Political Stability and Fiscal Policy
Time Series Evidence for the Swiss Federal Level since 1849

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Abstract

This paper explores the role of political stability on fiscal policy choices in a time-series analysis over 158 years on the Swiss federal level. We argue that the fiscal-commons problem of public finances is affected by the time-horizon of a finance minister. Arguably, the incentives for an incumbent to maintain a good reputation with sound policy decisions are stronger the longer the time-horizon of a respective term. In addition, a finance minister who succeeds to stay a long time in office normally enjoys a politically powerful position towards the parliament, the administration and the interest groups to influence policy decisions. In contrast, frequent government turnover weakens the position of the finance minister.

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1. Introduction

In 1918, Schumpeter (1918, [1953], p. 5) contended that people's nature, its cultural achievements, social structure, and what their countries' policies offer could be read from its fiscal history.[1] Fiscal policy appeared to him as the best expression of world history. Since this publication, public choice analysis and political economics have followed his suggestions, though more often unconsciously than deliberately, to investigate how constitutional frameworks, institutional environments and political events influence fiscal policy in different countries. For example, Peacock and Wiseman (1961) studied the impact of wars (and other deep crises) on government growth and argued for the existence of a displacement effect. While tax resistance before a crisis prevents politicians from extending the state's grip on the economy, a crisis reduces this resistance because taxpayers accept the necessity to raise government resources to overcome a critical situation. After the crisis, taxpayers have gotten accustomed to the increased tax burden and the government is not compelled to reduce its activities to the level prevailing before the outbreak of the crisis. Similar to wars, the Great Depression served such a purpose and allowed for the extension of social welfare states in many Western societies (see Wallis 2000 for the U.S.). In the U.S., this even led to a revision in the basic structures of American federalism (Wallis 1991).

The political economy of government size (Tridimas and Winer 2005) attributes the factors shaping fiscal policy to the demand and supply side. Thus, Peacock and Wiseman's (1961) displacement effect results from an extraordinary demand for government expenditure during a crisis. Lott and Kenny's (1999) analysis underlines the importance of changes in the demand for income redistribution and is thus in line with the Meltzer-Richard (1981) model. Similarly, the classical studies by Wagner (1892) and Brecht (1932) emphasize income and urbanization, respectively, as determinants of the demand for government activity. Concerning the supply side, the relative productivity of public services as a reason for the "cost disease" (Baumol 1967), the inherent desire of Leviathan governments to exploit citizens (Brennan and Buchanan 1980), and partisan influences (Hibbs 1977, Blais, Blake and Dion 1993) provide grounds for a relative increase in government activity.

However, as Tridimas and Winer (2005) or Besley and Case (2003) emphasize, these approaches somewhat ignore the impact of constitutional and institutional structures on fiscal policy

1. The original quote goes back to the German sociologist Rudolf Goldscheid who argued that "The budget is the skeleton of the state stripped of all misleading ideologies".

outcomes.[2] Only recently have the constitutional differences between majoritarian and proportional representation systems or between presidential and parliamentarian systems (Persson and Tabellini 2000, 2003, Milesi-Ferretti, Perotti and Rostagno 2002), but also those between direct and representative democracies (Feld and Kirchgässner 2001a, Feld and Matsusaka 2003, Matsusaka 1995, 2004) been studied in comparative political economics. The starting point is the fiscal commons problem that arises when political decision-makers in the legislature or the executive provide benefits from public projects concentrated on particular groups of society while the costs of these projects are spread across the whole population through general taxation. This particular common pool problem has been known at least since the seminal work by Buchanan and Tullock (1962, chapters 10 and 11), but it could occur in different forms. While the U.S. discussion mainly pays attention to the effects of pork-barrel politics in legislatures on public spending (Weingast, Shepsle and Johnson 1981, Inman and Fitts 1990, Gilligan and Matsusaka 1995, 2002), the European discussion focuses on coalition or cabinet size of the executives as characteristics of a fiscal commons problem determining spending, budget deficits and public debt (Roubini and Sachs 1989a, 1989b, Kontopoulos and Perotti 1999, Volkerink and de Haan 2001, Perotti and Kontopoulos 2002). This distinct emphasis may be interpreted as a hint to the importance of the constitutional differences between majoritarian/presidential and proportional representation/parliamentarian systems.

Comparing direct and representative democracies, Feld and Kirchgässner (2001a, 2001b), Feld and Matsusaka (2003), Feld, Schaltegger and Schnellenbach (2008) and Schaltegger and Feld (2009) argue (and present evidence for Switzerland) that the fiscal commons problem is less severe under direct democracy due to difficulties to organize log-rolling in referenda and initiatives. Their results of a lower level of public spending and of less centralized spending and revenue in direct democracies, which they obtain for a panel of the Swiss cantons between 1980 and 1998, are supported by Funk and Gathmann (2007) in a larger panel of Swiss cantons between 1890 and 2000. These studies focus on fiscal policy of the Swiss cantons and how it is affected by fiscal referenda. Fiscal policy at the Swiss federal level is however seldom analyzed. Only the works by Gebhard Kirchgässner stand out. For example, Kirchgässner and Prohl (2008) provide a time series analysis of federal fiscal policy in Switzerland from 1900 to 2002. Their main concern is the sustainability of federal fiscal policy. There is also an earlier time series analysis by Kirchgässner and Pommerehne (1997) for all three go-

2. Tridimas and Winer (2005) underline the additional importance of political influence without discussing however constitutional or institutional structures either.

vernment levels in Switzerland and for Germany from 1961 to 1987. They include political variables in addition to characteristics of demand and supply for government activity and socio-demographic controls. However, they do not look at institutional factors such as proportional representation or direct democracy and the time period they study is too short to investigate short-run and long-run effects in a differentiated way.[3]

This paper contributes to the political economy of fiscal policy using time series data for the Swiss federal level. In contrast to previous analyses, the data set extends from the creation of the Swiss constitution in 1849 until 2007. It thus covers the full time period with many historical events that need to be captured in addition to economic and socio-demographic factors. Moreover, the long time series allows us to investigate potential short-run and long-run relations between the economic and fiscal variables. Our main research interest, however, consists in testing the hypothesis whether political stability induces sound fiscal policies in the long-run. Political stability is mainly captured by the time horizon of the finance minister, but is evaluated against the background of exogenous shocks like the two world wars or the Great Depression and constitutional changes like the switch to proportional electoral representation.

The remainder of the paper is organized as follows: In *section 2*, the impact of political stability on fiscal policy outcomes and how it is achieved under different constitutional regimes are discussed. The empirical strategy follows in *section 3*. The results will be discussed in *section 4* while *section 5* offers some concluding remarks.

2. Long-term political stability and fiscal policy: Some theoretical considerations

Starting from Buchanan's and Tullock's (1962) perspective of the fiscal commons problem, fiscal policy results from a differential success of societal groups which reap particular benefits from public policy, but spread its costs broadly over the whole population through general taxes. The core element of the fiscal commons problem is the notion of targeted spending and general taxes. As the marginal costs of each spending project are lower than the marginal benefits for the individuals in groups which are particularly privileged, these groups demand higher than socially optimal spending. Government activity is consequently extended beyond its optimal scope. It should, however, be noticed that this exploitation of those not participating

3. See also Kirchgässner and Pommerehne (1988) for a detailed analysis of fiscal developments in Switzerland. There is an earlier study by Meier et al. (1973), which uses time series of revenue, spending and federal grants from 1950 – 1969 for all three government levels, but their focus is on income, inflation and population size. In addition to the recent panel studies on cantonal fiscal policy, there are of course several earlier papers like the one by Hauser et al. (1975) using cantonal cross section data, or the ones by Pommerehne and Frey (1976), Pommerehne (1978) and Pommerehne and Schneider (1978) using local data.

in log-rolling arrangements, which bestow a privileged access to the fiscal commons, is generally restricted by a membership externality which stems from the intersection of members among separate majority coalitions (Buchanan and Yoon 2004).

The fiscal commons problem is affected by different constitutional systems. The argument is that majoritarian electoral systems strengthen the accountability of representatives in contrast to proportional electoral systems, where the link between the electorate and the representative is much looser. In majoritarian systems, each representative in the legislature thus aims at ensuring re-election in his constituency by providing benefits from federal spending projects to his district. Only a part of the legislature will be successful in bringing home such funds. The successful incumbents exchange votes according to a log-rolling arrangement resulting in pork-barrel politics (Weingast, Shepsle and Johnsen 1981). Such log-rolling arrangements are particularly successful in presidential regimes as legislators are less disciplined by partisan considerations. In parliamentary democracies, parties gain more importance as the government depends on a confidence vote of the different fractions in parliament. The argument is one of weak checks and balances. Parties must ensure their majority and ascertain a stronger independence from pork-barreling. In a parliamentary system with proportional representation, the fiscal commons problem occurs more directly and explicitly in the executive. Due to proportional representation, a parliament with more than two parties becomes highly probable, such that coalitions between parties must often be built to form a government. Log-rolling is then explicitly achieved in a coalition contract (Roubini and Sachs 1989a, 1989b). Similar considerations obtain when different wings of a large party gain ministerial representation in government (Perotti and Kontopoulos 2002).

In sum the traditional fiscal commons problem occurs with respect to public spending and subsequently public revenue. In more recent times, the role a fiscal commons problem plays in explaining the increasing indebtedness in OECD countries is additionally emphasized (von Hagen and Harden 1995, Velasco 1999, 2000, Volkerink and de Haan 2001). The same mechanism could be described with the further complication of spreading the costs of concentrated spending projects not only to the current, but also to future taxpayers. The exploitation of the fiscal commons then implies excessive debt.

Several solutions to fiscal commons problems are discussed in the literature. Most prominently formal fiscal rules restrain overspending and excessive debts.[4] Moreover, budgetary proce-

4. See Poterba (1997) or Kirchgässner (2002) for surveys on the effects of fiscal institutions on fiscal policy, Feld and Kirchgässner (2008) for evidence on the cantonal debt brakes, and Schaltegger (2002) for both.

dures may constrain public debt (von Hagen 1992, Hallerberg and von Hagen 1999, Hallerberg, Strauch and von Hagen 2007). In these analyses, the role of an agenda setter in the budgetary process, e.g. the finance minister, is emphasized. By coordinating the proposals of the different spending ministers, such a central player is able to reduce the fiscal commons problem if budgetary goals are tight and strictly enforced. From that perspective the fiscal commons problem is a particular kind of government weakness which finds its expression in different forms of fragmentation from large coalitions and cabinets to pork-barrel spending and divided government (Alt and Lowry 1994, Alesina and Rosenthal 1996).[5] Fiscal policy under such a severe threat of common pool problems lacks the intertemporal reliability which is important for private actors in taking their economic dispositions. An institutionally strong finance minister thus helps to establish political reliability and stability. Institutional strength of the finance minister could be established by different measures, for example a right to veto the budget law, as in Germany, or the right to set pre-specified spending targets.

In addition to institutional strength, government stability, i.e. when a finance minister succeeds in remaining in office for longer time horizons, can reduce the fiscal commons problem. Arguably, the incentives for an incumbent to maintain a good reputation with sound policy decisions are stronger the longer the time-horizon. In addition, a finance minister who succeeds in staying a long time in office usually enjoys a politically powerful position towards the parliament, the administration and the interest groups. In contrast, frequent government turnover weakens the position of the finance minister. A long time-horizon on the job vests such a person with a natural advantage with respect to spending ministers who have a lower tenure. Moreover, as Besley and Case (1995) argue, a longer time horizon provides the incentives to build reputation in office. The reputation gained as a finance minister may boost her prospects for becoming prime minister or head of state or, after finishing the term, pursuing a career in the private sector. Career concerns could thus provide for beneficial incentives. This also holds if the reputation accumulated in office promotes someone's career in the private sector. While Besley and Case (1995) underline the detrimental effects of term limits when career concerns play a role, De Haan and Sturm (1994) emphasize the importance of the frequency with which government changes for the growth in public debt. In any case, factual

5. Using a large panel data set of Norwegian local governments, Borge (2005) emphasizes the role of political strength for the common pool problem caused by competing interest groups. Measures of political strength are obtained by looking at party fragmentation of the local council, the type of political leadership and ideological differences within the political leadership.

government stability is arguably important for sound fiscal policies. We thus have a closer look on government stability in an institutionally strong polity, namely in Switzerland.

3. Empirical strategy

In order to investigate the impact of political stability on fiscal policy, we conduct a time series analysis for the Swiss federal level over a long time horizon between 1849, i.e. one year after the foundation of the Swiss Confederation, to 2007 which is the year in which the Swiss debt brake is supposed to work without qualifications. Our data set thus covers the whole time period for which Switzerland has existed as a Confederation. Choosing the Swiss federal level for such an investigation is natural as the political system slowly evolved without being deranged by major constitutional eruptions or revolutions, but still exhibits several important constitutional and political changes. More importantly, the federal government consists of a coalition between the same four parties since 1959. In this respect, Switzerland is the country with the highest degree of political stability in Europe.

In one of the previously conducted time series analyses for Switzerland from 1961 to 1987, Kirchgässner and Pommerehne (1997) study Swiss (and German) fiscal policy by starting from an Almost Ideal Demand System (AIDS) as their econometric approach. This notwithstanding they are forced to estimate reduced form models owing to the prevailing simultaneity between public spending, revenue and budget surplus. The simultaneity in fiscal policy decisions prevents them from imposing meaningful exclusion restrictions such that the structural form of the model cannot be identified. In another time series analysis for the Swiss federal level from 1900 to 2002, Kirchgässner and Prohl (2008) conduct unit root, stationarity and cointegration tests as well as tests on structural breaks to investigate the sustainability of fiscal policy. While the structural break they find for the Second World War underlines the influence of particular exogenous events on fiscal policy, the authors are subsequently only interested in the sustainability question. According to their results, Swiss fiscal policy has been (weakly) sustainable for the whole time period and for the sub-period since 1946.[6]

As we are more interested in the effect of political and constitutional factors on fiscal policy than on sustainability of fiscal policy, we propose the following reduced form model:

$$X_t = \beta_0 + \beta_1 CTRL_{t-1} + \beta_2 Political\ Stability_{t-1} + \beta_3 Constitutional\ Changes_t + Trend + \varepsilon_t, \quad (1)$$

6. Similarly, Afonso and Rault (2008) investigate fiscal sustainability in the EU using stationarity and cointegration analysis. They conclude that overall, fiscal policy in the EU15 has been sustainable during the period 1970 to 2007. However, the general result does not hold in any individual case.

where *t* are the year indices. *X* represents the budget variables, i.e. budget surplus, public debt, public spending or revenue, each normalized by GDP. In addition to the time trend which is included in each regression, the vector of economic controls (CTRL), lagged by one period, consists of the oil price, real GDP, nominal interest rates and population size. Unfortunately, data on other structural variables, like age of population, the share of urban population or the unemployment rate are not available or are not consistently measured over this long time period. Real GDP is included to capture potential income effects of the demand for public goods. Population size controls for the extent of publicness of government spending due to non-rivalness in consumption and is thus included. The oil price is supposed to proxy supply shocks. Nominal interest rates are included to capture business cycle effects.

With respect to public spending and revenue, we expect GDP to exert a positive influence following Wagner's (1896) arguments. Population size is supposed to have a negative influence on spending per capita if Samuelson's (1954) theory on public goods holds true. A simple politico-economic argument, however, suggests the opposite sign. A larger population size implies a broader tax base such that a Leviathan government could raise revenue. If the Peacock and Wiseman (1961) mechanism prevails, i.e. if the ability to extend public spending depends on revenue restrictions, higher spending might result from a larger population. The sign of this variable is thus theoretically indeterminate. Interest rates reflect the business cycle, and might be negatively associated with budget surpluses and positively with public debt.

In addition to these economic variables, the model contains dummy variables capturing particular events in Swiss history which could be hypothesized to have affected fiscal policy. One dummy variable takes on the value of 1, and zero otherwise, for the years of the two world wars between 1914/18 and 1939/45 and the German-French-War in 1870/71. Another dummy variable takes on the value of one for the time of the Great Depression between 1929 and 1933. Furthermore, the years with major tax amnesties on the federal level in 1940, 1945 and 1969, years for which a federal income tax was levied (1916, 1917, 1921, 1924, 1925, 1928, 1929, 1932, 1940-2007) and the drastic devaluation of the Swiss franc in 1936 are controlled for. Moreover, dummy variables which mark the shift from a majoritarian to a proportional representation system in 1919, the creation of the Swiss National Bank (SNB) in 1907 and of the federal old age pension system (AHV) in 1948 are included in the model.

With respect to these variables, and following the analysis by Peacock and Wiseman (1961), we could hypothesize an unambiguously positive effect of the two world wars on public expenditure and revenue as well as on debt, but a negative effect on the budgetary surplus. In

addition, we expect the introduction of the AHV to increase public spending, revenue and debt. It indicates the new era of the welfare state in Switzerland and thus exemplifies the demand for income redistribution as suggested by Meltzer and Richard (1981). Also, following Persson and Tabellini (2000), the switch from a majoritarian system to proportional representation supposedly increases spending, deficits and debt.

While additional instruments of direct democracy were introduced at the federal level since the foundation of the Swiss Confederation, direct democracy is controlled for by the number of referenda and initiatives, lagged by one period as well as a one period lag of voter turnout. According to the partisan theory, ideological dispositions are often supposed to affect fiscal policy as well (Hibbs 1977, Blais, Blake and Dion 1993). In particular, left-wing parties are assumed to favor a larger public sector and incur higher indebtedness. In our econometric model, ideology is captured for the executive by including a dummy variable adopting the value of one if a Social Democratic finance minister was in office and zero otherwise. In addition, the influence of the SPS is measured by the share of its seats in the national parliament. Both variables are lagged by one period. Although the Social Democrats are usually hypothesized to favor a larger public sector, it should also be noted that the rise of the Social Democratic Party marks a boost of political competition at the federal level. In the beginning of the Confederation, federal politics was dominated by the (then largely protestant) Free Democratic Party (FDP). Its main political competitor, the (then largely catholic) Christian Democratic Party (CVP) entered the federal government in the end of the 19th century in 1891. But both parties represented groups of the population which were more or less conservative. They could be expected to both favor conservative fiscal policies, but thus also to target spending to their clienteles. The rise of social democrats, in particular before the Second World War, threatened the rents of the CVP and the FDP obtained from the public budget. As long as the SPS was not included in the federal government (until 1943), the political competition which was triggered by its rise could have led to a reduction in rents and possibly also spending. As a part of the governing coalition, it could be expected that the additional party in government increased spending because of the fiscal commons problem.

Political stability, as the final variable included in the analysis, has a particular meaning in this paper. It is measured by the time horizon of the finance minister. The measure is constructed retrospectively adopting a value of one in the first year of a finance minister and then counting continuously to the end of his term. Following the combined arguments by Besley and Case (1995) and the fiscal commons literature, a longer time in office provides a finance

minister with incentives to perform well due to career concerns. The longer he is in office, the more experience will help him to enforce budgetary goals against the different spending ministers. Arguably, the incentives for an incumbent to maintain a good reputation with sound policy decisions are stronger the longer the time horizon of a respective term. In addition, a finance minister who succeeds in staying a long time in office normally enjoys a politically powerful position towards the parliament, the administration and the lobbies to influence policy decisions. In contrast, frequent government turnover weakens the position of the finance minister. We thus expect this variable to exert a positive effect on budget surpluses and a negative effect on public debt as well as on spending and revenue.

Political stability in this context does not mean the lack of exogenous shocks or the lack of coups and revolutions. With respect to the former, important exogenous shocks like the wars or the Great Depression could of course be observed in the time period covered by our data set. Regarding the latter, no coup or revolution took place in Switzerland. Since 1959, Switzerland experiences even an extraordinary degree of political stability in the sense that the government consists of the same four coalition partners. This system also allows a finance minister to stay in office without being much threatened by elections. He has a relatively high degree of discretion as to whether he wants to stay, to become minister in another ministry or to retire. Infrequently, Swiss finance ministers are forced to step down by their party or by political (and legal) scandals. The perspective adopted here is thus on the personality of the finance minister. It is a particular form of political leadership we are interested in.

The test strategy followed in this paper is straightforward. First, the time series characteristics of the data set are investigated by conducting unit root and cointegration tests. Tests on structural breaks are not conducted as they are well documented in the paper by Kirchgässner and Prohl (2008) for the Second World War. Moreover, several less important breaks are covered by different dummy variables in the reduced form regressions. Depending on the unit root and cointegration tests, the final models for the four dependent budgetary variables are specified. In any case, given the structural break induced by the Second World War, these analyses are conducted for the whole sample and the two sub-samples before and after the war excluding these war years. For the two sub-samples, some exogenous variables may be meaningless, e.g. if a particular event did not occur in the sub-period, and are then excluded.

4. Results

Anecdotal evidence

A first look at Swiss federal fiscal policy since 1849 already reveals interesting patterns. From the foundation of the constitution until the first integral revision of the constitution in 1874, the federal level carried a relatively light fiscal burden. The government was mainly concerned with the formation of a federal army and the construction of a federal infrastructure to promote mobility and education. The source of income consisted of customs and excise duties. Usually, the federal budget was balanced in the first 30 years with the exception of extraordinarily high spending during the German-French-War in 1870/71. From 1874 to 1914 the federal government gained new competencies from the cantons in the sense of Popitz' Law (1927). For example, the nationalization of formerly private railway companies to the Schweizerische Bundesbahnen SBB, the formation of a central bank (the SNB), laws to subsidize education and farmers, the construction of alpine roads and some inchoate social security transfer programs. Since the upgrading of government tasks at the federal level was not followed by new tax sources, the federal government warned the parliament repeatedly against the introduction of new spending proposals – with mixed success. Until the eve of the First World War, the federal government nevertheless conducted a relatively sound fiscal policy (Weber, 1969). Neither do budget surpluses (in percent of GDP) exhibit important turns into the negative (*Figure 1*), nor does public debt (in percent of GDP) reveal any boost or much volatility (*Figure 2*). In the second half of the 19th century, the Swiss Confederation appears to be a different one from today. However, it should be noted that a slightly increasing trend in the debt ratio could already be observed. Similarly, federal expenditure (*Figure 3*) and revenue (*Figure 4*), both in percent of GDP, indicate similar increasing trends in public sector activity. Admittedly, the level of relative public sector size on the federal level was still well below 10%.

During World War I, government finances ran into huge deficits. This was the result of extraordinarily high military spending as well as falling government revenue due to drastically decreasing customs duties. Though the government introduced a federal income and wealth tax in 1915, additional revenue was not raised until 1916/17 and was small in amount. Thus, Switzerland was defraying the financial burden of World War I with debt (government bonds) and the seignorage from the Swiss National Bank SNB. After World War I, government spending was not immediately cut back to the initial level and the creation of new taxes was vetoed by public referenda. Thus, public finances recovered only slowly. In autumn 1929, federal government finances were hit anew by the onset of the Great Depression. The government

answered with the implementation of a “deflation-policy”. This policy resulted in severe economic and social turbulences which culminated in 1936, when the government had to devaluate the national currency Swiss Franc by 30% (Weber, 1969). All in all, the First World War led to a remarkable change inducing a first noticeable federal budget deficit of 4% of GDP in 1915 and leading to stronger shifts in spending and revenue although Switzerland was not actively involved in the war. These unexpected deficits of the war period led to an increase in federal debt to 31% in 1922, before larger surpluses reversed that development during the years 1924 to 1937 (including the great depression).

In 1938, a “sales-tax” was introduced on the federal level due to financial needs of the upcoming World War II. In contrast to World War I, the government wanted to be prepared this time. However, the federal council was only partially successful. The reintroduction of a federal income tax, changes in stamp duties and the introduction of a balanced-budget-rule were vetoed in parliament. Despite all the preparations by the government, the financial burden of World War II went far beyond the scope of World War I. In 1940, the government made use of its extended constitutional powers and introduced several new taxes together with a tax amnesty. 29% of all extraordinary military spending were covered by the additional revenues (Weber, 1969). During the Second World War, again the budget deficits, spending and revenue increased tremendously which led to big increases in federal debt. In 1941, the federal budget deficit amounted to 13% of GDP. Federal spending rose from 5.5% in 1937 to 18.6% in 1944. Federal debt consequently rose from 27.4% in 1937 to 63.2% in 1944.

The period after the war brought a time of fiscal consolidation at the federal level. From 1946 to 1970, only in the three years 1951, 1952 and 1967 could small budget deficits of 0.13 to 0.88% of GDP be observed. Federal debt was reduced to 7% of GDP in 1969. However, the growth in federal spending and revenue continued after the war. Like Peacock and Wiseman (1961) argued, federal spending and revenue did not come back to the same relative size of the years before the war and subsequently rose at an accelerated pace, notwithstanding small ups and downs triggered by economic activity.

Figure 1: Budget Surplus in % of GDP, Swiss Federal Level, 1849 – 2007

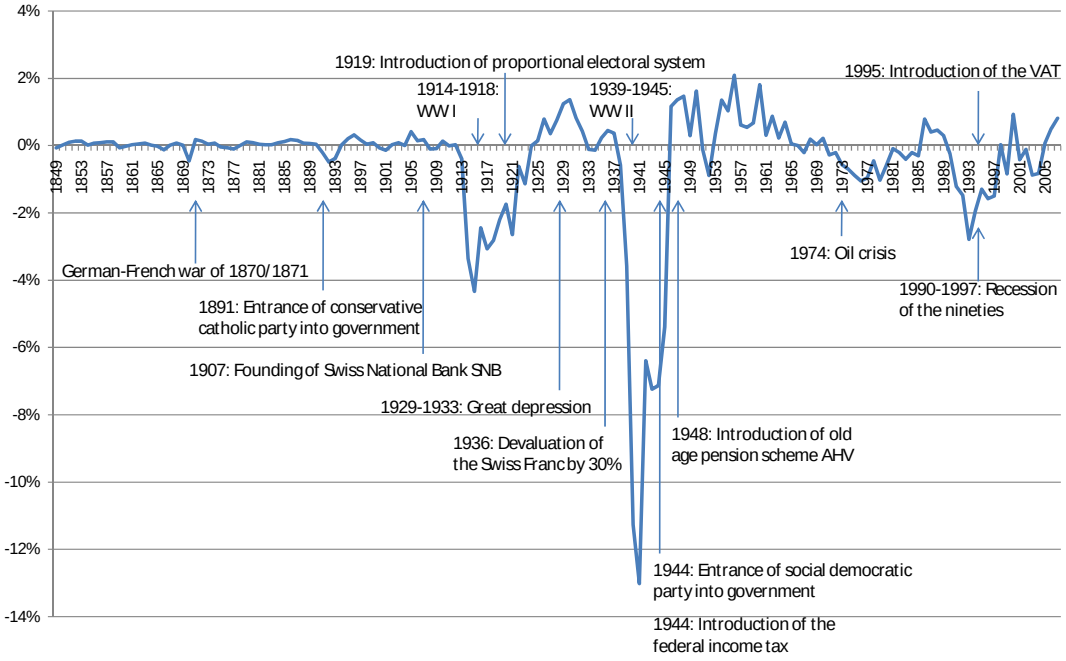


Figure 2: Public Debt in % of GDP, Swiss Federal Level, 1849 – 2007

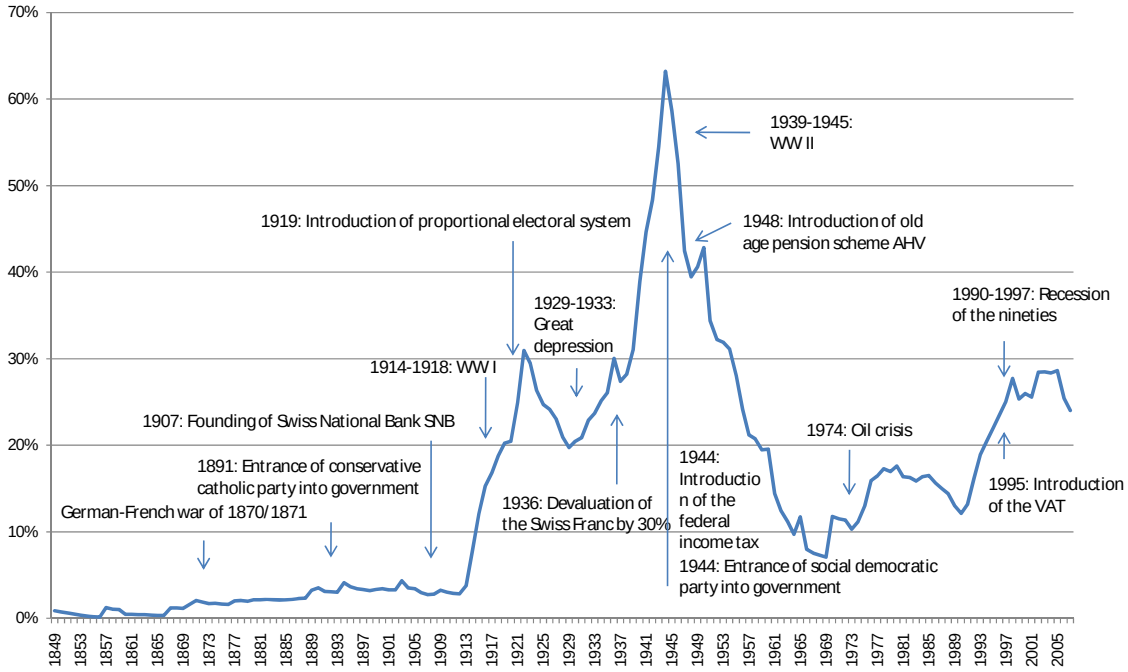


Figure 3: Public Spending in % of GDP, Swiss Federal Level, 1849 – 2007

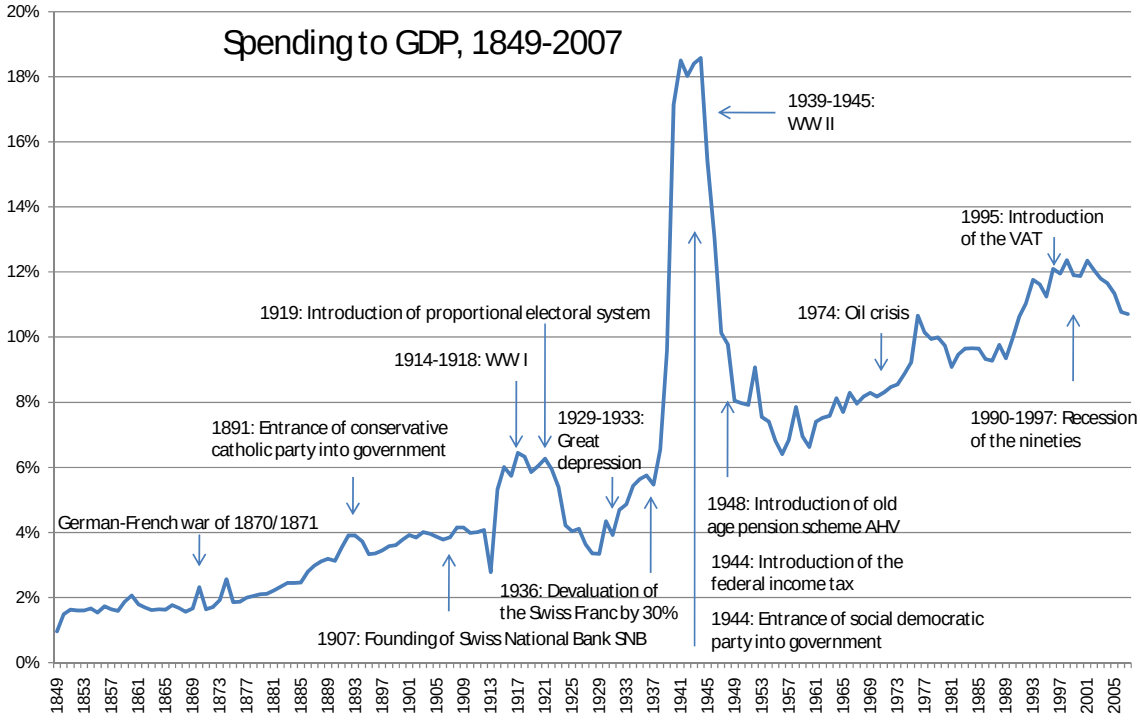


Figure 4: Public Revenue in % of GDP, Swiss Federal Level, 1849 – 2007

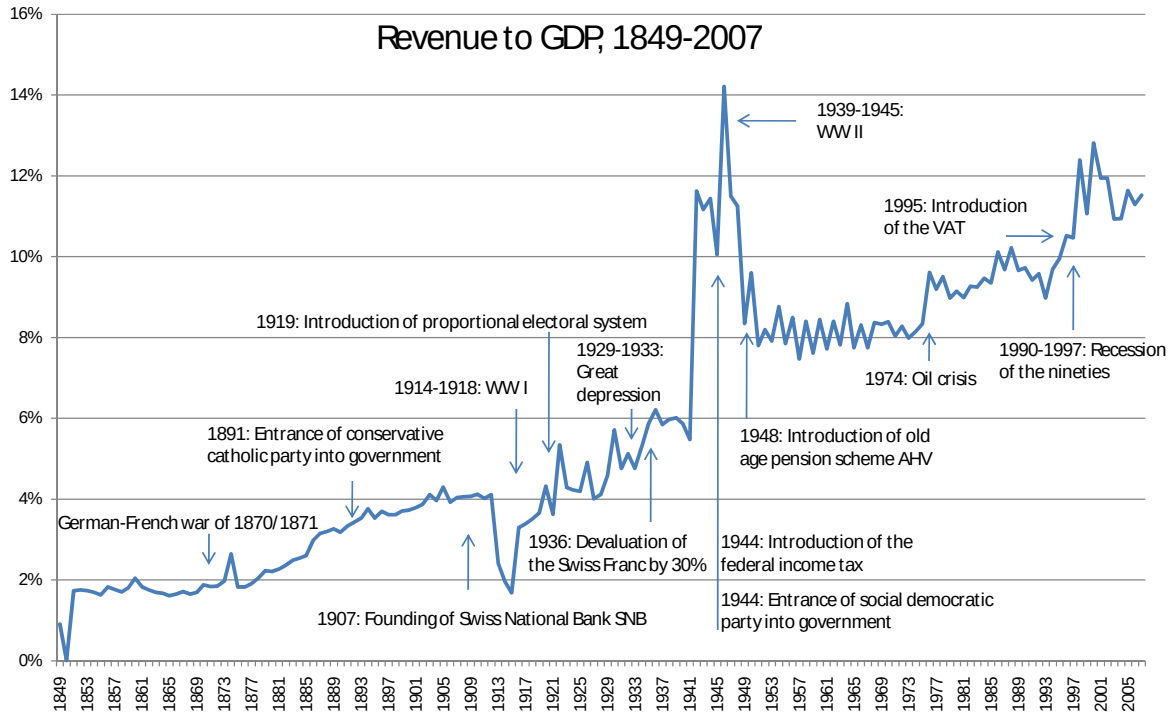
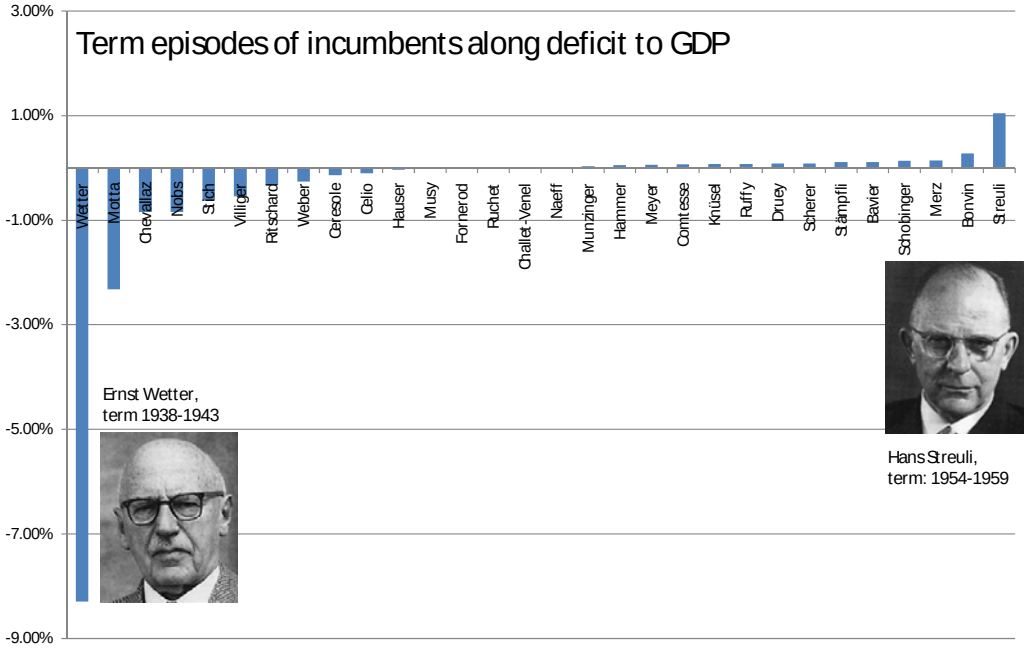


Figure 5: Average Federal Budget Surplus, in % of GDP, for Swiss Finance Ministers, 1849 – 2007



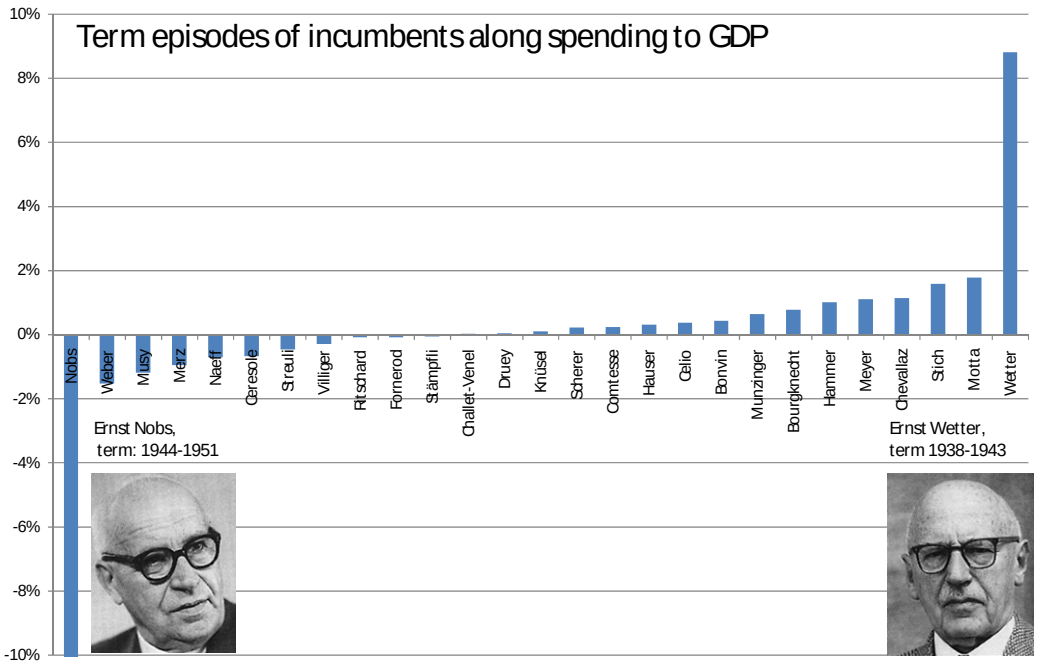
The development of government finances after 1960 was characterized by two trends: a first wave of government expansion was accompanied by good economic conditions so that public finances could be held more or less balanced even during the oil crises. The second wave of government expansion occurred during the 1990s and was accompanied by an economic downswing and relatively high rates of unemployment which ended at the beginning of the 21st century. Additionally, in 1995 the VAT was introduced at the federal level which expanded the revenue capacity of the federal government considerably compared to the former sales tax. In 2001 voters agreed in a referendum to a balanced-budget-rule aimed to fight continued deficit spending (Frey, 2007).

Regarding the performance of each individual minister of finance, *Figure 5*, *Figure 6* and *Appendix C* illustrate their relative success with respect to federal budget surpluses and federal spending. It certainly is a bad coincidence that Giuseppe Motta and Ernst Wetter served as federal finance ministers during the First and Second World War, respectively. Unsurprisingly, their performance appears to be the worst in terms of average budget deficits and spending growth. Motta, who served from 1912 to 1919 as minister of finance, increased federal spending by 1.8% on average per year and presented budget deficits of 2.32% on average. Federal debt thus increased during his time in office by 17.43 percentage points. In his term between

1938 and 1943, Wetter had to bear federal deficits of 8.3% of GDP on average per year. Federal debt rose by 23.54 percentage points during this time.

Jean-Marie Musy served from 1919 to 1934 and thus the longest time as federal finance minister. Overall, his performance with respect to fiscal policy is relatively good.[7] He stressed the importance of a balanced budget and the stability of the Swiss franc. He reduced federal spending in percent of GDP by 1.18 percentage points, on average presented an almost balanced budget of –0.02% and moderately increased federal debt (in percent of GDP) by 3.27 percentage points. The first social democratic finance minister was Ernst Nobs between 1944 and 1951 who could also offer a good performance favored by the postwar consolidation mood. He reduced public debt in percent of GDP by 28.83 percentage points overall.

Figure 6: Average Change in Federal Expenditure, in % of GDP, for Swiss Finance Ministers, 1849 – 2007



Results from Unit Root Tests and Cointegration Tests

Of course the anecdotal evidence can only illustrate the development of Swiss federal fiscal policy and the performance of the finance minister. A more rigorous analysis must be conducted to test the hypothesis on political stability and sound public finances. A first step towards

7. More debated is his role during World War II: Musy was close to fascist ideas and had connections to important persons of the NSDAP. However, as a private person without political or diplomatic status, he helped to rescue 1200 Jews from the KZ Theresienstadt into Switzerland.

a serious analysis consists in the elaboration of the time series characteristics of the main fiscal policy variables (Kirchgässner and Wolters 2007). First, tests for unit roots are presented in order to test on the stationarity of fiscal policy at the federal level. We conduct Augmented Dickey-Fuller (ADF) tests and Philipps-Perron (PP) tests, but abstained from also presenting the KPSS tests. The ADF and PP tests for the whole sample are much in line with the results of Kirchgässner and Prohl (2008) such that the KPSS test results would not have provided further insights in order to proceed in our analysis.

Table 1 Test for Unit Roots, Swiss Federal Level, 1849 – 2007

Variables	ADF test			Philipps-Perron (PP) test		
	Level	Level with Trend	First Differences	Level	Level with Trend	First Differences
1849 – 2007						
Budget Surplus (in % of GDP)	-4.036**	-5.610**	-11.423**	-4.425**	-4.419**	-11.377**
Public Debt (in % of GDP)	-1.185	-2.438	-7.631**	-1.597	-1.854	-7.555**
Expenditure (in % of GDP)	-1.507	-4.648**	-8.555**	-1.990	-3.388(*)	-8.656**
Revenue (in % of GDP)	-1.571	-4.085**	-19.539**	-1.252	-4.547**	-19.100**
1849 – 1939						
Budget Surplus (in % of GDP)	-2.836(*)	-3.109	-7.852**	-2.888(*)	-3.036	-7.801**
Public Debt (in % of GDP)	-0.882	-2.022	-5.841**	0.285	-1.542	-5.753**
Expenditure (in % of GDP)	-1.061	-3.633*	-7.382**	-0.939	-3.269(*)	-7.330**
Revenue (in % of GDP)	-1.388	-2.962	-7.924**	-0.985	-3.974**	-7.382**
1946 – 2007						
Budget Surplus (in % of GDP)	-3.469*	-3.506*	-11.558**	-3.381*	-3.923*	-11.631**
Public Debt (in % of GDP)	-4.106**	-3.554*	-7.066**	-3.780**	-3.633*	-7.051**
Expenditure (in % of GDP)	-2.086	-5.061**	-9.376**	-2.332	-6.192**	-7.330**
Revenue (in % of GDP)	-2.197	-2.933	-18.003**	-1.607	-4.823**	-16.075**

The values are the estimated t-statistics. '**', '*' or '(*)' indicate that the null hypothesis of a unit root can be rejected at the 1, 5, or 10 percent level, respectively. The number of lags of the ADF tests has been determined using the Hannan-Quinn criterion. For the Philipps-Perron tests always 4 lags have been used.

As *Table 1* indicates, the hypothesis of a unit root in levels can be rejected for the federal budget surplus in percent of GDP for the whole time period from 1849 to 2007 on the one percent significance level, but also for the two sub-periods, 1849 to 1939 and 1946 to 2007, at the ten and five percent levels respectively. This holds irrespective of which test, the ADF or the PP test, is used. While the result for the whole time period is in line with that of Kirchgässner and

Prohl (2008), the results for the sub-periods are stronger. In addition, the hypothesis of a unit root can be rejected for the level of federal debt in percent of GDP in the sub-period 1946 to 2007. Otherwise, the test statistics indicate that only first differences are stationary. In particular for federal spending and revenue, the hypothesis of a unit root in the levels could never be rejected for any period. However, as the results for the ADF-test as well as the PP-test suggest, government spending and revenue seem to be trend stationary. In the case for government debt, at least the period after World War II is trend stationary.

Table 2 Results of the Engle-Granger Cointegration Test, Swiss Federal Level, 1849 – 2007

	Cointegrating equation		Residual regression	
Dependent Variable	Coefficient (S.E.)	R^2	ADF statistic	PP statistic
1849 – 2007				
Expenditure-GDP-ratio	1.100 (0.03)	0.868	-5.857**	-6.030**
Revenue-GDP-ratio	0.789 (0.02)	0.868	-5.897**	-6.027**
1849 – 1939				
Expenditure-GDP-ratio	0.901 (0.07)	0.643	-4.720**	-4.789**
Revenue-GDP-ratio	0.714 (0.06)	0.643	-5.432**	-5.395**
1946 – 2007				
Expenditure-GDP-ratio	1.083 (0.08)	0.760	-5.798**	-5.965**
Revenue-GDP-ratio	0.701 (0.05)	0.760	-5.326**	-5.250**

'**', '*' or '(*)' indicate that the null hypothesis of no cointegration can be rejected at the 1, 5, or 10 percent level, respectively. For the ADF tests 1 lag has always been used. For the Philipps-Perron tests always 4 lags have been used. The critical values for the ADF- and the PP-statistics of expenditure and revenue to GDP rations are -3.491 for the 1 percent level, -2.886 for the 5 percent level and -2.576 for the 10 percent level.

Given that the levels of budget surpluses in percent of GDP are I(0) and of the federal debt ratio is I(1) for the whole time period and before the Second World War, one of the usual tests for sustainability, namely that deficits and debt are cointegrated, would not make sense and could not serve as a help for our subsequent econometric specification. Thus, only tests on cointegration of federal spending and revenue are performed as they are difference stationary with the same order of integration. *Table 2* presents the results of the residual based Engle-Granger test for cointegration. The ADF test of the residuals for the whole time period gives a

t-statistic of 5.9 which is significant at the 1 percent level. This indicates that federal revenue and expenditure in percent of GDP are cointegrated for the whole time period. Similarly high t-statistics for the two sub-periods could be observed such that cointegration between federal spending and revenue prevails consistently. Again our results for the sub-periods are stronger than those presented by Kirchgässner and Prohl (2008).

Table 3 Results of the Johansen Cointegration Test, Swiss Federal Level, 1849 – 2007

Eigenvalue	Null hypothesis	Lags	Trace statistic
	1849 – 2007		
0.145	r = 0	4	24.60**
0.002	r = 1	4	0.25
	1849 – 1939		
0.050	r = 0	4	4.55*
0.002	r = 1	4	0.18
	1946 – 2007		
0.260	r = 0	4	21.51**
0.050	r = 1	4	3.13

'**' or '*' indicate that the null hypothesis of no cointegration can be rejected at the 1 or 5 percent level, respectively.

Finally, we use the Johansen multivariate cointegration test in order to determine the number of cointegrating vectors in the system. We perform the trace test only and assume the existence of a constant in the error correction term. *Table 3* shows the results for the whole sample and the two sub-samples. The null hypothesis of no cointegration can be rejected for the whole time period and for the sub-period from 1946 to 2007 on the 1 percent level as well as for the sub-period from 1849 to 1939 on the 5 percent significance level. These results support the previous findings and the hypothesis that federal spending and revenue are cointegrated.

Multivariate analysis

For the multivariate analysis, these clear-cut results suggest the following strategy. As the federal budget surplus in percent of GDP is stationary for the whole time period and both sub-periods, the model formulated before is estimated by OLS. As we could not establish any cointegrating relation between the federal debt ratio and economic or fiscal variables and as the federal debt ratio is even stationary for the time after the Second World War, the model is again estimated by OLS. In the case of federal debt to GDP, regressions for the levels and the first differences are presented. In both sets of regressions capturing indebtedness, the results including a one period lagged endogenous variable are presented.

Table 4: Results for Federal Budget Surplus, in % of GDP, 1849-2007

Variables	*Budget Surplus in % of GDP*					
	Full Sample				*Subsamples*	
	Huber-White-Sandwich	*Newey-West (lag five years)*	*Lagged Endo-genous*	*Prais-Winsten AR (1)*	*Without wars, Lagged Endogenous*	*Without wars, recession 90/97, Lagged Endogenous*
Oil Price t-1	0.010 (0.27)	0.010 (0.21)	0.021 (0.71)	0.016 (0.32)	0.011 (0.51)	-0.001 (0.58)
Real GDP t-1	-0.014(*) (1.69)	-0.014 (1.31)	-0.021* (2.37)	-0.007 (0.64)	-0.006(*) (1.74)	-0.006 (-1.47)
Population t-1	0.002* (2.04)	0.003 (1.51)	0.004* (2.53)	0.003 (1.39)	0.001 (1.42)	0.001 (1.27)
Wars	-4.234** (4.85)	-4.237** (3.80)	-2.611** (4.03)	-2.727** (3.52)	–	–
Great Depression	1.792** (3.20)	1.792** (3.19)	0.766(*) (1.68)	0.703 (1.29)	0.433 (1.21)	0.544 (1.50)
Tax Amnesty	-2.521(*) (1.72)	-2.521* (2.07)	-2.745 (1.59)	-1.946 (1.12)	-1.261 (0.89)	-1.591 (1.20)
Existence SNB	0.003 (0.60)	0.003 (0.56)	-0.004 (1.17)	-0.007 (0.13)	-0.018 (0.91)	-0.031 (1.47)
Devaluation	1.674** (4.50)	1.674** (3.73)	1.211** (3.67)	0.628 (1.44)	0.840** (3.19)	0.841** (3.16)
State Old Age Pension System (AHV)	1.453* (2.23)	1.453(*) (1.69)	0.685 (0.85)	0.736 (0.98)	-0.279 (0.72)	-0.268 (0.68)
Proportional Representation	-2.463* (2.48)	-2.463* (2.26)	-1.514* (2.50)	-1.257 (1.17)	0.279 (0.72)	0.212 (0.54)
Time Horizon of Finance Minister t-1	0.076** (2.85)	0.076* (2.28)	0.053* (2.34)	0.029 (1.32)	0.032* (2.06)	0.025(*) (1.72)
Number of Referenda and Initiatives t-1	-0.132(*) (1.93)	-0.132* (2.49)	-0.118(*) (1.76)	-0.047 (0.91)	-0.083(*) (1.79)	-0.080(*) (1.72)
Turnout t-1	0.056 (0.10)	0.056 (0.11)	0.001 (0.37)	0.001 (0.27)	0.001 (0.59)	0.002 (0.90)
Social Democratic Finance Minister t-1	0.890* (2.28)	0.890 (1.48)	1.039* (2.37)	0.012* (2.38)	0.027 (1.25)	0.043(*) (1.90)
Number of Seats of Social Democrats in Parliament t-1	0.159** (3.20)	0.159* (2.25)	0.115** (3.13)	0.144* (2.38)	0.026 (1.43)	0.015 (0.81)
Surplus in % of GDP t-1	–	–	0.492** (3.03)	–	0.266* (2.35)	0.210(*) (1.94)
Interest rates t-1	-0.044** (4.27)	-0.044** (3.96)	-0.038** (3.79)	-0.054** (3.44)	-0.043** (4.75)	-0.038** (4.26)
Federal income tax	-0.009 (1.46)	-0.009 (1.06)	0.003 (0.08)	-0.006 (1.04)	0.004 (1.05)	0.003 (0.89)
Time Trend	-0.001** (2.94)	-0.001* (2.06)	-0.001** (3.00)	-0.001* (2.07)	-0.002(*) (1.87)	-0.002 (1.50)
Constant	1.430	1.430	1.447	1.656	0.391	0.344
Observations	158	158	158	158	144	136
R^2	0.720	–	0.809	0.413	0.580	0.488
D.W. (transformed)	1.285	–	1.855	1.951	1.853	1.804
F-Test	–	13.10**	–	–	–	–
RMSE	0.011		0.009	0.010	0.052	0.0050
S.W. for normal data	8.084**	8.084**	8.432**	7.230**	5.376**	4.906**

Note: The numbers in parentheses are the absolute values of the estimated t-statistics. '***', '**', '*' or '(*)' show that the estimated parameter is significantly different from zero at the 0.1, 1, 5, or 10 percent level, respectively. RMSE is the root mean squared error, and D.W. is the value of the Durbin-Watson statistic on autocorrelation of the residuals. S.W. displays the Shapiro-Wilk test for normal data.

Table 5: Results for Federal Debt, in % of GDP, 1849-2007

Variables	*Public Debt in % of GDP*					
	Level			*First Differences*		
	Full Sample	*Without wars*	*Without wars, recession 90/97*	*Full Sample*	*Without wars*	*Without wars, recession 90/97*
Oil Price t-1	-0.001	-0.002	-0.001	-0.001	-0.001	-0.001
	(0.23)	(0.43)	(0.21)	(1.61)	(0.13)	(0.14)
Real GDP t-1	0.002	0.001	0.002	-0.001(*)	-0.001	-0.001
	(1.35)	(0.83)	(1.29)	(1.97)	(1.14)	(0.91)
Population t-1	-0.467	-0.165	-0.302	-0.714	-0.950	-0.100
	(1.64)	(0.67)	(1.15)	(1.08)	(1.49)	(1.50)
Wars	4.548**	–	–	3.625**	–	–
	(5.18)			(4.30)		
Great Depression	0.508	0.016	0.014	0.008	0.017(*)	0.017(*)
	(0.54)	(1.66)	(1.44)	(0.98)	(1.79)	(1.78)
Tax Amnesty	0.221	-0.379	-0.212	-0.002	0.002	0.001
	(0.11)	(0.53)	(0.29)	(0.09)	(0.31)	(0.22)
Existence SNB	-0.995	0.180	0.602	-0.598	-0.002	-0.008
	(0.12)	(0.30)	(0.94)	(1.05)	(0.55)	(0.19)
Devaluation	3.046**	3.520**	3.531**	3.124**	3.542**	3.611**
	(4.52)	(5.01)	(5.02)	(4.91)	(5.03)	(5.00)
State Old Age Pension System (AHV)	1.011	2.275	2.588	0.641	2.404(*)	2.607(*)
	(0.59)	(1.30)	(1.49)	(0.48)	(1.83)	(1.94)
Proportional Representation	2.932*	-0.953	0.014	2.176*	-0.277	-0.475
	(2.21)	(0.09)	(0.13)	(2.17)	(0.34)	(0.58)
Time Horizon of Finance Minister t-1	-0.001	-0.001	-0.001	-0.001	0.001	0.001
	(1.21)	(0.22)	(0.05)	(0.37)	(0.22)	(0.48)
Number of Referenda and Initiatives t-1	0.115	0.056	0.033	0.051	0.001	0.002
	(0.94)	(0.49)	(0.28)	(0.44)	(0.09)	(0.01)
Turnout t-1	-0.001	0.001	0.001	0.001	0.001	0.001
	(0.12)	(0.43)	(0.45)	(0.50)	(0.65)	(0.62)
Social Democratic Finance Minister t-1	-0.022**	-0.010	-0.012(*)	-0.017*	-0.010	-0.012(*)
	(2.73)	(1.51)	(1.70)	(2.30)	(1.48)	(1.67)
Number of Seats of Social Democrats in Parliament t-1	-0.222**	-0.045	-0.045	-0.165**	-0.061(*)	-0.043
	(2.87)	(0.79)	(0.78)	(3.19)	(1.66)	(1.18)
Debt in % of GDP t-1	0.973**	0.975**	0.963**	0.112	0.052	0.0247
	(22.71)	(24.54)	(23.89)	(0.85)	(0.36)	(0.16)
Interest rates t-1	0.010**	0.011**	0.010**	0.005(*)	0.008**	0.008*
	(4.09)	(4.52)	(3.84)	(1.78)	(2.73)	(2.32)
Federal income tax	-0.007	-0.023*	-0.021(*)	-0.007	-0.021(*)	-0.022(*)
	(0.70)	(1.99)	(1.87)	(0.93)	(1.83)	(1.84)
Time Trend	0.001*	0.001	0.001	0.001(*)	0.001	0.001
	(2.36)	(0.88)	(1.27)	(1.77)	(1.22)	(0.91)
Constant	-2.206	-0.715	-1.055	-0.490	-0.357	-0.272
Observations	158	144	136	157	143	135
R^2	0.985	0.985	0.985	0.500	0.464	0.442
D.W. (transformed)	1.829	1.963	1.982	2.083	2.105	2.064
RMSE	0.018	0.016	0.016	0.018	0.015	0.016
S.W. for normal data	5.919**	5.889**	5.878**	4.795**	5.538**	5.718**

For Notes see Table 4. Please note also that in the first difference equations the continuous explanatory variables are also in first differences.

Table 6: Error Correction Model for Federal Spending and Revenue, in % of GDP, 1849-2007

Variables	*First Difference in Expenditure*			*First Difference in Revenue*		
	Full Sample	*Without wars*	*Without wars, recession 90/97*	*Full Sample*	*Without wars*	*Without wars, recession 90/97*
Oil Price t-1	-0.015 (0.71)	-0.019 (1.14)	-0.009 (0.61)	-0.004 (1.58)	-0.003(*) (1.76)	-0.003 (1.51)
Real GDP t-1	0.012** (3.00)	0.054* (1.99)	0.037 (1.24)	0.075(*) (1.76)	0.093 (0.28)	0.003 (0.99)
Population t-1	-0.002** (3.14)	-0.008 (1.64)	-0.005 (1.05)	-0.001 (1.64)	-0.002 (0.00)	-0.004 (0.74)
Wars	0.013* (2.50)	–	–	0.015* (2.00)	–	–
Great Depression	-0.467 (1.19)	0.209 (0.01)	-0.060 (0.00)	-0.124 (0.28)	0.035 (1.25)	0.031 (1.12)
Tax Amnesty	0.010 (1.14)	0.025* (2.08)	0.022(*) (1.94)	0.050 (0.76)	-0.022 (1.53)	-0.011 (0.95)
Existence SNB	0.324 (1.23)	0.172 (1.08)	0.002 (1.26)	-0.931* (2.06)	-0.658(*) (1.74)	-0.006 (1.56)
Devaluation	-0.581* (2.02)	-0.016 (0.83)	-0.016 (0.83)	-0.006 (1.35)	-0.064 (0.04)	0.048 (0.29)
State Old Age Pension System(AHV)	0.226 (0.50)	0.581(*) (1.76)	0.551 (1.64)	0.429 (0.89)	0.057 (1.65)	0.073(*) (1.95)
Proportional Representation	0.625 (1.17)	-0.002 (0.86)	-0.003 (1.06)	0.186* (1.98)	0.004 (0.69)	0.004 (0.83)
Time Horizon of Finance Minister t-1	-0.031* (2.05)	-0.019(*) (1.80)	-0.015 (1.50)	-0.004(*) (1.72)	-0.001 (0.83)	-0.001 (0.73)
Number of Referenda and Initiatives t-1	0.052 (1.11)	0.018 (0.59)	0.0024 (0.79)	0.013* (2.21)	0.041 (1.30)	0.026 (0.95)
Turnout t-1	0.042 (0.15)	-0.010 (0.48)	-0.015 (0.69)	-0.002 (0.70)	0.003 (0.11)	0.008 (0.28)
Social Democratic Finance Minister t-1	-0.048* (2.09)	-0.021 (1.21)	-0.003 (1.40)	-0.002 (0.65)	0.001 (0.62)	0.005 (0.30)
Number of Seats of Social Democrats in Parliament t-1	-0.049* (2.04)	-0.010 (0.66)	-0.036 (0.23)	-0.044 (1.25)	0.005 (0.26)	0.002 (0.09)
Change in Expenditure in % of GDP t-1	0.179* (2.03)	-0.066 (0.81)	-0.089 (1.00)	0.065 (0.66)	0.165(*) (1.84)	0.143(*) (1.70)
Change in Revenue in % of GDP t-1	0.288(*) (1.96)	0.001 (0.01)	-0.024 (0.26)	-0.300* (2.10)	-0.405** (3.45)	-0.356** (2.84)
Expenditure in % of GDP t-1	-0.302** (3.60)	-0.362** (7.03)	-0.379** (6.97)	0.096 (0.79)	0.071 (1.01)	0.074 (1.02)
Revenue in % of GDP t-1	0.270* (2.16)	0.328** (3.73)	0.356** (3.85)	-0.524** (2.98)	-0.400** (3.02)	-0.450** (3.26)
Interest rates t-1	0.017* (2.16)	0.003** (3.88)	0.002** (3.12)	-0.004 (0.36)	0.003 (0.49)	0.001 (0.13)
Federal income tax	-0.001 (0.01)	-0.004 (1.49)	-0.005 (1.56)	-0.004 (1.07)	-0.003 (1.33)	-0.003 (1.06)
Time Trend	0.004** (3.10)	0.001* (2.25)	0.001 (1.44)	0.005** (2.96)	0.002(*) (1.67)	0.003* (2.21)
Constant	-0.740	-0.347	-0.247	-0.923	-0.346	-0.486
Observations	157	143	135	157	143	135
R^2	0.646	0.615	0.611	0.491	0.548	0.560
D.W. (transformed)	1.835	2.022	2.028	1.986	1.595	1.631
RMSE	0.006	0.004	0.004	0.007	0.005	0.004
S.W. for normal data	7.667**	8.574**	8.664**	5.297**	8.075**	8.151**

For Notes see Table 4.

Table 7: Results for Federal Spending and Revenue, in % of GDP, 1849-2007

Variables	*Level for Expenditure*			*Level for Revenue*		
	Robust Standard Errors	*Lagged Endogenous*	*Prais-Winsten AR (1)*	*Robust Standard Errors*	*Lagged Endogenous*	*Prais-Winsten AR (1)*
Oil Price t-1	-0.0001	-0.0001	0.000	-0.0001*	-0.0005(*)	0.000
	(1.44)	(1.42)	(0.19)	(2.19)	(1.66)	(0.06)
Real GDP t-1	0.0001	0.0002*	-0.0001	0.0001	0.0004	0.00001
	(0.79)	(2.50)	(1.06)	(1.22)	(0.74)	(0.11)
Population t-1	0.000	0.000*	-0.000	-0.000	-0.000	-0.000
	(0.78)	(2.61)	(0.72)	(0.95)	(0.46)	(0.17)
Wars	0.041**	0.018**	0.014**	0.023**	0.017*	0.014
	(3.96)	(3.93)	(3.40)	(3.74)	(2.39)	(1.39)
Great Depression	-0.033**	-0.005	-0.003**	-0.011**	-0.004	-0.0005
	(3.93)	(1.12)	(2.86)	(2.97)	(0.98)	(0.02)
Tax Amnesty	0.018	0.019	0.011	0.008	0.002	0.003
	(1.60)	(0.99)	(0.87)	(1.42)	(0.52)	(0.71)
Existence SNB	-0.018*	0.0003	-0.001	-0.021**	-0.011*	-0.006
	(2.48)	(0.12)	(0.71)	(3.82)	(2.27)	(1.13)
Devaluation	-0.012*	-0.006(*)	0.0002	-0.006	-0.006	-0.002
	(2.15)	(1.90)	(0.04)	(1.64)	(1.51)	(0.64)
State Old Age Pension System(AHV)	-0.036**	0.008	-0.003	-0.010(*)	-0.003	-0.008
	(3.24)	(1.64)	(1.13)	(1.71)	(0.48)	(1.33)
Proportional Representation	0.040**	0.018**	0.007	0.033**	0.019(*)	0.005
	(2.94)	(3.30)	(1.38)	(3.72)	(1.92)	(0.36)
Time Horizon of Finance Minister t-1	-0.001**	-0.001*	-0.003(*)	-0.001*	-0.0003	0.000
	(2.95)	(2.52)	(1.85)	(2.22)	(1.37)	(0.09)
Number of Referenda and Initiatives t-1	0.001	0.001	0.0001	0.001*	0.001*	0.001*
	(1.09)	(1.00)	(0.39)	(2.26)	(2.38)	(2.32)
Turnout t-1	-0.0001	-0.0002	-0.000	-0.0003	-0.000	-0.000
	(0.81)	(0.61)	(0.86)	(0.87)	(0.36)	(1.19)
Social Democratic Finance Minister t-1	0.004	-0.009**	-0.012	0.003	0.001	-0.003
	(0.90)	(2.76)	(1.55)	(1.10)	(0.34)	(0.62)
Number of Seats of Social Democrats in Parliament t-1	-0.129*	-0.088**	-0.107	-0.063	-0.035	-0.018
	(2.00)	(3.18)	(1.57)	(1.55)	(0.96)	(0.36)
Expenditure in % of GDP t-1	–	0.788**	–	–	–	–
		(11.40)				
Revenue in % of GDP t-1	–	–	–	–	0.486**	–
					(4.12)	
Interest rates t-1	-0.003	0.002**	0.004*	-0.003**	-0.001	-0.001
	(1.64)	(3.04)	(2.53)	(2.69)	(1.10)	(0.72)
Federal income tax	0.022*	0.0001	0.004	0.006	-0.001	0.000
	(2.29)	(0.03)	(0.83)	(1.22)	(0.28)	(0.01)
Time Trend	0.001**	0.001**	0.0018(*)	0.001**	0.0004*	0.0008*
	(3.61)	(3.08)	(1.93)	(5.10)	(2.44)	(2.39)
Constant	-1.955**	-1.443**	-3.314(*)	-1.437**	-0.712*	-1.536*
	(3.69)	(3.11)	(1.96)	(5.18)	(2.51)	(2.44)
Observations	158	158	158	158	158	158
R^2	0.894	0.973	0.302	0.944	0.958	0.598
D.W. (transformed)	0.929	1.731	1.600	1.479	2.569	2.598
RMSE	0.014	0.007	0.008	0.009	0.008	0.008
S.W. for normal data	3.889**	4.932**	5.736**	4.930**	5.132**	3.273**

For Notes see Table 4.

With respect to federal spending in percent of GDP and federal revenue in percent of GDP, the existence of a cointegration relation allows us to estimate error correction models for the whole time period and the two sub-periods also investigating long-run and short-run effects of different variables. In comparison to that, we display also the results for spending and revenue levels since trend stationarity cannot be fully rejected.

The results for the federal budget surplus in percent of GDP are presented in *Table 4*. The first column shows the results of our regression model with robust standard errors using the Huber-White sandwich correction and the second column the same model with a Newey-West correction of the standard errors. The Durbin Watson test statistics for the first regression indicates the existence of autocorrelation of the residuals. The reaction of the standard errors to the Newey-West correction does so likewise. In the third column, the model including a lagged endogenous variable is presented, while the AR(1) regression is shown in the fourth column. In the fifth and sixth columns we exclude the time period of wars and additionally of the recession period during the 1990s (1990-1997) from the sample to control for outliers (see the Shapiro-Wilk-Test for normal data). Overall, across these specifications, the structure of the estimation results remains relatively robust. Given the strong autocorrelation of the residuals, the much stronger variation in significances does not surprise.

Focusing on the regression with a lagged endogenous variable in column 3, it becomes obvious that the federal budget surplus ratio is mainly determined by particular shocks, but also by political factors. The two world wars together with the German-French-War, as expected from the descriptive analysis, strongly and significantly reduce the budget surplus, while the devaluation of the Swiss franc increased the federal surplus. Both variables are significant on the 1 percent level. A larger number of seats in parliament for the social democrats significantly increase the federal budget surplus (at the 1 percent level), though this might be the luck of social democratic finance ministers being in office directly after the Second World War. Party affiliation seems to play a role in the federal council, too, even though there is not much variation in the data. As expected, a longer time horizon of the finance minister has also a positive sign and is significant at the 5 percent level for the whole time period. Regarding the two sub-periods, these results largely remain robust. While the time horizon of the finance minister keeps its significantly positive sign after excluding observations for the periods of the German-French-War, the First World War and the Second World War, it falls to the 90 percent significance level when also excluding the recession period of the 1990s. Anyhow, there is quite a robust relationship between the time horizon of a minister of finance and the

soundness of public finances giving support to our argument in limiting the incentive to exploit the fiscal commons and in limiting the access to the fiscal commons for lobbies if the minister of finance remains in office for a long time-horizon.

Many of the other control variables, also the economic variables, do not have a robust significant effect on federal budget surpluses in percent of GDP with the important exception of interest rates. A higher number of referenda and initiatives have a weakly significant negative effect on the budget surplus which could be the outcome of the asymmetric restriction direct democracy puts on the revenue side as compared to the spending side on the federal level.

The results for the level of the public debt ratio, presented in the first three columns in *Table 5*, contain some similarities to the surplus regressions, but also offer some interesting differences. Again the wars have a significant positive impact on debt. The devaluation in 1936 significantly increased the debt to GDP ratio for the whole period and the two sub-periods. The same holds true for the level of interest rates. Also the number of seats of social democrats in parliament significantly reduces federal debt even though the effect vanishes if we exclude the war periods as well as the recession period. The same is true for social democratic finance ministers. For the whole time period, the switch to proportional representation has a significant positive effect on the level of debt to GDP which does however not hold for the sub-samples. Interestingly, the introduction of a federal income tax is positively associated with increases in the level of the federal debt ratio if we exclude the war-periods. The effect is significant at the 5 percent level and is also remarkable because the level of debt to GDP is stationary for that period. Thus, these estimations for the level of federal debt are particularly reliable.

A closer look at the first differences of the federal debt to GDP ratio reveals largely similar results to the level estimations.[8] The wars, the devaluation of the Swiss franc and the level of interest rates significantly increase changes in debt to GDP. The only remarkable deviation between the regressions for the level and the change of debt is that the state old pension system proves to be significant for the first differences of federal debt to GDP without the war periods as well as the recession period in the 1990s.

Table 6 presents the results for the error correction model of federal expenditure and revenue to GDP. The first three columns contain the results for the first differences in spending for the full sample and the two sub-periods, while columns (4) to (6) exhibit the respective results for the first differences of federal revenue. Given the cointegration relation between federal spen-

ding and revenue, it is most interesting that a significant short-run and long-run impact of revenue on expenditure is reported for the full sample, which is not matched by a similar effect of spending on revenue. That the revenue effects on spending vanish for the two sub-periods may be due to the much shorter time period. For the whole sample, these results provide support for the arguments by Peacock and Wiseman (1961) that the ability of a government to raise revenue is a precondition for an extension of public expenditure. In addition, the wars positively and significantly affect spending and revenue. Interest rates prove to be significant and positive in the spending ECM but not for revenue. Otherwise spending appears to be mainly determined by the dynamics between revenue and spending.

In the case of revenue, additional interesting results show up. The oil price and the foundation of the SNB have marginally significant and negative effects on revenue. The introduction of proportional representation significantly increases revenue differences in the whole time period. Similarly, a higher number of referenda and initiatives significantly increase revenue. Both may indicate the ability of the government to raise revenue if the political procedures leading to higher taxation are perceived to be fair by the citizens.

While political stability measured by the time horizon of the finance minister does not significantly affect debt, government spending is significantly lower due to higher political stability also according to the results from the ECM. The same holds regarding the results of the level estimates in *Table 7*. Looking at the revenue ECM as well as the level estimates, the time horizon of a finance minister plays only a minor role. This is very much in line with the results in the deficit equation. Thus overall, we obtain evidence that political stability induces sound public finances by smaller government spending but only marginally smaller government revenue. The general result supports other empirical evidence of the impact of government stability on the exploitation of the public budget as a fiscal commons.

5. Conclusion

In this paper, we have analyzed the impact of political stability on fiscal policy using time series for the Swiss federal level between 1849 and 2007. Theoretically, political stability, interpreted as a factually strong and successful finance minister who stays in office for a long time, may be a possibility to contain the fiscal commons problem of spending ministers exploiting the fiscal resources. Our estimation results are quite heterogeneous across the four budgetary

8. It has to be noted that the first differences in federal debts and the levels in deficits are different since many off-budget activities are included in the federal debt statistics but not in the deficit statistics.

indicators, i.e. federal surplus, debt, expenditure and revenue, all normalized by GDP. For the federal budget surplus and for federal spending, we obtain evidence that a longer time horizon of the federal finance minister leads to sounder public finances by smaller government spending. However, federal revenue as well as federal debt are largely unaffected by government stability. In the case of government revenue, this is plausible while the results on debt stand in contrast to our predictions.

Fiscal policy in Switzerland appears to be mainly driven by fiscal shocks such as the wars, but also by other events, like the devaluation of the Swiss franc by 30% in 1936. Of much importance are the dynamics between spending and revenue which provide support for the contention of Peacock and Wiseman (1961) that public spending increase if tax resistance wanes. Finally, some ideological effects can be found though not in the usually assumed direction. If social democrats have more seats in parliament this reduces deficits and debt. Although this might be the luck of a social democratic finance minister being in office during the consolidation after the Second World War, it still adds to the doubts regarding ideological effects.

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Appendix A

Table A: Data description		
Variable name	*Description*	*Source*
Expenditure	Federal expenditure divided by GDP	1950-2007: Swiss Federal Finance Administration, Swiss Federal Statistical Office 1913-1949: Swiss Federal Department of Finance, Swiss Federal Statistical Office 1849-1912: Walter von Burg (1916)
Revenue	Federal revenue divided by GDP	1950-2007: Swiss Federal Finance Administration, Swiss Federal Statistical Office 1913-1949: Swiss Federal Department of Finance, Swiss Federal Statistical Office 1849-1912: Walter von Burg (1916)
Surplus	Federal budget surplus divided by GDP	1950-2007: Swiss Federal Finance Administration, Swiss Federal Statistical Office 1913-1949: Swiss Federal Department of Finance, Swiss Federal Statistical Office 1849-1912: Walter von Burg (1916)
Debts	Federal debts divided by GDP	1950-2007: Swiss Federal Finance Administration, Swiss Federal Statistical Office 1913-1949: Swiss Federal Department of Finance, Swiss Federal Statistical Office 1849-1912: Walter von Burg (1916)
Oil Price	Crude oil price in US Dollars per barrel (in 2006 $)	BP Statistical Review of World Energy, June 2007
GDP	Real GDP, 1990=100	1851-1913: Historische Statistik der Schweiz, Cronos (1996) 1914-1947: Andrist/ Anderson/ Williams: Real Output in Switzerland in Quarterly Review Federal Reserve Bank St.Louis, USA 1948-2007: Bundesamt für Statistik, Volkswirtschaftliche Gesamtrechnungen (BFS)
Population	Total Regular Population	Swiss Federal Statistical Office
Wars	Dummy=1 for years with German-French War, World War I and World War II	Own calculations
Great Depression	Dummy=1 for years between 1929 and 1933	Own calculations
Tax Amnesty	Dummy=1 for year with tax amnesty on the federal level (1940, 1945, 1969)	Documentation of the Swiss Federal Tax Administration
Existence SNB	Dummy=1 for years after the founding of the Swiss central bank SNB in 1907	Die Schweizerische Nationalbank 1907-2007, NZZ, Zürich
Devaluation	Dummy=1 for year of the 30%-devaluation of the Swiss currency in 1936	Die Schweizerische Nationalbank 1907-2007, NZZ, Zürich
State Old Pension System (AHV)	Dummy=1 for year after introduction of the Old Pension System AHV in 1948	Own calculations

Proportional Representation	Dummy=1 for years after introduction of proportional electoral system in 1919.	Swiss Chancellerie
Time Horizon of Finance Minister	Number of years until the end of the term for the respective minister of finance	Urs Altermatt (1991), Die Schweizer Bundesräte, Artemis and Winkler, Zürich
Number of Referenda	Number of voter initiatives and public referenda in a year on the federal level	Swiss Chancellerie
Turnout	Average voter turnout of the voter initiatives and public referenda in a year on the federal level with 0 = no referendum or initiative was held	Swiss Chancellerie
Social democratic minister of finance	Dummy=1 if the finance minister belongs to the social democratic party	Swiss Chancellerie
Social Democrats	Share of seats in the house of representatives held by members of the social democratic party	1849-1918: Erich Gruner (1978): Die Wahlen in den Schweizerischen Nationalrat 1848-1919, Francke Bern 1919-2007: Swiss Federal Statistical Office
Time trend	Time variable from 1849-2007	Own calculations
Interest Rates	Bond yields, nominal, average of the year	1849 – 1898: Interest rates on savings deposits in Switzerland, regional average 1899-2007: Yields on Swiss Confederation bonds
DBST	Dummy=1 for year with a federal income tax in 1916, 1917, 1921, 1924, 1925, 1928, 1929, 1932, 1940-2007	Documentation of the Swiss Federal Tax Administration

Appendix B

Table B: Descriptive statistics

Variable	*Mean*	*Std. Dev.*	*Minimum*	*Maximum*
Budget surplus divided by GDP	-0.005	0.019	-0.130	0.021
Debt divided by GDP	0.146	0.137	0.001	0.632
Revenue divided by GDP	0.060	0.034	0.016	0.142
Expenditure divided by GDP	0.063	0.041	0.010	0.186
Time trend	1928	46.044	1849	2007
Wars	0.088	0.284	0	1
Proportional representation	0.553	0.499	0	1
Devaluation	0.006	0.079	0	1
Existence SNB	0.635	0.4829	0	1
Great depression	0.031	0.175	0	1
Time horizon of finance minister	4.344	3.247	1	14
Social-democratic minister	0.164	0.371	0	1
Old age pension system	0.3774	0.486	0	1
Oil price	25.210	18.515	8.665	104.354
Population	4435557	153308	2392740	7508739
GDP	77.206	131.749	0.659	504.167
Tax amnesty	0.019	0.136	0	1
DBST	0.478	0.501	0	1
Nominal interest rates	4.047	0.865	2.106	7.118
Voter turn-out	38.928	238427	0	80.509
Ballots	1.862	1.536	0	9
Share of social democrats	0.174	0.092	0	0.2887

Note:
For a detailed description of the variables see Appendix A.
All statistics are computed for 159 observations.

Appendix C

Table C: Head of Finance Ministry

Term	*Name*	*Party affiliation*	*citizenship*
1848/50	Martin Josef Munzinger	FDP	SO
1851	Henry Druey	FDP	VD
1852	Martin Josef Munzinger	FDP	SO
1853/54	Henry Druey	FDP	VD
1855/56	Melchior Josef Martin Knüsel	FDP	LU
1857/58	Jakob Stämpfli	FDP	BE
1859/61	Constant Fornerod	FDP	VD
1862/63	Melchior Josef Martin Knüsel	FDP	LU
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