effects was challenged by the neoclassical theory. The neoclassical theory stresses the fact that households internalize the government budget constraint. Hence, the present value of household disposable income will be positively affected by a decrease in government expenditures. As in the German case, the decrease in government expenditures will decrease the expected present value of taxation, which imply higher expected present value of disposable income. However, the Keynesian effect and the neoclassical effect are not mutually exclusive. It is not only possible, but also probable,

that the two effects coexist. The key issue is which of the effects that dominates the other at a particular point in time.

One of the main traits of the neoclassical model is the fact that a permanent increase in disposable income affects consumption more than a temporary increase in disposable income. The reasoning extends to the fiscal variables as well. A permanent increase in taxes or government spending reduces the expected present value of disposable income more than a temporary increase. However, it is not obvious what determines whether a change in e.g. government expenditures is to be perceived as permanent or transitory. Two distinct ways of signaling permanence have previously been considered when explaining expansionary fiscal contractions. Alesina and Perotti (1995, 1996) and Alesina and Ardanga (1998) have studied the driving forces behind the expansionary fiscal contractions. Their main finding is that the composition of fiscal contractions plays a central role for the economic outcome. Giavazzi and Pagano (1990, 1996), on the other hand, argue that the size and duration of a fiscal change is the main signaling factor that drives the expansionary fiscal contractions. Large and long-lasting fiscal changes are to be interpreted as signals of the overall fiscal stance. In the type of empirical model specified by Giavazzi and Pagano (1996), the signal of permanence will show up as a shift in the slope parameters of the model. The authors show that large and durable fiscal expansions and fiscal contractions, together labelled extraordinary fiscal periods, alter the effects of fiscal policy. The two different views, that composition and size of a fiscal adjustment matters for the economic outcome, have become competitors in explaining the unexpected, non-Keynesian, effects of fiscal policy. However, the two views are not necessarily in conflict with each other. *Both* the size and the composition can be of crucial importance for the economic outcome of a fiscal contraction or expansion. By formulating an empirical model of private consumption that contains different fiscal instruments, while allowing for non-constant marginal effects of these instruments, this eclectic proposition can be investigated.

In this paper we, study how prolonged periods of fiscal budget changes affect the way private consumption responds to fiscal policy. In our investigation, we use a model similar to the one specified by Giavazzi and Pagano (1996). We investigate how sizable and/or long-lasting fiscal budget adjustments alter the way that private consumption is affected by changes in government consumption, taxes and transfers. A long-lasting or sizable budget balance enhancement is called a contraction, while a corresponding weakening of the budget balance is called an expansion. Since the changes in the fiscal budget per definition are extensive during expansions and contractions, one can imagine that these

periods signal fundamental changes in the fiscal path followed by the government. We investigate how this signaling value of expansions and contractions affects the relationship between fiscal policy instruments and private consumption. Since we let the effects of fiscal policy vary between expansions and contractions, it is easy to test whether the changes are symmetric. In this way we can study if the signaling value of an expansion is equal to the signaling value of a contraction. This gives an indication of whether the overall fiscal stance, regardless of whether it is an expansion or a contraction, is the only thing that matters for the expectations of the private agents or if the expectations are altered asymmetrically by tight and loose fiscal stance. If private consumption, as modelled by Giavazzi and Pagano (1996), is altered asymmetrically, the specific circumstances surrounding the contractions and expansions have to be investigated more closely.

In our investigation, we formulate a panel data regression model with private consumption as the dependent variable. As explanatory variables we use income, government consumption, transfers and taxes. Using an unbalanced panel of 19 OECD countries during the periods 1960-2000 we find that the effect of transfers on private consumption is particularly altered by the signaling value of a contraction. This suggests that transfer changes are, to a greater extent, believed to be permanent during fiscal contractions. The believed permanence of the transfer change will enhance the neoclassical effect of transfers, which implies that transfer cuts can be expansionary on private consumption during periods of tight fiscal stance. Our results confirm previous results, which state that it is more likely that a fiscal contraction has an expansionary effect on private consumption if the fiscal contraction consists of a considerable amount of transfer cuts (see Alesina and Perotti, 1995, 1996; Alesina and Ardanga, 1998; Hellwig and Neumann, 1987). Our results also suggest that both the composition of the fiscal change and the overall fiscal stance are important determinants for the effect of fiscal policy. That is, the eclectic view of expansionary fiscal contraction hypothesis is not rejected. The delicate trade-off between economic outcome and social cost of a fiscal contraction is also highlighted by the role played by transfers in fiscal adjustments.

The rest of the paper is organized as follows. Section 2 describes the previous empirical findings on the expansionary fiscal contraction hypothesis and the relationship between fiscal policy and private consumption during different fiscal policy regimes. In Section 3, the different effects of fiscal instruments on private consumption are discussed. It will be evident that a mixture of effects is likely to occur. In Section 4 we describe what may cause one effect to dominate another. In Section 5, we discuss the net effects of fiscal policy that expect to find under different fiscal policy regimes. Section 6 discusses the

necessary preparatory data analysis. From the discussion regarding the different effects of fiscal policy, we formulate an empirical consumption function in Section 7. The model is estimated and the results are presented in Section 8. Finally, Section 9 concludes.

2 Previous empirical results

As indicated above, several previous studies have investigated the expansionary effects that fiscal contractions can have on private consumption. In this section we present the important results within the area. We first concentrate on the empirical studies that have investigated the importance of fiscal regimes on the relationship between fiscal instruments and private consumption. We then consider the evidence of asymmetric effects across fiscal expansions and fiscal contractions. Asymmetries can be an important part in the understanding of how private consumption is determined. Finally, we bring together the two areas and discuss the role our paper can play in understanding of the effects of fiscal policy under different fiscal policy regimes.¹

The single paper that has had most impact on the analysis of fiscal policy effects during different fiscal policy regimes is the paper by Giavazzi and Pagano (1996). The authors study how sizable and/or long-lasting periods of fiscal budget changes alter the effects that fiscal policy instruments have on private consumption. The periods during which the cyclically adjusted fiscal deficit, as percentage of potential GDP, has been changed much are labelled extraordinary periods. Giavazzi and Pagano (1996) find that the effect of government consumption and transfers become non-Keynesian during extraordinary periods. Increases in transfers and government consumption are found to reduce private consumption during the extraordinary periods. But the extraordinary periods include both periods during which the fiscal budget has been strengthened and periods during which it has been weakened. That is, no care is taken to investigate whether the effects are changed symmetrically during expansions and contractions. A similar approach is taken by Gobbin and van Aarle (2001) and van Aarle and Garresten (2003). The effects of transfers, taxes and governments consumption on private consumption are studied during non-normal (or extraordinary) fiscal periods. These authors find very weak evidence in favor of expansionary fiscal contractions.

¹As mentioned in Section 1, some studies have investigated the role that the composition of fiscal policy plays for the outcome of a fiscal change. These studies have not explicitly focused on expansionary fiscal contractions. Hence, we note that the composition of fiscal changes can play an important role for the outcome and take this into account when formulating the empirical consumption function.

Later findings by Afonso (2001) suggest that the effects of fiscal policy on private consumption can be altered asymmetrically by fiscal expansions and fiscal contractions. This is a reasonable notion since, for example, the general economic environment is likely to differ between periods of fiscal expansion and fiscal contraction. Often fiscal expansions are brought about to stimulate economic activity while contractions are performed to slow down the government debt growth. These simple circumstances imply that the symmetry assumption may be a serious misperception. Afonso (2001) investigates the effects that government expenditure and revenue have on private consumption. No further division into different expenditure and revenue components is made. This can possibly hide information about the importance of the composition of the fiscal change. Since only aggregate expenditure and revenue changes are considered nothing can be said about the effects of for example government consumption and transfers. This can be an omission of important information. In fact, Alesina and Ardanga (1998) and Alesina and Perotti (1995, 1996) have shown that transfers can play an important role in determining the outcome of a fiscal contraction. Hence, the findings of Afonso (2001) could be further enriched by the findings of Alesina and Ardanga (1998) and Alesina and Perotti (1995, 1996).

Giavazzi et al. (2000) studied the effects of fiscal contractions and fiscal expansions on national savings. The authors find asymmetries in the effects of government consumption and taxes. The asymmetry arises from the fact that the changes in the effects of the fiscal policy instruments seem to be stronger during fiscal contractions than during fiscal expansions. In their study, the authors only investigate taxes and government consumption. Effects of transfers are not investigated although they have been proven to play a key role for the outcome of fiscal contractions.

To our knowledge, no previous study has investigated the effects of government consumption, taxes and transfers on private consumption while allowing for the effects to vary asymmetrically during fiscal expansions and contractions.

In this paper, we study the effects of fiscal policy during different fiscal policy regimes. We allow for the effects of the fiscal instruments to be different during expansions and contractions. The effects during expansions and contractions are then compared to the effects during normal periods. As in the studies performed by Giavazzi and Pagano (1996), Gobbin and van Aarle (2001), van Aarle and Garresten (2003) and Afonso (2001), we use a panel consisting of several countries over a rather long period of time. However, contrary to Afonso (2001) we study the effects of different fiscal policy tools, not only government expenditure and revenue. On the revenue side of the fiscal budget we study

the effect of taxes on private consumption. On the expenditure side we study the effects of transfers and government consumption. By studying different fiscal policy instruments, while allowing for asymmetric effects, we can in greater detail investigate the causes of expansionary fiscal contractions. Our study also differs from the Giavazzi and Pagano (1996), Gobbin and van Aarle (2001) van Aarle and Garresten (2003) studies. Instead of summing up expansions and contractions in the term extraordinary fiscal periods, we allow the effects of fiscal policy to vary between expansions and contraction. In our paper, the role of large and/or long-lasting fiscal changes can be compared to the role played by the composition of the fiscal change by simultaneously including several fiscal instruments in our empirical framework and still allow the effects of these instruments to vary across expansions and contractions.

To shed light on the empirical results to be presented in later sections, we first discuss the possible channels through which fiscal policy can affect private consumption.

3 Channels of fiscal policy

In this section we will discuss the different effects fiscal policy may have on private consumption. We will in turn consider government consumption, transfers and taxes. There will often be competing effects of fiscal policy. On the one hand there are neoclassical effects of fiscal policy measures. On the other hand there are effects that cannot be captured by the neoclassical reasoning. Here, Keynesian theory can give some insights to how the relationship can be depicted. Below we will discuss the different effects that are likely to be present.

3.1 Government consumption

One of the main concerns when studying the effects of fiscal policy is the behavior of government consumption. Government consumption constitutes a part of total government expenditures. As such it must be financed through collection of government revenues from the private sector. It is probable that an increase in government expenditure will increase future household taxation since the taxes that households pay are important revenue sources to the government. But increased household taxation will reduce the present value of household disposable income. As a consequence it is likely that private consumption falls. It is important to note that an increase in government expenditure *can* induce higher expected present value of taxes and hence lower expected present value of

disposable income. It is however not a necessity that the increase in government expenditure *will* induce lower expected present value of disposable income. Suppose that the private agents in our theoretical model have a finite lives. At every point in time the agent faces a probability of death. An increase in government expenditure must be financed through revenue collection since the government has to obey its budget constraint. But this revenue collection can take place at different points in time. As a consequence it is not certain that the private agent is alive when the increase in government expenditure is financed. Hence, the government budget constraint is not fully internalized by the private agent and the government expenditure increase does not affect private consumption through the neoclassical channel.²

The implication that increases in government consumption will reduce private consumption is the opposite to what the Keynesian theory states. In a Keynesian world we would expect effective demand to be stimulated by an increase in government consumption. The demand stimulation is transmitted through to income, which increase. Following the increase in income, private consumption will also increase. Keynesian theory suggests that the correlation between government consumption and private consumption is positive. To make clear the Keynesian mechanisms, several structural relationships would have to be investigated. However, this is not possible without a considerable amount of data. Instead we have to settle for the fact that we only can portray the correlation between government consumption and private consumption, not the entire mechanism of transmission.

Besides the neoclassical and Keynesian theories, private and government consumption can be viewed as complements or substitutes for each other. Government consumption that is devoted to the build-up of a well functioning legal system will act as a complement to private consumption. When a well-functioning legal system is established the transaction costs in the economy is reduced. As a consequence private consumption will be allowed to increase. But government consumption can also act as a substitute for private consumption. Suppose that government consumption expenditure is allocated to good or service that otherwise would be bought by the consumers directly. When the government provides the good or service the households don't have to buy it directly. Hence, government expenditure has worked as a substitute. When government consumption expenditures act as a complement we observe a positive correlation between private and

²It is also possible that the government has different sources of revenue. Some of these may concern the private agents while some don't. The financing options that don't directly involve the private agents may weaken the neoclassical relationship between government expenditure and private consumption.

government consumption. If instead government consumption is a substitute for private consumption we observe a negative correlation.

The conclusion is that there are several ways to describe the effects that government consumption has on private consumption. Hence, it takes a more detailed investigation to find the true mechanisms that generates the observed effects. However, we wish to establish a consistent terminology throughout this paper. Therefore, a positive correlation between government consumption and private consumption is denoted a Keynesian effect. A negative correlation is denoted a neoclassical effect.

In Section 4 we discuss what may cause some effect to dominate another effect. One explanation, the general change in the fiscal stance, is the main topic in this paper.

3.2 Taxes

One of the main revenue sources for the government is taxation. The effects of taxes are not likely to have ambiguous effects on private consumption unless extremely rare circumstances are prevalent. An increase in taxes has a contractionary effect on private consumption since it reduces household disposable income. Hence, we expect to find a negative correlation between taxes and private consumption.

3.3 Transfers

When we study transfers we see, as in the case with government consumption, that there is a possibility that we will observe different effects on private consumption. As government expenditure in general, transfers must be financed through revenue collection. If transfers are increased, taxes must eventually be raised to meet the growing expenditures of the government. Increased taxes, once again, lead to lower present value of household disposable income and lower private consumption. In this aspect, transfers possess an expenditure property. Transfers are government expenditure that has to be financed through government revenues. Hence, an increase in transfers induces a decrease in private consumption.

But there is another important effect of transfers. Transfers are likely to be a redistribution from richer households to poorer households. The poorer households are often liquidity constrained. The liquidity constraints will imply expansionary effects of increased transfers even in a simple permanent income model of consumption. For the non-liquidity-constrained households, the decrease in current income will lead to a small decrease permanent income. The liquidity-constrained households, on the other hand,

will have a motive to increase consumption at the margin one-to-one with income increases since current income is lower than desired consumption. The net effect of the redistribution will then be expansionary on private consumption. This effect describes the redistribution property of transfers.

We have seen that transfers can possess both an expenditure property and a redistribution property. How different circumstances may affect the outcome of changes in transfers, and other fiscal policy tools, is discussed in the next section.

4 Non-linear effects of fiscal policy

As mentioned above, there are theoretical reasons to suspect that the effects of fiscal policy on private consumption are ambiguous. Indeed, several empirical studies have found that this is the case (see Section 2 above and Afonso, 2001, for a summary of these empirical findings). One explanation of this ambiguity is that the overall fiscal stance is an important determinant of the effects that will follow a change in the fiscal policy tools. If sizeable and/or prolonged changes in the structural fiscal budget balance signal a long-run change in the overall path of fiscal policy, we would expect that the effects of the fiscal policy tools are non-linear, at least when we consider an empirical model like the one used by Giavazzi and Pagano (1996). The periods of sizable and/or prolonged fiscal changes can be classified as expansions or contractions depending on the change in the fiscal deficit. An expansionary period is recognized if the fiscal deficit increases. If the deficit decreases the period will be denoted a contraction.

Suppose that the government is engaged in a structural fiscal budget consolidation and that this consolidation signals a permanent change in fiscal policy. If the government cuts its consumption expenditures during this period the private sector believes that the cut will be permanent. But according to the neoclassical theory of consumption we know that the households revise their consumption more in response to permanent changes in government consumption than to transitory changes. Hence, we would expect that the effect of government consumption on private consumption is altered during a fiscal contraction of the described type. Since the change is perceived to be permanent, the neoclassical response in private consumption becomes more predominant. The marginal effect of a change in government consumption becomes smaller (i.e. less positive or more negative). Exactly the same reasoning applies during expansions. If changes are perceived to be permanent the marginal effect of government consumption becomes smaller.

The reasoning regarding the non-linear effect of government consumption can equally

well be extended to transfer payments made by the government. As discussed in Section 3.3, transfers can be seen both as a redistributing tool that relieves liquidity constraints and as a part of government expenditure. This duality gives the implication that ambiguous effects are possible, as with government consumption.

When taxes are considered the reasoning is a little different. When we study taxes we see that there is only one effect of a change in taxes. An increase in taxes works to reduce disposable income regardless of whether we adopt the Keynesian or neoclassical interpretation of fiscal policy. But, as with government consumption and transfers, a non-linear effect is possible. During contractions and expansions the private sector receives a signal that the fiscal changes are permanent. Hence, a tax increase during a contraction or a expansion signals permanently higher taxes. The effect of tax changes during contractions is hence enhanced. A tax increase reduces private consumption more. The same reasoning applies to the effects of tax changes during expansions.

The importance of studying the effects of the size and composition of fiscal changes, while allowing for asymmetries, is highlighted by the possibility of non-linear relationships between the fiscal policy tools and private consumption. As seen in this section and in Section 3, the effects of fiscal policy will be uncertain. Furthermore, it is possible that the effects vary during expansions and contractions. In the next section we summarize the net effects of fiscal policy that may occur during normal periods and during periods of fiscal expansions and contractions.

5 Net effects of fiscal policy

In the previous two sections we have discussed the different channels through which fiscal policy can affect private consumption. However, these transmissions channels cannot easily be studied unless a structural analysis is performed. Such a structural analysis would be hard to conduct using the limited amount of data available to us. However a reduced form analysis, which only looks at the net marginal effect of fiscal policy, is possible to perform. The effects described by the theoretical models in the last sections will then be present in the net marginal effects that the fiscal policy instruments have on private consumption. In this section we summarize the net effects that different channels will have on private consumption.

In Table 1 we portray the net effects that are possible as a consequence of the different channels and non-linearities discussed in Section 3 and Section 4 above. If we start with the Keynesian channel of fiscal policy, we know from Section 3 that an increase in govern-

ment consumption, a decrease in taxes and an increase in transfers strictly will increase private consumption. The neoclassical channel of fiscal policy will imply that increases in government consumption, taxes and transfers will decrease private consumption.³ Hence, the net effect, on private consumption, of a change in government consumption or transfers will be indeterminate. However, the net effect of a tax increase will have a negative impact on private consumption. These net effects are described in the first column, denoted 'Normal periods', of Table 1. Normal periods are years that are not classified as expansions or contractions. These periods are used as a benchmark in this study. Next, we discuss how the effects during normal periods are altered during fiscal expansions and fiscal contractions.

Table 1: Net marginal effects of fiscal policy^a

	Normal times ^b	Changes during	
		Expansions ^c	Contractions ^d
Government consumption	+ / 0 / -	Unch. / Neg.	Unch. / Neg.
Taxes	-	Unch. / Neg.	Unch. / Neg.
Transfers	+ / 0 / -	Unch. / Neg.	Unch. / Neg.

Notes: ^a Net marginal effects of different fiscal policy instruments on private consumption.

^b (+) denotes movement in the same direction of the fiscal instrument and private consumption. (-) denotes movement in opposite directions. (0) means no response.

^c Changes in marginal effects during expansions. 'Unch.' denotes unchanged effects. 'Neg.' means that the marginal effects become more negative or less positive.

^d Changes in marginal effects during contractions. 'Unch.' denotes unchanged effects. 'Neg.' means that the marginal effects become more negative or less positive.

If expansions and contractions signal that fiscal changes made during these periods are permanent, we would expect that the net effects that we observe are altered during these periods as well. Since it is the signalling value in contractions and expansions that we study, we don't expect a priori that asymmetries should be present. But on the other hand there is no reason to assume that the changes are symmetric either. In the

³Note that the decrease in private consumption is not strict during all circumstances. If the agents fully internalize the budget constraint of the government there will be no effect of a change in taxes unless there is a change in government expenditure. Similarly, there will no effect of government expenditure changes if government revenue is fixed.

discussion below, expansions and contractions signals permanence equally well and the symmetry proposition is settled empirically.

If a contraction signals a permanent downward change in government expenditure, the private agents expects future taxes to be permanently lowered. This is due to the internalization of the government budget constraint. Hence, the present value of disposable income increases and so does consumption. Since both transfers and government consumption are government expenditure, we would expect that the marginal effect of these fiscal instruments become more negative if contractions indeed signal permanent changes. The same goes for tax increases. If contractions signal permanence, the marginal effect of tax changes should become more negative during contractions. But it is of course not certain that expansions or contractions signal permanent changes in fiscal policy. If no signalling effects are present, we would expect all of the net marginal effects to be unchanged.

The discussion regarding the change in effects of fiscal policy during contractions applies equally well to expansions. But as mentioned above, there is no need for the effects to change symmetrically. The changes could very well be asymmetric. The changes in the net effects are summarized in the last two columns of Table 1.

Since we consider different fiscal policy instruments and let the marginal effects of these vary over fiscal policy regimes, we can compare symmetry within the same fiscal instrument across expansions and contractions and between fiscal instruments within the same fiscal regime. From the results obtained when estimating the empirical model, we can see if a certain fiscal instrument and/or a certain fiscal policy regime gives rise to non-Keynesian effects on private consumption.

6 Preparatory data analysis

A crucial part of any empirical analysis is to collect reliable data series. In the present paper it is important to describe the fiscal policy measures in a way such that the effects of fiscal policy on private consumption is correctly portrayed. Two of the most vital steps are to define the data series in a correct way and to identify discretionary fiscal impulses. That is, we first want to obtain data series that are relevant for the purpose of the present paper. Then we want to sort out the changes in fiscal policy that is attributable to automatic feedback rules. Automatic feedback rules are likely to disturb the picture of the effects of fiscal policy on private consumption. Consider for example taxes. If income increases it is reasonable to assume that consumption increases as well. But it

is also reasonable to assume that household taxes increase. Hence, we observe a positive correlation between taxes and consumption that does not convey the true structure of causality. When we ask what effect a tax change has on private consumption, the answer we get from the correlation does not correspond to the question asked. If we want to study the effects of taxes on consumption we have to sort out the effects that are attributable to automatic feedback rules and accounting identities. Below we set out by presenting our data series. The way they are constructed is an important part of the analysis since a poor treatment of the input data gives results that are not open for reasonable interpretation. We then describe the method used to identify discretionary fiscal impulses.

6.1 The data series

The objective of this paper is to investigate the effects of fiscal policy on private consumption. We study three different fiscal policy tools, two items appearing on the expenditure side of the fiscal budget and one item appearing on the revenue side. The government expenditures that we study are government consumption and transfers. The revenue item in this paper is taxes collected by the government.

First consider government consumption. Two main types of expenditure can be traced back to government consumption. These are wage and non-wage government consumption expenditures. Wage expenditure is simultaneously income to the households and an expenditure to the government. This is likely to induce a high correlation between income and government consumption. This makes it harder to draw inference about the government consumption effects on private consumption. As a consequence, we consider only non-wage government consumption.

When we refer to transfers we mean the sum of social security payments from the government, transfer payments from the government and subsidies. Since some transfer payments constitute a part of household disposable income, it becomes important to define household income so that transfers and household income become non-overlapping. We discuss this issue below when we define household income.

The final fiscal policy tool is taxes. We include both direct and indirect taxes in our measure of taxes. The inclusion of indirect taxes can be motivated by the fact that an increase in indirect taxes will induce less consumption per unit of income.

Income is defined as wages plus self-employed and property income. The income measure gives income before taxes are paid and transfers are received. By defining income in this way, the problem induced by transfers will be eliminated. But this will also

influence the estimated marginal propensity to consume. Using this measure of income, we will obtain the marginal propensity to consume out of gross (i.e. pre-tax and pre-transfer) income.

In Appendix A the different definitions and data sources are described in detail.

6.2 Identifying discretionary fiscal impulses

To deal with the blurred structure of causality that arise as a consequence of automatic feed-back channels, we have to adjust the measures of fiscal policy. If we consider the fiscal tools described in the previous section it seems like the automatic responses in the fiscal quantities are of greatest importance when taxes and transfers are considered. The problem is probably not a big issue in the government consumption series. Hence, we only adjust the tax and transfer series. We denote the correction of the series 'cyclical adjustment'. By this we mean an adjustment that removes the influence of factors that simultaneously affect both taxes and transfers and private consumption without conveying a real structure of causality. When the effects of such factors are eliminated it is possible to study the effects between discretionary changes in the fiscal policy tools and private consumption. The cyclical adjustment performed in this paper is analogous to the procedure suggested by Blanchard (1993) and the procedure is described by Alesina and Perotti (1995).

We start out by considering changes in taxes. We suspect that taxes and consumption both are driven by the general level of economic activity. To adjust the tax series we use the gross domestic product. First, we fit a regression with a constant and GDP growth as independent variables and growth in taxes as the dependent variable, as in (1). The estimated relationship illustrates the effect of changes in GDP on tax growth. After this, the tax growth in the current period, given the parameter estimates, the residuals for the present period and the GDP growth for the previous period, is calculated as in (2). This gives a measure of what the tax growth in period t would be given that GDP growth had remained unaltered from period $t - 1$ to period t . Third, the difference between the tax growth in the current period, given the GDP growth in the previous period, and the actual tax growth in the current period, is calculated. This step is presented in (3). The difference corresponds to the negative of the increase in taxes that is attributable to changes in GDP growth. Finally, the cyclically adjusted series is calculated as the sum of tax growth in the current period and the cumulative difference between tax growth at constant GDP growth and actual tax growth, as in (4). The procedure presented above

removes the influence of cyclical changes in aggregate GDP growth from the tax growth series. The adjusted tax series can be seen as the tax growth that would have prevailed given that GDP growth remained unaltered. This allows us to investigate the effect of a discretionary tax change on private consumption.⁴

$$\Delta TA_t = \alpha + \beta \Delta GDP_t + \epsilon_t \quad (1)$$

$$\Delta TA_t(\Delta GDP)_{t-1} = \hat{\alpha} + \hat{\beta} \Delta GDP_{t-1} + \hat{\epsilon}_t \quad (2)$$

$$\Delta TA_t(\Delta GDP)_{t-1} - \Delta TA_t \quad (3)$$

$$\Delta TACA_t = \Delta TA_t + \sum_{\tau=1}^t (\Delta TA_{\tau}(\Delta GDP)_{\tau-1} - \Delta TA_{\tau}) \quad (4)$$

We adjust the transfer series similarly. The only difference is that we use growth in unemployment, instead of growth in GDP, to adjust transfers.

7 Modelling consumption

In this section we discuss the specification of the empirical consumption model. We also introduce our definitions of fiscal policy expansions and contractions.

7.1 The empirical consumption function

The goal of this paper is to analyze the effects of fiscal policy on private consumption. To do this we formulate a regression model that capture the effects of different fiscal policy tools on private consumption. We set private consumption to be the dependent variable. As independent variables we use a constant, income and the fiscal variables of interest. The empirical formulation that we use is similar to the empirical consumption function of Giavazzi and Pagano (1996). We make one adjustment however. We disregard of the long-run relationships between the variables of interest and study the relationship between the first-differences only. The reason for this is that the short-run effects of fiscal policy are the only interesting effects with regard stabilization policy. The specified model nests several previous regression models used in the literature (see e.g. Graham, 1993, and Ho, 2001).

⁴By cyclically adjusting the series in this way, we get a measure of the tax change that would have prevailed had GDP growth been constant. This is not the same thing as finding tax growth given that GDP growth is equal to zero. The latter methodology corrects tax growth for the total effect of GDP growth, while the former corrects for the cyclical influence of GDP growth.

Below, in (5), we present the empirical consumption function. In (5), Δ denotes the first-difference operator while subindex it indicates cross-sectional unit and time period. c and y are private consumption and household income. The fiscal instruments government consumption, cyclically adjusted taxes and cyclically adjusted transfers are denoted gc , $taca$ and $trca$. Furthermore, in (5) $z_{it} = (\Delta gc_{it}, \Delta taca_{it}, \Delta trca_{it})'$ is a 3×1 vector with the fiscal variables. $\beta = (\beta_1, \beta_2, \beta_3)$ and $\gamma = (\gamma_1, \gamma_2, \gamma_3)$ are 1×3 parameter vectors. Since we want to investigate the effects of fiscal policy also during fiscal expansions and fiscal contractions, we interact the fiscal variables with one expansion dummy, d_{1it} , and one contraction dummy, d_{2it} . The variable d_{1it} (d_{2it}) will take the value one during expansions (contractions) and zero otherwise. The dummy-variables are further described in Section 7.2 below. The parameters β_j and γ_j , where $j \in \{1, 2, 3\}$, represent the change in the fiscal policy slope parameters during expansions and contractions. These parameter estimates are to be interpreted as the change in the marginal effect of the fiscal variables during expansions and contractions. Finally D_t is a time-specific dummy-variable.

$$\Delta c_{it} = \alpha_{i0} + \alpha_1 \Delta y_{it} + \alpha_2 \Delta gc_{it} + \alpha_3 \Delta taca_{it} + \alpha_4 \Delta trca_{it} + d_{1it}(\beta z_{it}) + d_{2it}(\gamma z_{it}) + \delta_t D_t + \varepsilon_{it} \quad (5)$$

As seen in (5) we estimate a model where all the slope parameters are homogenous across cross-sections. The use of homogenous effects of income and fiscal policy allows us to utilize information for several countries during several time-periods to estimate the parameters. Still, we acknowledge country heterogeneity through allowing the countries to have a cross-section specific intercept. We estimate the model using a panel of 19 OECD countries during the period 1960-2000.⁵ When the regression model is formulated, it is important to determine periods of fiscal expansion and fiscal contraction. In the next subsection we proceed to define and extract expansionary and contractionary episodes of fiscal policy.

7.2 Fiscal expansions and contractions

An important part of this paper is the identification of fiscal expansions and fiscal contractions. Since we are interested in the signaling content of different fiscal policy regimes, more precisely expansions and contractions, we have to utilize a regime definition that clearly indicate a profound change in fiscal deficit policy. This change in policy can either

⁵See Appendix A for a more detailed discussion of the data series.

be made gradually over several years or more drastically over fewer years. Hence, a suitable regime definition should recognize both types of changes. Furthermore, temporary changes in the fiscal balance, due to business cycle fluctuations, should not be recognized as regime shifts. With these aspects in mind, the regime definition of Giavazzi and Pagano (1996) seems suitable. The criteria for a contractionary regime is given in 1.-4. below. The definition of an expansionary regime is defined similarly. This definition of fiscal policy regimes is able to identify both of the two types of regime-changes discussed above. Long-lasting, but less drastic, fiscal deficit changes are identified as a regime by the use of criteria 1.-2. below. Short, but relatively big, adjustments of the fiscal deficit or surplus are recognized to constitute a regime change by criteria 3.-4. below. Besides the fact that these different types of fiscal changes can be detected, the problem with business cycle fluctuations that influence the government budget balance can be avoided by using the structural primary budget deficit as percentage of potential GDP. Below the definition of a fiscal contraction is given.

A period t is classified as a contraction, if the cumulative change in the structural primary balance, as percentage of potential GDP, has

1. increased by 5% or more in 4 successive years including t , or
2. increased by 4% or more in 3 successive years including t , or
3. increased by 3% or more in 2 successive years including t , or
4. increased by 3% during the time period t .

Expansions are defined analogously. The only difference is that, instead of increases in structural primary balance, decreases are considered. The expansionary and contractionary periods that are obtained through this method is presented in Appendix B.

Some countries experience both a fiscal expansion and a fiscal contraction simultaneously as seen in Table 7 in Appendix B. The reason for such a classification is illustrated by the following example. Suppose that a fiscal expansion is followed by a fiscal contraction that is big. As a consequence, criterion 1. or criterion 2. of the definition above is fulfilled for the contraction. The consequence is that the last year (or the last years) of the expansion will become also a contraction. Different strategies can be used to handle this situation. One way to handle the problem would be to let the expansions net out the contraction (or vice versa). This will imply that periods that simultaneously are expansionary and contractionary will be classified as periods that do not contain large

or persistent fiscal changes. This is not satisfactory since extraordinary periods possibly signal permanent fiscal changes. As a consequence, the estimation of the fiscal policy effects during ordinary periods can be disturbed. Another strategy would be to classify a period that is both expansionary and contractionary as either a contraction or an expansion. But this will imply a judgement over what signal that will be the predominant. If a double classification is determined to be a contraction period it would imply that the contractionary signal is assumed to dominate. The opposite applies if a double-classification is determined to be an expansion. The best way to solve the problem is hence to let the double classification prevail. This is not an unreasonable way to solve the problem. During periods with a double classification the fiscal authorities goes from a period of contraction to a period of expansion (or vice versa). It is natural to assume that the signal about the fiscal stance that is received by the private agents is mixed during such events. The double-classifications hence provide a reasonable way to classify such events.

With a specified empirical model and definitions of fiscal policy regimes we can go on by estimating the model of Section 7.1 and study the results. This is done in the next section.

8 Empirical results

8.1 Regression results

Even though we allow for heterogenous intercept in our regression model it is possible that variance of the error term in (5) will display cross-sectional heterogeneity. To correct this problem we estimate the model using the feasible generalized least squares (FGLS) estimator with cross-sectional weights. As with all empirical models, it is essential that the regression model put forward above is correctly specified. Hence, We perform some general misspecification tests. The test results are presented in Table 3. It can be noted that the dynamic specification of the model seems reasonable. Both the Breusch-Godfrey test (see Table 3) and the Durbin-Watson statistic (see Table 2) indicate that there is no autocorrelation in the disturbance term. We also perform a Hausman test, as suggested by Wu (1973), to test the null hypothesis on exogeneity of the regressors. We find that the null of exogeneity can't be rejected.⁶

⁶This test result have striking implications for the Keynesian theory of fiscal policy. The Keynesian theory states that an increase in government consumption will increase private sector income. This increase will in turn lead to increased consumption. Hence, Keynesian theory assigns not only a sign

From the diagnostic tests it seems like the FGLS estimator is reasonable to use for the model, (5), presented in the previous section. Hence, we go on by estimating the regression model.

From the regression results, presented in Table 2, we see that income affect private consumption greatly. This is of course obvious. But interest can be directed towards the estimated parameter for income. At first this parameter may seem small. But if we consider that the income measure is defined as gross income, before taxes are paid and before transfers are received, the parameter estimate is not unreasonable small.

During periods that aren't classified as an expansion or a contraction, ($d_{1it} = d_{2it} = 0$), we see that the effects of the fiscal policy instruments are rather small. Government consumption exhibits a Keynesian correlation. An increase in government consumption during these periods is expansionary on private consumption. A tax increase will decrease private consumption. This is also what we would expect. Finally, an increase in transfers is followed by an increase in private consumption. This indicates that the redistribution property of transfers dominates the expenditure property during ordinary periods.

During contractions, ($d_{1it} = 0, d_{2it} = 1$), the effects of the fiscal policy instruments are changed. Increases in government consumption become more expansionary although the change is not statistically significant at the 5% significance level. If contractions signal that fiscal changes are permanent we would expect that an increase in government consumption leads to a downward revision of expected permanent disposable income. Hence, the neoclassical effect should appear to a greater extent. But the Keynesian correlation between private and government consumption does not become weaker during contractions according to the results in Table 2. This indicates that the households do not interpret contractionary fiscal episodes as a signal of permanence in government consumption changes. Increases in taxes become more contractionary according to Table 2. Even though contractions don't signal permanence with regard to government consumption, this seems to be the case with taxes. The effect of changes in transfers is altered dramatically during contractions. The aggregate effect change sign and an increase in transfers becomes contractionary on private consumption. The redistribution property of transfers that was apparent during ordinary periods is outweighed by the expenditure property during contractions. The households hence seem to take contractions as a signal of permanent changes when transfers are considered.

to the effect that government consumption has on private consumption. The theory also suggests a transmission mechanism. As mentioned in previous sections, we disregard from this mechanism and focus on the net effect that occurs.

Table 2: Regression results

Regime	Variable	Parameter	Parameter estimate ^{a,b}
	Income	(α_1)	0.51** (0.04)
Normal ($d_{1it} = d_{2it} = 0$)	Government consumption	(α_2)	0.01 (0.02)
	Taxes	(α_3)	-0.03 (0.02)
	Transfers	(α_4)	0.04* (0.02)
Contraction ($d_{1it} = 0, d_{2it} = 1$)	Government consumption	(γ_1)	0.01 (0.05)
	Taxes	(γ_2)	-0.01 (0.03)
	Transfers	(γ_3)	-0.11** (0.04)
Expansion ($d_{1it} = 1, d_{2it} = 0$)	Government consumption	(β_1)	-0.03 (0.05)
	Taxes	(β_2)	-0.05 (0.04)
	Transfers	(β_3)	0.08** (0.03)
	Number of obs.		441
	R^2_{adj}		0.61
	Durbin-Watson		2.02

Notes: ^a White (1980) robust standard errors are presented within parentheses.

^b * denotes significance on the 10% significance level while

** denotes significance at the 5% level.

Table 3: Diagnostic tests

	Hausman test ^a	Autocorrelation test ^b
Test statistic	1.19	1.38
p-value	0.30	0.25

- Notes: ^a We use a Hausman test according to Wu (1973). As instruments we use the first lag of private consumption, income, government consumption and cyclically adjusted transfers and taxes. We also interact the first lag of the fiscal variables with the expansion and contraction dummies. The test is performed under the assumption of no cross-sectional correlation
- ^b We use a Breusch-Godfrey test for autocorrelation up to the second order.

If we consider expansions ($d_{1it} = 1, d_{2it} = 0$) we get a completely different picture. The effect of government consumption becomes more neoclassical. Taxes are changed in the same direction, and by the same magnitude, as during contractions. Hence, expansions seem to signal permanence in government consumption and tax changes. However, the redistribution property of transfers is becoming more prevalent during expansions. While the households believe that changes in government consumption and taxes are permanent when made during expansions, no such indication exists for transfers. The expenditure property of transfers is becoming smaller. This indicates a asymmetry in the signaling value of expansions and contractions. The consequence is that previous studies (such as Giavazzi and Pagano, 1996) may misinterpret the empirical results as a consequence of the fact that expansions and contractions are considered jointly instead of separately. In the next subsection we test existence of, and discuss the reasons for, this asymmetry.

8.2 On the symmetry of fiscal policy effects

As mentioned above there seems to be some asymmetries in the effects of fiscal policy during expansions and contractions. In this section we test this formally.

The notion that sizeable and/or persistent fiscal changes signal a change in course of fiscal policy have some interesting implications for the parameters of the consumption model, (5). Consider for example a contraction. *If* the contraction signals a permanent change in fiscal policy, every change in transfers, taxes and government consumption should effect private consumption more extensively according to the neoclassical model

of consumption. This is equivalent to saying that the marginal effect of fiscal policy on private consumption is enhanced during the contraction. Moreover, the marginal effect of fiscal policy is enhanced in the direction pointed out by the neoclassical theory. Exactly the same reasoning applies to fiscal expansions. However, it is not obvious whether or not contractions and expansions both signal permanence in fiscal changes. But this is an empirically testable hypothesis that is nested in the consumption function, (5). Below we test the if expansions and contractions symmetrically signals permanent fiscal changes.

Symmetry between expansions and contractions can be tested both simultaneously for all fiscal variables and for each and every one of the variables separately. A simultaneous test indicates the general existence of asymmetries, whereas individual tests indicate the source of the asymmetries. In Table 4 we present the test statistic and p-value for the null hypothesis of simultaneous symmetry between expansions and contractions. In terms of parameters in (5), the null hypothesis is stated as $\beta_1 = \gamma_1$, $\beta_2 = \gamma_2$ and $\beta_3 = \gamma_3$, with all three equalities holding simultaneously.

Table 4: Wald test for joint symmetry

Null hypothesis	$\beta_1 = \gamma_1, \beta_2 = \gamma_2, \beta_3 = \gamma_3$
F-statistic	10.03
p-value	0.00

As seen in Table 4 the null hypothesis of simultaneous symmetry is rejected. Hence, the conclusion is that significant asymmetries exist. However, the results in Table 4 say nothing about the source of the asymmetry. To investigate this issue we perform a symmetry test on each and every one of the fiscal instruments. The results are presented in Table 5.

Table 5: Wald test for individual symmetry

Fiscal instrument	Government consumption	Taxes	Transfers
Null hypothesis	$\beta_1 = \gamma_1$	$\beta_2 = \gamma_2$	$\beta_3 = \gamma_3$
F-statistic	0.35	0.60	25.54
p-value	0.55	0.44	0.00

As seen in Table 5 we cannot reject the null hypothesis of symmetry for taxes and

government consumption. However, the same null is strongly rejected when transfers are considered. If we study the regression results in Table 2 we see that the marginal effect of transfers are lower during contractions. Contractions seem to signal that changes in transfers are permanent. The neoclassical effect of a change in transfers becomes more predominant as a consequence of the signal received by the private sector. No such signal seems to be present during expansions.⁷

The fact that contractions signal permanent changes for transfers and not for government consumption is supported by previous empirical findings. Alesina and Perotti (1996) and Alesina and Ardanga (1998) find that the probability of a successful fiscal contraction is increased if the fiscal contraction consists of transfer cuts. A successful contraction is one where the fiscal deficit is permanently reduced and output is increased. Hence, a successful contraction bears a close resemblance to an expansionary fiscal contraction. Our results provide a possible explanation to why transfers possess a central role in the determination of fiscal contraction outcomes. Changes in transfers are perceived as permanent during contractions. This is not the case with government consumption and taxes.

The previous results obtained by Giavazzi and Pagano (1996) state that fiscal policy becomes non-Keynesian during extraordinary fiscal periods. Extraordinary fiscal periods is the label for expansions and contractions when they are considered jointly. However, our results indicate that is important to distinguish expansions from contractions. The effects of fiscal policy changes are asymmetrically altered during expansions and contractions. The reason for the asymmetry could for example be different circumstances regarding the fiscal budget deficit or the public debt situation.

If we adopt the view that transfer changes are interpreted to be permanent during contractions, the results have some far-reaching consequences for the expansionary fiscal contraction hypothesis. The sacrifice made during a fiscal contraction can be lowered considerably if a cutback in government expenditure can induce an increase in income and private consumption. But if the private consumption expansion, following the fiscal contraction, only can be brought about by reducing transfers the problem becomes more delicate. If transfers are decreased it is likely that this will affect poor households negatively. Even if income and consumption eventually increase it is not obvious that this will outweigh the harm that has been inflicted by the transfer cut. Hence, it is likely that

⁷It can be noted that the results presented in Table 2 are changed only marginally, and kept qualitatively unaltered, when the regression model is estimated under the two restrictions that are not rejected in Table 5.

the issue of fiscal contractions will be a delicate matter for decision-makers also in the future.

9 Conclusions

In this paper we investigate if long-lasting and/or sizable government budget changes are perceived as a signal of a change in the long-run conduct of fiscal policy. More precisely, we study if the effects of government consumption, taxes and transfers on private consumption are altered by the signaling value of fiscal expansions and contractions. Using an unbalanced panel of 19 OECD countries during the period 1960-2000, we find a significant asymmetry between the effects of the different fiscal policy tools during expansions and contractions. Closer investigation reveals that transfers play a central role in causing the asymmetries.

The role of transfers is both that of an income source for the households and an expenditure to the government. When considered as an income to the households, an increase in transfers should increase private consumption. However, the expenditure feature of transfers implies that an increase in transfers should increase taxation since the government must eventually finance its outlays. This works to reduce private consumption through higher expected future taxes. Our results indicate that the expenditure feature of transfers dominates during fiscal contractions while the income feature dominates during other periods. This implies that an expansionary fiscal contraction is more likely if the contraction is brought about by cuts in transfers. This finding supports results from previous empirical studies. The need to account for specific circumstances, such as the deficit and debt situation, is highlighted by the existence of an asymmetry. But our results also points to a very important question. Since some households that are in need of financial support receive transfers, the social cost of an expansionary fiscal contraction through transfer cuts can be considerable. This fact poses a tough issue for the governments that have to embark in fiscal consolidations.

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Appendix

A Data description

To obtain the data series in this study, we gather the disaggregate data series presented in Table 6.

Table 6: Description of variables

Variable	Database ^a	Code
Private consumption, household account basis	EO	CPAA
Private consumption, volume ^b	EO	CVP
Wages and salary	EO	WAGE
Self-employed and property income received by households	EO	YOTH
Government consumption, excluding wages	EO	CGNW
Subsidies	EO/FPBC	TSUB
Social benefits paid by government	EO/FPBC	SSPG
Other transfers paid by government	EO/FPBC	TRPG
Direct taxes	EO	TY
Indirect taxes	EO/FPBC	TIND
Total population	EO	POP
Unemployment	EO	UN
Deflator for GDP at market prices	EO	PGDP
Primary government balance, cyc. adj., % of potential GDP	EO/FPBC	NLGXQA

Notes: ^aSpecific database in OECD Statistical Compendium Ed. 02:2001

^bCPV is obtained for Greece only. CPAA was not available.

Income, taxes, transfers and government consumption is calculated as follows:

$$\text{Income} = \text{WAGE} + \text{YOTH}^8$$

$$\text{Taxes} = \text{TY} + \text{TIND}$$

$$\text{Transfers} = \text{SSPG} + \text{TRPG} + \text{TSUB}$$

⁸For Greece, the income series consists of wages and salary only since the series containing self-employed and property income received by households was not available.

Government consumption = CGNW

These three series, together with consumption, are then transformed into per capita terms and 1995 prices using the series POP and PGDP.

B Fiscal expansions and contractions identified

The following expansions and contractions (see Table 7), respectively, are identified using the Giavazzi and Pagano, 1996, regime definition.

Table 7: Expansions and contractions (Giavazzi and Pagano, 1996, definition)

Countries	Expansions	Contractions
Australia	1990-1993	1986-1988
Austria	1974-1976	1996-1997
Belgium	1978-1981	1981-1987, 1993-1994
Canada	1974-1978	1993-1999
Denmark	1974-1977	1982-1987
Finland	1978-1980, 1987	1993-1994, 1998-2000
France	-	-
Germany	1990-1991	1980-1983
Greece	1980-1981, 1984-1985, 1987-1990	1986-1987, 1990-1997
Ireland	-	1980-1989
Italy	-	1976-1977, 1982-1983, 1989-1997
Japan	1992-1996	-
Netherlands	1978-1979, 1989-1990	1991-1993
Norway	1976-1979, 1989-1993	1993-1997
Portugal	1972-1976, 1981-1983	1977-1980, 1982-1987
Spain	-	1986-1987, 1996-1997
Sweden	1973-1974, 1977-1980, 1988-1994	1975-1976, 1986-1987, 1993-1999
UK	1992-1993	1995-1999
USA	1975	-