Monitoring Fiscal Adjustments in the European Union and EMU

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Summary

The international monitoring of public finances in EMU member states is an essential element of the Stability and Growth Pact. Part of evaluating government budgets involves determining the sustainability of the envisaged consolidation measures. The academic and political debate on this topic emphasises various criteria which suggest persistent consolidation efforts. The academic literature stresses the contribution which government consumption and transfer payments make to reducing the deficit. The literature also indicates a significant reversal in previous trends which had been responsible for expanding the deficit. In its Convergence Report of 1998 and in background studies, the European Commission cited the reduction of primary expenditure as a criterion of sustainability. Although various criteria have been mentioned in the debate, it is important to note that the empirical support for these criteria is based largely on the same data and methods, which are subject to certain shortcomings.

This study systematically compares the criteria for evaluating the sustainability of consolidation measures using parametric and non-parametric methods of duration analysis. This approach not only makes possible a comparison with already existing studies on this subject but also enables us to examine the effects of other factors, which have only partly been taken into account in the current literature. One such factor is the debt level. Moreover, this study avoids the arbitrary approach of formulating criteria for evaluating the "success" of a measure that characterises other studies. The analysis employs budget data for the EU member states extending from 1970 to 1997 and cyclically adjusted by various methods.

The empirical evidence indicates that total primary expenditure exerted no discernible influence on a premature end of consolidation episodes. Fiscal policy adjustments to wage payments, by contrast, do contribute to the persistence of fiscal policy consolidation. The influence of transfer payments on the duration of consolidation measures depends critically on the extent to which previous tendencies towards expansion have been suppressed. These findings therefore qualify the existing evidence in the literature and confirm the adequacy of the criteria as a heuristic element for assessing the sustainability of stabilisation programmes.

Zusammenfassung

Die internationale Überwachung der Entwicklung öffentlicher Finanzen in den Mitgliedstaaten der EWWU ist wesentlicher Bestandteil des Stabilitäts- und Wachstumspaktes. Teil der Bewertung der Staatshaushalte ist es, die Dauerhaftigkeit der angestrebten Konsolidierungsmaßnahmen zu beurteilen. Die wissenschaftliche und politische Diskussion zu diesem Thema betont verschiedene Kriterien, die auf anhaltende Konsolidierungsbemühungen hinweisen. In der wissenschaftlichen Literatur wird zum einen der Beitrag des Regierungskonsums und der Transferleistungen zur Verringerung des Defizits hervorgehoben. Darüber hinaus verweist die Literatur darauf, daß die Umkehrung vorheriger Trends, die für die Ausweitung des Defizits verantwortlich waren, von Bedeutung ist. Die Europäische Kommission hat in ihrem Konvergenzbericht von 1998 und in Hintergrundstudien die Reduzierung der primären Ausgaben als Nachhaltigkeitskriterium genannt. Obwohl verschiedene Kriterien in der Diskussion genannt werden, ist festzustellen, daß die empirische Fundierung dieser Kriterien weitgehend auf denselben Daten und Methoden beruhen, mit denen sich aber gewisse Nachteile verbinden.

Die vorliegende Arbeit vergleicht systematisch die Kriterien zur Evaluierung der Dauerhaftigkeit von Konsolidierungsbemühungen mit Hilfe parametrischer und nicht-parametrischer Methoden der Verweildaueranalyse. Dieser Ansatz erlaubt nicht nur einen Vergleich der bestehenden Arbeiten, sondern ermöglicht es auch den Einfluß weiterer Faktoren zu prüfen, die in der bisherigen Literatur nur partiell berücksichtigt wurden. Dazu gehört zum Beispiel das Schuldenniveau. Außerdem wird die arbiträre Vorgehensweise der Formulierung von Evaluierungskriterien für den "Erfolg" einer Maßnahme vermieden, die andere Studien kennzeichnet. Für die Analyse werden Haushaltsdaten der EU-Mitgliedstaaten von 1970 bis 1997 herangezogen, die mit verschiedenen Methoden zyklisch bereinigt wurden.

Im Ergebnis zeigt sich, daß sich für die primären Gesamtausgaben kein Einfluß auf ein frühzeitiges Ende der Konsolidierungsepisoden feststellen läßt. Fiskalpolitische Anpassungen bei den Personalausgaben tragen jedoch zur Dauerhaftigkeit der fiskalpolitischen Konsolidierungen bei. Für den Einfluß der Transferleistungen auf die Dauer der Konsolidierung ist entscheidend, inwieweit vorherige Ausweitungstendenzen zurückdrängt werden. Diese Ergebnisse qualifizieren somit die bestehende Evidenz in der Literatur und untermauern die Validität der Kriterien als heuristisches Element zur Beurteilung der Dauerhaftigkeit von Stabilisierungsprogrammen.

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Monitoring Fiscal Adjustments in the European Union and EMU*

1. Introduction

Now that Stage Three of the European Monetary Union (EMU) has started and the euro has been successfully launched, fiscal issues remain a major concern of central bankers. Adequate fiscal policies have been considered a basic requirement for the functioning of a currency union from the very beginning of the integration process. As a consequence, the Maastricht Treaty requires member countries to maintain a sustainable fiscal position. The logic of the Maastricht Treaty focuses on the debt level of a country and the deficit level allowed to maintain an acceptable level or, at least, to prevent debt from rising excessively. At the current stage, the rules set forth in the Stability and Growth Pact should govern the development of public finances in member states. The Stability and Growth Pact sets an even tougher deficit limit enabling member states to let the automatic fiscal stabilisers work and, at the same time, to comply with the Maastricht deficit reference value. The regulations of the Stability and Growth Pact leave more room for interpretation since the fiscal criteria are less clear-cut and include more economic conditions than the reference values of the Maastricht Treaty. As a consequence, major importance is given to the monitoring of fiscal developments.

This paper makes a contribution to the discussion on the monitoring of countries' public finances. Several strands of literature are related to this topic. Here we will concentrate on the empirical work assessing the persistence of fiscal consolidations. This is particularly important in the current situation. Previous efforts to adjust public finances have often been very recent and influenced by the threat of not being permitted to join monetary union. The requirements of the Stability and Growth Pact would make further fiscal consolidations necessary in a number of EMU member states. Yet politicians and academics are increasingly expressing concern that countries may feel a "consolidation fatigue" and fall back into a lax fiscal stance without the accession threat. But even at later stages,

* I am grateful to the participants of the BBK/ÖNB Workshop, the BBK Seminar, Bernhard Manzke and Francesco Mongelli for their comments and suggestions. All remaining errors are my own.

deviations from the required fiscal balance may occur due to unforeseen problems, making consolidation measures necessary to bring countries "back on track".

Most contributions to the persistence-oriented literature either were written by Alesina and Perotti or are related to their work. Due to this commonality, the empirical basis from which the recommendations are derived suffer from the same restrictions. Nonetheless, despite the common empirical basis different emphases have resulted in the formulation of distinctive criteria indicating the likelihood of a persistent consolidation. The paper will use an approach which overcomes some of the restrictions, permits a comparison of the performance of the different criteria and systematically relates the predictions to the debt level and economic performance, which are the most relevant variables in terms of the intentions and regulations of the Stability and Growth Pact. We will use a duration analysis to unravel the underlying hazard of consolidation episodes and the impact of co-variates on the risk of ending consolidation efforts.

The next section of the paper presents in more detail the regulations of the Stability and Growth Pact pointing toward the importance of monitoring fiscal developments. Section three gives a short literature overview summarising the main arguments, empirical restrictions and policy recommendations of different contributions. Section four clarifies methodological issues and presents the data and the empirical results. Section five concludes.

2. The Stability and Growth Pact

The Stability and Growth Pact consists of two Council regulations and one recommendation clarifying the meaning and procedures of the Maastricht Treaty's fiscal provisions in Stage Three of EMU. Art. 104c of the Maastricht Treaty states that all member states shall avoid excessive government deficits. The protocol of the Treaty specifies two reference values as a benchmark for the lack of the required fiscal discipline - a deficit of 3 percent of GDP and a debt level of 60 percent. Moreover, it stipulates some qualifying conditions if the fiscal conditions of a country surpass the amount defined by the reference values. The Treaty allows a deficit to exceed the 3 percent without being claimed "excessive" if it remains close to that threshold, is due to exceptional circumstances and

promptly drops below the reference value as soon as the cause of the deficit has vanished. With regard to the second criterion, the debt level has to be on a clearly downward-sloping trajectory if it lies above the 60 percent threshold.

The Stability and Growth Pact specifies the conditions and mechanisms which assure that the deficit limit is only breached under exceptional circumstances. Therefore the core element of the Stability and Growth pact is a fiscal strategy maintaining the medium-term objective of a budgetary position close to balance or in surplus which allows member states to stay under 3% ceiling during economic downturns. Moreover, the Pact delimits the economic conditions which are considered exceptional. An annual fall of GDP by at least 2% percent unambiguously presents an "exceptional" situation which would allow states to surpass the deficit limit. An annual fall of GDP of less than 2% can be considered exceptional given further supporting conditions, such as the abruptness of the downturn or the overall size of the output gap. However, as a general rule the annual fall has to be more than 0.75% in order for such qualifying considerations to exist. Finally, the deficit has to be temporarily confined to the period when these underlying economic conditions prevail and immediately move back below the 3 percent limit in the year following the recession.

In addition the Pact specifies the mechanisms enforcing a prudent fiscal stance of member states. First of all, improved international surveillance should work as a preventive instrument to detect at an early stage fiscal policies which may lead to excessive deficits. For this purpose, member states must annually submit stability programmes specifying the medium fiscal targets. Then the Council analyses and evaluates these programmes with respect to the feasibility of economic projects and the sufficiency of the proposed fiscal measures to achieve the targeted adjustment path.

Second, the Stability and Growth Pact specifies the sanctions if a country, in fact, incurs a persistent excessive deficit. Sanctions take the form of non-remunerated deposits, which start at 0.2% of GDP and rise by one-tenth of the excess deficit up to a maximum of 0.5% of GDP in the first year. In each subsequent year until the abrogation of the excessive deficit decision, only the variable component will be paid. If the deficit is not sufficiently corrected after two years, the deposit will be converted into a fine and not returned to the member state.

The Stability and Growth Pact attaches great importance to international surveillance as disciplining device. In judging a country's fiscal position, those in charge of the monitoring process will have to assess three relevant criteria: first, whether the country may breach the deficit limit during the economic business cycle; second, whether it has some additional leeway for anti-cyclical policies; third, whether the long-term fiscal target reflects the burden of future demographic and structural developments. In more practical terms, this implies that monitors have to evaluate the stability programmes submitted by member states regarding the country's medium term fiscal position, the assumptions made for forecasting future developments and the effectiveness of fiscal measures proposed to correct shortcomings.[1] The academic literature primarily concerned with these criteria[2] provides a device for determining the "optimal" fiscal balance of a country, which should not be excessively restrictive and still permit full compliance with the Pact. But this literature does not address another set of questions: Are the measures proposed in a stabilisation report likely to be "successful" or will fiscal consolidation efforts run "out of steam"? Which measures should be recommended to bring a country (back) to the "optimal" fiscal position? Do these measures reduce the risk that it will lose fiscal control immediately afterwards? The remainder of the paper will focus on the small, but relatively influential debate in the academic and political circles addressing this second set of questions.

3. Existing "Monitoring Devices" - Prescriptions and Restrictions

The recent literature on the adjustment experiences in OECD countries and particularly in EU states in the post-Maastricht convergence process has produced various criteria to assess the persistence and "credibility" of adjustment efforts. In general, this line of research was initiated by Alesina and Perotti. In a series of articles[3] they examined the empirical regularities of strong fiscal adjustments and expansions in OECD countries form

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1 I thank Francesco Mongelli and Bernhard Manzke for pointing out these aspects to me.

2 See Buti et al. (1997, 1998) and the literature quoted therein.

3 See Alesina & Perotti (1995, 1997); Alesina, Perotti & Tavares (1998); Alesina & Ardagna (1998), Perotti (1996). Certain theoretical arguments employed in their analysis are analysed more thoroughly in Alesina & Perotti (1997b), Perotti (1998), Lane & Perotti (1998). See also Perotti et al. (1998) which will be discussed on more detail later.

the 1960s onward. The basic finding of this line of research is that the composition of adjustment efforts matters. Fiscal consolidation proves to be more successful in terms of a persistent reduction of debt and deficits if it is based on spending cuts and, in particular, the reduction of transfers and government wage payments. The authors draw on a number of theories to provide some explanations for these findings. Their reasoning rests on effects of different order, one being a first-order effect associated with changes in fiscal policies, and the other being the effects which fiscal adjustments have on macro-economic variables shaping a country's international competitiveness or influencing consumption behaviour. The presumption concerning the persistence of fiscal policies is that cutting government wages and transfer payments is politically more costly and more long-lasting per se. While public investment cannot be reduced or postponed indefinitely, for example, changes in eligibility criteria to social security programs have long-lasting effects, actually becoming more important over decades.

The second line of reasoning rests more on the macro-economic consequences of different spending cuts or tax increases. More specifically, Alesina and Perotti (1997) and Lane and Perotti (1998) argue that, depending on the structure of the labour market, changes in income taxes and government employment will have a bearing on wage settlements, influence labour costs and, hence, influence output. Moreover, they assume non-linear credibility or expectational effects of fiscal policy associated with the "non-Keynesian effects" of fiscal consolidation. Apart from the long-term impact of the measure itself, the credibility effect rests on people's expectations that a government which incurred the political costs of cutting wage payments and social transfers is more serious about consolidation. These expectations determine their presumptions on future tax liabilities and, consequently, their consumption decisions. Extending the argument of Giavazzi and Pagano (1990, 1996) about the non-Keynesian effects of strong fiscal adjustments, they assert the importance of the composition of adjustment for this effect, making transfers and government wage spending the most important elements of the budget.

The work of Alesina and Perotti has been criticised for various reasons. Firstly, the starting conditions, particularly the size of the debt level, may have a greater bearing on the persistence of fiscal consolidation than the authors make clear. In more recent papers (Perotti 1998 and Alesina & Perotti 1998) they take this into account, finding that consolidation efforts are more enduring in situations of fiscal stress. However, it remains

unclear to which extent it affects the chances of success and if or how it interacts with the structure of consolidation. Secondly, the work of Giavazzi and Pagano (1990, 1996) suggests that the Keynesian and non-Keynesian effects of fiscal consolidations differ systematically with the "strength" of the consolidation effort. By focusing on episodes of strong fiscal adjustments, for the methodological reason of selecting periods of actual adjustment efforts and not episodes where the primary deficit was reduced "by chance", their sample incurs a selection bias. Their finding that the success cannot solely be explained by the size of adjustment is subject to the restriction that their sample of consolidation incidence includes only observations where the reduction of the deficit was above a relatively high threshold. Therefore, one would like to know whether the effects on persistence can still be found if we look at all episodes, including those of minor adjustment. Thirdly, and most importantly, their measure of success is actually thought to capture persistence. But, as the authors admit (Alesina et al. 1998: 201), the choice of the period when the "success" is evaluated is entirely discretionary. This makes sensitivity analyses applying different periodicities and debt or deficit reduction rates necessary to check the validity of their results. The fact that these sensitivity analyses generally support the authors finding is of no help in solving the basic problem.

The previously presented findings of Alesina and Perotti have been reflected in political statements. The European Commission refers to their previous research to derive an argument for its optimistic assessment of the recent consolidation efforts in EU countries in a preparatory study (EC 1997) and in the convergence report itself (EC 1998). In these documents, the Commission's main indicator for the assumption of persistent consolidations is the fact that the adjustment occurred above all on the expenditure side and particularly within primary spending in many EU member states.[4] In this sense, the criteria of the EC to assess the persistence of a consolidation effort is less specific than the characteristics set forth by Alesina and Perotti. Empirically, the Commission simply groups the recent fiscal developments according to the tax vs. expenditure cutting pattern in its

[4] In the Convergence Report, the Commission mentions current primary expenditure. However, this focus is less clear from the background study of the Commission (1997).

assessment of the situation. It does not provide a more direct test of its judgement, other than the claim that the recent consolidation pattern presents a clear break with the past (EC 1997:63-64).

In contrast to the Commission, Perotti et al. (1998) set forth more specific requirements for the confirmation that a consolidation effort may persist beyond the current fiscal year. According to this work, it is important "to address the problem at the source". A government has to redress the source of the previous deterioration of the fiscal balance in the adjustment phase to regain control over its public finances. Concomitantly, a country has achieved a sustainable fiscal position if it has successfully reversed the spending increase or revenue trend causing the fiscal problem. This is primarily underpinned by political economic reasoning. The principal consideration is that a country which has lost control over its public finances must demonstrate that it is able to eliminate the sources of this problem. If the consolidation effort is concentrated on another part of the budget, any achievement, of course, cannot be considered as evidence that the government was actually able to contain the political pressures or overcome the institutional weaknesses leading to the prior deterioration. On the same score, the authors explicitly argue that countries should reform the institutional weaknesses forming the underlying sources of the fiscal problem.

The stylised facts underscoring this argument are by and large generated by the same methods employed by Alesina and Perotti. To a certain extent, the principle of "addressing the problem at the source" is a corollary of Alesina and Perotti's previous findings, since the increasing transfers and wage payments figure among the primary sources of fiscal deterioration. Since cutting these spending categories is an ingredient of "successful" consolidation efforts, the fiscally problematic functional expenditure class has been addressed. In laying out their argument and developing an index for the assessment of consolidation efforts, they do not distinguish between expenditure and revenue adjustments.

One may criticise the approach for its "status quo bias" and its neglect of effects on macro economic conditions. Among others, the authors do not make a distinction between expenditures and revenues. For example, if a deterioration of the fiscal balance occurred because a highly distorting or overly excessive tax on labour income was reduced or abolished, the approach would require the reinstatement or increase of a tax in this category

for the confirmation that the country is actually making efforts at sustainable consolidation. Even if this is empirically well-founded, it seems less desirable from a more welfare-oriented policy perspective. Moreover, it conspicuously neglects the macroeconomic effects, mentioned by Alesina and Perotti (1997), which may contribute to the persistence of a consolidation effort. Although this criticism points towards possible theoretical extensions and practical problems in implementing the related policy recommendations, it does not invalidate the basic tenet of the approach. This could only be refuted if the empirical regularity they find did not emerge from other data sets or, alternatively, if adequate methods applied to their data set did not bear out their argument.

The above brief review has shown that the contributions to this debate, although based on the same line of research and empirical foundation, are rather different with regard to their monitoring suggestions. They set forth distinctive requirements for the confirmation that fiscal adjustment programs reveal an increased likelihood of persistence. Since the criteria imply strong restrictions on "adequate" adjustment patterns it is a valid exercise for the practical purpose of monitoring to systematically compare the different prescriptions. Furthermore, the main findings of the academic contribution to this debate are derived from an empirical base with clear data restrictions and a discretionary method of defining consolidation episodes and evaluating their success.[5] In the following section we will present an empirical approach overcoming these shortcomings.

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5 The latter issue applies also to McDermott and Wescott (1996), who reach a similar conclusion to Alesina and Perotti, as well as Heylen and Everaert (2000), who generate contradictory empirical evidence. The only study I am aware of which applies a similar methodology to that used here is Bayar (1998). He conducts a duration analysis for countries entering and leaving the excessive deficit status. By focusing on the "excessive deficit status" he addresses a different issue and, obviously, encounters an important methodological problem due to the ex-post application of a fiscal policy criterion which was irrelevant prior to the Maastricht process.

4. Duration Analysis of Consolidation Experiences in EU Member States

4.1. Data and Model

In our approach we analyse consolidation episodes, or in other words, spells of tight fiscal adjustments for EU member states from 1960 to 1997. All data are taken from the AMECO data set of the European Commission. In line with the previous literature focusing on the persistence of adjustment efforts, we define a consolidation episode as a period of continuous reduction of the cyclically adjusted primary deficit, measured as a percentage of GDP. By using this definition, consolidation episodes are assumed to be independent spells with an absorbing end state. Alternatively, one could have focused on country histories with multiple entry and exit observations. Our assumption may appear overly restrictive because it presupposes that people's experience of a five-year consolidation, for example, is irrelevant after one year of subsequent fiscal expansion. Nonetheless, it still presents a natural starting point, because the infinite past would have an impact on the current situation under the alternative approach, which seems equally questionable, or it would be necessary to subdivide a country's history into sub-periods. This however is a discretionary confinement, which should be avoided given the purpose of the analysis.

We apply the same method as Alesina and Perotti (1995) for the cyclical adjustment of the budget balance and the spending resources.[6] Some of the advantages of their approach are already spelled out by the authors. For the present purpose, two additional advantages are worth mentioning. First, it permits the disaggregation of spending into different spending categories and allows us to correct transfer payments for the impact of the business cycle. Unfortunately, the AMECO data set does not provide these figures and they cannot be computed applying the Eurostat method because the expenditure elasticity used

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6 Alesina and Perotti (1995) regress the fiscal variables on two time trends and the unemployment. Then they compute the predicted values using the unemployment rate lagged by one year. In other words, the cyclical component depends on whether unemployment is at the same level as in the previous year.

to adjust primary expenditures refers to unemployment-related spending, which does not necessarily belong to transfer payments. Second, it supports the comparability of our results with the relevant literature.

By applying this method to the 15 EU member states, we generate a sample of 98 consolidation episodes, ranging from one to nine years. This presents a total of 325 calendar years. The longest duration pertains to well-known consolidation episodes in Belgium, France, Ireland, Sweden and the UK during the 1980s. Among all consolidation spells we find 87 failures, saying that eleven episodes are censored at the right due to the end of the data set in 1997. The mean and median end of a consolidation episode is approximately three years.

Since the application of duration models to fiscal adjustments is new empirical ground, we will begin the analysis by employing the non-parametric Kaplan-Meier estimates. This method has the advantage that we do not have to specify the functional form in advance, which seems adequate for a first assessment. But it may be less efficient than parametric estimates and, by itself, does not allow us to check for the impact of exogenous variables on the time impact on duration. Therefore, in a second stage, we employ the following standard parametric Weibull hazard rate model to include exogenous variables in our analysis:

$$\lambda(t|x) = \rho t^{\rho-1} \exp(x'\beta) \qquad (1)$$

$\lambda(t)$ indicates the hazard rate of the stochastic duration of consolidation spells, which are assumed to have a Weibull distribution. Both the Weibull and the Gompertz distributions would be suited to testing the "consolidation fatigue" argument which implies an increasing hazard. However, tests using the AIC indicate that the Weibull distribution is the preferable specification (see Table A4). In the Weibull model, it depends on the magnitude of the time t related parameter ρ whether the hazard increases or decreases over time. The vector β includes the unknown parameter values β_i, which will be estimated by a full likelihood estimator. x is the vector of independent variables which we assume to be exogenous and time independent. The regressors comprise three variables which are stable or vary during the consolidation spell. We will include as the first variable the structure of the consolidation process. The fiscal criteria are computed as follows:

$$AP\_EC\_x = \frac{e_t - e_T}{\delta_t - \delta_T}, \qquad PEA\_x = \left(\frac{e_t - e_T}{\delta_t - \delta_T}\right) \cdot \left(\frac{e_{T-1} - e_\tau}{\delta_{T-1} - \delta_\tau}\right)^{-1}$$

The *AP_EC_x* variable represents the criterion of the European Commission and Alesina and Perotti. *e* is the respective spending flow and δ the deficit. *T* is the year where the adjustment episode starts and *t* is the last year of the tightening fiscal adjustment.[7] Thus, the variable measures the contribution of the respective spending category to the improvement of the fiscal balance. The *PEA_x* variable measures the extent to which the changes in expenditure during the consolidation reverse the previous contribution to the deterioration of the fiscal balance during the expansionary episode. τ represents the year in which the fiscal expansion started. According to the above-mentioned arguments, these structural characteristics of the consolidation effort should reduce the hazard rate. The second variable is the debt level prior to the consolidation episode. This variable captures the fiscal crisis effect, mentioned by Giavazzi and Pagano (1990, 1996), Sutherland (1997) and Perotti (1998) and the impact of the initial conditions, noticed by Eichengreen (1998). We expect that the debt level has a negative impact on the hazard, i.e. that it increase the duration of consolidation efforts. The third variable in the above model is the "strength" of the consolidation measured by the size of the primary cyclically adjusted surplus.

The third variable clearly raises an endogeneity problem. While the structure of adjustment can be considered independent of the timing of the consolidation episode, for obvious theoretical reasons, this is less so for the "strength" of the consolidation effort, i.e. the size of the primary surplus. Decision-makers facing a sustainability problem of public finances may trade off time for the pace of consolidation. Therefore it is necessary to instrumentalise this variable. As an instrument, we will use the predicted surplus values of the following equation:

$$s_{it} = \alpha + \gamma_j d_{it-1} + \gamma_k y_{it} + \gamma_l y_{it-1} + m_{it} + \varepsilon_{it} \qquad (2)$$

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[7] It should be noted that *t* is one year before the end of the consolidation spell, because the end of the consolidation effort is measured in the year *t+1*.

The dependent variable s of country i at time t represents the cyclically adjusted primary fiscal surplus. The independent variables are the lagged debt-to-GDP ratio d and the current and lagged value of the output gap y.[8] m represents a dummy, capturing the Maastricht effect, which is equal to one from 1992 onward and zero otherwise. Since the equation serves to estimate the "reaction function" of different countries to the debt level and cyclical swings, we use country-by-country OLS regressions based on the entire set of data from 1960 to 1997. For the regressions it is assumed that the variables are stationary. This assumption may be questioned with regard to the debt level. However, we maintain this assumption because the power of stationarity tests with regard to alternative hypotheses is notoriously weak for small samples like ours. Thus, empirical results indicating the non-stationarity of the debt level would not be convincing.[9] Second, Bohn (1998) has theoretically derived that a positive response of the primary surplus to an increasing debt level is a sufficient, but not necessary, condition for the stationarity of debt in a stochastic environment. Mélitz (1997) presents supportive evidence for this reaction in OECD countries and, as will be shown below, our analysis corroborates this result for most EU countries.

4.2. Empirical Results

4.2.1. Non-Parametric Analysis

As a first approach to assess the validity of the different claims, we will use a non-parametric technique and distinguish adjustment periods by their different structural characteristics. At this point we do not yet check for other variables. To compute the Kaplan-Meier product limit survivor function for different adjustment structures, we will create a dummy variable, capturing at least in a simplified form the criteria mentioned by Alesina and Perotti (1997), the European Commission and Perotti et al. (1998), to separate adjustment episodes. The argument of Alesina and Perotti is captured by a dummy which equals one (APEX 1) if the contribution of transfers and wage compensation to the fiscal

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8 For the definition and methodology used to compute the output gap see European Commission (1995). According to this definition, the gap is negative if the actual GDP is smaller than the trend GDP and positive if the actual GDP outperforms the trend.

9 An extensive discussion and application of different tests can be found in Artis and Marcellino (1998). But even these authors do not derive a clear-cut answer.

consolidation is more than 50 percent and zero (APEX 0) otherwise. The EC's contention that primary expenditure is the most relevant category is operationalised by a dummy (EUEX) equal to one if primary expenditures account for more than 50 percent of the adjustment. Finally, we will directly apply the 2/3 rule of Perotti et al. (1998) coding episodes according to whether the contribution of expenditures (PEAEX) or revenues (PEAREV) to the fiscal deterioration was reversed by more than 2/3 during the stabilisation episode.

Figure 1: Kaplan-Meier Estimates for Different Adjustment Structures

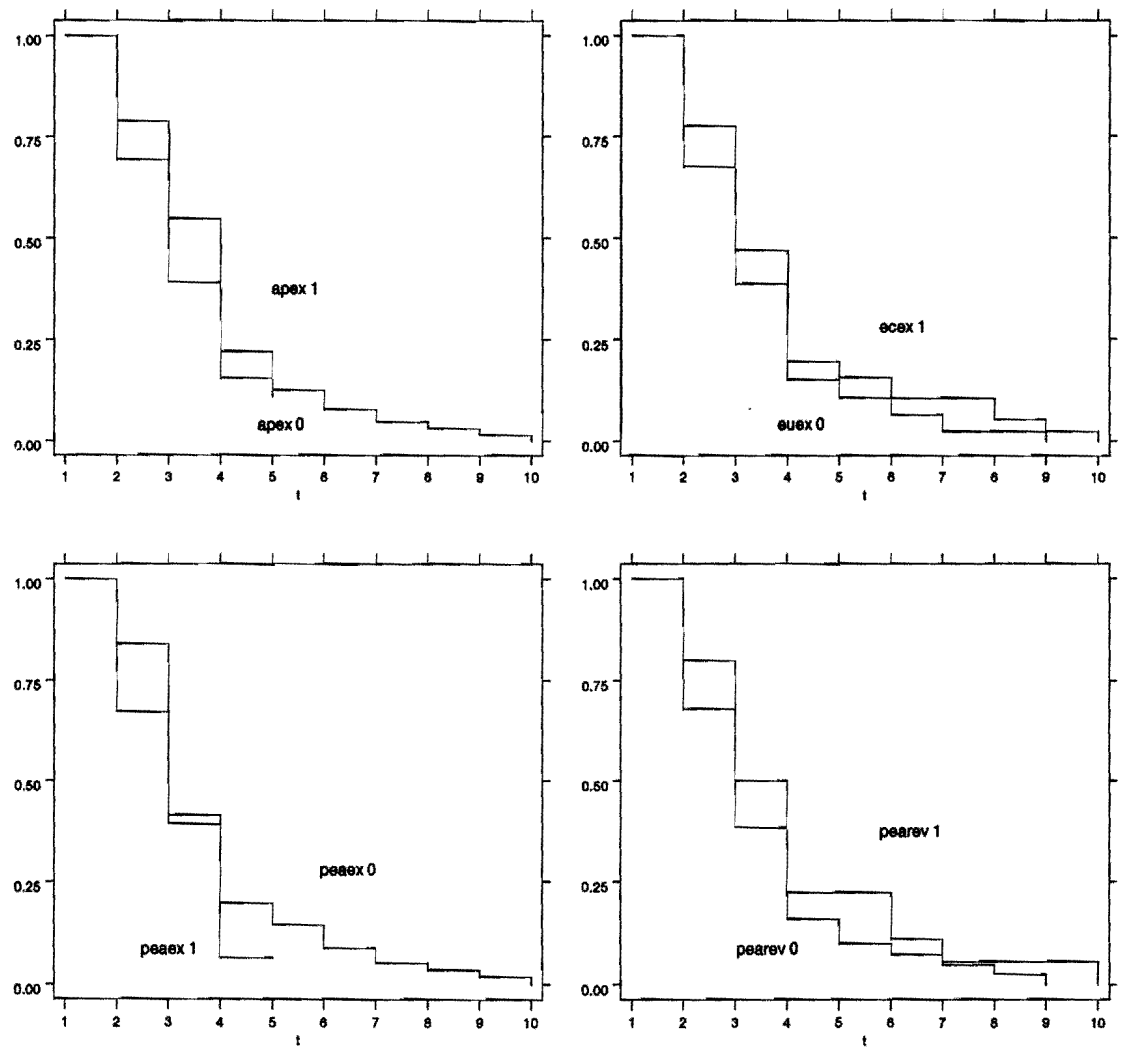


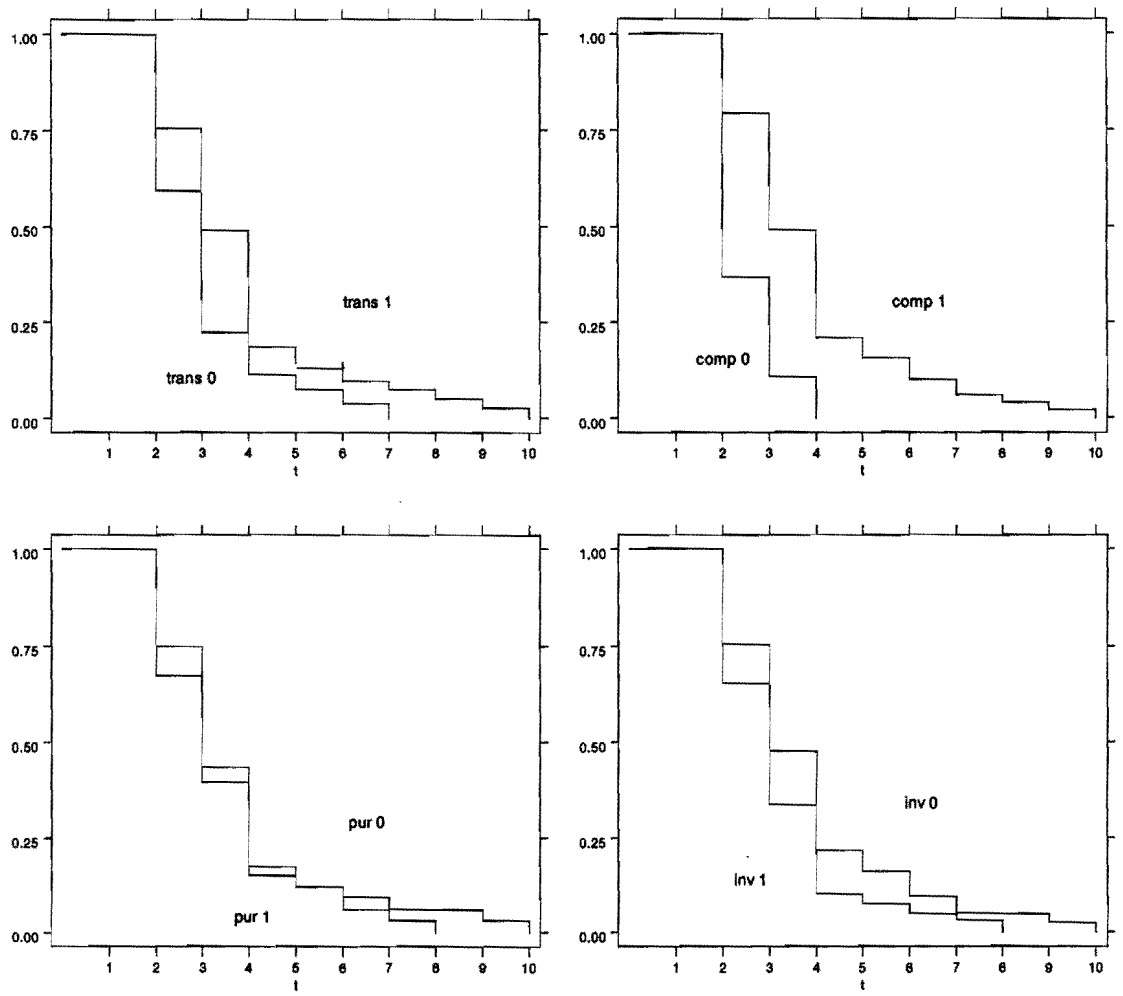
Figure 1 displays the results for the different characteristics for all EU member states. The test results for the equality of the survivor functions for all EU member states are given in the appendix. We find that the consolidation episodes complying with the criterion of

Alesina and Perotti as well as the spending criterion of Perotti et al. ends after a maximum of five years in our sample. During this time period, the duration curve of those consolidations primarily based on transfers and wage compensation has higher values than the function of consolidations resting on other resource flows. In comparison, we find a higher survival probability only up to the third year for those countries which reduce expenditures by more than 2/3 of their contribution to fiscal deterioration.[10] After that spell length, the survival probability falls below the values of those cases not complying with the criterion. For the European Commission's criterion and for PEAREV we find a more stable, higher survival probability up to 9 or 10 years, although the difference is not very pronounced. As a consequence, none of these separation criteria renders statistically different survivor functions at a standard significance level.

In their work, Alesina and Perotti as well as Perotti et al. disaggregate primary expenditures and look at different spending categories. They analyse four categories: transfers (TRANS), wage compensation (COMP), non-wage consumption (PUR) and public investment (INV). To repeat this exercise with our data requires a re-definition of the separation criteria. For Alesina and Perotti we will follow the suggestion of Alesina and Ardagna (1998: 502), who simply separate cases by the average reduction. As a separating variable, we will create a dummy, which is equal to one if the spending category has contributed more to the reduction of the deficit than the sample average and zero otherwise. With regard to the PEA criterion, Perotti et al. reduce their reversal requirement from 2/3 to one half for the previous expenditure increase. The Kaplan-Meier estimates for our sample are depicted in Figures 2 and 3.

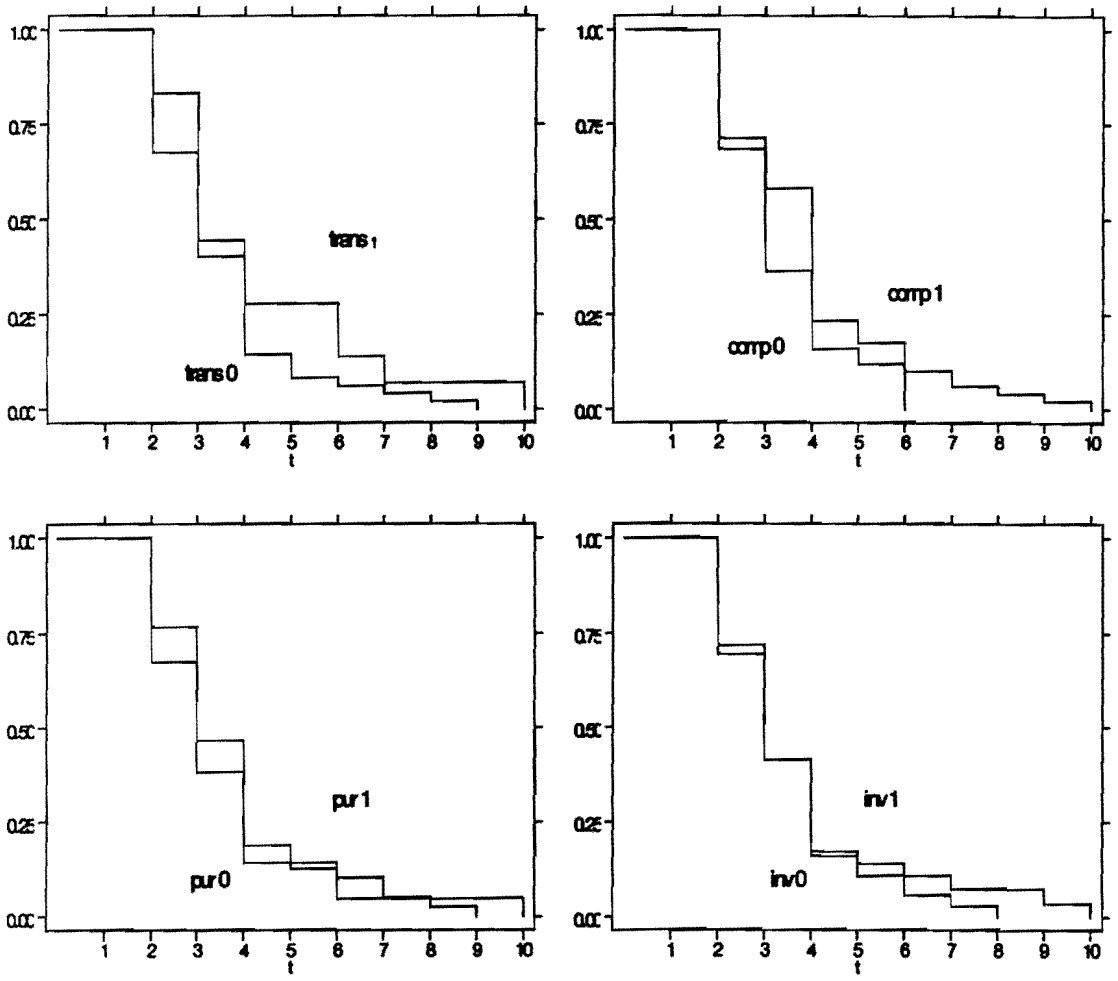
[10] Here we treat expansion and contraction during the period of fiscal deterioration symmetrically by including all observations. I.e., if expenditure were reduced while the deficit increased and, subsequently, spending rose during the consolidation episode, that is considered to be the same as a genuine contribution of expenditures to a fiscal consolidation. This corresponds to the method applied in Perotti et al. (1998). Excluding the first group of cases by restricting the sample to those episodes, where a genuine contribution to consolidation was made yields qualitatively similar results.

Figure 2: Kaplan-Meier Estimates for Different Spending Categories (AP criterion)



The upper left graph in Figure 2 shows that separating observations according to the relative contribution of transfers to fiscal consolidation produces a sizeable difference in the duration probability up to the fourth consolidation year; thereafter it diminishes. As a consequence the survivor functions are statistically different. The upper right graph similarly suggests a strong difference of the two estimated functions for public wages. However, since all observations with a below-average contribution of wage compensation lasted between two and four years, it is difficult to compare the two curves. Separating the observations according to the contribution of non-wage compensation yields very similar survivor functions, which are not statistically different as the Wilcoxon test confirms. The same holds for public investment. Nonetheless it is interesting that the estimates suggest a

Figure 3: Kaplan-Meier Estimates for Different Spending Categories (PEA Criterion)



shorter duration of episodes where the consolidation effort concentrated more on this spending category. This fits the argument of Alesina and Perotti that unsuccessful, i.e. less persistent, consolidations tend to be based on the reduction of public investment.

Using the criterion of Perotti et al. produces the most pronounced differences for transfers. As the upper left graph in Figure 3 shows, the likelihood of a consolidation enduring beyond the fourth year is considerably higher in cases where the improvement in the fiscal balance redresses the previous contribution of transfers to the fiscal deterioration. The other three graphs do not reveal marked differences for the remaining spending categories. Concomitantly, the Wilcoxon test does not permit the hypothesis of an equal survivor functions to be rejected. On this score, the non-parametric analysis provides little support

for the validity of the PEA criterion as a monitoring device at the level of functional expenditure categories.

In short, the main result of the non-parametric analysis is that the contribution of aggregate primary expenditures or the sum of transfers and wages apparently does not have an identifiable effect on the duration of consolidation efforts. Therefore, it seems worthwhile to look at individual spending categories. On this score, the results suggest that the structure of adjustment, i.e. the contribution of transfers or wages, has a positive impact on the consolidation spell. These findings, of course, have to be considered tentative in light of the restrictions of a non-parametric approach and the absence of checking for other influences. They will therefore be reassessed in the subsequent section.

4.2.2. Parametric Analysis

The following analysis will carry the previous non-parametric assessment further. The task set forth at the beginning has been to evade the discretionary element inherent in others studies. The previous part has a first step into this direction by endogenously determining the duration of a consolidation spell, instead of evaluating it after an exogenously given fixed time period. But the criterion for distinguishing different structures of adjustment efforts has still been formulated in a discretionary, discontinuous way. This will be changed in this section of the paper where we want to employ continuous measures. Furthermore, critics have said that other studies do not systematically relate their adjustment measures to the debt level. We will explicitly include such a consideration into the hazard rate analysis.

To start with, we will briefly present the estimates for equation (2). These are of interest in themselves because they allow an assessment to be made of the sustainability of a country's public finances. Table 1 summarises the results. The adjusted coefficient of determination and the F-test statistic indicate that the simple model captures the most important determinants of primary surpluses for most countries. The model has no predictive power for Luxembourg, where the cyclically adjusted primary surplus follows a rather erratic pattern and only 19 observations were available. The Spanish case also fits poorly into the model since the adjusted R_square remains below 30 percent. For Greece only the constant

Table 1: Determinants of the Primary Surplus

Country	Constant	Debt (lag)	Gap	Gap (lag)	Maas_Dum	Adj R_sq	F-Stat.
BE	-8.08***	0.09 ***	0.42**	-0.04	2.04**	0.82	30.72***
	(1.11)	(0.01)	(0.19)	(0.19)	(0.83)		(DF 23)
DE	-2.93***	0.08***	0.25**	-0.33**	-0.55	0.55	8.76***
	(0.96)	(0.03)	(0.12)	(0.15)	(0.84)		(DF 21)
DK	-3.44***	0.10***	0.12	0.19	5.70***	0.66	13.04***
	(1.31)	(0.03)	(0.38)	(0.40)	(1.74)		(DF 21)
EL	-4.43***	0.03	0.52	-0.02	3.90*	0.58	7.26***
	(1.48)	(0.03)	(0.36)	(0.34)	(2.08)		(DF 14)
ES	0.48	-0.07***	0.51***	-0.49**	3.93***	0.28	3.56 **
	(0.69)	(0.02)	(0.19)	(0.20)	(1.20)		(DF 22)
FI	2.92***	0.06	0.28***	-0.04	-1.01	0.70	15.91***
	(039)	(0.27)	(0.07)	(0.07)	(1.12)		(DF 22)
FR	-2.39***	0.07***	0.25**	-0.28***	-0.91**	0.69	11.40***
	(0.49)	(0.02)	(0.10)	(0.10)	(0.40)		(DF 15)
IR	-10.54***	0.11***	-0.04	-0.82**	4.79***	0.71	17.09
	(2.35)	(0.03)	(0.35)	(0.35)	(1.61)		(DF 22)
IT	-8.91***	0.07***	0.20	-0.02	3.50***	0.90	57.04***
	(0.95)	(0.01)	(0.15)	(0.14)	(0.88)		(DF 22)
LX	-1.75	0.07	-0.03	-0.41	7.36	-0.03	0.88
	(6.38)	(0.39)	(0.56)	(0.49)	(5.64)		(DF 14)
NL	-7.97***	0.13***	0.02	-0.61***	1.30**	0.88	41.14***
	(1.08)	(0.02)	(0.20)	(0.21)	(0.61)		(DF 17)
OS [1)]	0.22	0.05***	0.14	-0.06	0.01	0.59	8.06
	(0.56)	(0.02)	(0.12)	(0.12)	(0.52)		(DF 21)
PO	-4.62***	0.07***	-0.007	0.19	1.22	0.45	5.48***
	(1.18)	(0.02)	(0.16)	(0.14)	(0.93)		(DF 18)
SW	2.28**	0.04*	0.67***	0.87***	-0.40	0.84	36.09***
	(0.92)	(0.02)	(0.18)	(0.17)	(0.84)		(DF 22)
UK	-1.04	0.04	0.47***	-0.27*	-0.70	0.44	6.19***
	(1.44)	(0.02)	(0.13)	(0.17)	(0.66)		(DF 22)

Note: The numbers in brackets are standard errors. The stars indicate a 10% (*), 5% (**) and 1% (***) significance level. 1) In addition, a dummy for the years 1975 to 1997 was included yielding the following estimate γ=-2.82 (se= 0.56). This was done to fit the "regime shift" characterising Austrian fiscal policies after the first oil shock.

is highly significant and the Maastricht dummy is associated with a weakly significant coefficient.

Moreover, it should be noted that the coefficients reflect some of the prevailing features of the debt problem in European countries. The countries having a coefficient for the constant belowminus eight are Belgium, Ireland and Italy. It could be argued that the constant captures the effect of unobserved variables and may therefore be considered an indicator of

the "deficit bias" due to national characteristics conceptualised by other approaches (see, e.g., von Hagen & Harden 1996). However, several countries, most notably Denmark, Ireland, Spain and Italy strongly changed their fiscal regime from 1992 onward leading to a significantly higher primary fiscal surplus. In contrast, the coefficients for other countries, such as Germany and the UK, with a historically low debt level, do not indicate a similarly strong reaction in response to the Maastricht criteria. France, to the contrary, even extended its deficits at a statistically significant level. Most importantly, almost every country reacts to rising debt levels with a higher fiscal surplus. One exception is Spain, where the tendency to build up debt is reflected in a negative coefficient for the lagged debt level. The Finish data do not render a significant debt-reversing coefficient, probably due to Finland's historically low debt level which then skyrocketed in the early 90s. In Sweden and the UK, the fiscal response has been such that the positive coefficient is only weakly significant, slightly below or slightly above the ten percent level. The strongest impact of the debt level implies the coefficient for the Dutch case, where a ten-percentage-point increase in the debt level results in an average reduction of the cyclically adjusted primary deficit by 1.3 percentage points. Finally, the budget does not react significantly to the output gap in some states. According to this finding, governments in Austria, Denmark, Greece, Italy and Luxembourg did not take significant discretionary action to adjust the budget balance to the business cycle.

Turning back to the duration analysis, we have used a full likelihood estimator to estimate a Weibull model of equation (1). Table 2 depicts the estimates for a base model and different adjustment variables, first for all EU member states, and then for all EMU members, both excluding Luxembourg.[11] The results confirm the usefulness of a Weibull specification instead of an exponential model since the ρ-coefficients are much higher than one. The estimates indicate that the probability of failure increases over time, as the "stabilisation fatigue" argument would suggest. However, the overall explanatory power of the models is rather weak. Only for the equations 1a, 2a, 2b and 3a does the chi-square test value achieve at least a ten percent significance value. The lower explanatory power for the

[11] The criteria for the structure of fiscal adjustments, particularly the formula for the PEA criterion, may produce large outliers, e.g. if an extended consolidation period follows a short-term fiscal expansion. These outliers were dropped from the sample since they considerably distort the estimation results. Therefore, the structural criteria range from -400 to 400 percent.

EMU may be read as an indication that we excessively reduced the sample. We therefore exclude individual countries to check the robustness of the estimates for the EU sample. The corresponding estimates are presented in Table A4 in the appendix.

The coefficient for the debt level carries a negative sign in all cases, which fits the argument that the fiscal crises, in terms of high debt levels prior to the stabilisation period, tend to contribute to a lower probability of ending the consolidation effort. More specifically, the estimate in the first model indicates that, for example, a 20-percentage-point increase in the debt level reduces the hazard of ending the consolidation effort during the current fiscal year by one-fifth. However, the coefficient is only significant if we do not check for the structure of adjustment. The negative sign of the lagged surplus coefficient, which is most significant when we include the structural characteristic of the European Commission in the model, may come as a bit of a surprise. According to the estimate, a one-percentage-point increase in the primary cyclically adjusted surplus in the previous year lowers the propensity to end the consolidation by almost 9 percent. In other word, contrary to what may have been expected about the potential political damage of maintaining a high fiscal surplus or fiscal contraction in response to rising debt levels, this does not necessarily imply shorter consolidation episodes.

At first sight, the impact of different adjustment characteristics is evident for total expenditures and the Alesina and Perotti criterion, in the latter case for all EU countries only. The criterion of Perotti et al. carries a negative coefficient but is not significant at standard levels. According to the estimates, an adjustment primarily based on primary expenditures reduces the risk of ending by somewhat more than 10 percent in comparison to an adjustment episode, where expenditures do not contribute to the adjustment process. Although this result sounds promising, it does not prove to be robust for both criteria. The Commission's criterion fails to achieve statistical significance if we exclude the UK or Germany from the sample. The Alesina and Perotti criterion, being statistically weaker, fails for a number of countries. (see Table A4)

Table 2: The Impact of Primary Expenditures on the Consolidation Hazard

	(1a)	(1b)	(2a)	(2b)	(3a)	(3b)	(4a)	(4b)
Cons.	-2.68***	-2.63***	-3.21***	-3.02***	-3.26***	-2.99***	-2.98***	-2.90***
	(0.38)	(0.42)	(0.48)	(0.5)	(0.48)	(0.46)	(0.45)	(0.48)
Debt Level	-0.012*	-0.013*	-0.006	-0.008	-0.007	-0.01	-0.008	-0.009
	(0.007)	(0.007)	(0.007)	(0.007)	(0.006)	(0.007)	(0.007)	(0.007)
Primary Surplus (Lag)	-0.06	-0.054	-0.096**	-0.05	-0.08*	-0.04	-0.05	-0.04
	(0.04)	(0.056)	(0.05)	(0.06)	(0.04)	(0.06)	(0.04)	(0.06)
Primary Expenditures			-0.003**	-0.002**				
			(0.001)	(0.001)				
Transfers and Wage Comp.					-0.0028*	-0.002		
					(0.0016)	(0.0017)		
Primary Expenditures (Reversion)							-0.001	-0.001
							(0.001)	(0.001)
ρ	2.38	2.40	2.53	2.47	2.49	2.41	2.36	2.36
Log likelihood	-52.33	-36.19	-45.24	-32.34	-43.76	-31.47	-42.44	-29.30
Chi_sq	5.42*	3.38	9.52**	8.80**	7.14*	3.35	5.40	3.36

Note: All models indexed with (a) are were estimated for EU countries and models indexed with (b) for EMU member states. The numbers in brackets are standard errors. The stars indicate a 10% (*), 5% (**) and 1% (***) significance level. ρ is the ancillary parameter of the Weibull distribution.

Since the method of cyclical adjustment employed in this study has been criticised, and more importantly, those involved in actually conducting the monitoring task will have to use different data, we repeat the same estimates with other fiscal data. Non-cyclically adjusted expenditure and balance figures were used first, followed by cyclically adjusted data as provided by the European Commission. Using these figures, of course, also changes the consolidation episodes under consideration. For nominal data, the sample now contains 105 episodes, with a maximum duration of nine years. Using the fiscal data adjusted according to the EC methodology yields 113 episodes and a maximum duration of seven years. Despite these differences, the estimates presented in Table A6 and A7 in the appendix corroborate the previous finding. Certain structural characteristics are associated with a negative, statistically significant coefficient, but none proves to be robust. Hence, our previous finding is apparently not merely the product of our method of cyclical adjustment.

Table 3: The Impact of the Contribution of Different Spending Categories to the Consolidation Hazard (AP Criterion)

	(1a)	(1b)	(2a)	(2b)	(3a)	(3b)	(4a)	(4b)
Cons.	-2.90***	-2.66***	-3.19***	-2.96***	-2.89***	-2.74***	-0.27***	-2.62***
	(0.46)	(0.44)	(0.43)	(0.44)	(0.44)	(0.47)	(0.48)	(0.47)
Debt Level	-0.01	-0.013*	-0.01*	-0.13*	-0.011*	-0.01*	-0.01*	-0.01*
	(0.007)	(0.007)	(0.007)	(0.007)	(0.007)	(0.007)	(0.007)	(0.008)
Primary Surplus (Lag)	-0.079*	-0.04	-0.07**	-0.04	-0.08**	-0.06	-0.06	-0.05
	(0.042)	(0.06)	(0.36)	(0.06)	(0.04)	(0.05)	(0.04)	(0.06)
Transfers	-0.00012	00006						
	(0.0027)	(0.003)						
Wage Compen-sation			-0.006***	-0.006***				
			(0.001)	(0.001)				
Purchases					-0.004	-0.004		
					(0.003)	(0.003)		
Investment							0.001	-0.001
							(0.005)	(0.005)
ρ	2.45	2.40	2.66	2.58	2.47	2.44	2.40	2.40
Log likelihood	-46.90	-33.65	-43.93	-32.09	-48.33	-34.49	-51.39	-35.32
Chi_sq	6.40*	3.20	26.77***	23.06***	10.53***	7.84**	5.24	3.39

Note: All models indexed with (a) are were estimated for EU countries and models indexed with (b) for EMU member states. The numbers in brackets are standard errors. The stars indicate a 10% (*), 5% (**) and 1% (***) significance level. ρ is the ancillary parameter of the Weibull distribution.

Having analysed total primary expenditures and the aggregate of transfers and wage compensation, let us turn again to disaggregated expenditure categories. Table 3 presents the estimates of the model in equation (1) including the Alesina and Perotti criterion. The most important finding shown in the table is that a higher contribution of wage compensation to the reduction of the deficit significantly diminishes the risk of disrupting the consolidation effort. According to the coefficient, a consolidation where half of the reduction of the deficit is based on cuts in wage payments lowers the purely time-related risk of ending the episode by around 25 percent. The coefficient maintains its significance if we repeat the robustness check mentioned above (see Table A4) and reduce the sample to the euro area. In this sense it is the first fiscal criterion which seems to provide a valid base for evaluating the likelihood of consolidation "success" in the euro area. Contrary to the prediction of Alesina & Perotti, the contribution of transfers to the consolidation effort

Table 4: The Impact of Reversal of Different Spending Categories on the Consolidation Hazard (PEA Criterion)

	(1a)	(1b)	(2a)	(2b)	(3a)	(3b)	(4a)	(4b)
Cons.	-3.22***	-3.25***	-2.66***	-2.65***	-2.84***	-2.57***	-2.94***	-2.81***
	(0.44)	(0.52)	(0.39)	(0.43)	(0.42)	(0.43)	(0.50)	(0.54)
Debt Level	-0.006	-0.007	-0.01*	-0.01*	-0.01	-0.01*	-0.01	-0.01
	(0.007)	(0.008)	(0.007)	(0.007)	(0.007)	(0.008)	(0.008)	(0.009)
Primary Surplus (Lag)	-0.04	-0.005	-0.08*	-0.06	-0.08**	-0.07	-0.08*	-0.07
	(0.05)	(0.006)	(0.04)	(0.06)	(0.04)	(0.06)	(0.05)	(0.07)
Transfers	-0.003***	-0.004**						
	(0.001)	(0.002)						
Wage Compensation			-0.003	-0.003				
			(0.002)	(0.002)				
Purchases					-0.0001	-0.0000		
					(0.002)	(0.003)		
Investment							-0.0009	0.0002
							(0.001)	(0.002)
ρ	2.43	2.47	2.37	2.37	2.40	2.34	2.46	2.43
Log likelihood	-38.64	-28.11	-42.74	-31.37	-41.47	-30.07	-35.4	-23.84
Chi_sq	14.10**	7.83**	8.46**	5.10	6.71*	3.65	5.27	3.20

Note: All models indexed with (a) are were estimated for EU countries and models indexed with (b) for EMU member states. The numbers in brackets are standard errors. The stars indicate a 10% (*), 5% (**) and 1% (***) significance level. ρ is the ancillary parameter of the Weibull distribution.

yields a positive coefficient, which could be considered an indication that a higher contribution of transfers to the deficit reduction increases the hazard. Yet, the coefficient remains far from the standard significance level.

Looking at the same spending category from the perspective of Perotti et al., by contrast, we find a significant negative coefficient (see Table 4). In other words, while the contribution of transfer payments to the consolidation per se does not increase its likelihood of persistence, we find a significant adjustment characteristic if we evaluate this contribution in relation to the importance of transfers for the previous fiscal deterioration. The magnitude of the coefficient is about half the size of the effect of wage payments in Table 3. Accordingly, a relative reduction of transfers by 50 percent lowers the hazard by around 15 percent. The coefficient is highly significant and robust to changes in the sample. Interestingly, however, whereas the fiscal criterion for transfers emerges as an

important characteristic, the PEA criterion does not prove to have any measurable, significant impact on the consolidation duration for wage payments. The coefficient for wages maintains the negative sign, but it is smaller in absolute terms, carries larger standard errors, and, hence, is not statistically significant. This would imply that for wage payments the relative performance to the previous fiscal expansion episode is not of importance. The empirical regularity found here is not in contradiction to the predictions of Perotti et al. even if the result for transfers does not extent to the other spending categories. One should expect to find the persistence effect for this spending category if transfers have been the driving forces of fiscal expansion, which probably holds for most fiscal developments in Europe from the 1970s onward. Hence, one may conclude that the PEA criterion provides a second valid monitoring device for the duration of consolidation efforts.

Again, we repeat the analysis with non-cyclically adjusted fiscal data. According to the results presented in Table A8 and A9 in the appendix, the criterion of Alesina and Perotti, found to be effective with regard to wage payments, maintains a statistically significant negative coefficient for this spending category. The coefficient is robust to changes in the sample, i.e. the exclusion of individual countries as well as all non-EMU states. In contrast, the criterion of Perotti et al. does not show the previously detected negative impact. The coefficient is negative, but not significant at standard levels. The significant effect found for wage payments using the PEA criterion does not prove to be robust. These results, however, are neither very confirming nor defeating with regard to the previous findings. Since public transfers are the only spending category which is modified by the method of Alesina and Perotti, the confirmation of the impact of wage payments on the hazard simply states that a change in the sample due to a different deficit concept does not undermine the result. Conversely, the loss of significance for transfer payments should have been expected because this is the spending category most sensitive to cyclical changes. Hence, not adjusting this category introduces "noise" into our structural measure.

5. Conclusion

This paper makes a contribution to the literature on the persistence of consolidation efforts and to the more practical task of monitoring countries fiscal adjustment projects during the implementation of the Stability and Growth Pact. It compares the different fiscal criteria

mentioned in the literature and overcomes the discretionary elements of previous studies. The first major finding of the empirical analysis is that the adjustment of broad expenditure aggregates, as primary expenditures and the sum of wage payments and transfers, has no discernible impact on the duration of consolidation episodes. This finding holds for non-parametric and parametric tests as well as for different fiscal concepts. The second main finding of the empirical analysis is that the contribution of wage payments and the reversal of transfers have a positive effect on the likelihood that consolidation efforts will endure. This result applies to all EU member states as well as to the euro area if the AP criterion and the PEA criterion are treated as continuous variables. It specifies the argument of Alesina and Perotti in line with the approach of Perotti et al. by suggesting that a) transfers and government wage consumption are the most important spending categories for the "success" of consolidation efforts, but b) transfers have to be considered relative to their previous contribution as a driving force of fiscal deterioration.

This finding is of interest for monitoring of fiscal adjustments under the regime of the Stability and Growth Pact. But two important caveats should be kept in mind regarding the applicability of the method employed in this study. First, although the hazard rate model is helpful in developing an understanding of which factors actually affect the duration of consolidation episode, it remains a heuristic device for the monitoring task. On a very basic level, of course, knowing the probability of ending an episode is different from being able to predict when it will precisely occur. Even pinpointing a "benchmark" which could tell us whether a country will or will not continue the consolidation effort seems a rather precarious endeavour. The graphs in the appendix nicely illustrate the point (see Figure A1). The predicted values of the survival rate or the hazard for the years when consolidation efforts actually ended vary greatly, which means that it makes little sense to fix a "benchmark survival rate", for example of 0.75, or a hazard rate where one would argue that the episode is certainly doomed to end. In short, the most adequate application of this approach is to interpret the results in terms of factors affecting the likelihood of ending or sustaining a consolidation episode.

Second, the data of the sample did not permit an assessment of the "success" or "failure" of a consolidation program in terms of achieving previously stated fiscal targets. On this score, the notion of success and failure introduced by Alesina and Perotti is somewhat misleading. Exploring the duration issue with or without the immediate relation to fiscal

targets may be valid exercises in either case, depending on the assumptions regarding the binding character of fiscal goals. Including target setting into the analysis would be futile if one believes that the statement of multi-annual fiscal programmes does not really serve as a commitment device. However, if one assumes that the public or the international community judges the governments by their ability to stick to a pre-defined fiscal plan, and the governments care about this judgement, the fiscal goals themselves may be important factors in explaining the duration of a consolidation episode. Which notion actually prevailed in the pre-Maastricht period is an empirical issue and very much related to national institutions. For the present, and more so for the future, the institutional setting created by the Stability and Growth Pact certainly has been set forth to assure the binding force of stabilisation plans. Exploring the ability of governments to achieve their fiscal goals, hence, is an important empirical exercise, even if it seems reasonable to say that the degree to which governments de facto have to live up to their plans will be one of the evolving norms of the EMU regime. Investigating the likelihood that a government will stick to a previously stated goal and the factors leading to deviations therefore remains an important topic. Fortunately the Stability and Growth Pact will make it easier to cope with the demanding data requirements to conduct such an empirical analysis. A panel analysis including all EU or EMU member states will be more feasible in the future because all governments regularly have to make multi-annual statements about their fiscal plans.

Appendix

Table A1: Wilcoxon Test for the Equality of Survivor Function (chi_sq values)

	Primary Exp. (EC criterion)	Transfers & Wage Compensation (AP criterion)	Primary Expenditures (PEA criterion)	Current Revenues (PEA criterion)
EU	1.03	0.90	0.18	1.30
Euro area	0.57	0.85	0.00	0.02

Note: The stars indicate a 10% (*), 5% (**) and 1% (***) significance level.

Table A2: Wilcoxon Test for the Equality of Survivor Function - AP criterion (chi_sq values)

	Transfers	Wage Comp.	Purchases	Investment
EU	4.95**	16.89***	0.32	2.31
Euro area	3.37*	12.42***	0.16	0.47

Note: The stars indicate a 10% (*), 5% (**) and 1% (***) significance level.

Table A3: Wilcoxon Test for the Equality of Survivor Function - PEA criterion (chi_sq values)

	Transfers	Wage Comp.	Purchases	Investment
EU	1.39	0.64	0.51	0.02
Euro area	0.18	0.73	0.75	0.40

Note: The stars indicate a 10% (*), 5% (**) and 1% (***) significance level.

Table A4: AIC for the Weibull and Gompertz Specifications

Variable	Gompertz		Weibull	
	EU	EMU	EU	EMU
(base model)	137.99	101.51	112.66	80.38
Primary Expenditures (EC)	121.03	91.86	98.49	72.67
Transfers and Wages (AP)	117.72	98.31	95.51	70.94
Primary Expenditures (PEA)	110.55	81.97	92.88	66.59
Transfers (AP)	124.26	94.54	101.79	75.30
Wage Compensation (AP)	124.80	96.45	95.86	72.18
Purchases (AP)	129.71	98.43	104.66	76.98
Investment (AP)	135.83	99.22	110.78	78.64
Transfers (PEA)	104.92	81.19	85.29	64.21
Wage Compensation (PEA)	114.37	87.34	93.49	70.74
Purchases (PEA)	110.13	83.80	90.95	68.14
Investment (PEA)	93.70	69.37	78.28	55.67

Note: The abbreviations in brackets indicate the criterion applied to construct the fiscal variable: AP = Alesina and Perotti, EC = European Commission, PEA = Perotti et al. For further explanations and the full references see the text.

Table A5: Sensitivity Analysis for Adjusted Fiscal Data

Omitted Country	Coeff. for Primary Expenditures (EC criterion)	Coeff. for Trans. & Wage Comp. (AP criterion)	Coeff. for Wage Comp. (AP criterion)	Coeff. for Transfers (PEA criterion)
BE	-0.0024*	-0.0028*	-0.006***	-0.004***
	(0.0013)	(0.0017)	(0.001)	(0.001)
DE	-0.0018	-0.0026	-0.006***	-0.003***
	(0.0014)	(0.00169	(0.001)	(0.001)
DK	-0.0026**	-0.0028*	-0.006***	-0.003**
	(0.0011)	(0.0015)	(0.001)	(0.0016)
EL	-0.003**	-0.003*	-0.006***	-0.003***
	(0.0014)	(0.0018)	(0.001)	(0.001)
ES	-0.0024*	-0.0026	-0.006***	-0.003***
	(0.0013)	(0.0018)	(0.001)	(0.001)
FI	-0.0029**	-0.003*	-0.006***	-0.003***
	(0.00149	(0.0016)	(0.001)	(0.001)
FR	-0.0022*	-0.003**	-0.005***	-0.003***
	(0.0013)	(0.0016)	(0.001)	(0.001)
IR	-0.0022*	-0.002	-0.006***	-0.0024**
	(0.0014)	(0.0018)	(0.001)	(0.001)
IT	-0.0028**	-0.0028	-0.006***	-0.003***
	(0.0013)	(0.0017)	(0.001)	(0.001)
NL	-0.0030**	-0.0036**	-0.006***	-0.003***
	(0.0013)	(0.0017)	(0.001)	(0.001)
OS	-0.0027**	-0.0029*	-0.006***	-0.0033*
	(0.0013)	(0.0017)	(0.001)	(0.0019)
PO	-0.0025*	-0.0020	-0.006***	-0.0026**
	(0.0014)	(0.0018)	(0.001)	(0.001)
SW	-0.0030**	-0.0030*	-0.006***	-0.003***
	(0.0012)	(0.0016)	(0.001)	(0.001)
UK	-0.0017	-0.0015	-0.005***	-0.003***
	(0.0012)	(0.0017)	(0.001)	(0.001)
WD	-0.0036***	-0.0032*	-0.006***	-0.004***
	(0.0014)	(0.0017)	(0.001)	(0.001)

Note: The numbers in brackets are standard errors. The stars indicate a 10% (*), 5% (**) and 1% (***) significance level.

Table A6: The Impact of Primary Expenditures (Not Cyclically Adjusted) on the Consolidation Hazard

	(1a)	(1b)	(2a)	(2b)	(3a)	(3b)	(4a)	(4b)
Cons.	-2.87***	-2.79***	-3.29***	-3.40***	-2.96***	-2.91	-3.60***	-3.70***
	(0.30)	(0.33)	(0.37)	(0.43)	(0.32)	(0.35)	(0.41)	(0.46)
Debt Level	-0.01*	-0.08	-0.05	-0.002	-0.009	-0.006	-0.0003	-0.003
	(0.006)	(0.06)	(0.06)	(0.006)	(0.006)	(0.006)	(0.006)	(0.006)
Primary Surplus (Lag)	0.39	0.01	0.04	-0.01	0.04	0.01	0.042	0.05
	(0.04)	(0.05)	(0.04)	(0.07)	(0.037)	(0.06)	(0.039)	(0.07)
Primary Expenditures			-0.003*	-0.004***				
			(0.002)	(0.001)				
Transfers and Wage Comp.					0.0002	0.0001		
					(0.002)	(0.002)		
Primary Expenditures (Reversion)							-0.002**	-0.002***
							(0.001)	(0.001)
ρ	2.49	2.39	2.62	2.63	2.50	2.40	2.69	2.66
Log likelihood	-45.69	-36.44	-40.21	-30.53	-44.34	-35.05	-37.90	28.97
Chi_sq	5.72**	2.08	12.65***	15.63***	5.03	1.53	8.11**	7.37*

Note: All models indexed with (a) are were estimated for EU countries and models indexed with (b) for EMU member states. The numbers in brackets are standard errors. The stars indicate a 10% (*), 5% (**) and 1% (***) significance level. ρ is the ancillary parameter of the Weibull distribution.

Table A7 The Impact of Primary Expenditures (Cyclically Adjusted According to the European Commission Procedure) on the Consolidation Hazard

	(1a)	(1b)	(2a)	(2b)	(3a)	(3b)
Cons.	-2.60***	-2.64***	-2.70***	-2.80***	-2.76***	-2.77***
	(0.27)	(0.32)	(0.29)	(0.32)	(0.33)	(0.39)
Debt Level	-0.008	-0.005	-0.007	-0.03	-0.007	-0.004
	(0.005)	(0.006)	(0.006)	(0.06)	(0.005)	(0.006)
Primary Surplus (Lag)	-0.008	-0.24	-0.01	-0.01	-0.01	-0.04
	(0.04)	(0.61)	(0.04)	(0.06)	(0.04)	(0.07)
Primary Expenditures			-0.0009	-0.02		
			(0.002)	(0.02)		
Primary Expenditures (Reversion)					-0.002	-0.002
					(0.002)	(0.003)
ρ	2.44	2.38	2.46	2.43	2.49	2.47
Log likelihood	-54.63	-40.70	-53.18	-39.24	-42.75	-31.67
Chi_sq	2.73	1.20	3.20	2.65	3.49	1.83

Note: All models indexed with (a) are were estimated for EU countries and models indexed with (b) for EMU member states. The numbers in brackets are standard errors. The stars indicate a 10% (*), 5% (**) and 1% (***) significance level. ρ is the ancillary parameter of the Weibull distribution.

Table A8: The Impact of the Contribution of Different Spending Categories (Not Cyclically Adjusted) to the Consolidation Hazard - AP Criterion

	(1a)	(1b)	(2a)	(2b)	(3a)	(3b)	(4a)	(4b)
Cons.	-3.08***	-3.01***	-3.26***	-3.14***	-2.91***	-2.87***	-2.92***	-2.95***
	(0.34)	(0.37)	(0.35)	(0.39)	(0.31)	(0.35)	(0.32)	(0.33)
Debt Level	-0.008	-0.005	-0.008	-0.006	-0.01*	-0.007	-0.01*	-0.007
	(0.006)	(0.006)	(0.005)	(0.006)	(0.006)	(0.006)	(0.006)	(0.006)
Primary Surplus (Lag)	-0.04	0.01	-0.04	0.02	-0.04	0.007	0.04	0.007
	(0.04)	(0.06)	(0.04)	(0.06)	(0.04)	(0.06)	(0.04)	(0.06)
Transfers	0.003	0.003						
	(0.002)	(0.002)						
Wage Compen-sation			-0.006***	-0.006***				
			(0.002)	(0.002)				
Purchases					0.000	-0.001		
					(0.005)	(0.005)		
Investment							0.001	-0.001
							(0.006)	(0.005)
ρ	2.53	2.44	2.67	2.56	2.49	2.41	-2.50	-2.40
Log likelihood	-43.36	-34.12	-41.80	-33.12	-45.08	-35.75	-45.05	-35.74
Chi_sq	7.43*	3.53	16.61***	12.33***	5.08	1.74	5.07	1.56

Note: All models indexed with (a) are were estimated for EU countries and models indexed with (b) for EMU member states. The numbers in brackets are standard errors. The stars indicate a 10% (*), 5% (**) and 1% (***) significance level. ρ is the ancillary parameter of the Weibull distribution.

Table A9: The Impact of Reversal of Different Spending Categories (Not Cyclically Adjusted) to the Consolidation Hazard - PEA Criterion

	(1a)	(1b)	(2a)	(2b)	(3a)	(3b)	(4a)	(4b)
Cons.	-2.93***	-2.86	-3.07***	-2.90	-3.27***	-3.27***	-3.32***	-3.21***
	(0.35)	(0.40)	(0.36)	(0.38)	(0.33)	(0.37)	(0.46)	(0.51)
Debt Level	-0.008	-0.006	-0.01*	-0.01	-0.003	0.001	-0.05	-0.003
	(0.007)	(0.007)	(0.006)	(0.006)	(0.006)	(0.006)	(0.07)	(0.007)
Primary Surplus (Lag)	0.03	-0.009	-0.04	0.02	0.05	0.07	0.002	-0.04
	(0.04)	(0.06)	(0.04)	(0.08)	(0.04)	(0.08)	(0.04)	(0.07)
Transfers	-0.001	-0.001						
	(0.001)	(0.001)						
Wage Compen-sation			-0.002**	-0.003*				
			(0.001)	(0.001)				
Purchases					0.000	-0.000		
					(0.002)	(0.002)		
Investment							0.002*	0.002**
							(0.001)	(0.001)
ρ	2.47	2.36	2.62	2.51	2.55	2.48	2.61	2.50
Log likelihood	-41.66	-32.59	-33.88	-27.06	-36.13	-27.70	-30.58	-25.68
Chi_sq	3.66	1.71	10.49***	6.94*	1.51	0.89	8.47**	6.77*

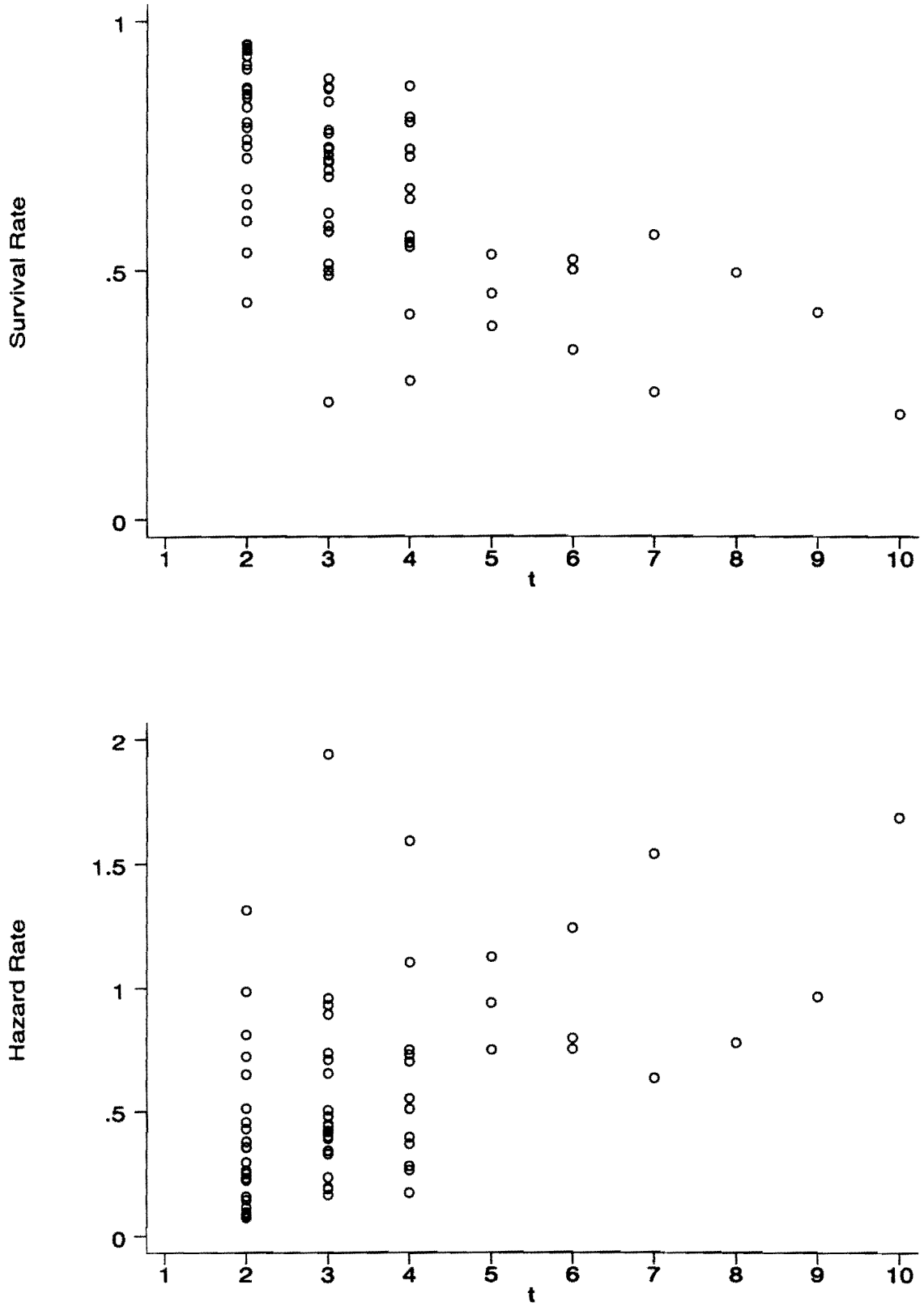
Note: The numbers in brackets are standard errors. The stars indicate a 10% (*), 5% (**) and 1% (***) significance level. ρ is the ancillary parameter of the Weibull distribution.

Table A10: Sensitivity Analysis for Unadjusted Fiscal Data

Omitted Country	Coeff. for Primary Expenditures (EC Criterion)	Coeff. for Primary Expenditures (PEA Criterion)	Coeff. for Wage Consumption (AP Criterion)	Coeff. for Wage Consumption (PEA criterion)	Coeff. for Investment (PEA criterion)
BE	-0.003***	-0.002	-0.0069***	-0.0027**	0.0024*
	(0.001)	(0.0013)	(0.0027)	(0.001)	(0.0013)
DE	-0.004***	-0.0024**	-0.0067***	-0.0026**	0.0023**
	(0.001)	(0.001)	(0.002)	(0.001)	(0.001)
DK	-0.004***	-0.0023**	-0.0062***	-0.002**	0.0022*
	(0.001)	(0.001)	(0.002)	(0.001)	(0.001)
EL	-0.003***	-0.0023**	-0.064***	-0.002**	0.002*
	(0.001)	(0.001)	(0.002)	(0.001)	(0.001)
ES	-0.0032**	-0.0017	-0.0066***	-0.002**	0.0024**
	(0.0016)	(0.001)	(0.002)	(0.001)	(0.0012)
FI	-0.004***	-0.003***	-0.006***	-0.0028**	0.004**
	(0.001)	(0.001)	(0.002)	(0.001)	(0.0017)
FR	-0.002	-0.0030***	-0.004*	-0.0013	0.0008
	(0.0014)	(0.001)	(0.002)	(0.0009)	(0.001)
IR	-0.003***	-0.0017	-0.0063***	-0.0025**	0.002*
	(0.001)	(0.001)	(0.002)	(0.001)	(0.001)
IT	-0.003**	-0.0026**	-0.007***	-0.0027***	0.002*
	(0.001)	(0.001)	(0.0025)	(0.001)	(0.001)
NL	-0.003**	-0.0024**	-0.0067***	-0.0024**	0.002*
	(0.001)	(0.001)	(0.0022)	(0.001)	(0.001)
OS	-0.003**	-0.002*	-0. 0064***	-0.0025**	0.002*
	(0.001)	(0.0012)	(0.002)	(0.001)	(0.001)
PO	-0.004***	-0.0025	-0.0069***	-0.0022**	0.002*
	(0.001)	(0.001)	(0.002)	(0.001)	(0.001)
SW	-0.003**	-0.0025**	-0.0059***	-0.0024**	0.0025**
	(0.001)	(0.001)	(0.002)	(0.001)	(0.001)
UK	-0.004***	-0.0027***	-0.0069***	-0.0030**	0.002*
	(0.001)	(0.001)	(0.002)	(0.0013)	(0.001)
WD	-0.0035**	-0.0022*	-0.0065***	-0.0023**	0.002*
	(0.0014)	(0.001)	(0.002)	(0.001)	(0.001)

Note: The numbers in brackets are standard errors. The stars indicate a 10% (*), 5% (**) and 1% (***) significance level. ρ is the ancillary parameter of the Weibull distribution.

Figure A1: Predicted Survival and Hazard Rates for Fiscal Years Where Consolidation Episodes Ended



Note: The graphs show the predicted value of the model (2a) applying the AP criterion (see Table 3).

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