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Fiscal Rules: Historical, Modern, and Sub-National Growth Effects

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Abstract

We examine how fiscal rules influence economic growth. The results show that constitutional fiscal rules promoted growth from the Industrial Revolution until World War II (1789–1950) and also increased modern economic growth (1985–2015). To address selection on unobservables, we conduct a large-scale international survey among 1,224 economic experts in 109 countries. We exploit cross-country differences in expert preferences as an instrumental variable for the adoption of constitutional fiscal rules. The results show that the cumulative long-run effect of permanently adopting constitutional fiscal rules on real per capita GDP is 18%. As a complementary strategy to tackle unobservables, we examine sub-national fiscal rules, employing a newly collected dataset of 206 regional governments from 10 federal states (1992–2012). The results show that fiscal rules also increased economic growth at the sub-national level.

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1 Introduction

"Blessed are the young, for they shall inherit the national debt."
— Herbert Hoover

Fiscal rules are laws that constrain policymakers' leeway for fiscal policy. During the past 200 years, many countries have introduced fiscal rules in their constitutions. The historically high and rising levels of public debt brought about by the Financial Crisis prompted governments across the globe to implement fiscal rules in their national constitutions. The consequences of such rules for public finances and economic activity are subject to a longstanding and controversial discussion among both academia and policymakers. For instance, the European Commission President Roman Prodi described the European Union's intention to limit public deficits via the Stability and Growth Pact as *"stupid"* (BBC News, 2002), while his successor José Manuel Barroso noted that *"we need fiscal consolidation and a new financial stability culture in Europe"* (European Commission, 2010).

We show that constitutional fiscal rules increase long-run economic growth. Examining how fiscal rules influence economic outcomes is demanding because fiscal rules may reflect stability preferences of a country's voters and politicians, and these preferences may depend on past developments of GDP. Our strategy is to provide the broadest possible overview on how fiscal rules have influenced growth in economic history (1789–1950), modern economic growth (1985–2015), and growth of sub-national regions (1992–2012). The results show that introducing fiscal rules in country-level or state-level constitutions is positively associated with growth in real per capita GDP. Our findings suggest that from the Industrial Revolution until World War II, constitutional fiscal rules were related to a short-run increase in economic growth of 1.4%. In line with the historical results, we find that fiscal rules are associated with a 1.3% increase in growth during the past three decades. Fiscal rules also promote growth when adopted in regional constitutions: growth in sub-national regions with fiscal rules was about 1.8% higher than in regions without fiscal rules.

Estimating the growth effect of fiscal rules is afflicted with three main challenges. First, availability of data on fiscal rules is restricted. Second, the introduction of fiscal rules may depend on past developments of GDP. Third, relating economic growth to fiscal rules is confronted with the potential of a selection bias. Our empirical strategy tackles these challenges. First, we use a new dataset on constitutions of the Comparative Constitutions Project (CCP, Elkins et al., 2020). The CCP provides text analyses of constitutions for all independent countries from 1789 to present, allowing us to construct measures of historical constitutional fiscal rules. While fiscal rules are well-documented by the IMF for our period of modern economic growth (1985–2015), there is no readily available dataset on constitutional fiscal rules of regional governments. We therefore collect a new dataset

on sub-national fiscal rules that includes 206 regional governments in 10 federal states for the period 1985–2020. Second, we estimate a panel difference-in-differences model that accounts for dynamics in GDP prior to the introduction of fiscal rules. Our event study analyses show that including GDP dynamics eliminates the confounding influence of past economic conditions. Third, we employ strategies to account for potential selection biases. We control for numerous confounding factors (human capital, economic crises, population dynamics, political institutions, constitutional changes, globalization) to rule out that our results are driven by selection on observables. To account for selection on unobservables, we take three steps: (i) we include fixed effects for countries, sub-national units and continent-decades to account for time-invariant and quasi time-invariant unobservables, (ii) we employ the Oster (2019) test to estimate how large selection on unobservables must be to neutralize the estimated effect, and (iii) we conduct a new large-scale international survey among economic experts to explore attitudes towards fiscal stability. We use experts' attitudes to employ a novel instrumental variable that captures a country's propensity to adopt fiscal rules.

Our international survey, which has been conducted in February and March 2020, includes 1,224 leading economic experts working in 109 countries. We exploit the unique infrastructure of the World Economic Survey (WES) conducted by the ifo Institute for Economic Research in Munich to reach out to economic experts from central banks, multinational companies, embassies, international organizations, research institutes, and universities. The experts polled in our survey are among the most influential economists and policy advisers in their country, and their assessment has impact on the national economic debate. Expert views are suitable to measure a country's attitude towards fiscal rules, because they influence the public opinion and have experienced the same cultural socialization as non-experts. As a result, there is a close connection between a population's preferences and the preferences of economic experts (Alesina et al., 2017; Saint-Paul, 2018; Asatryan et al., 2020). The advantage of surveying experts is that attitudes of politicians may be less representative, because policymakers are directly influenced by rules that limit their fiscal capacity. Also, surveying households is impeded by the complexity of the topic, particularly in light of widespread economic illiteracy (Jappelli, 2010). We measure attitudes towards fiscal rules by three questions on the perceived consequences of rules, which we consolidate into an index of a country's propensity to adopt fiscal rules. By specifically focusing on attributes towards fiscal rules, we distinguish our instrumental variable from other dimensions of fiscal or political conservatism that may influence economic growth.

Our historical analysis is based on a sample of 54 countries over the period 1789–1950. The results show that from the Industrial Revolution until World War II, countries with fiscal rules in their constitution had higher growth rates than countries without fiscal rules. Inferences do not change when we reduce the time period, restrict the sample to OECD member countries, and control for major societal and economic changes initiated

by the demographic transition, the process of democratization, and war. We substantiate our cross-country results by a case study on fiscal rules in the German Empire, which have been adopted in the constitution in 1871.

Fiscal rules have also been successful in increasing modern economic growth. Because of substantial improvements in data availability, our results for the modern episode rest on a narrow sample of 88 countries and a broader sample of 166 countries over the period 1985–2015. The results show that fiscal rules are positively associated with economic growth during the past three decades in case that the rules have been adopted in the constitution. The short-run effect size (1.3%) is almost identical to the marginal effect found for the historical sample (1.4%). In contrast, non-constitutional fiscal rules, regardless of whether initiated by the government or by supra-national entities, do not influence growth in either direction. We also find that debt rules, balanced budget rules, and expenditure rules are better for growth than revenue rules. We conduct many robustness analyses for our country-level results, both for the historical and the modern sample. The results of event studies suggest that there is no effect of fiscal rules on growth in the five years prior to the introduction of fiscal rules, ruling out potential anticipation effects and suggesting that the parallel trends assumption is valid. We also address the potential of selection on observables by accounting for many confounding factors.

Our instrumental variable strategy alleviates concerns about omitted unobservables. The Two-Stage Least Squares (2SLS) estimates corroborate the results of our difference-in-differences model. Numerically, the 2SLS estimates suggest that the cumulative long-run effect of permanently adapting fiscal rules in the constitution is 18%. We conduct many weak instrument diagnostics, and these tests all suggest that our attitude-based measure is a strong instrument for the adoption of constitutional fiscal rules. Our analysis on the transmission mechanisms shows that the growth effect of fiscal rules works via reducing debt-to-GDP ratios.

Fiscal rules are imposed either by national governments or by local governments. While most studies on the causes and consequences of fiscal rules focus on the country-level, much less is known about the effects of fiscal rules on the sub-national level. Our results obtained from a novel dataset of 206 regional governments from 10 federal states suggest that constitutional fiscal rules also increased growth on the sub-national level. The sub-national perspective delivers a complementary strategy to tackle concerns about selection biases, because fiscal preferences are typically more homogeneous within than between countries.

Contribution to the literature: The role of public debt for the allocation of resources and economic prosperity is as old as the economic profession. The early classicists concurred that increasing government spending comes at the cost of sacrificing private capital formation. This view gave rise to David Ricardo's conviction that public spending should

by no means be funded by increasing public debt (Ricardo, 1817). Hence, from a classical perspective, rules to restrict public debt should increase economic growth. Modern economists draw a more differentiated picture on the growth effect of fiscal rules, describing two opposing directions of influence. On the one hand, fiscal rules tackle the negative growth effect of public indebtedness by reducing the incentive to accumulate debt (Reinhart et al., 2012). In a similar vein, reducing the potential to raise public expenditure prevents negative growth effects from an increasing size of government (Berg et al., 2018; Gründler and Scheuermeyer, 2018) and from political business cycles (Bonfatti and Forni, 2019). Fiscal rules may also be growth-enhancing when they increase or restore the credibility in the financial markets (Poterba and Rueben, 2001; Heinemann et al., 2014). On the other hand, fiscal rules may hinder growth when they decrease public investment, particularly when there is crowding-in. Our study contributes to this literature by examining the empirical growth effects of fiscal rules. The causal effect of fiscal rules on economic growth has not been examined yet. Preliminary evidence suggests that fiscal rules introduced by the Maastricht treaty and the Stability and Growth Pact were not harmful to growth of EU countries (Castro, 2011; Afonso and Jalles, 2013).

We also contribute to the longstanding debate on "rules versus discretion" (Kydland and Prescott, 1977). Discretion enables flexible reaction to changing economic conditions, but it also comes at the risk of accommodating short-term demands that undermine desirable long-term targets. Our results show that fiscal rules are growth-enhancing in the long run, supporting rule-based institutional designs.

Our study also contributes to the literature dealing with the measurement and documentation of stability preferences. A key problem is that questions about fiscal preferences of households have not been included in international surveys. Hence, prior work has documented attitudes towards fiscal stability of politicians (Heinemann et al., 2016) or used proxies for fiscal stability such as inflation rates, government ideology, and social capital (Heinemann et al., 2014; Funk and Gathmann, 2011; Holtz-Eakin, 1988). Our study provides large-scale international data on fiscal preferences of economic experts for a large number of countries. The data is available for future studies on the consequences of fiscal rules on many economic and fiscal outcomes.

We compile a new dataset on sub-national fiscal rules and examine how fiscal rules influence growth of sub-national regions. The effects of sub-national fiscal rules are still understudied. Previous studies do not exploit variation in fiscal rules across constitutions of sub-national governments (Foremny, 2014).

Organization: The paper is organized as follows. In Section (2), we describe the datasets, including data from historical constitutions, a dataset for the past three decades, and our novel dataset on sub-national fiscal rules. In Section (3), we present our country-level results for the historical and the modern sample. In Section (4), we show our

sub-national results. Section (5) summarizes our findings and discusses avenues for future research.

2 Data and descriptive evidence

2.1 Historical fiscal rules

The role of public debt for the allocation of resources and economic prosperity is a fundamental building block of many classical economic theories. In Chapter III of the *Wealth of Nations*, Adam Smith argues that *"when the public expense is defrayed by funding, it is defrayed by the annual destruction of some capital which had before existed in the country; by the perversion of some portion of the annual produce"* (Smith, 1776, p.878). Classical economists also debated about rules to restrict government debt. David Ricardo, for instance, recommended that government expenditure should under no circumstances be financed by means of borrowing (Ricardo, 1817). Given that the mechanisms of fiscal rules were well understood in the early days of the economic profession, we expect that fiscal rules may have influenced historical rates of economic growth.

We use data on historical constitutional fiscal rules from a novel dataset collected by the Comparative Constitutions Project (CCP, Elkins et al., 2020). The dataset provides information on constitutions for all independent countries from 1789 to present and has been used in new studies (e.g. Amick et al., 2020; Asatryan et al., 2018; Bjørnskov and Voigt, 2018).

Our definition of fiscal rules in the historical context follows Asatryan et al. (2018). This classification requires that two criteria are fulfilled. First, the constitution must hold that revenues and expenditures are laid out by legislation. Second, the constitution must state the requirement for balanced budgets.[1]

Figure (1) shows the share of countries with constitutions. The CCP includes data on constitutions for all independent countries since 1789, but only two countries (the United Kingdom and the United States) had a constitution ratified in 1789. Many of these early constitutions were vulnerable. For instance, the constitution in the Commonwealth of Poland came into force in 1792, much earlier than in most other European countries. After invasions carried out by the Russian Empire, the Kingdom of Prussia, and the Habsburg Monarchy, the Commonwealth of Poland ended in 1795. It was not until 1920 that the Polish Republic was to have a constitution again. This and many other examples from the late 18th and the early 19th century underline the slow course of constitutionalization at that time. Starting in the 1820s the share of sovereign states with constitutions increased

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[1]Balanced budget rules are formulated differently in national constitutions. Hence, fiscal rules according to the measure described above can be thought of as "an indicator for a country's stated constitutional preference for a balanced budget" (Asatryan et al., 2018, p.109).
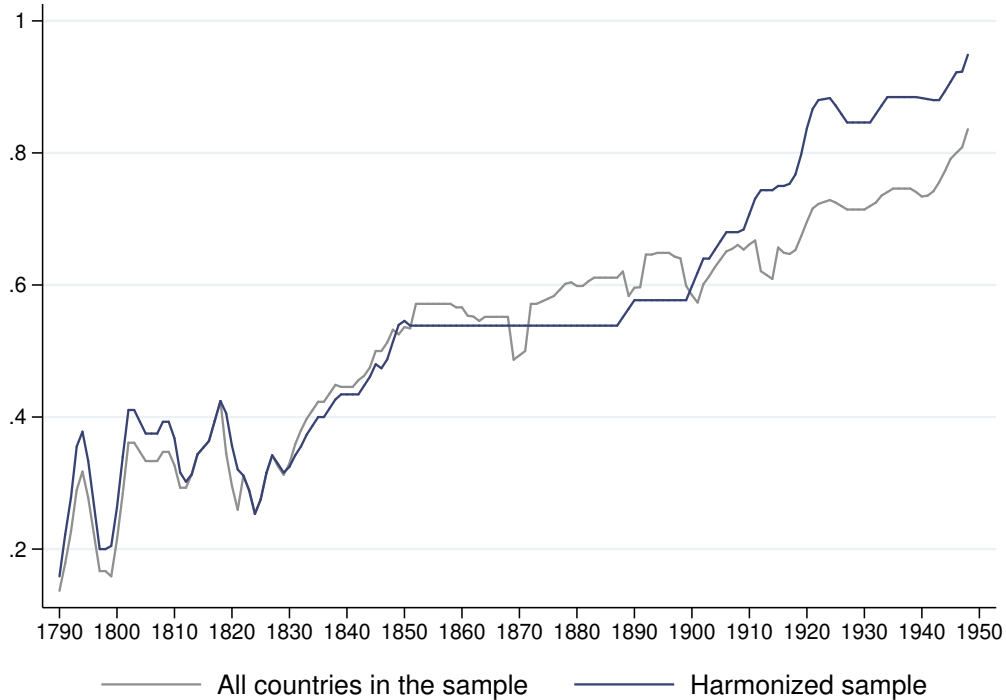
Figure 1 SHARE OF COUNTRIES WITH CONSTITUTIONS, 1789–1950.
Notes: The figure shows the share of countries with formal constitutions for the sample of all countries across the globe (blue line) and a harmonized sample of countries for which data is available for the period 1820–1950.

steadily over time. At the end of our historical sample in the year 1950, about 85% of countries had some form of constitution.

To account for potential concerns related to a sample selection bias, we use three strategies. First, we use the broadest possible sample of countries for which data is available. For robustness analyses, we also restrict this sample to the period after 1820, where constitutionalization started to spread steadily across countries. Second, we use a harmonized sample of countries for which data is available in the 1820s. This sample includes 26 countries, 21 of which have been OCED member states in 2020.[2] We also restrict this sample to current OECD member states. Finally, our historical sample only runs until 1950. After 1950, data availability increased drastically, and many of the more recent data series (e.g. the Penn World Tables version 9.1, which includes data from 1950 onward) are incomparable with our historical datasets.

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[2]The sample includes data for: Australia, Austria, Belgium, Chile, China, Denmark, Finaland, France, Germany, Greece, India, Indonesia, Ireland, Italy, Japan, the Netherlands, Norway, Peru, Poland, Portugal, South Africa, Spain, Sweden, Switzerland, the United Kingdom, and the United States.

2.2 Fiscal rules from the mid-1980s to the mid-2010s

To examine how fiscal rules influence modern economic growth, we use data on the Fiscal Rules Dataset provided by the International Monetary Fund. The dataset was first collected by Schaechter et al. (2012) and later expanded by the Fiscal Affairs Department of the IMF. The dataset contains detailed information on the type of rules (budget balance rules, debt rules, expenditure rules, and revenue rules) and presents country-specific details on various characteristics of rules, such as their legal basis, coverage, monitoring and enforcement procedures, and escape clauses. It also includes supranational fiscal rules. Contrary to our historical dataset, fiscal rules collected by the IMF do not necessarily need to be included in the national constitution. The IMF data distinguish between five layers of legal basis, including political commitment, coalition agreement, statutory rules, international treaty, and constitutional rules. Data on fiscal rules is available for the period 1985–2015. During this period, fiscal rules have been in place in 96 countries. Figure (2) shows the countries with fiscal rules in our "modern sample". The figure highlights countries with fiscal rules in place in at least one of the sample years (1985–2015). Fiscal rules have been in place in each continent, but they are more prevalent in Europe, North America and Latin America than in Africa or Asia.

From the mid-1980s to the mid-2010s, fiscal rules were in place in 48.54% of the country-year observations (1,339 country-years in total) included in the IMF dataset. This dataset, however, only considers countries with at least one fiscal rule in place between 1985 and 2015. If we consider all countries, including those that never implemented a fiscal rule during the observation period, the share of countries with fiscal rules declines to 26.02%. Figure (C-1) in the appendix shows how the total number of countries with fiscal rules has developed over time. While there have been few countries with fiscal rules in place during the mid-1980s, we observe a steady increase in the use of fiscal rules starting in the early 1990s.

2.3 Fiscal rules on the sub-national level

We compile a new dataset on sub-national fiscal rules to examine how fiscal rules imposed on regional governments influence economic growth. The dataset includes 206 regional governments in 10 federal states for the period 1985–2020. We conduct manual text analyses of the constitutions of regional governments to identify the periods during which fiscal rules have been adopted in the constitution. Table (D-1) in the appendix surveys the sub-national governments, including information on whether states had fiscal rules in the observation period, the periods during which fiscal rules had been in place, and the sources upon which our fiscal rules variable is coded (in most cases, we relied on constitutions, but we also used additional expert-based sources in case the timing of the ratification was unclear). In total, the dataset includes 7,416 country-year observations. We focus on
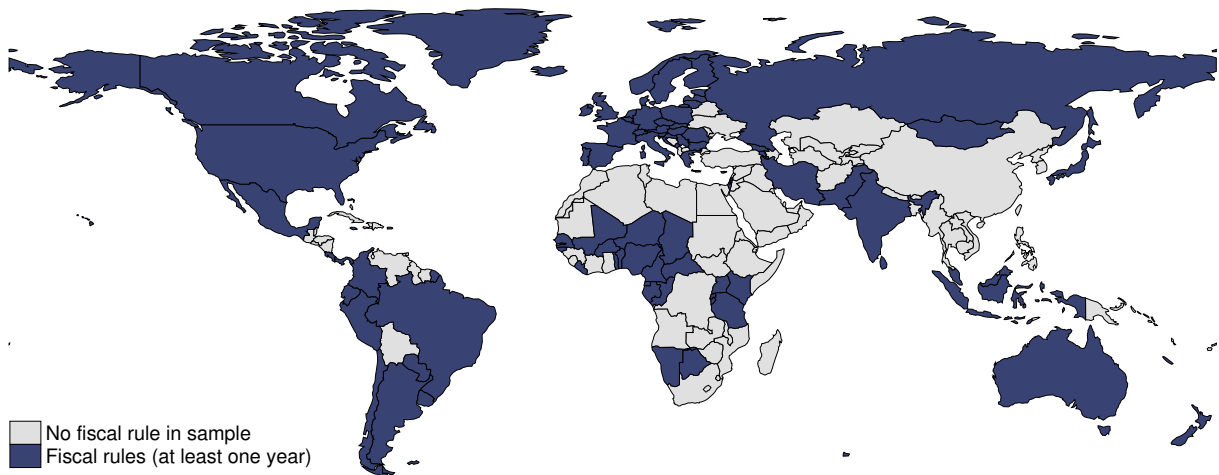
Figure 2 FISCAL RULES IN THE WORLD, MODERN SAMPLE, 1985–2015.
Notes: The figure shows all countries with fiscal rules in place (national and supranational) in at least one year of the modern sample (1985–2015). Countries with at least one fiscal rule in place are marked blue, countries with no fiscal rule are marked grey. Data refers to the Fiscal Rules Dataset of the IMF (see Schaechter et al., 2012 for details).

federal states, which have their sovereign powers divided between the central authority and the self-governed federated states. Unlike in non-federal states, regional governments in federal states enjoy some control over their internal affairs, which is a key requirement for independent public finances. Regional governments in federal states typically have their own state-level constitutions, where the organization of regional public finances is enshrined in law. We only collect fiscal rules that have been adopted in the state-level constitutions.

Our dataset covers observations for 10 federal states with developed economic institutions, including Argentina, Australia, Austria, Belgium, Brazil, Canada, Germany, Mexico, Switzerland, and the United States.[3] Of the 7,416 country-year observations in our sample, fiscal rules have been adopted in state-level constitutions for 3,855 country-year observations (52.2% of cases). This number resembles the share on the country-level (48.5%, see Section 2.2). Figure (3) shows the prevalence of regional fiscal rules across time (upper graph) and across countries (lower graph). Similar to the development across countries (Figure C-1), the number of regional governments with fiscal rules has increased substantially over time. There is, however, large heterogeneity in use of sub-national fiscal rules across countries.

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[3]Federal states not included in our list are, for instance, Comoros, Ethiopia, Micronesia, Nigeria, Pakistan, Palau, St. Kitts and Nevis, South Africa, the United Arab Emirates, and Venezuela. We exclude these countries because institutions and the public sectors are less developed compared with the other countries in our sample.

Development of sub–national fiscal rules over time (% of sub–national governments)

Sub–national fiscal rules across federal states, 1985–2020 (% of sub–national governments)
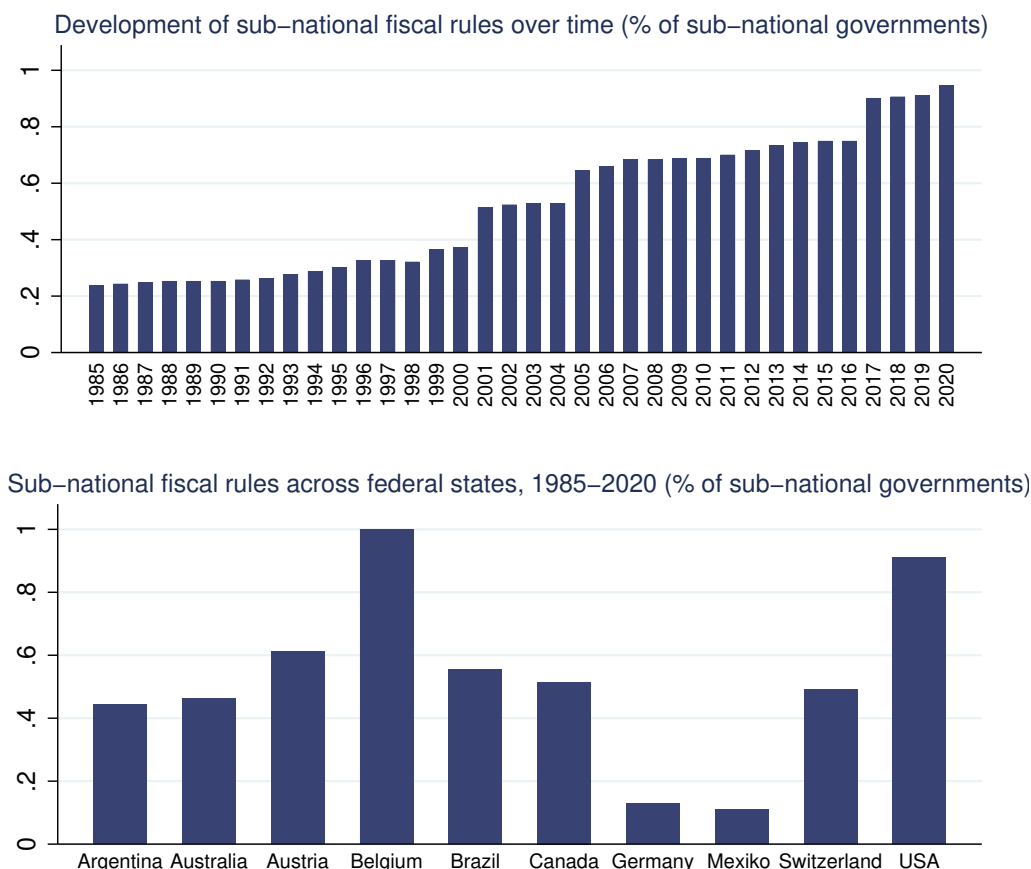
Figure 3 FISCAL RULES IN STATE-LEVEL CONSTITUTIONS, 1985–2020
Notes: The figure shows the share of states with fiscal rules adopted in their constitutions. The upper graph shows the development of this share for the entire dataset between 1985 and 2020. The lower graph shows the share of sub-national governments with fiscal rules in their constitution separately for the countries included in our dataset. The share in the lower graph refers to the full observation period between 1985 and 2020.

2.4 GDP data

Data on historical real per capita GDP is taken from the Maddison Project Database 2018 (for details, see Bolt et al., 2018). The dataset revises and updates the original dataset on historical economic development compiled by the historical statistician Angus Maddison (Maddison, 1995; Maddison, 2006; Maddison, 2007). The updated version includes estimates on real per capita GDP that, in principle, reach back to the year 1 (estimates are available, for example, for France, Greece, and Egypt), but there is a substantial surge in data availability from 1820 onward. Data is available for 169 countries. The goal of the Maddison Project Database is to provide systematic and broad cross-country information on comparative income levels for the period before 1950 (Bolt et al., 2018).

From 1950 onward, the gold standard in providing harmonized country measures of real GDP is the Penn World Table (PWT) (for details, see Feenstra et al., 2015). The most
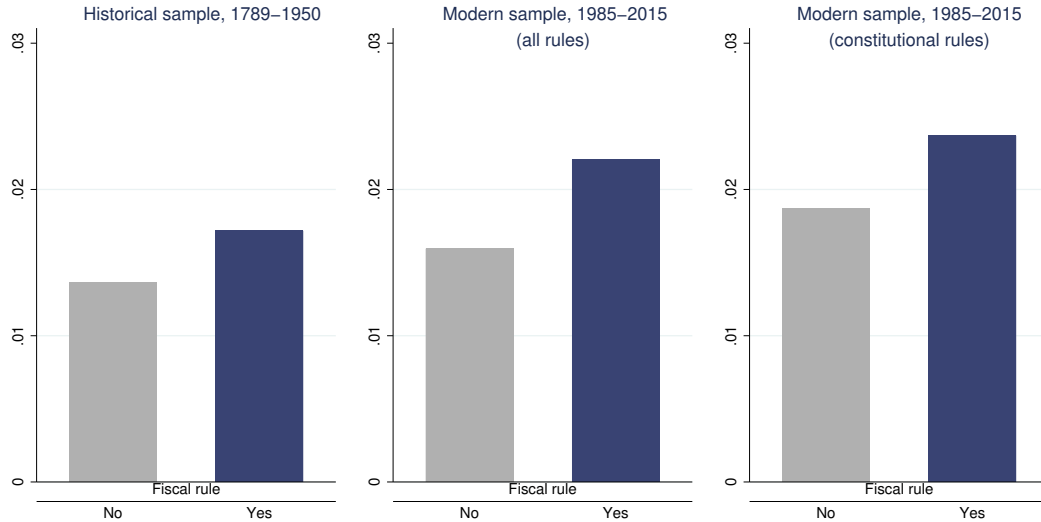
Figure 4 FISCAL RULES AND AVERAGE RATES OF ECONOMIC GROWTH.
Notes: The figure shows average growth rates for country-years with and without fiscal rules for each of our samples. The figure on the left-hand side uses data on fiscal rules from the Comparative Constitutions Project (CCP, Elkins et al., 2020). The CCP includes data on balanced budget rules that have been adopted in national constitutions. The figures in the middle and on the right-hand side use data on fiscal rules from the Fiscal Rules Dataset of the International Monetary Fund (Schaechter et al., 2012). This dataset covers the period 1985–2015.

recent version of the PWT is version 9.1, which was released in 2019 and includes information on 180 countries between 1950 and 2017. We use this dataset for our modern sample of economic growth.

Figure (C-3) in the appendix shows comparative economic development between 1789 and 2016. The figure shows that worldwide per capita income has increased substantially during the past 250 years. There is, however, strong and persistent heterogeneity in living standards across geographical regions.

For our sub-national analysis we use data on economic development on the first-level administrative level (ADM1) provided by Lessmann and Seidel (2017).[4] The dataset is computed based on nighttime lights collected from satellite data provided by the National Oceanic and Atmospheric Administration (NOAA). Estimates for sub-national levels of Gross Regional Product (GRP) is available for the period 1992–2012.

2.5 Descriptive evidence on fiscal rules and growth

Figure (4) shows real per capita GDP growth rates for countries with and without fiscal rules in their constitutions. The figure on the left-hand side reports growth rates for our historical sample and uses data on fiscal rules from the Comparative Constitutions

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[4]First-level administrative regions in federal states are sub-national units with own constitutions. For example, the 26 Cantons of Switzerland, the 16 Bundesländer of Germany, and the 50 U.S. states are classified as ADM1 regions.
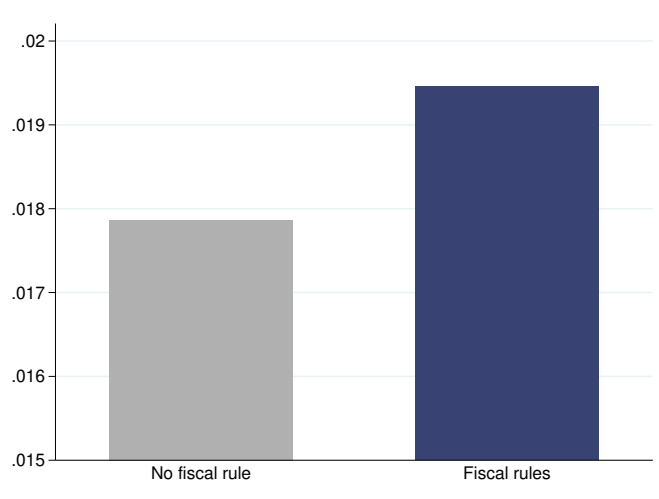
Figure 5 FISCAL RULES AND AVERAGE RATES OF ECONOMIC GROWTH, REGIONAL GOVERNMENTS.
Notes: The figure shows average growth rates for country-years with and without fiscal rules in the constitution for regional governments. The figure includes all country-year observations for which data on economic growth is included in the Lessmann and Seidel (2017) dataset and for which our sub-national dataset includes information on regional fiscal rules. Our dataset includes a total of 206 regional governments from Argentina, Australia, Austria, Belgium, Brazil, Canada, Germany, Mexico, Switzerland, and the United States.

Project (CCP). The CCP includes balanced budget rules that are adopted in national constitutions. The figures in the middle and on the right-hand side use data on fiscal rules from the Fiscal Rules Dataset of the International Monetary Fund (Schaechter et al., 2012), which is available for the period 1985–2015 (see Section 2 for a detailed description of the datasets). The figure in the middle is based on all types of fiscal rules. The figure on the right-hand side is based on constitutional rules to facilitate comparison with the historical data. The figure shows that growth rates have been higher for country-year observations with fiscal rules than for country-year observations without fiscal rules.

In Figure (C-2) in the appendix, we compare growth rates of countries with and without fiscal rules in our modern sample across decades. This analysis shows that there is heterogeneity across time.

Figure (5) shows differences in economic growth across federal states with and without fiscal rules in their state-level constitution. We observe that average growth rates in states with fiscal rules are higher (1.95%) than in states without fiscal rules (1.78%).

Taken together, the descriptive statistics suggest that growth in countries that have adopted fiscal rules were higher than in those that have not adopted fiscal rules. This difference is particularly pronounced for constitutional fiscal rules. There is, however, considerable heterogeneity across both time and countries.

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3 Country-level results

3.1 Estimation strategy

Our approach to estimate how fiscal rules influence economic growth on the country level is a generalized difference-in-differences design. We follow St. Clair and Cook (2015) in specifying empirical public finance models based on longitudinal cross-country data. Our econometric model is also closely related to Asatryan et al. (2018), who use country-level data to examine how fiscal rules influence fiscal outcomes. We estimate variants of the specification

$$y_{it} = \gamma F_{it} + \mathbf{X}_{it}\boldsymbol{\rho} + \eta_i + \zeta_t + \nu_c \times \mu_d + \varepsilon_{it}, \tag{1}$$

where the binary variable F_{it} is 1 if a country i has adopted a fiscal rule in the constitution in year t (and 0 otherwise). The outcome variable, y_{it}, is the log of real per capita GDP. To account for period-specific shocks and trends in GDP (e.g. because of crises), we include year fixed effects ζ_t. The descriptive statistics in Section (2.5) have shown that there is large heterogeneity in use of fiscal rules across regions. To handle the spatial dependency in the adoption of fiscal rules, Equation (1) includes country fixed effects η_i, implemented by country dummies. The country fixed effects also account for any source of cross-country heterogeneity in time-invariant factors that may influence the probability to adopt or abolish (e.g. via escape clauses) fiscal rules, such as exposure to natural disasters or vulnerability to economic crises. Fixed effects also eliminate cross-country differences in institutions (Acemoglu et al., 2019), climatic factors (Masters and McMillan, 2001) and natural resources (Rodríguez and Sachs, 1999), which have been shown to influence GDP growth. Both the propensity to implement fiscal rules and the rate of growth may also depend on the broader geographical location and, given that our sample includes data for more than two centuries, the specific time period. To account for these factors, our model also includes decade-specific continent effects $\nu_c \times \mu_d$. Any other unobservable shock to GDP is absorbed by the idiosyncratic error ε_{it}. In our robustness analyses, we also control for selection on observables, controlling for potential confounding factors that are correlated simultaneously with GDP and the probability to adopt fiscal rules in the constitution ($\mathbf{X}_{it}$).

3.2 Identification

Identifying how fiscal rules influence economic growth based on Equation (1) is difficult, because the treatment may well be endogenous. The threat of endogeneity in our model does not come from measurement errors, because the exact timing at which countries changed their constitutions and adopt fiscal rules is documented. Rather, our strategy faces three potential sources of endogeneity caused by (i) a selection bias, (ii) confounding

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factors (observable and unobservable), and (iii) the entanglement of the adoption of fiscal rules and other constitutional changes.

The first potential source of endogeneity is based on a selection bias if past levels of GDP influence the probability that a country implements fiscal rules. To tackle the possibility of a selection bias, we include GDP dynamics prior to the introduction of fiscal rules in the constitution, augmenting Equation (1) via

$$y_{it} = \sum_{j=1}^{J} \beta_j y_{it-j} + \gamma F_{it} + \mathbf{X}_{it} \boldsymbol{\rho} + \eta_i + \zeta_t + \nu_c \times \mu_d + \varepsilon_{it}, \tag{2}$$

where $\sum_{j=1}^{J} \beta_j y_{it-j}$ denotes GDP dynamics. In our preferred specification, we include four lags of GDP per capita for two reasons: first, the standard assumption of linear dynamic panel models requires that the error term ε_{it} is serially uncorrelated and that fiscal rules and past levels of GDP are orthogonal to current and future shocks to GDP (*sequential exogeneity*).[5]

To fulfill this assumption, it is required to include a sufficiently long time period to account for GDP dynamics that may influence the probability of the adoption of fiscal rules. Second, including a sufficiently long lag structure ensures that real per capita GDP follows a stationary process, enabling consistent parameter estimates and well-behaved limit distributions. Hamilton (2018) shows that including four lags of the dependent variable creates stationary series with very high probability. Also, Acemoglu et al. (2019) have shown that the results of empirical growth regressions are most stable when GDP dynamics are modeled based on four lags.

Our empirical strategy rests on the assumption that the potential bias from a selection on past economic conditions is eliminated after the model accounts for GDP dynamics prior to introducing fiscal rules. We test for selection bias in Equation (2) in an event study analysis, showing that the effect of fiscal rules on economic growth in years leading to their introduction are statistically indistinguishable from zero. Hence, the parallel trends assumption is likely to be fulfilled.

A second source of endogeneity could arise from the failure to account for omitted factors that are correlated with both GDP and the probability that a country implements fiscal rules. To the extent that these factors are observable, we account for this source of endogeneity in our robustness analyses when we include covariates $\mathbf{X}_{it}$. To the extent that these factors are time-invariant and unobservable, they are absorbed by our country-level fixed effects. To the extent that confounding factors are time-varying and unobservable, our estimates may be biased in the event that unobservables are uncorrelated with past

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[5]The assumption in our case is

$$\mathrm{E}\left(\varepsilon_{it} | y_{it-1}, \ldots, y_{it_0}, F_{it}, \ldots, F_{it_0}, \eta_i, \zeta_t, \nu_c \times \mu_d\right) = 0, t = 1, \ldots, T. \tag{3}$$

GDP. We adopt three strategies to tackle this source of bias. First, we implement the method of Oster (2019) to construct a measure that assesses the degree to which the selection on unobservables must be stronger compared to the covariates to eliminate the estimated effect γ. Second, in Section (3.5), we use an instrumental variable strategy to tackle these sources of endogeneity bias on the country-level. We conduct a large-scale international survey among 1,224 economic experts in 109 countries to construct measures for attitudes towards fiscal rules, which we use as an instrumental variable for constitutional fiscal rules. Third, we collect a new dataset on fiscal rules in federal states on the sub-national level (first-level administrative regions, ADM1) and exploit sub-national variations for identification.

A final source of bias comes from the simultaneity of constitutional changes and the adoption of fiscal rules. It is unclear whether the estimates are driven by the adoption of fiscal rules or by the change in constitutions *per se*. To address this concern, we create a variable that captures the timing at which new constitutions were drafted or existing constitutions were amended.

3.3 Fiscal rules from the Industrial Revolution to World War II

3.3.1 Historical results

Table (1) reports the empirical results for our historical sample. The main result is that in a historical context, countries with fiscal rules in their constitution have higher growth rates than countries with no fiscal rules in place. Column (1) reports baseline results for our full historical sample between 1789 and 1950. The parameter estimate for constitutional fiscal rules is positive and statistically significant at the 1% level ($t = 15.89$). Having a fiscal rule in the constitution is associated with a short-run increase in per capita GDP growth of 1.4%.

In Columns (2)–(6), we conduct robustness analyses of our baseline estimate. Our preferred specification in Column (1) accounts for clustering of standard errors within countries. In Column (2), we use two-way clustering (Cameron et al., 2011) to also account for systematic autocorrelation on the continent level. Given the long time span of our dataset and the distinct geographical patterns in comparative development (see, e.g., Figure C-3), we might expect that there is serial correlation within geographic regions. In Columns (3) and (4), we disentangle the effect of fiscal rules from that of constitutions *per se*. We reduce the sample to observations of countries that have a constitution in place at a given point in time (Column 3) and introduce an indicator variable that is one in years when a new constitution was drafted or the existing constitution was amended, and zero in case of "non-events" (Column 4). Column (5) includes continent-decade fixed effects to account for asynchronous developments of GDP across geographic regions and across time periods in our large sample. This specification addresses the concern that

the Industrial Revolution spread differently across continents and had major impact on the development of real per capita GDP. Figure (1) shows that many constitutions have been vulnerable during the Industrial Revolution until the early 19th century. There was, however, substantial progress in constitutionalization after 1820. To rule-out that our results are driven by fluctuations in the early periods of our sample, we only consider country-year observations after 1820 in Colunm (6). Inferences do not change when we account for potential sources of bias in Columns (2) to (6). The parameter estimate retains its statistical and economic significance in each specification, and the parameters are statistically indistinguishable from the baseline outcome of Column (1) (see the test for equality of coefficients reported in row "Equality" in Table 1).

The sample of countries included in the estimates of Table (1) changes over time. A threat to the validity of the estimates may be that the results are driven by a changing sample composition. In Table (B-2) in the appendix, we present estimates based on a harmonized sample that only included countries for which data reaches back to the year 1820 (see Section 2.1 for a description). Columns (1)–(3) report results for all countries in the harmonized sample, Columns (4)–(6) report separate effects for those countries in the harmonized sample that are currently members of the OECD. Restricting the sample hardly changes the inferences. The parameter estimates in the baseline model of the harmonized sample (0.0179) and the harmonized sample of OECD countries (0.0169) are close to the parameter obtain based on all available country-years (0.0143, Column 1 of Table 1). If anything, the parameters are larger when focusing on a harmonized sample, but there is no statistically significant difference between the coefficients of the harmonized samples and the full sample.[6]

3.3.2 Robustness of the historical results

Threats to the validity of our results come from three sources: (i) the assumption of parallel trends in GDP prior to the introduction of fiscal rules may be violated (selection bias), (ii) there may be a bias caused by observable confounding factors ("selection on observables"), (iii) there may be a bias caused by unobservable confounding factors ("selection on unobservables"). We now investigate these threats.

Parallel trends assumption: An important assumption of our empirical strategy is that there are no systematic differential trends in GDP of countries with and without fiscal rules ("parallel trends"). To assess the plausibility of this assumption, we examine the dynamics between constitutional fiscal rules and economic growth by using a flexible event study. The flexible event study shows the effect of fiscal rules in years before and years after their introduction in the constitution

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[6]The Wald test for equality of the parameter estimates delivers p-values of 0.1106 (harmonized sample) and 0.2474 (harmonized sample, OECD members).

Table 1 FISCAL RULES AND ECONOMIC GROWTH—HISTORICAL RESULTS, 1789–1950

Dependent variable: Logarithm of GDP (per capita), y_{it}

	Full sample (1789–1950) Baseline Model (1)	Full Sample (1789–1950) Two-way clust. (2)	Full Sample (1789–1950) Constitut. (3)	Full Sample (1789–1950) Δ Constitut. (4)	Full Sample (1789–1950) C×D FE (5)	Post-1820 (1820–1950) C×D FE (6)
Fiscal Rule$_{it}$	0.0143***	0.0143***	0.0124**	0.0124**	0.0136**	0.0138**
	(0.0023)	(0.0008)	(0.0044)	(0.0045)	(0.0047)	(0.0051)
$y(t-1)$	0.905***	0.905***	0.917***	0.916***	0.876***	0.880***
	(0.0276)	(0.0193)	(0.0325)	(0.0326)	(0.0281)	(0.0281)
$y(t-2)$	-0.0461*	-0.0461**	-0.0239	-0.0241	-0.0506**	-0.0547**
	(0.0255)	(0.0218)	(0.0274)	(0.0275)	(0.0253)	(0.0267)
$y(t-3)$	0.0405	0.0405	-0.00713	-0.00709	0.0426	0.0346
	(0.0299)	(0.0328)	(0.0395)	(0.0395)	(0.0309)	(0.0301)
$y(t-4)$	0.0367	0.0367**	0.0335	0.0336	0.0506	0.0480
	(0.0312)	(0.0181)	(0.0392)	(0.0392)	(0.0312)	(0.0318)
Observations	4,229	4,229	2,961	2,961	4,229	3,956
Countries	54	54	46	46	54	54
R-Squared	0.868	0.868	0.841	0.841	0.827	0.809
F-Stat	1859.3	42810.1	935.9	911.5	730.7	686.8
F p-val	0.000	0.000	0.000	0.000	0.000	0.000
Equality	–	0.968	0.662	0.673	0.890	0.919
Country FE	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
C × D FE	No	No	No	No	Yes	Yes

Notes: The table shows the results of our estimations on the effect of constitutional fiscal rules on economic growth in a historical perspective over the period 1789–1950 (Equation 2). Robust standard errors (adjusted for arbitrary heteroskedasticity and clustering by countries) are reported in parentheses. The log of per capita GDP is measured in 2010 US-Dollar, data on fiscal rules is collected by the Comparative Constitutions Project (CCP) from Elkins et al. (2020). The variable "Fiscal Rule" denotes whether a fiscal rules has been in place in the constitution in a given year. Fiscal rules in the CCP sample are balanced budget rules. The row labeled "Equality" reports the p-value of a test on equality between the baseline parameter estimate (Column 1) and the corresponding parameter estimates of Columns (2)–(6).

***   Significant at the 1 percent level,
**   Significant at the 5 percent level,
*   Significant at the 10 percent level
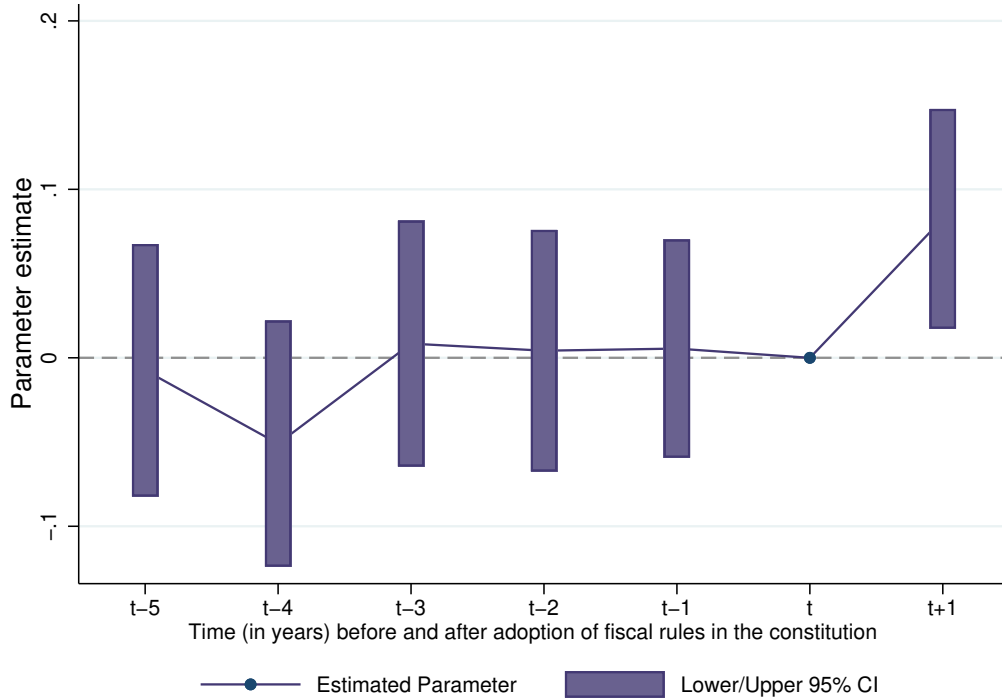
Figure 6 EVENT STUDY ANALYSIS, FISCAL RULES AND ECONOMIC GROWTH.
Notes: The figure shows trends in real per capita GDP (log scale) before the introduction of constitutional fiscal rules. The figure plots yearly point estimates of our historical model (Equation 2) on the effect of the adoption of a fiscal rule in the constitution in year t on real per capita GDP.

$$y_{it} = \sum_{j=1}^{j=4} \beta_j y_{it-j} + \sum_{T=t-5}^{T=t+1} \delta_T (\mathrm{F})_{it}^T + \eta_i + \zeta_t + \varepsilon_{it}. \tag{4}$$

The results in Figure (6) do not show that there is an effect of fiscal rules on growth in the five years leading to their introduction in the constitution. These results suggest that the parallel trends assumption is not violated and the results are not distorted by anticipation effects.

Selection on observables: An additional source of bias may arise from confounding factors that are simultaneously correlated with economic growth and the adoption of fiscal rules. The demographic transition is an important building block of theoretical models describing the take-off from stagnation to sustained growth. Starting in the mid-19th century, mortality and fertility dropped sharply in many Western countries. This decline explains a substantial part of the observed differences in comparative development (Cervellati and Sunde, 2011; Cervellati and Sunde, 2015). In Table (B-3) in the appendix, we control for population dynamics to rule out that our results are biased by demographic changes that took place in our sample period. Doing so hardly changes the inferences. In Table (B-4), we control for additional confounders, including political institutions at the

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time fiscal rules were introduced, as well as data on intra-state, inter-state, and extra-state war.[7] By including measures of democracy, we disentangle the adoption of fiscal rules and franchise extension. In many countries, suffrage increased substantially during our historical observation period (for franchise extension in Europe in the 19th and 20th century, see Aidt and Jensen, 2014). Accounting for war addresses the argument documented in many historical sources that fiscal consolidation took place as a reaction of extraordinary spending during war times (see, e.g., Wagner, 1902 for public finances of the German Empire). It also eliminates confounding effects from World War I. Including these factors does not change the inferences. The inferences also do not change if we exclude all war periods from the sample (not reported).

Selection on unobservables: A final source of endogeneity bias may come from selection on unobservables. We cannot rule out that our results are driven by unobservable time-varying factors, but we can estimate the degree to which selection on unobservables must be stronger than selection on observables to nullify our estimated effect of fiscal rules (see Oster, 2019 for computational details).[8] The results show that selection on unobservables has to be 9.77 times larger than selection on GDP dynamics and fixed effects to cancel out our estimated effect (the usual threshold considered to define robust results is $\delta = 1$). It is therefore unlikely that the estimated effect of fiscal rules on economic growth is spurious.

Conditionality: We test whether the growth effect of fiscal rules depends on the level of public debt (Figure C-4 in the appendix). We augment our benchmark model (Equation 2) by an interaction term between government debt and fiscal rules. Data on government debt is taken from Jordà et al. (2017). The results show that fiscal rules are particularly growth-enhancing when public indebtedness is high. However, the results are not directly comparable with the baseline estimates, because historical data on public debt is available only for up to 17 countries from 1870 onward.

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[7]Historical data on democracy comes from the dataset compiled by Foldvari (2014). Data on war is collcted from Sarkees and Wayman (2010). "Extra-state wars" are wars between a state and a non-state entity outside the borders of the state.

[8]The bound around the parameter estimate of fiscal rules is

$$\gamma^* \approx \tilde{\gamma} - \delta(\dot{\gamma} - \tilde{\gamma}) \frac{R_{\max} - \tilde{R}}{\tilde{R} - \dot{R}},$$

where $\tilde{\gamma}$ is the parameter estimate of our baseline model and $\dot{\gamma}$ is the intercept of a simple liner regression model of real per capita GDP in log terms on our fiscal rules variable and $\dot{\gamma}$. The Oster (2019) approach allows to estimate δ, giving the proportional degree of selection to match our parameter estimate $\tilde{\gamma}$.

3.3.3 Case study: Fiscal rules in the German Empire, 1871–1918

To substantiate our historical findings, we examine the effects of the balance budget rule of the German Empire ("Deutsches Kaiserreich"). The constitution of the German Empire, often referred to as the Bismarck imperial constitution ("Bismarcksche Reichsverfassung (BRV)"), came into effect on 4 May 1871. The constitution organized the German Empire as a federation of 25 states under the permanent presidency of Prussia. Section XII of the constitution includes detailed rules regarding public finances of the German Empire. In Article 73, the constitution stipulates that taking debt is only allowed in *"cases of extraordinary need"*.[9]

Figure (7) shows how real per capita GDP of the German Empire has developed between 1860 and 1875. In 1860, average real per capita income in Germany was 3,312 USD, which was about the level of the United States (3,425 USD), but substantially less than the United Kingdom (4,988 USD), the Netherlands (4,334 USD) or Switzerland (5,456 USD). Between 1860 and 1871, per capita incomes in the German Empire grew by an average of 0.94% per year. After the introduction of the constitution and the adoption of a budget balance rule in 1871, the annual growth rate increased substantially (3.84% per year until the end of the observation period in Figure 7). A key question is what the counterfactual growth rate without the introduction of the balanced budget rule would have been. Computing such a counterfactual is difficult because the introduction of the fiscal rule was based on a well-considered and potentially preference-driven decision by the founders of the constitution. We use the synthetic control method invented by Abadie and Gardeazabal (2003) to obtain an estimate of the counterfactual development of GDP.[10] The donor pool includes all industrialized Western countries for which data on constitutional fiscal rules and real per capita GDP is available for the entire period between 1860 and 1875 and that have been on a similar development path as the German Empire. A concern is that the increase in growth after 1871 was triggered by the new constitution rather than by the balanced budget rule. We cannot fully rule out this concern, but we address the possibility of a "constitution-effect" by only considering countries as donors that (i) had a formal constitution in place and that (ii) did not have a fiscal rule in the constitution over the entire observation period (14 countries in total).

Figure (7) shows that per capita GDP in the synthetic German Empire would have increased as well during the post-1871 period, but this increase would have been slower without the budget balance rule. We provide accompanying evidence in Figure (C-5) in

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[9]The original wording is: *"In Fällen eines außerordentlichen Bedürfnisses kann im Wege der Reichsgesetzgebung die Aufnahme einer Anleihe, sowie die Uebernahme einer Garantie zu Lasten des Reichs erfolgen"* (engl.: *"In cases of extraordinary need, the taking of a bond as well as the inclusion of a guarantee can take place at the expense of the Reich by means of the Reich legislation"*). In Article 69 et sequ., the BRV also holds that revenue and surpluses from previous years had to cover spending.

[10]To measure the synthetic German Empire, we use all pre-treatment outcomes and no additional predictors (e.g. Doudchenko and Imbens, 2016).
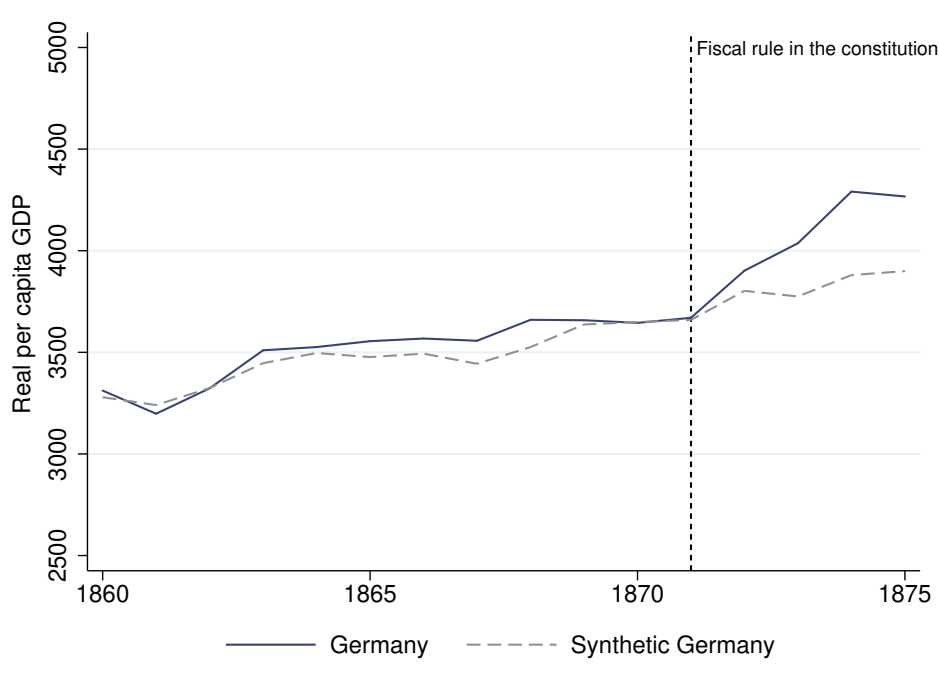
Figure 7 CASE-STUDY: FISCAL RULES IN THE GERMAN EMPIRE, SYNTHETIC CONTROL METHOD.

Notes: The solid line shows the development of real per capita GDP in the German Empire, the dashed line is the counterfactual development suggested by the synthetic control group. The donor pool includes all Western industrial countries for which data on constitutional fiscal rules and real per capita GDP is available for the entire period between 1860 and 1875 and that did not have constitutional fiscal rules in place during that time (14 countries in total). We also restrict the donor pool to countries with constitution in place over the whole period to rule out that the results are confounded by a "constitution-effect". The empirically computed weights are: Belgium: 30.9%; Denmark: 15.9%; the United States: 18.7%; France: 13.6%; Italy: 13.7%; and Sweden: 7.2%.

the appendix, where we use indices of real per capita GDP with base year 1871 for the German Empire and all countries included in the donor pool. Again, the development in the German Empire for the post-1871 period outperformed that of all countries in the donor pool.

3.4 Fiscal rules and modern economic growth

3.4.1 Baseline results for the period 1985–2015

Many countries in our historical sample experienced a surge in economic growth during the early 19th century. This stark increase was initiated by the transition from hand production methods to new chemical and iron production, the increasing use of railroads and steam power, and the rise of mechanized factory systems and machine tools (Gordon, 2015). Technological progress gave rise to a fundamental change in the structure of economies and promoted the transition from stagnation to growth (Galor and Weil, 1999; Galor, 2005). The Industrial Revolution coincided with the adoption of the first constitutional fiscal rules. By focusing on the growth effects of fiscal rules during the past

four decades, we rule out that our results are confounded by the substantial structural changes during the 19th century.

Table (2) reports our results for the period 1985–2015. We select this period for three reasons: first, the Fiscal Rules Database of the IMF is by far the most complete collection of fiscal rules in modern times (see Section 2.2). The most recent update of this dataset includes observations for the period 1985–2015. Second, Figure (2) shows that fiscal rules are particularly used in industrialized countries. By focusing on the growth process from between the mid-1980s and the mid-2015s, we rule out that the results are driven by the strong post-war growth rates in many industrialized countries in the aftermath of World War II. These effects lasted until the 1970s (Smolny, 2001). Third, the adoption of fiscal rules has increasingly picked up pace during the past four decades (see Figure C-1).

Our preferred specification, presented in Table (2), is based on a harmonized sample of countries and years. First, we only include country-year observations during which constitutions have been in place. There has been a rapid process in constitutionalization after World War II, with the majority of countries possessing a form of constitution in our sample.[11] By focusing on constitutionalized countries, we rule out that the estimated parameters capture the effect of constitutions rather than the effect of fiscal rules. Second, we only include countries that had fiscal rules adopted at least once during the period 1985–2015. This restriction alleviates concerns about fiscal preference as an unobservable confounding factor, as we can assume that countries with fiscal rules are more homogeneous in terms of stability preferences.

The main result of Table (2) is that fiscal rules are positively associated with economic growth only if they are anchored in the constitution. To measure fiscal rules, we construct an indicator variable that is 1 if a country has adopted a fiscal rule in a given year (0 otherwise). We distinguish between four layers of legal base, including any type of rule (Column 1), national rules (Column 2), supra-national rules (Column 3), and constitutional rules (Column 4). Supra-national rules were used quite often during the past years. For instance, the Fiscal Compact, which has been accepted in 2012 by all EU member countries except of the United Kingdom and the Czech Republic, committed countries to adopt numerical fiscal constraints. Still, the majority of rules included in the IMF dataset are national rules.

The parameter estimates in Columns (1)–(3) are statistically indistinguishable from zero, suggesting that there is no robust correlation between fiscal rules and economic growth. For many of the rules included in the IMF dataset, however, the statutory basis is lax, and sanctions in terms of non-compliance do not exist. About one third of the national fiscal rules are based on coalition agreements and political commitment. Compliance with these types of fiscal rules is generally low. While countries in Europe, for instance, comply

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[11]At the beginning of our sample (mid-1980s), more than 80% of all countries have adopted a form of constitution. In 2000, the share of countries with constitutions was 95%.

Table 2 FISCAL RULES AND ECONOMIC GROWTH—MODERN SAMPLE, 1985–2015

Dependent variable: Logarithm of GDP (per capita), y_{it}

	All Rules (1985–2015) (1)	National Rules (1985–2015) (2)	Supra-National Rules (1985–2015) (3)	Constitutional Rules (1985–2015) (4)
Fiscal Rule$_{it}$	-0.0013	0.0067	0.0045	0.0133***
	(0.0082)	(0.0045)	(0.0098)	(0.0032)
$y(t-1)$	0.980***	0.976***	0.980***	0.980***
	(0.0367)	(0.0347)	(0.0374)	(0.0365)
$y(t-2)$	0.0064	0.0091	0.0064	0.0065
	(0.0330)	(0.0313)	(0.0330)	(0.0328)
$y(t-3)$	0.0009	0.0076	0.0011	0.0011
	(0.0340)	(0.0324)	(0.0340)	(0.0338)
$y(t-4)$	-0.0758***	-0.0836***	-0.0756***	-0.0760***
	(0.0104)	(0.00494)	(0.0105)	(0.0109)
Observations	2555	2535	2555	2555
Countries	88	88	88	88
R-Squared	0.879	0.878	0.879	0.879
F-Stat	182137	1455228	8730	12567
F p-val	0.000	0.000	0.000	0.000
Country FE	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes
C × D FE	Yes	Yes	Yes	Yes

Notes: The table shows the results of our estimations on the effect of fiscal rules on economic growth (Equation 2) for the period 1985–2015. Robust standard errors (adjusted for arbitrary heteroskedasticity and clustering) are reported in parentheses. The log of per capita GDP is measured in 2011 US-Dollar, data on fiscal rules is collected by the IMF Database on Fiscal Rules (see Schaechter et al., 2012 for details). We use information from four legal layers of fiscal rules included in the IMF dataset: The column labeled "All Rules" uses all data on fiscal rules, column "National Rules" only uses fiscal rules on the national level, Column "Supra-National Rules" exploits fiscal rules introduced by mutual agreements on the supranational level, and "Constitutional Fiscal Rules" only considers fiscal rules that are adopted in the constitution. The table focuses on country-years during which formal constitutions have been in place.

  ***   Significant at the 1 percent level,
   **   Significant at the 5 percent level,
    *   Significant at the 10 percent level

with their fiscal rule in about 50% of cases, compliance rates are lower (43%) if fiscal rules are only based on political commitment (Reuter, 2019). Non-compliance is more difficult if compliance is monitored by fiscal councils and other independent institutions. Such enforcement processes are in place in 65% of cases if we consider all fiscal rules in the dataset, but they are obligatory for almost all rules that are enshrined in the constitution (95% of cases). In Column (4), we only consider constitutional fiscal rules. In this case, the estimated parameter is positive and statistically significant at the 1% level ($t = 4.12$). The coefficient suggests that the adoption of fiscal rules in the constitution is associated with a short-run increase in real per capita GDP by 1.3% points. This effect is almost identical to the effect found in the historical analysis (1.4%).

From the estimates in Table (2), we derive the cumulative long-run effect of constitutional fiscal rules, defined as the impact of a change from $F_{it-1} = 0$ to $F_{it+l} = 1$ on $y_{i,\infty}$ for all $l \geq 0$ via (see Acemoglu et al., 2019)

$$\frac{\hat{\gamma}}{1 - \sum_{j=1}^{J} \hat{\beta}_j}. \tag{5}$$

Using the estimates from Column (4), we find that the permanent adoption of a fiscal rule in the constitution is associated with a 15% increase in real per capita GDP in the long-run.

3.4.2 Robustness of the modern results

The information on the characteristics of fiscal rules included in the IMF Fiscal Rules dataset allows for a fine-grained analysis on the sensitivity of our parameter estimates to differences in the organization of rules. We also examine whether the identifying assumption underlying our estimation strategy are plausible. Specifically, we (i) explore alternative sample compositions, (ii) examine whether the effects differ for types of rules, (iii) consider formal monitoring and enforcement mechanisms of fiscal rules, (iv) vary key parameters of our estimation strategy, (v) examine potential sources of a bias caused by selection on observables and violations of the parallel trends assumption, and (vi) discuss potential biases caused by selection on unobservables.

Alternative sample compositions: Our results in Table (2) are obtained based on the restricted sample of countries that (i) had formal constitutions in place and that (ii) had fiscal rules adopted in their constitution in at least one year. In Tables (B-5) and (B-6) in the appendix, we report results when we relax these requirements. Our results are robust to these changes in sample composition. Although the sample increases from 2,555 country-year observations (baseline outcomes) to 2,620 (Table B-5) and 4,513 (Table B-6) observations, the parameter estimate for constitutional fiscal rules retains its statistical and economic significance. The size of the estimated parameter also hardly

changes (ranging from 1.3% to 1.1%).

Types of fiscal rules: For our baseline results, we distinguish between fiscal rules according to their legal basis. Fiscal rules also differ in terms of the fiscal position that they restrict. There are four "types" of fiscal rules: *Debt rules* set an explicit limit on the stock of public debt, *budget balance rules* constrain the size of the deficit, *expenditure rules* limit public spending, and *revenue rules* set ceilings or floors on revenues or determine use of windfall revenues. In Tables (B-7) and (B-8), we examine whether growth effects vary across types of fiscal rules. The tables associate economic growth with types of fiscal rules irrespective of their legal base (Table B-7) and those that are anchored in the constitution (Table B-8). Again, we observe no significant correlation between economic growth and fiscal rules that are not adopted in the constitution. For constitutional rules, there is a positive and statistically significant relationship (at the 1% level) to economic growth for expenditure rules, balanced budget rules, and debt rules. The parameter estimates suggest that the introduction of such rules is associated with an increase in real per capita GDP of between 1.5% and 1.6%. However, there is no statistically significant relationship between growth and fiscal rules that are designed to influence revenues.

Monitoring and enforcement: An explanation for the growth effect of constitutional rules and the absence of an effect for non-constitutional rules may be that monitoring and enforcement mechanisms are stronger for constitutional rules. In Table (B-9), we only consider fiscal rules that have a formal enforcement process in place. Again, we find that only constitutional fiscal rules are positively associated with growth.

Alternative specifications of the empirical model: A key assumption of our estimation strategy is that GDP dynamics can be modeled with four lags of GDP. In Table (B-10), we examine whether our results are robust when we reduce the number of lags. We also examine changes in the effect when using a richer lag structure (not reported). These robustness tests do not change the inferences. Another important assumption of our model in Equation (2) is that once we include GDP dynamics, we eliminate the potential presence of a unit root in GDP (see also Hamilton, 2018). The standard test of Levin et al. (2002) supports this assumption ($p = 0.000$). As a complementary analysis to assess the robustness of our results to unit root levels of persistence in the GDP process, we re-arrange Equation (2) under the explicit assumption of a unit root

$$\Delta y_{it} = \sum_{j=1}^{J} \beta_j' \Delta y_{it-j} + \gamma \mathrm{F}_{it} + \eta_i + \zeta_t + \nu_c \times \mu_d + \varepsilon_{it}, \tag{6}$$

where $\Delta y_{it} = y_{it} - y_{it-1}$. The results, shown in Table (B-11), are comparable to our main outcomes. Hence, we conclude that our results are not affected by unit root dynamics.

Parallel trends assumption: Our baseline model removes the confounding influence of GDP dynamics prior to the introduction of fiscal rules. Doing so rules out that there is a selection bias initiated by economic conditions. As in our historical analysis, an important question is whether there are anticipation effects and whether countries have been on a similar development path in terms of GDP before adopting constitutional fiscal rules. We replicate the event study analysis conducted in our historical analysis (Equation 4) for the modern sample and present the results in Figure (C-6) in the appendix. The estimates suggest that there is no effect of fiscal rules on growth in the five years leading to their introduction in the constitution.

Selection on observables: There may be selection on observable factors other than GDP. We address this concern in Table (B-12) in the appendix, where we control for potential confounding factors. Our list of covariates includes political institutions and democracy, constitutional changes, economic crises, human capital, and globalization.[12] The results show that including these variables has little impact on the parameter estimate of constitutional fiscal rules.

Selection on unobservables: A remaining threat to the identification of a growth effect of fiscal rules is that there may be selection on unobservables. To the extent that these unobservables are time-invariant, they are absorbed by our country fixed effects. To the extent that these unobservables are correlated with the development of GDP, they are eliminated by our included GDP dynamics. A threat may be that there are unobservable time-varying factors that are either not correlated with past GDP or that exert influence over at least five periods, exceeding the time dimension of our modeled GDP dynamics. As in our historical sample, the results of the Oster (2019) test suggest that selection on unobservables has to be substantial (about the same amount as selection on GDP dynamics, country fixed effects, and time fixed effects) to eliminate the effect of fiscal rules. However, it is impossible to fully rule out that selection on unobservables biases our coefficients on fiscal rules.

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[12]Democracy is measured via the continuous indicator of political institutions compiled by Gründler and Krieger (2016, 2018). Constitutional changes constructed based on information included in the CCP dataset. Economic crises are defined as period where real per capita GDP decreased by 5% (about 7.2% of the country-year observations included in our sample). Human capital refers to the human capital indicator provided by PWT version 9.1. Globalization is measured by the KOF Globalisation Index (Dreher, 2006; Gygli et al., 2019; see Potrafke, 2015 for a survey). The growth effect of fiscal rules may also depend on corruption (Gründler and Potrafke, 2019). The Corruption Perception Index is, however, comparable over time and across countries only from 2012 onwards.

3.5 Instrumental variable strategy

To address the concern about selection on unobservables in more detail, we use an instrumental variable strategy. We conduct a large-scale international survey among experts in the field of economic policy. The goal of our survey is to identify country-specific attitudes towards fiscal rules that reflect a country's propensity to adopt fiscal rules in their constitution. Such attitudes have never been collected in international surveys.

3.5.1 Using experts' opinions to measure national attitudes towards fiscal rules

While attitudes towards fiscal rules, in principle, could be collected for politicians, households, and experts, we focus on experts for three important reasons. First, we do not focus on politicians, as reported fiscal preferences vary systematically across party affiliations (Heinemann et al., 2016), and politicians may tend to answer survey questions in line with their party's program and not according to their own preferences. Also, politicians are directly influenced by rules that restrict their fiscal capacity. Attitudes towards fiscal rules of politicians may hence be systematically downward biased compared to those of a representative national agent. Second, given the widespread economic illiteracy in many countries (Jappelli, 2010), we may expect the topic to be too specific to directly ask households about their preferences. This concern is particularly relevant for countries that never have adopted fiscal rules. This is, however, not to say that individuals would not care about fiscal rules. As fiscal policies affect household incomes via the tax and transfer scheme, we might expect that, once informed, households would form distinct preferences towards rules that govern public debt. Third, experts' views are good proxies for a nations' attitudes towards fiscal rules, because they can be thought of as a counterfactual of fiscally informed citizens.

Our expert-based strategy is motivated by recent findings showing that personal beliefs of economic experts influence their policy-relevant research outcomes. Preference-driven research findings have been shown to vary systematically across countries (Asatryan et al., 2020). Cross-country differences in expert preferences have their origin in the dominant national schools of thought and the cultural values shared by the population (Alesina et al., 2017; Saint-Paul, 2018). Heinemann et al. (2014) refer to these values as "stability cultures". These cultures have been shown to be quite stable over time (Funk and Gathmann, 2011). The reason is that cultural socialization between experts and the population is a reinforcing process. Experts are influence by a population's cultural norms and values, and experts shape the public opinion with their presence in the public sphere (Johnston and Ballard, 2016).

Our key assumption on the representativeness of experts does not require that there is no heterogeneity in expert preferences because there is heterogeneity in preferences

Table 3 ATTITUDES TOWARDS FISCAL RULES, DESCRIPTIVE STATISTICS OF SURVEY QUESTIONS

	Question 1 FR reduce debt		Question 2 FR increase growth		Question 3 FR decrease pub. invest.	
Answers	Obs.	%	Obs.	%	Obs.	%
Strongly agree	257	35.01	101	13.91	66	9.17
Slightly agree	350	47.68	342	47.11	260	36.11
Slightly disagree	75	10.22	166	22.87	230	31.94
Strongly disagree	41	5.59	64	8.82	106	14.72
I don't know	11	1.50	53	7.30	58	8.06

Notes: Table reports descriptive statistics of answers given to our key questions asking for attitudes towards fiscal rules. The questions are: *"Please state if you agree with the following statement: Fiscal rules are effective in reducing government debt"* (Q1); *"Please state if you agree with the following statement: Fiscal rules increase economic growth"* (Q2); *"Please state if you agree with the following statement: Fiscal rules crowd out public investments"* (Q3).

also among households. What is needed is that the variation within countries is smaller than the variation between countries. While there is diversity in views regarding optimal economic policy on the national level (Potrafke, 2013), experts' opinions are more homogeneous within (Gordon and Dahl, 2013) than between countries (Dovern et al., 2012). For instance, in a survey among 120 German economists carried-out in Fall 2019, we find that only one out of four respondents did not support fiscal rules.[13] In contrast, expert opinions on fiscal policy differ substantially in international surveys (Mosler et al., 2019).

3.5.2 Design and background of the survey

Our survey has been conducted in February and March 2020. It includes 1,224 economic experts working in 109 key advanced, emerging and developing countries. Table (D-2) lists the countries included in our surveys as well as the number of experts per country. Selecting suitable experts and assessing their expertise is challenging on the global scale. A related restriction is that surveying experts is costly. We exploit the unique infrastructure of the World Economic Survey (WES) collected by the ifo Institute for Economic Research in Munich to reach out to renowned economic experts from central banks, multinational companies, embassies, international organizations, and research institutes. The experts polled in the WES are prestigious economists and policy advisers in their country. The opinion of the surveyed experts, hence, has impact on the national economic debates. Almost each expert in our sample has completed tertiary education, 42% of the participants hold a PhD.

The WES survey was conducted quarterly by the ifo Institute with the purpose to provide

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[13]The survey was collected as part of the Economists' Panel, which is conducted by the ifo Institute of Economic Research in Munich and the *Frankfurter Allgemeine Zeitung.*

a representative picture of the economic situation and trends over time. Our unique survey on fiscal rules was conducted as a special poll of the WES. We designed the survey using an online platform, the invitation to participate and the survey links were then sent by the WES. Our survey consisted of questions that ask respondents about their views on the consequences of fiscal rules.

3.5.3 Instrumental variable and empirical strategy

For our instrumental variable, we use three questions of our survey, which capture attitudes of experts towards fiscal rules:

1. **Question on fiscal consequences:** *"Please state if you agree with the following statement: Fiscal rules are effective in reducing government debt"* (Q1).

2. **Question on economic consequences:** *"Please state if you agree with the following statement: Fiscal rules increase economic growth"* (Q2).

3. **Question on public investment:** *"Please state if you agree with the following statement: Fiscal rules crowd out public investments"* (Q3).

For each question, respondents are asked to give their opinion on a four-point scale and either choose "strongly agree", "slightly agree", "slightly disagree", or "strongly disagree". Respondents also had the option to tick "I don't know". Table (3) reports descriptive statistics of the answers given by survey respondents. We can infer from the figures that the experts have sound knowledge about fiscal rules, because the share of experts responding with "I don't know" is low.

We combine the data of the questions shown in Table (3) for all 1,224 experts to construct an index of attitudes towards fiscal rules for each country. For aggregation, we use a principal component analyses (PCA).[14] Our benchmark instrumental variable is based on countries with at least $N = 5$ experts (see Table D-2 in the appendix for details).

Figure (8) shows our instrumental variable and its raw components and plots group differences between countries with and without fiscal rules. The mean level of expert assessment is statistically different between experts from countries with and without fiscal rules for each component. More experts in countries with fiscal rules believe that rules are effective in reducing debt and increasing economic growth than in countries without fiscal rules.

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[14]Let $\mathbf{x}_i$ be the vector of data for questions i. The transformation of the PCA is defined by weights $\mathbf{w}_k$ that map each vector $\mathbf{x}_i$ to a new vector of principal component scores $\mathbf{t}_i = (t_1, \ldots, t_n)$ so that $t_i, \ldots, t_n$ successively inherit the maximum possible variance from the data. The first weight vector satisfies

$$\mathbf{w}_1 = \arg \max_{||\mathbf{w}||=1} \left\{ \sum_i (t_1)_i^2 \right\} = \arg \max_{||\mathbf{w}||=1} \left\{ \sum_i (\mathbf{x}_i \times \mathbf{w})^2 \right\}.$$

Based on these weights, we compute the first principal component via $t_1 = \mathbf{x}_i \times \mathbf{w}_1 = Z$, which is our final index of attitudes towards fiscal rules.
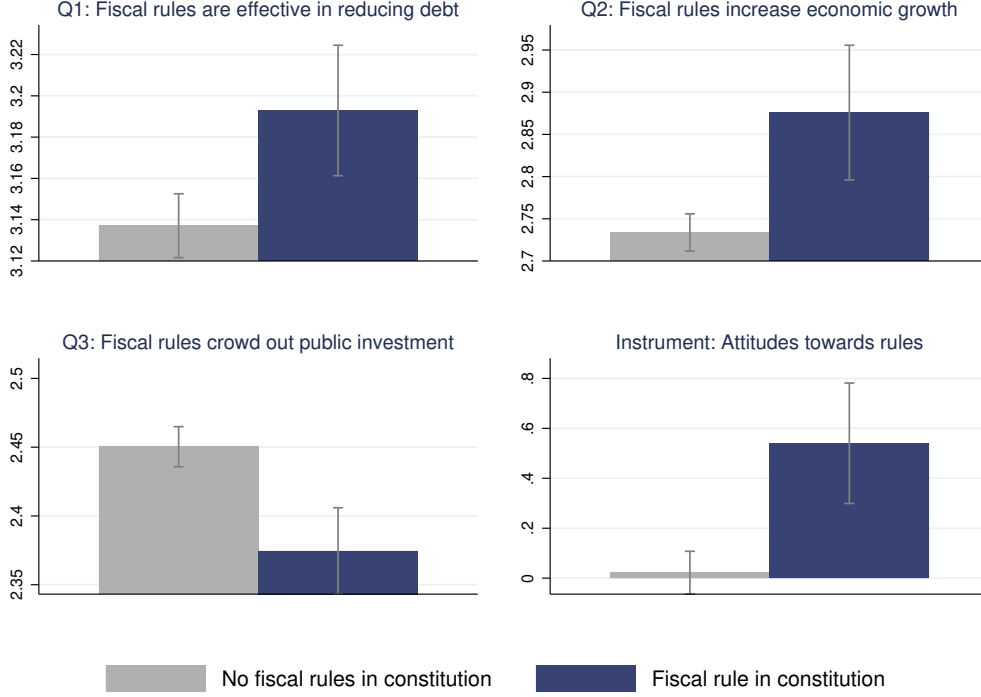
Figure 8 GROUP DIFFERENCES IN THE INSTRUMENTAL VARIABLE AND ITS UNDERLYING COMPONENTS.
Notes: The figure shows the raw data of the components of our instrumental variable as well as our final instrument and shows group differences between countries with and without constitutional fiscal rules. The figure also shows 90% confidence intervals to assess whether the group means are statistically different. The figure only considers countries for which we have data on $N = 5$ or more experts. The total number of surveyed experts is 1,224.

Also, less experts respond that fiscal rules crowd-out investment in countries with constitutional fiscal rules. Combining these variables yields an instrumental variable that is strongly correlated with the adoption of fiscal rules in the constitution. The group difference for our instrumental variable capturing attitudes towards fiscal rules is statistically significant at the 1% level.

We use our instrument, Z, to transfer our dynamic panel data model of Equation (2) into a two-stage least squares (2SLS) framework of the form

$$
\begin{aligned}
y_{it} &= \sum_{j=1}^{J} \beta_j y_{it-j} + \gamma \mathrm{F}_{it} + \mathbf{X}_{it}\boldsymbol{\rho} + \eta_i + \zeta_t + \nu_c \times \vartheta_d + \varepsilon_{it} \\
\mathrm{F}_{it} &= \pi_j Z_i + \sum_{j=1}^{J} \beta_j y_{it-j} + \mathbf{X}_{it}\boldsymbol{\rho} + \eta_i + \zeta_t + \nu_c \times \vartheta_d + u_{it}.
\end{aligned}
\tag{7}
$$

The model is identical to our dynamic models above, except that fiscal rules are treated as endogenous and instrumented by Z. We cannot estimate Equation (7) with a traditional "fixed effects" estimator, because our instrumental variable is time-invariant and hence

perfectly collinear with the country dummies in the first-stage. Instead, we fit the model using a two-stage least squares random-effects estimator (EC2SLS), developed by Baltagi (1981). We implement the estimator as proposed by Baltagi and Liu (2009) for practical applications. The random effects estimator is, essentially, a shrinkage estimator, balancing between pooled OLS and estimates obtain via within-transformations. The random effects model assumes $\eta_i \sim \mathcal{N}(\mu_\eta, \sigma_\eta^2)$ and is equivalent to the fixed effects model used previously when we instead assume $\eta_i \sim \mathcal{N}(\mu_\eta, \infty)$ (Gelman and Hill, 2007). In other words, random effects models specify η to be drawn from a finite and estimable variance σ_η^2, while fixed effects specifications assume η to be distributed with infinite variance. The main advantage of the random effects estimator in our setting is that it allows for time-invariant instrumental variables, but researcher also use random effects estimator in cross-country panels by arguing that fixed effects models take away too much variation (the cross-country variation) from the data (De Haan and Sturm, 2017). An argument often levied against the random effects estimator is that the additionally imposed assumption of zero correlation between η and all other regressors may bias estimates for γ. In a series of Monte Carlo simulation simulations, however, Clark and Linzer (2015) show that fixed effects outperform random effects estimates only in rare cases when the number of observations is low and the correlation between η and the regressors is above 90%.

3.5.4 Discussion of our instrumental variable

Our instrumental variable, Z, combines three series measuring attitudes towards fiscal rules. The instrumental variable captures the country-specific propensity to adopt fiscal rules. In order to represent a suitable instrumental variable, Z needs to be strongly correlated with fiscal rules ("relevance") and influence economic growth only through the introduction of fiscal rules ("exclusion restriction"). Both assumptions are likely to be fulfilled in our model. We expect a strong first-stage. The propensity to adopt fiscal rules is *relevant* because it directly increases the probability that countries introduce fiscal rules. Also, as the experts asked in our survey are actively engaged in policy advise, their attitudes towards fiscal rules increase the probability of a country to actually adopting rules. Descriptive evidence is provided in Figure (8). It is also plausible to expect that Z fulfills the *exclusion restriction*: Conditional on lags of GDP and cross-country heterogeneity η, the propensity to include fiscal rules should not influence a country's GDP except through the introduction of fiscal rules. We argue that the dynamic GDP process is key to fulfill this assumption, as past GDP accounts for many potentially confounding sources, and past economic conditions could be correlated with both current GDP and attitudes towards fiscal rules.

Our strategy to use experts' attitudes surveyed in spring 2020 for constructing the general propensity of countries to adopt fiscal rules is built on the literature of stability culture.
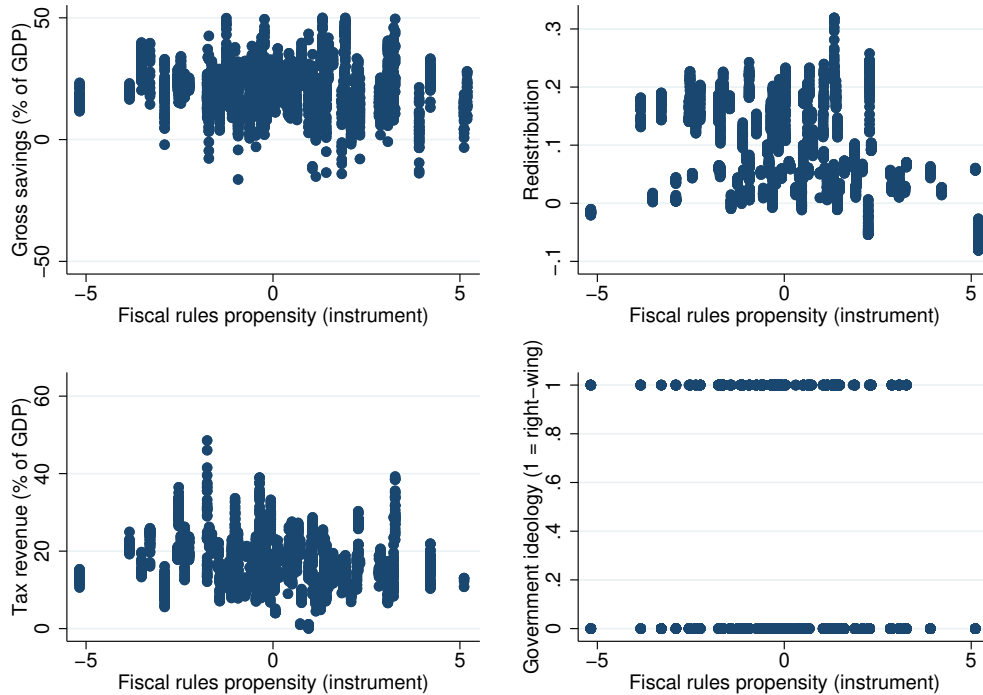
Figure 9 ATTITUDES TOWARDS FISCAL RULES AND OTHER DIMENSIONS OF FISCAL AND POLITICAL CONSERVATISM, 1985–2015.

Notes: The figure shows correlations between our instrumental variable and other dimensions of fiscal conservatism. Data for gross savings and tax revenue is taken from World Bank (2020). Redistribution is measured via the difference between the Gini indices pre and post taxes and transfers. Data comes from Solt (2016). Government ideology is a dummy that is 1 if the chief executive party has a right-wing ideology (0 otherwise). Data is taken from the Database of Political Institutions (Scartascini et al., 2018). The unconditional correlations between our instrumental variable and the variables measuring fiscal conservatism are: gross savings in % of GDP (9%), redistribution (-14%), tax revenue in % of GDP (-24%), right-wing government ideology (-5%).

First, preferences towards fiscal policies and stability are remarkably stable over time (Funk and Gathmann, 2011) and are *"deeply rooted in the culture and history of a country"* (Heinemann et al., 2014, p.114). Second, to test whether our instrumental variable measures persistent fiscal preferences, we included a control question in our expert survey, asking respondents *"Did you change your view about fiscal rules during the past five years?"*. We also include a similar question asking for changes in views during the past ten years. The overwhelming majority of experts did not change their view during the past five (80.3%) or ten (71.4%) years. The percentage of experts that did not change their view is particularly high in countries with constitutional fiscal rules (>85%). An important requirement to fulfill the exclusion restriction is that our instrumental variable does not capture other dimensions of fiscal or political conservatism that may influence economic growth. By specifically focusing on attributes towards fiscal rules, we distinguish our instrumental variable from other aspects of conservatism. Figure (9) shows that our instrumental is hardly correlated with saving rates, tax revenues, redistribution,

and conservative (right-wing) government ideology over the entire period of the modern sample (1985–2015).

3.5.5   2SLS results

Panel A of Table (4) presents the results of our IV estimation, with the underlying first-stage results reported in Panel B. The benchmark model in Column (1) includes random effects for countries and period-fixed effects. The subsequent columns explore changes in the baseline model when introducing continent-decade fixed effects (Column 2), restricting the sample to countries and years with constitutions (Column 3), and accounting for constitutional changes (Column 4). Estimates for these models are obtained based on the countries included in the IMF Fiscal Rules Database. In Column 5, we include all countries for which we have expert assessments (assuming that countries not included in the IMF Dataset do not have fiscal rules). The parameter estimate for fiscal rules in all models is positive and statistically significant at the 1% and 5% level. When we re-estimate our model for all rules—notwithstanding whether they are included in the constitution or not—we do not find any statistically robust relationship, and we also find that our attitudes measure is not a good instrument for other (less binding) types of fiscal rules (not reported).

The parameter estimates suggest that the cumulative long-run effect of adopting fiscal rules in the constitution is 18%. That is, the 2SLS parameter estimates exceed the parameters from our dynamic panel data model by 3 percentage points. The larger 2SLS estimates underscore that it is important to account for selection on unobservables, but given that the difference between the 2SLS and the OLS estimates are small, the bias in our previous estimates is small.

Strength and validity of our instrumental variable: The validity of our IV estimates depends on the statistical properties of our instrumental variable. The first-stage results show that the country-specific propensity to adopt rules, measured via experts' attitudes towards rules, is positively related to constitutional fiscal rules. The correlation is statistically significant at the 1% level for each specification. Table (4) reports detailed weak instrument diagnostics. The rows entitled "SW F Stat" and "SW p-val" report F-Statistics and p-values of the Sanderson and Windmeijer (2016) test for weak identification. The test is an improvement of the Angrist and Pischke (2009) test and several (statistically unjustified) rule-of-thumb assumption about the size of the F statistics in the first-stage. The SW statistics can be interpreted as the first-stage F statistics when the model includes a single endogenous regressor. The null of underidentification is strongly rejected in each case (also if we use arbitrary thresholds often assumed by conventional wisdom). Another way to assess weak instruments is to compare the F statistics of the first stage with the critical thresholds of a 20% maxmimum IV bias (Stock and Yogo,

Table 4 CONSTITUTIONAL FISCAL RULES AND ECONOMIC GROWTH—INSTRUMENTAL VARIABLE RESULTS, 1985–2015

Dependent variable: Logarithm of GDP (per capita), y_{it}

	IMF Sample (1985–2015) Baseline Model (1)	IMF Sample (1985–2015) C×D FE (2)	IMF Sample (1985–2015) Constitut. (3)	IMF Sample (1985–2015) Δ Constitut. (4)	Full Sample (1985–2015) Δ Constitut. (5)
Panel A: Second-stage results					
Fiscal Rule$_{it}$	0.182***	0.153***	0.0678***	0.0568**	0.0663**
	(0.0403)	(0.0341)	(0.0187)	(0.0176)	(0.0217)
$y(t-1)$	1.100***	1.067***	1.080***	1.070***	1.160***
	(0.0279)	(0.0268)	(0.0235)	(0.0237)	(0.0190)
$y(t-2)$	-0.00493	0.0100	0.00466	0.00998	-0.0541*
	(0.0412)	(0.0387)	(0.0342)	(0.0344)	(0.0288)
$y(t-3)$	-0.0771*	-0.0754**	-0.0799**	-0.0695**	-0.0665**
	(0.0396)	(0.0370)	(0.0327)	(0.0330)	(0.0276)
$y(t-4)$	-0.0280	-0.0201	-0.0165	-0.0217	-0.0509**
	(0.0250)	(0.0235)	(0.0208)	(0.0211)	(0.0173)
Panel B: First-stage results					
Rules Propensity	0.012***	0.013***	0.011***	0.012***	0.010***
	(0.0031)	(0.0026)	(0.0027)	(0.0025)	(0.0018)
Observations	1978	1978	1908	1778	2691
Countries	67	67	66	66	100
R-Squared	0.996	0.997	0.998	0.998	0.997
χ^2 Wald	513813	589831	743678	697050	833692
χ^2 p-val	0.000	0.000	0.000	0.000	0.000
SW F Stat	9.093	14.47	4058	1285	2107
SW p-val	0.000	0.000	0.000	0.000	0.000
Stock-Wright p-val	0.000	0.000	0.000	0.000	0.000
Stock-Yogo 20% max IV bias	6.76	6.76	6.76	6.76	6.76
Country RE	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes
C × D FE	No	Yes	Yes	Yes	Yes

Notes: The table shows the 2SLS results of our estimations on the effect of fiscal rules on economic growth (Equation 7) for the period 1985–2015. The estimator is implemented following Baltagi and Liu (2009), with standard errors obtained from asymptotic theory reported in parentheses. The log of per capita GDP is measured in 2011 US-Dollar, data on fiscal rules is collected by the IMF Database on Fiscal Rules (see Schaechter et al., 2012 for details). The columns labeled "IMF Sample" are obtained based on all countries included in the IMF Fiscal Rules Database. The column labeled "Full Sample" exploits information from all countries for which we have expert assessments, and assumes that these countries do not have fiscal rules. The benchmark model in Column (1) includes random effects for countries and period-fixed effects. The subsequent columns explore changes in the baseline model when introducing continent-decade fixed effects (Column 2), restricting the sample to countries and years with constitutions (Column 3), accounting for constitutional changes (Column 4), and including all countries for which we have expert assessments (Column 5). "SW F Stat" reports the Sanderson-Windmeijer F-Statistic for the first-stage, with p-values reported as "SW p-val". The critical Stock-Yogo thresholds for a maximum 20% IV bias as reported as "Stock-Yogo 20% max IV bias". "Stock-Wright p-val" reports weak-instrument robust inference using the Stock-Wright LM test.

***   Significant at the 1 percent level,
 **   Significant at the 5 percent level,
  *   Significant at the 10 percent level

2005). The SW F statistics is (much) smaller than this demanding threshold in each case. We also conduct several weak-instrument-robust tests of the null $\hat{\gamma} = 0$ that are fully robust to weak instruments (we report results of the Stock-Wright S test in Table 4, but results are similar for the Anderson-Rubin tests), with little effect on the inferences. Finally, we run a battery of weak identification tests (e.g. the Kleibergen-Paap rk LM tests), which reject the null of underidentification ($p = 0.000$) for each specification (not reported). Taken together, the instrument-diagnostics provide little sign for invalid or weak instruments.

Robustness of the IV results: Of the 67 countries included in our IV sample, 11 countries have adopted constitutional fiscal rules in at least one year between 1985 and 2015 (a share of 16.4%). Constitutional fiscal rules have been in place in 117 country-year observations in our sample. A concern is that the results may be driven by outliers. Also, as we measure experts' attitudes in 2020, the performance of the instrumental variable may differ between countries that have adopted fiscal rules early in our sample and those that included fiscal rules more recently. To address these concerns, we perform a jacknife resampling analysis in Table (B-13), where we compute estimates by successively leaving out each country with fiscal rules in place in at least one period between 1985 and 2015. Doing so does not change the inferences.

Exclusion restriction: In Table (B-14) in the appendix, we address potential concerns about a correlation of our instrumental variable with other dimensions of fiscal or political conservatism that may directly influence growth. The table re-estimates the benchmark model based on all available countries (Column 1) and gradually introduces gross saving (in % of GDP), public redistribution, tax revenues (in % of GDP) and the political ideology of the chief executive party. Including these variables has no impact on the inferences.

A conclusion from our instrumental variable regressions is that the positive and statistically significant parameter estimate found in the previous estimates are unlikely to be (entirely) driven by time-invariant unobservables.

3.6 Mechanisms

By reducing the capacity for fiscal policy, fiscal rules tackle the negative growth effect of public indebtedness (Reinhart et al., 2012). In a similar vein, reducing the potential to raise public expenditure prevents negative growth effects from an increasing size of government (Berg et al., 2018; Gründler and Scheuermeyer, 2018) and from political business cycles (Bonfatti and Forni, 2019). All of these mechanisms work via the reduction of public debt.

We examine the relationship between fiscal rules and public debt, as measured by the Debt-to-GDP ratio. We transform our growth regression of Equation (2) into a model examining the effect of fiscal rules on public debt, D_{it}

$$D_{it} = \sum_{j=1}^{J} \beta_j D_{it-j} + \gamma F_{it} + \eta_i + \zeta_t + \varepsilon_{it}. \tag{8}$$

Estimates for the debt-to-GDP ratio are taken from the Jordà-Schularick-Taylor Macrohistory Database (Jordà et al., 2017). The database covers 17 advanced economies since 1870 on an annual basis. The results are presented in Table (5). The main result is that fiscal rules are negatively related to public debt in the historical sample (Column 1), the modern sample (Column 2), and the full sample (Column 4). Consistent with the estimates for growth, fiscal rules reduce public debt only in the event that they are adopted in the national constitution.

In Table (B-15) in the appendix, we address the argument that fiscal rules may increase growth by stabilizing governments' in the financial markets. We use interest rates to proxy sovereign risk premia and find that fiscal rules are negatively related to interest-rates, particularly in a historical context.

Taken together, our results are consistent with previous studies showing that fiscal rules decrease public debt (Asatryan et al., 2018; Heinemann et al., 2018) and sovereign risk premia (Heinemann et al., 2014).

4 Sub-national results

We develop a complementary strategy to tackle concerns about selection biases. The strategy focuses on regional governments, as our international survey has shown that fiscal preferences are (much) more homogeneous within than between countries. By exploiting information on sub-national governments, we alleviate the confounding influence on unobserved fiscal stability preferences. We examine the relationship between fiscal rules in the constitution of regional governments using our newly collected dataset on sub-national fiscal rules (see Section 2.3 for a description).

4.1 Regional fiscal rules in state-level constitutions

To examine the effect of fiscal rules on the state-level, we follow our country-level specification (see Sections 3.1 and 3.2) and estimate variations of the model

$$y_{ist} = \sum_{j=1}^{J} \beta_j y_{ist-j} + \gamma F_{ist} + \mathbf{X}_{ist}\boldsymbol{\beta} + \eta_s + \zeta_t + \nu_i \times \mu_d + \varepsilon_{ist}, \tag{9}$$

where y_{ist} is the log of real Gross Regional Product (GRP) in sub-national unit s of

Table 5 FISCAL RULES AND ECONOMIC GROWTH—TRANSMISSION MECHANISM: GOVERNMENT DEBT

Dependent variable: Debt-to-GDP Ratio, D_{it}

	Historical sample	Modern Sample		Full Sample
	Const. Rules (1870–1950) (1)	Const. Rules (1985–2015) (2)	All Rules (1985–2015) (3)	Const. Rules (1870–2015) (4)
Fiscal Rule$_{it}$	-0.0625***	-0.0142**	-0.0000	-0.0278**
	(0.0123)	(0.0071)	(0.0001)	(0.0128)
$D(t-1)$	1.241***	1.385***	1.383***	1.286***
	(0.115)	(0.0589)	(0.0584)	(0.0964)
$D(t-2)$	-0.243	-0.297**	-0.292**	-0.250*
	(0.148)	(0.0948)	(0.0935)	(0.133)
$D(t-3)$	-0.0276	-0.0549	-0.0600	-0.0206
	(0.105)	(0.0626)	(0.0619)	(0.0966)
$D(t-4)$	0.00150	-0.0578*	-0.0560*	-0.0357
	(0.0575)	(0.0331)	(0.0326)	(0.0477)
Observations	1092	521	538	2198
Countries	17	17	17	17
R-Squared	0.926	0.974	0.975	0.968
F-Stat	7106.2	1637.4	1940.9	7273.9
F p-val	0.000	0.000	0.000	0.000
Country FE	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes

Notes: The table shows the results of our estimations on the effect of fiscal rules on the debt-to-gdp ratio (Equation 8) for the period 1985–2015. Robust standard errors (adjusted for arbitrary heteroskedasticity and clustering) are reported in parentheses. The log of per capita GDP is measured in 2011 US-Dollar, data on fiscal rules is collected by the IMF Database on Fiscal Rules (see Schaechter et al., 2012 for details). Columns (1)–(2) and (4) consider fiscal rules that have been adopted in national constitutions, Column (3) considers all fiscal rules. Data on government debt is taken from Jordà et al. (2017).

*** Significant at the 1 percent level,
** Significant at the 5 percent level,
* Significant at the 10 percent level

country i at time t. GRP series are estimates based on nighttime lights collected from satellite data of the National Oceanic and Atmospheric Administration (NOAA). Our main explanatory variable, F_{ist}, is an indicator variable that is 1 if a regional government has adopted a fiscal rule in their state constitution, and 0 otherwise. We again account for selection on economic conditions by including GRP dynamics $\sum_{j=1}^{J} \beta_j y_{ist-j}$. We also eliminate time-invariant unobservables by including fixed effects on the state level and account for period-specific shocks and trends by including period-fixed effects ζ_t. To consider country-specific differences in the effects of fiscal rules, we also consider country-decade fixed effects $\nu_i \times \mu_d$.

Table (6) shows our baseline results for the sub-national level. Columns (1)–(2) present estimates for the full sample for which GRP data is available (1992–2012), reporting results with (Column 1) and without (Column 2) fixed effects for country-decades. To address the heterogeneity of the included countries and regions in our sample, we restrict the sample to OECD member states (Column 3, status as of 2020) and European countries (Column 4). In each specification, fiscal rules are positively associated with economic growth. The parameter estimate in the full sample is statistically significant at the 1% level ($t = 13.00$) and larger in size than the coefficient on fiscal rules on the country-level. However, when we include fixed effects for country-decades, the estimated parameter on fiscal rules (1.8%) is roughly in the same ballpark as the parameter estimate of our historical sample (1.4%) and the parameter of our period of modern economic growth (1.3%). Restricting the sample to OECD countries and European countries yields a substantial reduction in the number of included observations and results in a decline of the parameter estimates (about 1% for OECD countries and 0.6% for European countries). The considerable changes in sample composition notwithstanding, the parameter estimates are statistically significant at the 5%.

4.2   Robustness of the sub-national results

We conduct several robustness tests. In Table (B-16) in the appendix, we explore whether the time structure of the included GRP dynamic influences the estimated parameters. In Table (B-17) in the appendix, we address the potential presence of a unit root in the GRP process by estimating our benchmark model in differences (see Equation 6 for details). We also account for factors that may simultaneously be correlated with GRP and the propensity to adopt fiscal rules in the state-level constitution (see Table B-18). The potential to account for confounders is restricted on the sub-national level, because availability and comparability of official statistics is limited. We instead use geo-coded data on population on the grid-cell level to account for selection on population dynamics. Georeferenced population data is taken from the Gridded Population of the World (GPW) version 3, provided by the Center for International Earth Science Information Network

Table 6 FISCAL RULES AND ECONOMIC GROWTH—SAMPLE OF SUB-NATIONAL GOVERN-MENTS, 1992–2012

Dependent variable: Logarithm of GRP (per capita), y_{ist}

	Constitutional Rules (1992–2012) Full sample (1)	Constitutional Rules (1992–2012) Full sample (2)	Constitutional Rules (1992–2012) OECD (3)	Constitutional Rules (1992–2012) Europe (4)
Fiscal Rule$_{ist}$	0.0237***	0.0189***	0.0089**	0.0055**
	(0.0018)	(0.0028)	(0.0030)	(0.0025)
$y(t-1)$	0.940***	0.716***	0.823***	0.511***
	(0.0204)	(0.0209)	(0.0389)	(0.0462)
$y(t-2)$	-0.0769**	-0.115***	0.0547	0.142***
	(0.0310)	(0.0252)	(0.0359)	(0.0312)
$y(t-3)$	-0.0219	-0.0446*	-0.0219	-0.0878**
	(0.0230)	(0.0232)	(0.0226)	(0.0416)
$y(t-4)$	-0.1060***	-0.1890***	-0.0005	-0.0583
	(0.0144)	(0.0184)	(0.0183)	(0.0432)
Observations	2822	2822	1513	748
Regions	166	166	89	44
R-Squared	0.961	0.970	0.963	0.982
F-Stat	12137.7	9642.2	10914.0	8816.8
F p-val	0.000	0.000	0.000	0.000
Country FE	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes
C × D FE	No	Yes	No	No

Notes: The table shows the results of our estimations on the effect of fiscal rules on economic growth (Equation 9) on the sub-national level for the period 1992–2012. Robust standard errors (adjusted for arbitrary heteroskedasticity and clustering) are reported in parentheses. The log of per capita GRP is measured using data from Lessmann and Seidel (2017), data on fiscal rules is based on our unique dataset on regional fiscal rules (see Table D-1 for details). We only consider fiscal rules that are adopted in the state-level constitution.

***	Significant at the 1 percent level,
**	Significant at the 5 percent level,
*	Significant at the 10 percent level

(see CIESIN, 2004, 2016, 2018a,b for details).[15] We also consider the effect of economic crises, defined as a decline in the growth rate of GRP by at least 5%. None of the robustness tests gives rise to different conclusions about the growth effect of fiscal rules on the sub-national level.

As a complementary strategy to asses the growth effect of fiscal rules on the sub-national level, we exploit a quasi-natural experiment using data on Italian municipalities. Starting 1999, the Italian government imposed strict constraints on public finances of municipal governments, and later exempted all municipalities with less than 5,000 inhabitants from the these regulations (see Law 23 December 2000, No. 388, Art. 53). We follow Grembi et al. (2016) in constructing a difference-in-discontinuity estimator to estimate the causal effect of abolishing sub-national fiscal rules. The results show that abolishing fiscal rules reduces average taxable incomes; for brevity, we describe these estimates in the online appendix (A.1).

5 Conclusions

Fiscal rules are expected to influence economic growth. It is not quite clear, however, how fiscal rules influence economic growth. Advocates of a large size and scope of government are likely to believe that fiscal rules decrease economic growth when they prevent public investment, especially when there is crowding-in. Advocates of a small size and scope of government may well recommend fiscal rules that help to prevent excessive public debt which, in turn, should stimulate economic growth. The empirical evidence at hand is very preliminary. There is no study yet estimating causal effects of fiscal rules on economic growth. We investigate empirically how fiscal rules influence economic growth.

We use historical data from the Industrial Revolution until World War II (1789-1950), data for modern economic growth (1985-2015), data for sub-national fiscal rules based on newly collected data for 206 regional governments from 10 federal states (1992-2012), and data for Italian municipalities (1999–2004). The results are stark: fiscal rules adapted in constitutions promoted economic growth—effects that hold for historical, modern and sub-national economic growth. We handle issues on availability of data on fiscal rules, reverse causality and selection bias. In particular, we compile new data on experts' fiscal preferences based on which we compute an instrumental variable. We survey 1,224 economic experts in 109 countries. The IV-estimates suggest that the cumulative long-run effect of permanently adopting fiscal rules on real per capita GDP is 18%.

Our results are useful for policymakers who need to handle the drastic consequences of the COVID-19 crisis. First, many governments have increased public debt and need to

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[15]We also account for other geographic confounders, such as the size of regions, access to shipping routes, arable land, and other geoclimatic characteristics (not reported). These factors are (mostly) absorbed by the sub-national fixed effects as they change very little (if at all) over our sample period.

develop consolidation strategies on how to reduce public debt in the future. Second, GDP has decreased considerably since the COVID-19 crisis began. Governments need to implement policies that will help to increase economic growth. Previous studies have shown that fiscal rules are suitable to decrease budget deficits and public debt (Heinemann et al., 2018). Our study shows that constitutional fiscal rules promote economic growth.

A. Supplementary Notes (for online publication)

A.1 Regional fiscal rules in Italian municipalities In response to the "Stability and Growth Pact" launched by the European Union in 1997, the Italian government passed the *"Patto di Stabilità Interno* (Domestic Stability Pact, DSP) in 1999. The DSP imposed strict constraints on public finances of municipal governments. Specifically, the DSP holds that growth of a municipalities' fiscal gap—defined as deficit, net of transfers, and debt service—should not exceed a certain cap. The cap depends on the fiscal gap two years prior to the actual budget and varies between 0% and 3%. In December 2000, the central government of Italy exempted all municipalities with less than 5,000 inhabitants from the regulations of the DSP, starting in 2001 (see Law 23 December 2000, No. 388, Art. 53). The Italian government set strong incentives for the municipal governments to comply with the fiscal rules. First, penalties in case of non-compliance are strong.[16] Second, municipalities complying with the fiscal rules benefited from a reduction in interest expense on central government loans.

While the setting, in principal, provides an ideal testing ground for regression discontinuity (RDD) or difference-in-differences (DiD) analyses, there is another policy that changes sharply at the cut-off of 5,000 inhabitants: the wage of the mayor (see Gagliarducci and Nannicini, 2013 for a discussion). Also, large and small municipalities are usually on differential trends in terms of public policies, which rules out the application of DiD methods. Instead, we replicate the econometric setup of Grembi et al. (2016), exploiting both the discontinuous variation at the cut-off of 5,000 inhabitants and the time variation after the treatment in 2001. Grembi et al. (2016) construct this "difference-in-discontinuity (diff-in-disc)" estimator to examine the influence of municipal fiscal rules on debt. Below, we borrow from their notation and description.

Two treatments change at the threshold of $P_c = 5,000$ inhabitants. First, the wage of the mayor (W_{it}) is lower in case the population size P_{it} of municipality i at time t falls below P_c, i.e.

$$W_{it} = \left\{ \begin{array}{ll} 1 & \text{if } P_{it} < P_c \\ 0 & \text{otherwise.} \end{array} \right\} \tag{10}$$

Second, fiscal rules are relaxed at time t_0 if $P_{it} < P_c$, i.e.

$$FRR_{it} = \left\{ \begin{array}{ll} 1 & \text{if } P_{it} < P_c \text{ and } t \geq t_0 \\ 0 & \text{otherwise,} \end{array} \right\} \tag{11}$$

where $FRR_{it} = 1$ denotes that fiscal rules have been relaxed. Let $y_{it}(\omega, \rho)$ be the income level for $W_{it} = \omega$ and $FRR_{it} = \rho$, with $\omega = \{0, 1\}$ and $\rho = \{0, 1\}$. Hence, the observed

---

[16]Punishment in case of non-compliance takes three forms (i) a 5% reduction in transfers received from the central government, (ii) a ban on municipal hires, and (iii) a 30% cut on bonuses for employees of the municipal administration.

income level is

$$y_{it} = W_{it}FRR_{it}(1,\, 1) + W_{it}(1 - FRR_{it})y_{it}(1,\, 0) + (1 - W_{it})FRR_{it}y_{it}(0,\, 1)$$
$$+ (1 - W_{it})(1 - FRR_{it})y_{it}(0,\, 0). \quad (12)$$

We want to estimate the causal effect of relaxing fiscal rules (FRR_{it}) on y_{it}. Let $Z^- \equiv \lim_{\rho \to P_c^-} \mathrm{E}[Z_{it}|P_{it} = \rho, t \geq t_0]$ and $Z^+ \equiv \lim_{\rho \to P_c^+} \mathrm{E}[Z_{it}|P_{it} = \rho, t \geq t_0]$ with $Z = y, y(1,\, 1), y(1,\, 0), y(0,\, 1), y(0,\, 0)$. In the absence of the confounding treatment W_{it}, the cross-sectional regression discontinuity estimator

$$\hat{\gamma}_{RD} \equiv y^- - y^+ \quad (13)$$

would identify the average treatment effect of the abolition of fiscal rules. To disentangle the effect of the two confounded treatments, we follow Grembi et al. (2016) in using information on the pre-treatment period $t < t_0$ to remove the selection bias. Following the notation for the post-treatment period, we define $\tilde{Z}^- \equiv \lim_{\rho \to P_c^+} \mathrm{E}[Z_{it}|P_{it} = \rho, t < t_0]$ ($\tilde{Z}^+$ analogously) and identify the causal effect by using both the variation in time after t_0 and the discontinuous variation at a municipal size of $5,000$ inhabitants

$$\hat{\gamma}_{DD} \equiv (y^- - y^+) - (\tilde{y}^- - \tilde{y}^+). \quad (14)$$

Grembi et al. (2016) derive precise conditions under which the $\hat{\gamma}_{DD}$ identifies the average treatment effect. We implement the estimator by estimating boundary points of regressions of y_{it} on P_{it}, both before and after the treatment and on both sides of the cut-off of $5,000$ inhabitants. We follow Gelman and Imbens (2019) using a local linear regression that uses observations that are located within a distance of d on both sides of P_c, i.e. we use observations that are located in the interval $P_{it} \in [P_c - d,\, P_c + d]$. Let $P_{it}^* = P_{it} - P_c$ be the normalized population size. We estimate

$$y_{it} = \kappa_0 + \kappa_1 P_{it}^* + C_i(\pi_0 + \pi_1 P_{it}^*) + T_t\{\alpha_0 + \alpha_1 P_{it}^* + C_i(\gamma_0 + \gamma_1 P_{it}^*)\} + \varepsilon_{it}, \quad (15)$$

where T_t indicates the post-treatment period and C_i is a dummy variable for municipalities with less than 5,000 inhabitants. The parameter γ_0 is the diff-in-disc estimator of Equation (15), reflecting the causal effect of the abolition of fiscal rules on average municipality income.

We follow Grembi et al. (2016) and restrict the sample in three ways. First, as regions with special autonomy were allowed to design their own fiscal rules in 2002, we exclude them from our sample. Second, the design of fiscal rules and the thresholds P_c were changed after 2005, which is why we exclude all observations after 2005. Third, we only consider municipalities with more than 3,500 and less than 7,000 inhabitants because of

Table 7 ABOLITION OF FISCAL RULES AND ECONOMIC GROWTH—ITALIAN MUNICIPALITIES, 1999–2004

Dependent variable: Average Taxable Income, y_{it}		
	MSE-Optimal Bandwith Selection (1999–2004) Full sample (1)	**CER-Optimal Bandwith Selection** (1999–2004) Full sample (2)
Relaxing Fiscal Rules	-594.96* (353.45)	-657.50* (394.39)
Bandwith estimate (d, left)	303	207
Bandwith estimate (d, right)	701	479
Observations	2,100	2,100

Notes: The table shows the results of our diff-in-disc estimations on the effect of relaxing fiscal rules on average taxable incomes in Italian municipalities (Equation 15). The results include budget years for the period 1999–2004. Included municipalities have between 3,500 and 7,000 inhabitants. The table presents estimates for two optimal bandwith selections. The first column reports results for Mean Square Error (MSE) optimal bandwith selection. The second column reports results for Coverage Error Rate (CER) optimal bandwith selection. For details on the implementation, see Calonico et al. (2014); Calonico et al. (2017); and Calonico et al. (2018).

***	Significant at the 1 percent level,
**	Significant at the 5 percent level,
*	Significant at the 10 percent level

the local nature of the diff-in-disc setting. A key requirement is that municipalities below and above the threshold of 5,000 are comparable in terms of the structure of the economy and the population. Table (B-19) in the appendix shows that municipalities below and above the threshold do not differ much in terms of average taxable income, age, education, area, and geographical location.

Table (7) reports our empirical results for two optimal bandwith selectors, mean squared error (MSE, Column 1) and coverage error rate (CER, Column 2). While the MSE-optimal bandwith is widely used, Calonico et al. (2018) show that it can be suboptimal in the sense that the bandwith can become too large. Hence, we compare the results with outcomes of CER-optimal bandwith selection (see Calonico et al., 2014 and Calonico et al., 2018 for details).

We find that relaxing fiscal rules results in a reduction of average taxable income of about 600 Euro. Given that average taxable income in our sample is between 5,257 Euro and 26,973 Euro (mean level: 13,831 Euro), this is a sizable effect in economic terms. The size of the effect is, however, sensitive to the selected bandwith and ranges from -594 Euro to -657 Euro. The effect is statistically significant at the 10% level. In any event, the estimates are consistent with our historical, country-level, and sub-national results, illustrating that fiscal rules are positively associated with economic growth.

B. Supplementary Tables (for online publication)

Table B-1 SUMMARY STATISTICS

	N	Mean	Std. Dev.	Min.	Max.
I. Historical Variables					
Fiscal Rule	6,000	0.020833	0.142838	0	1
y	4,696	7.949711	0.7007474	5.501258	9.97222
Constitution	6,000	0.5913333	0.4916284	0	1
ΔConstitution	3,548	0.1691094	0.3749013	0	1
Population	5,205	29175.91	78160.05	2	543941
Democracy	2,593	0.1716407	0.8164612	-1.218103	2.013837
Interwar	3,138	0.0621415	0.2414508	0	1
Intrawar	3,138	0.0433397	0.2036531	0	1
Extrawar	3,138	0.0484385	0.2147252	0	1
II. Modern Variables					
Fiscal Rule (all)	2,758	0.4854967	0.4998802	0	1
Fiscal Rule (national)	2,729	0.3268597	0.4691514	0	1
Fiscal Rule (supra-nat.)	2,758	0.2679478	0.4429706	0	1
Fiscal Rule (const.)	2,758	0.0420595	.2007612	0	1
y	5,138	8.908738	1.231282	5.062595	11.9578
Constitution	5,146	0.914108	0.2802317	0	1
ΔConstitution	4,384	0.2363139	0.4248656	0	1
Enforcement (all rules)	2,758	0.3245105	0.4682766	0	1
Enforcement (nat. rules)	2,729	0.1828509	0.386615	0	1
Enforcement (supra-nat. rules)	2,758	0.2494561	0.4327767	0	1
Enforcement (const. rules)	2,758	0.0395214	0.1948672	0	1
Democracy	5,022	0.5948098	0.392848	0	0.9999612
Crisis	5,146	0.0773416	0.2671587	0	1
Human Capital	4,230	2.308036	0.7057328	1.021879	3.742114
III. Expert Variables					
Q1	3,224	3.17928	0.565345	1	4
Q2	3,224	2.807921	0.5479226	1	4
Q3	3,162	2.389259	0.5266412	1	4
Fiscal Rules Propensity	3,162	0.2461178	1.881796	-5.173868	5.192719
IV. Sub-national Variables					
Fiscal rule (local gov.)	7,381	0.522287	0.4995369	0	1
y	3,486	9.872343	0.6513902	8.521169	10.90451
OECD	7,416	0.6262136	0.4838406	0	1
EU	7,416	0.2621359	0.4398258	0	1
Population	3,486	3546303	4888327	14960	4.30e+07
Crisis	7,416	0.0156419	0.1240938	0	1

Note: The table shows summary statistics of the variables used in the empirical estimations. Column labeled "Std. Dev." reports the standard deviation. Note that in some of our robustness checks, we use separate samples of the variables. For instance, we code all countries not included in the IMF Fiscal Rules Database as not having fiscal rules in the robustness checks. In this case, the number of observations is larger, and the means are smaller. For brevity, we do not separately report the modified variables. Note also that for transparency, the table reports the maximum number of observations. Because of limited availability of some variables, the sample compositions differ when we include controls. Population on the national level is in 1,000.

Table B-2 FISCAL RULES AND ECONOMIC GROWTH—HISTORICAL RESULTS, 1789–1950, HARMONIZED SAMPLE OF COUNTRIES

Dependent variable: Logarithm of GDP (per capita), y_{it}

	Harmonized Sample			**Harmonized Sample (OECD)**		
	Full sample (1789–1950)	Full Sample (1789–1950)	Post-1820 (1820–1950)	Full Sample (1789–1950)	Full Sample (1789–1950)	Post-1820 (1820–1950)
	Baseline Model (1)	Constitut. (2)	Baseline Model (3)	Baseline Model (4)	Constitut. (5)	Baseline Model (6)
Fiscal Rule$_{it}$	0.0179***	0.0643***	0.0184***	0.0169***	0.0779***	0.0177***
	(0.0036)	(0.0151)	(0.0040)	(0.0035)	(0.0203)	(0.0039)
$y(t-1)$	0.922***	0.946***	0.933***	0.951***	0.934***	0.950***
	(0.0360)	(0.0418)	(0.0353)	(0.0442)	(0.0509)	(0.0470)
$y(t-2)$	-0.0908**	-0.0886**	-0.101**	-0.102**	-0.0834	-0.107*
	(0.0353)	(0.0423)	(0.0385)	(0.0521)	(0.0513)	(0.0550)
$y(t-3)$	0.104**	0.0742*	0.0970**	0.0966**	0.0801*	0.103**
	(0.0322)	(0.0415)	(0.0317)	(0.0399)	(0.0483)	(0.0403)
$y(t-4)$	-0.0075	-0.0273	-0.0132	-0.0156	-0.0439	-0.0301
	(0.0257)	(0.0356)	(0.0267)	(0.0324)	(0.0369)	(0.0307)
Observations	2,873	1,930	2,628	2,366	1,710	2,153
Countries	26	23	26	20	19	20
R-Squared	0.851	0.828	0.836	0.858	0.806	0.838
F-Stat	762.7	893.9	644.2	733.6	998.9	560.4
F p-val	0.000	0.000	0.000	0.000	0.000	0.000
Country FE	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
C × D FE	Yes	Yes	Yes	Yes	Yes	Yes

Notes: The table shows the results of our historical estimations on the effect of constitutional fiscal rules on economic growth (Equation 2). Robust standard errors (adjusted for arbitrary heteroskedasticity and clustering by countries) are reported in parentheses. The log of per capita GDP is measured in 2010 US-Dollar, data on fiscal rules is collected by the Comparative Constitutions Project (CCP) from Elkins et al. (2020). The variable "Fiscal Rule" denotes whether a fiscal rules has been in place in the constitution in a given year. Fiscal rules in the CCP sample are balanced budget rules. Our sample includes information on the period 1789–1950. The sample is restricted to countries for which data is available at least since 1820 ("harmonized sample") and which are currently part of the OECD ("Harmonized Sample (OECD)", status as of March 2020). Given the heterogeneity of this small sample of countries, each estimation includes continent-decade fixed effects, but the inferences do not change if these effects are not included. Columns labeled "Constitut." (Columns 2 and 5) restrict the sample to countries with a formal institution and also include an indicator variable that is 1 if a new constitution was drafted or the existing constitution was amended.

***   Significant at the 1 percent level,
 **   Significant at the 5 percent level,
  *   Significant at the 10 percent level

Table B-3 FISCAL RULES AND ECONOMIC GROWTH—HISTORICAL RESULTS, 1789–1950, AC-COUNTING FOR CONFOUNDING FACTORS: POPULATION

Dependent variable: Logarithm of GDP (per capita), y_{it}

	Full sample (1789–1950) Baseline Model (1)	Full Sample (1789–1950) Two-way clust. (2)	Full Sample (1789–1950) Constitut. (3)	Full Sample (1789–1950) Δ Constitut. (4)	Full Sample (1789–1950) C×D FE (5)	Post-1820 (1820–1950) C×D FE (6)
Fiscal Rule$_{it}$	0.0137***	0.0137***	0.0135**	0.0135**	0.0143**	0.0143**
	(0.0023)	(0.0015)	(0.0045)	(0.0046)	(0.0049)	(0.0049)
Population	0.0000	0.0000	0.0002	0.0002	0.0002	0.0002
	(0.0002)	(0.0002)	(0.0002)	(0.0002)	(0.0001)	(0.0001)
$y(t-1)$	0.925***	0.925***	0.935***	0.935***	0.893***	0.893***
	(0.0299)	(0.0326)	(0.0361)	(0.0361)	(0.0304)	(0.0305)
$y(t-2)$	-0.0709**	-0.0709*	-0.0636	-0.0637	-0.0709**	-0.0713**
	(0.0348)	(0.0373)	(0.0395)	(0.0395)	(0.0340)	(0.0341)
$y(t-3)$	0.0241	0.0241	-0.00794	-0.00795	0.0219	0.0220
	(0.0390)	(0.0341)	(0.0501)	(0.0501)	(0.0392)	(0.0392)
$y(t-4)$	0.0543	0.0543**	0.0556	0.0557	0.0615	0.0616
	(0.0406)	(0.0273)	(0.0532)	(0.0531)	(0.0408)	(0.0409)
Observations	4,229	4,229	2,961	2,961	4,229	3,956
Countries	54	54	46	46	54	54
R-Squared	0.868	0.868	0.841	0.841	0.827	0.809
F-Stat	1859.3	42810.1	935.9	911.5	730.7	686.8
F p-val	0.000	0.000	0.000	0.000	0.000	0.000
Equality	–	0.697	0.858	0.859	0.999	0.998
Country FE	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
C × D FE	No	No	No	No	Yes	Yes

Notes: The table shows the results of our historical estimations on the effect of constitutional fiscal rules on economic growth (Equation 2). Robust standard errors (adjusted for arbitrary heteroskedasticity and clustering by countries) are reported in parentheses. The log of per capita GDP is measured in 2010 US-Dollar, data on fiscal rules is collected by the Comparative Constitutions Project (CCP) from Elkins et al. (2020). The variable "Fiscal Rule" denotes whether a fiscal rules has been in place in the constitution in a given year. Fiscal rules in the CCP sample are balanced budget rules. Our sample includes information on the period 1789–1950. The row labeled "Equality" reports the p-value of a test on equality between the baseline parameter estimate (Column 1) and the corresponding parameter estimates of Columns (2)–(6). Population is measured in million individuals.

  ***   Significant at the 1 percent level,
   **   Significant at the 5 percent level,
    *   Significant at the 10 percent level

Table B-4 FISCAL RULES AND ECONOMIC GROWTH—HISTORICAL RESULTS, 1850–1950, AC-COUNTING FOR CONFOUNDING FACTORS: DEMOCRACY AND WAR

Dependent variable: Logarithm of GDP (per capita), y_{it}

	Post-1850 Period (1850–1950) Baseline Model (1)	Post-1850 Period (1850–1950) Baseline Model (2)	Post-1850 Period (1850–1950) Baseline Model (3)	Post-1850 Period (1850–1950) Baseline Model (4)
Fiscal Rule$_{it}$	0.00753** (0.00363)	0.0129** (0.00449)	0.0130** (0.00465)	0.0129** (0.00451)
Democracy	0.00365 (0.00293)			
Inter-state War		-0.00412 (0.0109)		
Intra-state War			-0.0161** (0.00795)	
Extra-state War				0.0117 (0.00749)
$y(t-1)$	0.854*** (0.0570)	0.903*** (0.0341)	0.902*** (0.0344)	0.903*** (0.0338)
$y(t-2)$	0.0115 (0.0509)	-0.0220 (0.0284)	-0.0213 (0.0286)	-0.0206 (0.0281)
$y(t-3)$	0.0208 (0.0577)	-0.00401 (0.0421)	-0.00444 (0.0425)	-0.00511 (0.0421)
$y(t-4)$	0.0193 (0.0474)	0.0333 (0.0432)	0.0344 (0.0431)	0.0338 (0.0431)
Observations	2160	2572	2572	2572
Countries	40	41	41	41
R-Squared	0.825	0.824	0.824	0.824
F-Stat	620.5	530.7	606.2	549.6
F p-val	0.000	0.000	0.000	0.000
Country FE	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes
C × D FE	No	No	No	No

Notes: The table shows the results of our historical estimations on the effect of constitutional fiscal rules on economic growth (Equation 2). Robust standard errors (adjusted for arbitrary heteroskedasticity and clustering by countries) are reported in parentheses. The log of per capita GDP is measured in 2010 US-Dollar, data on fiscal rules is collected by the Comparative Constitutions Project (CCP) from Elkins et al. (2020). The variable "Fiscal Rule" denotes whether a fiscal rules has been in place in the constitution in a given year. Fiscal rules in the CCP sample are balanced budget rules. Our sample includes information on the period 1850–1950 due to restrictions in data availability of some of the additional variables. Historical data on democracy comes from the dataset compiled by Foldvari (2014). Data on war is collcted from Sarkees and Wayman (2010).

***	Significant at the 1 percent level,
**	Significant at the 5 percent level,
*	Significant at the 10 percent level

Table B-5 FISCAL RULES AND ECONOMIC GROWTH—MODERN SAMPLE, COUNTRIES WITH AND WITHOUT CONSTITUTIONS, 1985–2015

Dependent variable: Logarithm of GDP (per capita), y_{it}

	All Rules (1985–2015) (1)	National Rules (1985–2015) (2)	Supra-National Rules (1985–2015) (3)	Constitutional Rules (1985–2015) (4)
Fiscal Rule$_{it}$	-0.0002 (0.0077)	0.0093** (0.0044)	-0.0082 (0.0111)	0.0124*** (0.0032)
$y(t-1)$	0.982*** (0.0332)	0.978*** (0.0314)	0.982*** (0.0343)	0.982*** (0.0331)
$y(t-2)$	0.00377 (0.0312)	0.00633 (0.0297)	0.00392 (0.0313)	0.00388 (0.0311)
$y(t-3)$	-0.00594 (0.0317)	0.000448 (0.0291)	-0.00548 (0.0318)	-0.00576 (0.0315)
$y(t-4)$	-0.0765*** (0.0190)	-0.0842*** (0.0131)	-0.0762*** (0.0189)	-0.0767*** (0.0194)
Observations	2620	2600	2620	2620
Countries	88	88	88	88
R-Squared	0.873	0.872	0.873	0.873
F-Stat	768977.3	3236279.9	24432.1	198388.0
F p-val	0.000	0.000	0.000	0.000
Country FE	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes
C × D FE	Yes	Yes	Yes	Yes

Notes: The table shows the results of our estimations on the effect of fiscal rules on economic growth (Equation 2) for the period 1985–2015. Robust standard errors (adjusted for arbitrary heteroskedasticity and clustering) are reported in parentheses. The log of per capita GDP is measured in 2011 US-Dollar, data on fiscal rules is collected by the IMF Database on Fiscal Rules (see Schaechter et al., 2012 for details). We use information from four legal layers of fiscal rules included in the IMF dataset: The column labeled "All Rules" uses all data on fiscal rules, column "National Rules" only uses fiscal rules on the national level, Column "Supra-National Rules" exploits fiscal rules introduced by mutual agreements on the supranational level, and "Constitutional Fiscal Rules" only considers fiscal rules that are adopted in the constitution. The table includes all countries and years for which data on fiscal rules and real per capita GDP is available.

***	Significant at the 1 percent level,
**	Significant at the 5 percent level,
*	Significant at the 10 percent level

Table B-6 FISCAL RULES AND ECONOMIC GROWTH—MODERN SAMPLE, ALL COUNTRIES, 1985–2015

Dependent variable: Logarithm of GDP (per capita), y_{it}				
	All Rules (1985–2015) (1)	National Rules (1985–2015) (2)	Supra-National Rules (1985–2015) (3)	Constitutional Rules (1985–2015) (4)
Fiscal Rule$_{it}$	0.0006 (0.0026)	0.0050 (0.0037)	-0.0020 (0.0024)	0.0108*** (0.0029)
$y(t-1)$	0.982*** (0.0332)	0.978*** (0.0314)	0.982*** (0.0343)	0.982*** (0.0331)
$y(t-2)$	0.00377 (0.0312)	0.00633 (0.0297)	0.00392 (0.0313)	0.00388 (0.0311)
$y(t-3)$	-0.00594 (0.0317)	0.000448 (0.0291)	-0.00548 (0.0318)	-0.00576 (0.0315)
$y(t-4)$	-0.0765*** (0.0190)	-0.0842*** (0.0131)	-0.0762*** (0.0189)	-0.0767*** (0.0194)
Observations	4513	4513	4513	4513
Countries	157	157	157	157
R-Squared	0.871	0.871	0.871	0.871
F-Stat	972302.4	2214816.5	35617.9	2500142.3
F p-val	0.000	0.000	0.000	0.000
Country FE	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes
C × D FE	Yes	Yes	Yes	Yes

Notes: The table shows the results of our estimations on the effect of fiscal rules on economic growth (Equation 2) for the period 1985–2015. Robust standard errors (adjusted for arbitrary heteroskedasticity and clustering) are reported in parentheses. The log of per capita GDP is measured in 2011 US-Dollar, data on fiscal rules is collected by the IMF Database on Fiscal Rules (see Schaechter et al., 2012 for details). We use information from four legal layers of fiscal rules included in the IMF dataset: The column labeled "All Rules" uses all data on fiscal rules, column "National Rules" only uses fiscal rules on the national level, Column "Supra-National Rules" exploits fiscal rules introduced by mutual agreements on the supranational level, and "Constitutional Fiscal Rules" only considers fiscal rules that are adopted in the constitution. The table also includes countries and years that are not included in the IMF Fiscal Rules database (non-included countries are treated as not having fiscal rules).

*** Significant at the 1 percent level,
** Significant at the 5 percent level,
* Significant at the 10 percent level

Table B-7 FISCAL RULES AND ECONOMIC GROWTH—MODERN SAMPLE, DIFFERENT TYPES OF RULES, CONSTITUTIONAL AND NON-CONSTITUTIONAL RULES, 1985–2015

	Expenditure Rules (1985–2015) (1)	Revenue Rules (1985–2015) (2)	Balanced Budget Rules (1985–2015) (3)	Debt Rules (1985–2015) (4)
Dependent variable: Logarithm of GDP (per capita), y_{it}				
Fiscal Rule$_{it}$	0.0050	-0.0249	0.0029	-0.0025
	(0.0057)	(0.0164)	(0.0055)	(0.0100)
$y(t-1)$	0.980***	0.977***	0.980***	0.980***
	(0.0365)	(0.0391)	(0.0362)	(0.0371)
$y(t-2)$	0.00651	0.00672	0.00635	0.00641
	(0.0327)	(0.0330)	(0.0328)	(0.0329)
$y(t-3)$	0.00102	0.000364	0.000644	0.000902
	(0.0340)	(0.0335)	(0.0341)	(0.0340)
$y(t-4)$	-0.0763***	-0.0743***	-0.0760***	-0.0757***
	(0.0109)	(0.00954)	(0.0109)	(0.0103)
Observations	2555	2555	2555	2555
Countries	88	88	88	88
R-Squared	0.879	0.879	0.879	0.879
F-Stat	159887.7	48573.5	255278.0	34187.1
F p-val	0.000	0.000	0.000	0.000
Country FE	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes
C × D FE	Yes	Yes	Yes	Yes

Notes: The table shows the results of our estimations on the effect of fiscal rules on economic growth (Equation 2) for the period 1985–2015. Robust standard errors (adjusted for arbitrary heteroskedasticity and clustering) are reported in parentheses. The log of per capita GDP is measured in 2011 US-Dollar, data on fiscal rules is collected by the IMF Database on Fiscal Rules (see Schaechter et al., 2012 for details). We use information on different types of fiscal rules included in the IMF dataset: Expenditure rules (Column 1), revenue rules (Column 2), balanced budget rules (Column 3), and debt rules (Column 4). The table only includes countries and years that are included in the IMF Fiscal Rules database.

 *** Significant at the 1 percent level,
 ** Significant at the 5 percent level,
 * Significant at the 10 percent level

Table B-8 FISCAL RULES AND ECONOMIC GROWTH—MODERN SAMPLE, DIFFERENT TYPES OF RULES, CONSTITUTIONAL RULES, 1985–2015

Dependent variable: Logarithm of GDP (per capita), y_{it}

	Expenditure Rules (1985–2015) (1)	Revenue Rules (1985–2015) (2)	Balanced Budget Rules (1985–2015) (3)	Debt Rules (1985–2015) (4)
Fiscal Rule$_{it}$	0.0159***	-0.00611	0.0151***	0.0164***
	(0.0036)	(0.0037)	(0.0033)	(0.0043)
$y(t-1)$	0.980***	0.980***	0.980***	0.980***
	(0.0364)	(0.0365)	(0.0364)	(0.0364)
$y(t-2)$	0.0064	0.0064	0.0065	0.0065
	(0.0329)	(0.0329)	(0.0328)	(0.0328)
$y(t-3)$	0.0010	0.0008	0.0011	0.0010
	(0.0339)	(0.0339)	(0.0338)	(0.0338)
$y(t-4)$	-0.0759***	-0.0758***	-0.0760***	-0.0761***
	(0.0111)	(0.0110)	(0.0110)	(0.0109)
Observations	2555	2555	2555	2555
Countries	88	88	88	88
R-Squared	0.879	0.879	0.879	0.879
F-Stat	20485.0	19168.6	7207.2	21703.1
F p-val	0.000	0.000	0.000	0.000
Country FE	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes
C × D FE	Yes	Yes	Yes	Yes

Notes: The table shows the results of our estimations on the effect of fiscal rules on economic growth (Equation 2) for the period 1985–2015. Robust standard errors (adjusted for arbitrary heteroskedasticity and clustering) are reported in parentheses. The log of per capita GDP is measured in 2011 US-Dollar, data on fiscal rules is collected by the IMF Database on Fiscal Rules (see Schaechter et al., 2012 for details). We use information on different types of fiscal rules included in the IMF dataset: Expenditure rules (Column 1), revenue rules (Column 2), balanced budget rules (Column 3), and debt rules (Column 4). Only those rules that are adopted in the national constitution are considered. The table only includes countries and years that are included in the IMF Fiscal Rules database.

***	Significant at the 1 percent level,
**	Significant at the 5 percent level,
*	Significant at the 10 percent level

Table B-9 FISCAL RULES AND ECONOMIC GROWTH—MODERN SAMPLE, RULES WITH FOR-MAL MONITORING AND ENFORCEMENT PROCEDURES, 1985–2015

Dependent variable: Logarithm of GDP (per capita), y_{it}

	All Rules (1985–2015) Formal enforcement (1)	National Rules (1985–2015) Formal enforcement (2)	Supra-National Rules (1985–2015) Formal enforcement (3)	Constitutional Rules (1985–2015) Formal enforcement (4)
Fiscal Rule$_{it}$	-0.00687	0.00186	-0.00608	0.0133***
	(0.0101)	(0.00345)	(0.0128)	(0.00326)
$y(t-1)$	0.980***	0.976***	0.980***	0.980***
	(0.0375)	(0.0348)	(0.0373)	(0.0365)
$y(t-2)$	0.00638	0.00933	0.00644	0.00651
	(0.0331)	(0.0314)	(0.0330)	(0.0328)
$y(t-3)$	0.00101	0.00761	0.00104	0.00106
	(0.0339)	(0.0324)	(0.0340)	(0.0338)
$y(t-4)$	-0.0751***	-0.0834***	-0.0756***	-0.0760***
	(0.00980)	(0.00456)	(0.0103)	(0.0109)
Observations	2555	2555	2555	2555
Countries	88	88	88	88
R-Squared	0.879	0.878	0.879	0.879
F-Stat	46103.5	19088.8	9381.0	12567.3
F p-val	0.000	0.000	0.000	0.000
Country FE	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes
C × D FE	Yes	Yes	Yes	Yes

Notes: The table shows the results of our estimations on the effect of fiscal rules on economic growth (Equation 2) for the period 1985–2015. Robust standard errors (adjusted for arbitrary heteroskedasticity and clustering) are reported in parentheses. The log of per capita GDP is measured in 2011 US-Dollar, data on fiscal rules is collected by the IMF Database on Fiscal Rules (see Schaechter et al., 2012 for details). We use information from four legal layers of fiscal rules included in the IMF dataset: The column labeled "All Rules" uses all data on fiscal rules, column "National Rules" only uses fiscal rules on the national level, Column "Supra-National Rules" exploits fiscal rules introduced by mutual agreements on the supranational level, and "Constitutional Fiscal Rules" only considers fiscal rules that are adopted in the constitution. The table focuses on country-years during which formal constitutions have been in place and includes countries and years that are included in the IMF Fiscal Rules database.

*** Significant at the 1 percent level,
 ** Significant at the 5 percent level,
  * Significant at the 10 percent level

Table B-10 FISCAL RULES AND ECONOMIC GROWTH—MODERN SAMPLE, CONSTITUTIONAL FISCAL RULES, ALTERNATIVE SPECIFICATION OF GDP-DYNAMICS, 1985–2015

	Constitut. Rules (1985–2015) Baseline Dynamics (1)	Constitut. Rules (1985–2015) 3-Period Dynamics (2)	Constitut. Rules (1985–2015) 2-Period Dynamics (3)	Constitut. Rules (1985–2015) 1-Period Dynamics (4)
Dependent variable: Logarithm of GDP (per capita), y_{it}				
Fiscal Rule$_{it}$	0.0133*** (0.00326)	0.0108*** (0.00310)	0.00779** (0.00327)	0.00756** (0.00340)
$y(t-1)$	0.980*** (0.0375)	0.976*** (0.0348)	0.980*** (0.0373)	0.980*** (0.0365)
$y(t-2)$	0.00651 (0.0328)	-0.0102 (0.0495)	-0.119 (0.0805)	
$y(t-3)$	0.00106 (0.0338)	-0.0862** (0.0298)		
$y(t-4)$	-0.0760*** (0.0109)			
Observations	2555	2566	2575	2582
Countries	88	88	88	88
R-Squared	0.879	0.876	0.868	0.866
F-Stat	12567.3	8639.4	7479.3	7582.6
F p-val	0.000	0.000	0.000	0.000
Country FE	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes
C × D FE	Yes	Yes	Yes	Yes

Notes: The table shows the results of our estimations on the effect of constitutional fiscal rules on economic growth (Equation 2) for the period 1985–2015 using alternative specifications of the GDP dynamics process. Robust standard errors (adjusted for arbitrary heteroskedasticity and clustering) are reported in parentheses. The log of per capita GDP is measured in 2011 US-Dollar, data on fiscal rules is collected by the IMF Database on Fiscal Rules (see Schaechter et al., 2012 for details). The table only considers fiscal rules that are adopted in the constitution. The table focuses on country-years during which formal constitutions have been in place and includes countries and years that are included in the IMF Fiscal Rules database.

*** Significant at the 1 percent level,
** Significant at the 5 percent level,
* Significant at the 10 percent level

Table B-11 FISCAL RULES AND ECONOMIC GROWTH—MODERN SAMPLE, CONSTITU-
TIONAL FISCAL RULES, ACCOUNTING FOR UNIT ROOTS IN GDP, 1985–2015

	All Rules (1985–2015) (1)	National Rules (1985–2015) (2)	Supra-National Rules (1985–2015) (3)	Constitutional Rules (1985–2015) (4)
Dependent variable: Log Difference of GDP (per capita), Δy_{it}				
Fiscal Rule$_{it}$	-0.00757 (0.00914)	-0.000570 (0.00628)	-0.00791 (0.00587)	0.0156*** (0.00370)
$\Delta y(t-1)$	0.0244 (0.0411)	0.0241 (0.0398)	0.0245 (0.0407)	0.0248 (0.0400)
$\Delta y(t-2)$	0.0211 (0.0208)	0.0239 (0.0207)	0.0211 (0.0205)	0.0215 (0.0205)
$\Delta y(t-3)$	0.0320** (0.0120)	0.0381*** (0.00898)	0.0319** (0.0124)	0.0323** (0.0127)
$\Delta y(t-4)$	0.0140 (0.0201)	0.0175 (0.0192)	0.0140 (0.0206)	0.0143 (0.0210)
Observations	2544	2525	2544	2544
Countries	88	88	88	88
R-Squared	0.00370	0.00351	0.00350	0.00341
F-Stat	67.39	191.4	73.16	38.17
F p-val	0.000	0.000	0.000	0.000
Country FE	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes
C × D FE	Yes	Yes	Yes	Yes

Notes: The table shows the results of our estimations on the effect of constitutional fiscal rules on economic growth (Equation 2) for the period 1985–2015 allowing for unit roots in the GDP series (Equation 6). Robust standard errors (adjusted for arbitrary heteroskedasticity and clustering) are reported in parentheses. The log difference of per capita GDP is measured in 2011 US-Dollar, data on fiscal rules is collected by the IMF Database on Fiscal Rules (see Schaechter et al., 2012 for details). The table only considers fiscal rules that are adopted in the constitution. The table focuses on country-years during which formal constitutions have been in place and includes countries and years that are included in the IMF Fiscal Rules database.

 ***   Significant at the 1 percent level,
 **   Significant at the 5 percent level,
 *   Significant at the 10 percent level

Table B-12 FISCAL RULES AND ECONOMIC GROWTH—MODERN SAMPLE, CONSTITUTIONAL FISCAL RULES, ACCOUNTING FOR POTENTIAL CONFOUNDING FACTORS, 1985–2015

Dependent variable: Logarithm of GDP (per capita), y_{it}

	Const. Rules (1985–2015) (1)	Const. Rules (1985–2015) (2)	Const. Rules (1985–2015) (3)	Const. Rules (1985–2015) (4)	Const. Rules (1985–2015) (5)	Const. Rules (1985–2015) (6)
Fiscal Rule$_{it}$	0.0133*** (0.00326)	0.0148*** (0.00311)	0.00817*** (0.000937)	0.00933** (0.00316)	0.0140*** (0.00271)	0.0139*** (0.0032)
$y(t-1)$	0.980*** (0.0365)	0.977*** (0.0362)	0.995*** (0.0372)	0.958*** (0.0321)	0.975*** (0.0540)	0.9773*** (0.0345)
$y(t-2)$	0.0065 (0.0328)	0.0081 (0.0325)	-0.0226 (0.0358)	0.0309 (0.0337)	0.0083 (0.0435)	0.0047 (0.0333)
$y(t-3)$	0.00106 (0.0338)	0.00180 (0.0337)	0.0130 (0.0360)	0.00556 (0.0365)	0.0015 (0.0359)	0.0017 (0.0336)
$y(t-4)$	-0.0760*** (0.0109)	-0.0756*** (0.0105)	-0.0669*** (0.0105)	-0.0717*** (0.0169)	-0.0979*** (0.0145)	-0.0734*** (0.0139)
Democracy		0.0090 (0.0083)				
Const. Changes			-0.0005 (0.0024)			
Economic Crisis				-0.0966*** (0.0141)		
Human Capital					0.0599** (0.0236)	
Globalization						0.0012*** (0.0003)
Observations	2555	2524	2381	2555	2371	2555
Countries	88	87	88	88	81	88
R-Squared	0.879	0.879	0.875	0.887	0.858	0.879
F-Stat	12567.3	12291.3	222116.4	113671.3	44369.3	32803
F p-val	0.000	0.000	0.000	0.000	0.000	0.000
Country FE	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
C × D FE	Yes	Yes	Yes	Yes	Yes	Yes

Notes: The table shows the results of our estimations on the effect of constitutional fiscal rules on economic growth (Equation 2) for the period 1985–2015 including potential confounding factors. Robust standard errors (adjusted for arbitrary heteroskedasticity and clustering) are reported in parentheses. The log of per capita GDP is measured in 2011 US-Dollar, data on fiscal rules is collected by the IMF Database on Fiscal Rules (see Schaechter et al., 2012 for details). The table only considers fiscal rules that are adopted in the constitution. The table focuses on country-years during which formal constitutions have been in place and includes countries and years that are included in the IMF Fiscal Rules database. Democracy is measured via the continuous indicator of political institutions compiled by Gründler and Krieger (2016, 2018). Constitutional changes are constructed based on information included in the CCP dataset. Economic Crises are defined as period where real per capita GDP decreased by 5% (about 7.2% of the country-year observations included in our sample). Human Capital refers to the human capital indicator provided by PWT version 9.1. (Feenstra et al., 2015). Globalization is measured by the KOF Globalisation Index (Gygli et al., 2019).

*** Significant at the 1 percent level,
** Significant at the 5 percent level,
* Significant at the 10 percent level

Table B-13 FISCAL RULES AND ECONOMIC GROWTH—INSTRUMENTAL VARIABLE RE-SULTS, ROBUSTNESS TO OUTLIERS, 1985–2015

Dependent variable: Logarithm of GDP (per capita), y_{it}

	Coefficient (γ) (1)	Standard Error (2)	Observations (3)	Countries (4)	R-Squared (5)
Baseline	0.182***	0.0403	1,978	68	0.996
Exclude Denmark	0.181***	0.0409	1,947	67	0.996
Exclude France	0.149***	0.0345	1,947	67	0.997
Exclude Germany	0.205***	0.0431	1,947	67	0.996
Exclude Italy	0.174***	0.0404	1,947	67	0.996
Exclude Latvia	0.178***	0.0393	1,947	67	0.996
Exclude Lithuania	0.189***	0.0409	1,947	67	0.996
Exclude Malta	0.182***	0.0402	1,947	67	0.996
Exclude Poland	0.257***	0.0453	1,947	67	0.995
Exclude Singapore	0.404**	0.1990	1,947	67	0.992
Exclude Slovakia	0.174***	0.0387	1,947	67	0.996
Exclude Switzerland	0.186***	0.0412	1,947	67	0.996

Notes: The table shows the 2SLS results of our estimations on the effect of fiscal rules on economic growth (Equation 7) for the period 1985–2015. The estimator is implemented following Baltagi and Liu (2009), with standard errors obtained from asymptotic theory reported in parentheses. The log of per capita GDP is measured in 2011 US-Dollar, data on fiscal rules is collected by the IMF Database on Fiscal Rules (see Schaechter et al., 2012 for details). The table performs a jack-knife analysis, excluding in each step one of the countries that have had fiscal rules in their constitutions at least in one year during the observation period 1985–2015. The first row shows the baseline IV results reported in Column (1) of Table (4). Each model includes random effects for countries and period-fixed effects.

***   Significant at the 1 percent level,
 **   Significant at the 5 percent level,
  *   Significant at the 10 percent level

Table B-14 CONSTITUTIONAL FISCAL RULES AND ECONOMIC GROWTH—INSTRUMENTAL VARIABLE RESULTS, ACCOUNTING FOR OTHER DIMENSIONS OF FISCAL CONSERVATISM, 1985–2015

Dependent variable: Logarithm of GDP (per capita), y_{it}

	Full Sample (1985–2015) Baseline Model (1)	Full Sample (1985–2015) Baseline Model (2)	Full Sample (1985–2015) Baseline Model (3)	Full Sample (1985–2015) Baseline Model (4)	Full Sample (1985–2015) Baseline Model (5)
Panel A: Second-stage results					
Fiscal Rule$_{it}$	0.360*** (0.0663)	0.0665** (0.0208)	0.113*** (0.0324)	0.104*** (0.0212)	0.310*** (0.0578)
Gross Saving (% of GDP)		0.0005** (0.0002)			
Redistribution			-0.0059 (0.0219)		
Tax Revenue (% of GDP)				0.0008** (0.0003)	
Right-Wing Ideology					0.0029 (0.0039)
$y(t-1)$	1.181*** (0.0254)	1.155*** (0.0209)	1.198*** (0.0206)	1.160*** (0.0228)	1.183*** (0.0236)
$y(t-2)$	-0.0723* (0.0392)	0.00288 (0.0318)	-0.0560* (0.0320)	-0.0370 (0.0350)	-0.0723** (0.0365)
$y(t-3)$	-0.0674* (0.0376)	-0.127*** (0.0301)	-0.0920** (0.0307)	-0.0919** (0.0337)	-0.0673* (0.0350)
$y(t-4)$	-0.0576** (0.0235)	-0.0392** (0.0188)	-0.0577** (0.0192)	-0.0442** (0.0211)	-0.0581** (0.0219)
Panel B: First-stage results					
Rules Propensity	0.009*** (0.0019)	0.016*** (0.0023)	0.014*** (0.0023)	0.012*** (0.0030)	0.008*** (0.0019)
Observations	3009	2549	2527	2074	3009
Countries	102	100	99	93	102
R-Squared	0.994	0.997	0.997	0.997	0.995
χ^2 Wald	477446	903713	818081	594083	551070
χ^2 p-val	0.000	0.000	0.000	0.000	0.000
SW p-val	0.000	0.000	0.000	0.000	0.000
Stock-Wright p-val	0.000	0.000	0.000	0.000	0.000
Country RE	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes

Notes: The table shows the 2SLS results of our estimations on the effect of fiscal rules on economic growth (Equation 7) for the period 1985–2015. The estimator is implemented following Baltagi and Liu (2009), with standard errors obtained from asymptotic theory reported in parentheses. The log of per capita GDP is measured in 2011 US-Dollar, data on fiscal rules is collected by the IMF Database on Fiscal Rules (see Schaechter et al., 2012 for details). All estimates are based on the full sample of countries. Data for gross savings and tax revenue is taken from World Bank (2020). Redistribution is measured via the difference between the Gini indices pre and post taxes and transfers. Data comes from Solt (2016). Government ideology is a dummy that is 1 if the chief executive party has a right-wing ideology (0 otherwise). Data is taken from the Database of Political Institutions (Scartascini et al., 2018). "SW p-val" reports the p-value of the Sanderson-Windmeijer F-Statistic for the first-stage. "Stock-Wright p-val" reports weak-instrument robust inference using the Stock-Wright LM test.

*** Significant at the 1 percent level,
** Significant at the 5 percent level,
* Significant at the 10 percent level

Table B-15 FISCAL RULES AND ECONOMIC GROWTH—TRANSMISSION MECHANISM: INTEREST RATES

Dependent variable: Interest rates, I_{it}

	Long-term rates		Short-term rates	
	Const. Rules (1870–1950) (1)	Const. Rules (1870–2015) (2)	Const. Rules (1870–1950) (3)	Const. Rules (1870–2015) (4)
Fiscal Rule$_{it}$	-0.238***	-0.0860	-0.255*	-0.0519
	(0.0357)	(0.0835)	(0.136)	(0.119)
$I(t-1)$	0.993***	0.997***	0.639***	0.783***
	(0.0653)	(0.0736)	(0.0840)	(0.0616)
$I(t-2)$	-0.203***	-0.162*	-0.105***	-0.0965
	(0.0614)	(0.0940)	(0.0254)	(0.0601)
$I(t-3)$	0.253*	0.142	0.184***	0.0638
	(0.146)	(0.0882)	(0.0418)	(0.0463)
$I(t-4)$	-0.172	-0.0738	-0.0220	0.0918**
	(0.122)	(0.0786)	(0.0245)	(0.0367)
Observations	1241	2376	1132	2249
Countries	17	17	17	17
R-Squared	0.856	0.859	0.480	0.662
F-Stat	21770.3	6803.0	75.80	308.3
F p-val	0.000	0.000	0.000	0.000
Country FE	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes

Notes: The table shows the results of our estimations on the effect of fiscal rules on interest rates using a similar specification as in Equation (2). Robust standard errors (adjusted for arbitrary heteroskedasticity and clustering) are reported in parentheses. The log of per capita GDP is measured in 2011 US-Dollar, data on fiscal rules is collected by the IMF Database on Fiscal Rules (see Schaechter et al., 2012 for details). The table only considers fiscal rules that have been adopted in the national constitution. Data on interest-rates have been taken from Jordà et al. (2017).

***	Significant at the 1 percent level,
**	Significant at the 5 percent level,
*	Significant at the 10 percent level

Table B-16 FISCAL RULES AND ECONOMIC GROWTH—SAMPLE OF SUB-NATIONAL GOVERNMENTS, ALTERNATIVE SPECIFICATION OF GRP-DYNAMICS, 1992–2012

Dependent variable: Logarithm of GRP (per capita), y_{ist}

	Constitut. Rules (1992–2012) Full sample (1)	Constitut. Rules (1992–2012) Full sample (2)	Constitut. Rules (1992–2012) Full sample (3)	Constitut. Rules (1992–2012) Full sample (4)
Fiscal Rule$_{ist}$	0.0237*** (0.00182)	0.0263*** (0.00247)	0.0234*** (0.00214)	0.0287*** (0.00257)
$y(t-1)$	0.940*** (0.0204)	0.944*** (0.0229)	0.907*** (0.0181)	0.714*** (0.0241)
$y(t-2)$	-0.0769** (0.0310)	-0.228*** (0.0335)	-0.127*** (0.0144)	
$y(t-3)$	-0.0219 (0.0230)	0.0976*** (0.0269)		
$y(t-4)$	-0.106*** (0.0144)			
Observations	2822	2988	3154	3320
Regions	166	166	166	166
R-Squared	0.961	0.956	0.962	0.953
F-Stat	12137.7	11077.2	14339.1	10951.0
F p-val	0.000	0.000	0.000	0.000
Country FE	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes
C × D FE	No	No	No	No

Notes: The table shows the results of our estimations on the effect of fiscal rules on economic growth (Equation 9) on the sub-national level for the period 1992–2012. The table examines changes in the estimated parameter when altering the structure of GRP dynamics. Robust standard errors (adjusted for arbitrary heteroskedasticity and clustering) are reported in parentheses. The log of per capita GRP is measured using data from Lessmann and Seidel (2017), data on fiscal rules is based on our unique dataset on regional fiscal rules (see Table D-1 for details). We only consider fiscal rules that are adopted in the state-level constitution.

*** Significant at the 1 percent level,
** Significant at the 5 percent level,
* Significant at the 10 percent level

Table B-17 FISCAL RULES AND ECONOMIC GROWTH—SAMPLE OF SUB-NATIONAL GOVERNMENTS, ACCOUNTING FOR UNIT ROOTS IN GRP, 1992–2012

Dependent variable: Log Difference in GRP (per capita), Δy_{ist}

	Constitutional Rules (1992–2012) Full sample (1)	Constitutional Rules (1992–2012) Full sample (2)	Constitutional Rules (1992–2012) OECD (3)	Constitutional Rules (1992–2012) Europe (4)
Fiscal Rule$_{ist}$	0.0315***	0.0325***	0.00560*	0.00358*
	(0.00247)	(0.00414)	(0.00326)	(0.00196)
$\Delta y(t-1)$	0.00262	-0.0488*	-0.218***	-0.375***
	(0.0241)	(0.0250)	(0.0373)	(0.0445)
$\Delta y(t-2)$	-0.0716***	-0.116***	-0.0403	-0.169***
	(0.0210)	(0.0247)	(0.0254)	(0.0425)
$\Delta y(t-3)$	-0.0421**	-0.0422**	0.0288	-0.262***
	(0.0146)	(0.0157)	(0.0184)	(0.0666)
$\Delta y(t-4)$	-0.0767***	-0.107***	0.0113	-0.270***
	(0.0142)	(0.0159)	(0.0165)	(0.0376)
Observations	2656	2656	1424	704
Regions	166	166	89	44
R-Squared	0.641	0.662	0.723	0.816
F-Stat	1041.9	1159.9	529.3	1601.5
F p-val	0.000	0.000	0.000	0.000
Country FE	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes
C × D FE	No	Yes	No	No

Notes: The table shows the results of our estimations on the effect of fiscal rules on economic growth (Equation 9) on the sub-national level for the period 1992–2012. The table allows for unit roots in the GRP series (see equation 6 for details). Robust standard errors (adjusted for arbitrary heteroskedasticity and clustering) are reported in parentheses. The log of per capita GRP is measured using data from Lessmann and Seidel (2017), data on fiscal rules is based on our unique dataset on regional fiscal rules (see Table D-1 for details). We only consider fiscal rules that are adopted in the state-level constitution.

  ***   Significant at the 1 percent level,
   **   Significant at the 5 percent level,
    *   Significant at the 10 percent level

Table B-18 FISCAL RULES AND ECONOMIC GROWTH—SAMPLE OF SUB-NATIONAL GOVERNMENTS, ACCOUNTING FOR CONFOUNDING FACTORS, 1992–2012

Dependent variable: Logarithm of GRP (per capita), y_{ist}

	Population Dynamics		Economic Crises	
	Constitut. Rules (1992–2012) Full sample (1)	Constitut. Rules (1992–2012) Full sample (2)	Constitut. Rules (1992–2012) Full sample (3)	Constitut. Rules (1992–2012) Full sample (4)
Fiscal Rule$_{ist}$	0.0237*** (0.00182)	0.0263*** (0.00247)	0.0234*** (0.00214)	0.0287*** (0.00257)
Confounder	-0.000 (0.000)		-0.0717*** (0.0036)	
Confounder $(t-1)$		-0.0013 (0.0080)		-0.0164** (0.0050)
Confounder $(t-2)$		0.00362** (0.00178)		0.0136*** (0.0032)
Confounder $(t-3)$		-0.0015 (0.0019)		0.0010 (0.0040)
Confounder $(t-4)$		-0.0000 (0.0000)		-0.0004 (0.0026)
$y(t-1)$	0.940*** (0.0203)	0.937*** (0.0204)	0.900*** (0.0181)	0.891*** (0.0246)
$y(t-2)$	-0.0768** (0.0310)	-0.0755** (0.0307)	-0.0990*** (0.0272)	0.0128 (0.0310)
$y(t-3)$	-0.0219 (0.0230)	-0.0232 (0.0228)	0.00569 (0.0212)	-0.0687** (0.0240)
$y(t-4)$	-0.105*** (0.0143)	-0.106*** (0.0142)	-0.0635*** (0.0115)	-0.0894*** (0.0154)
Observations	2822	2822	2822	2822
Region	166	166	166	166
R-Squared	0.961	0.961	0.971	0.961
F-Stat	11823.6	11994.0	11308.4	10513.3
F p-val	0.000	0.000	0.000	0.000
Country FE	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes
C × D FE	No	No	No	No

Notes: The table shows the results of our estimations on the effect of fiscal rules on economic growth (Equation 9) on the sub-national level for the period 1992–2012. The table examines changes in the estimated parameter when we account for potential confounding factors. Columns (1)–(2) account for population dynamics using population data from the Gridded Population of the World (GPW) version 3, provided by the Center for International Earth Science Information Network (CIESIN). Columns (3)–(4) account for confounding effects of economic crises. We define a crisis as a decline in the growth rate of GRP by at least 5%. Robust standard errors (adjusted for arbitrary heteroskedasticity and clustering) are reported in parentheses. The log of per capita GRP is measured using data from Lessmann and Seidel (2017), data on fiscal rules is based on our unique dataset on regional fiscal rules (see Table D-1 for details). We only consider fiscal rules that are adopted in the state-level constitution.

*** Significant at the 1 percent level,
** Significant at the 5 percent level,
* Significant at the 10 percent level

Table B-19 DESCRIPTIVE STATISTICS, ITALIAN MUNICIPALITIES BELOW AND ABOVE 5,000 INHABITANTS, 1999–2004

Summary Statistics (Averages)

	Municipalities $< 5,000$ (1999–2004) (1)	**Municipalities $> 5,000$** (1999–2004) (2)	**All Municipalities** (1999–2004) (3)
Taxable Income (Level)	13,570.32	14,122.58	13,830.67
Taxable Income (Growth)	0.109	0.105	0.108
Age	47.65	47.42	47.54
College	0.445	0.448	0.446
Area	36.75	32.48	34.74
South	0.180	0.212	0.195
North	0.541	0.552	0.259
Center	0.279	0.236	0.546

Notes: The table shows summary statistics on key characteristics of regions below (Column 1) and above (Column 2) the critical threshold of 5,000 inhabitants. The table also reports averages for the full sample of Italian municipalities (Column 3). Data is taken from Grembi et al. (2016)..

C. Supplementary Figures (for online publication)
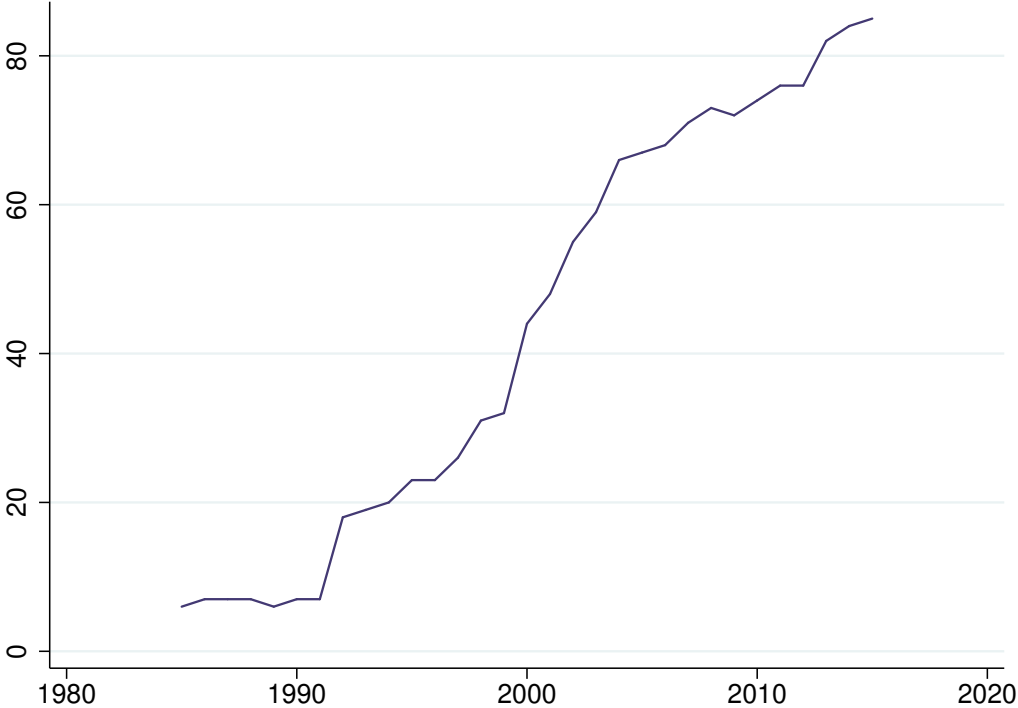
Figure C-1 DEVELOPMENT OF FISCAL RULES OVER TIME.
Notes: The figure shows the total number of countries with fiscal rules over time between 1985 and 2015.
Data source is the Fiscal Rules Dataset from the IMF (see Schaechter et al., 2012).

Figure C-2 CONSTITUTIONAL FISCAL RULES AND ECONOMIC GROWTH.
Notes: Constitutional fiscal rules and economic growth. The figure on the left-hand side shows average growth rates of per capita GDP for countries that have fiscal rules adopted in their constitution and compares them with growth rates in countries without any fiscal rule. The figure on the right-hand side shows average growth rates of per capita GDP for countries that have fiscal rules adopted in their constitution and compares them with growth rates in countries that have adopted non-constitutional fiscal rule.
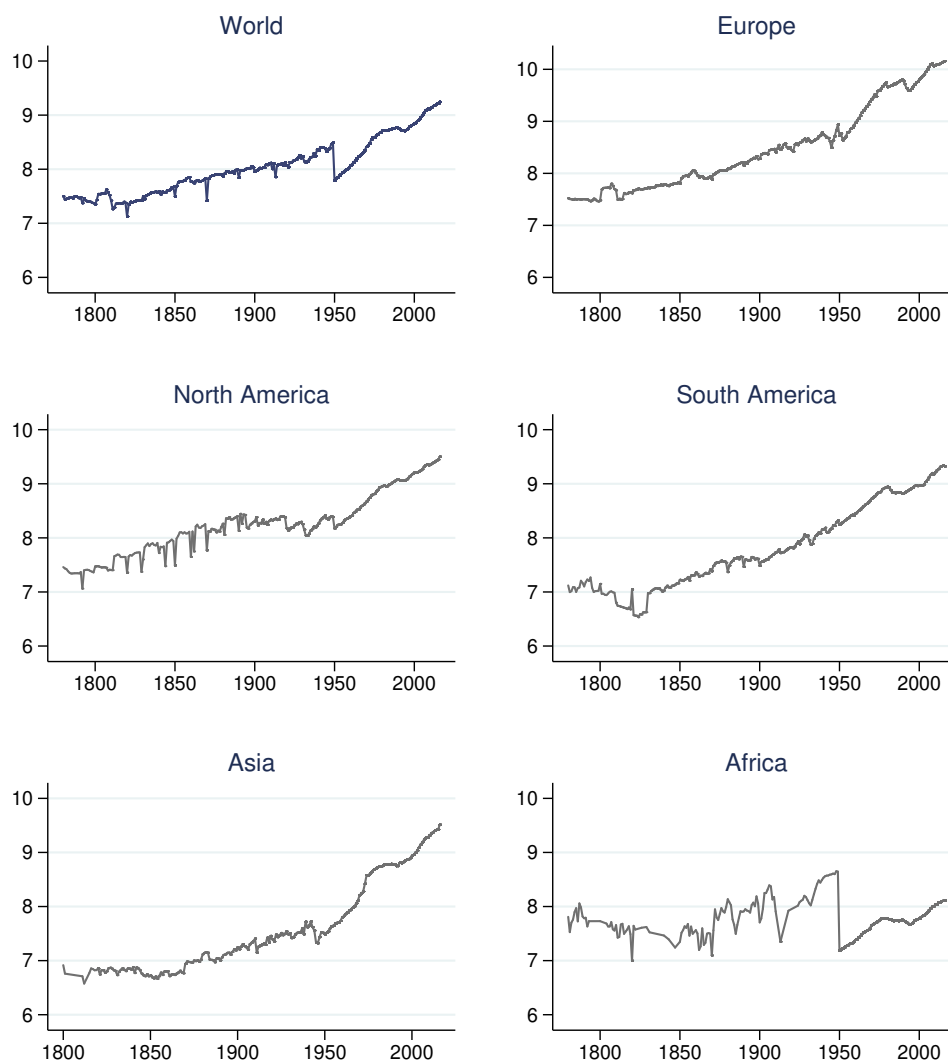
Figure C-3 DEVELOPMENT OF AVERAGE REAL PER CAPITA GDP (LOG SCALE), WORLD AND CONTINENTS, 1789–2016.
Notes: The figure shows the historical development of the average level of log real per capita GDP for world as a whole (blue line) and separately for continents (grey lines). Data source is the Maddison Project Database 2018 (Bolt et al., 2018).
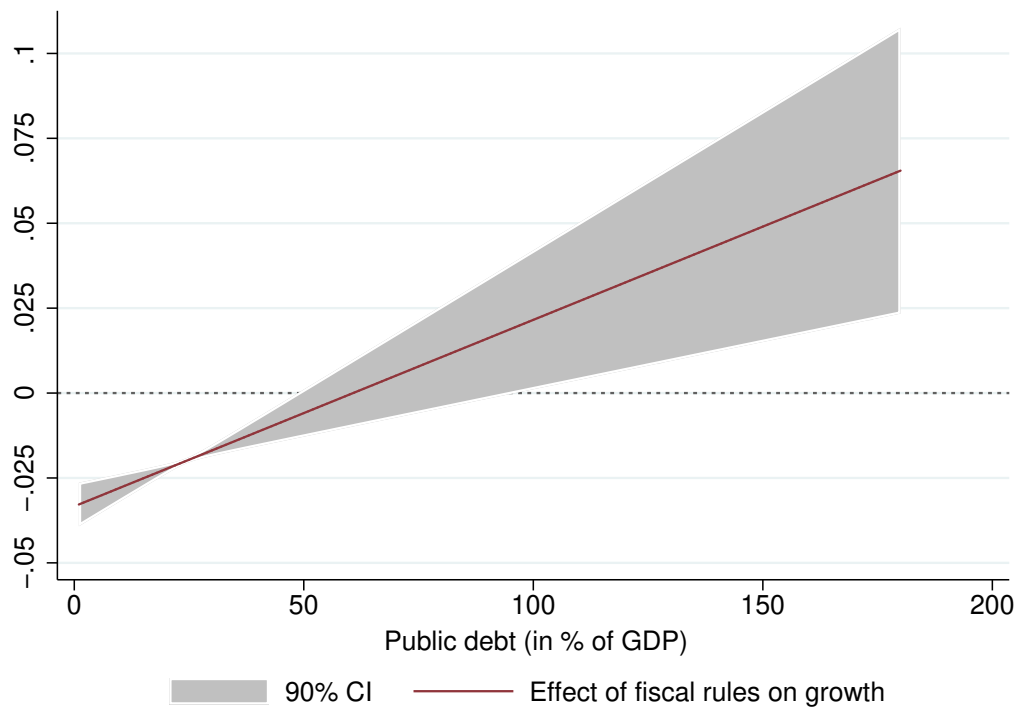
Figure C-4 CONSTITUTIONAL FISCAL RULES AND ECONOMIC GROWTH, RESULTS CONDITIONAL ON THE LEVEL OF GOVERNMENT DEBT, 1870–1950.

Notes: The figure shows the growth effect of fiscal rules conditional on the level of government debt. The results are obtained by including an interaction term between government debt and fiscal rules in our benchmark model (Equation 2). The included time period refers to the availability of historical data on government debt in the dataset of Jordà et al. (2017).
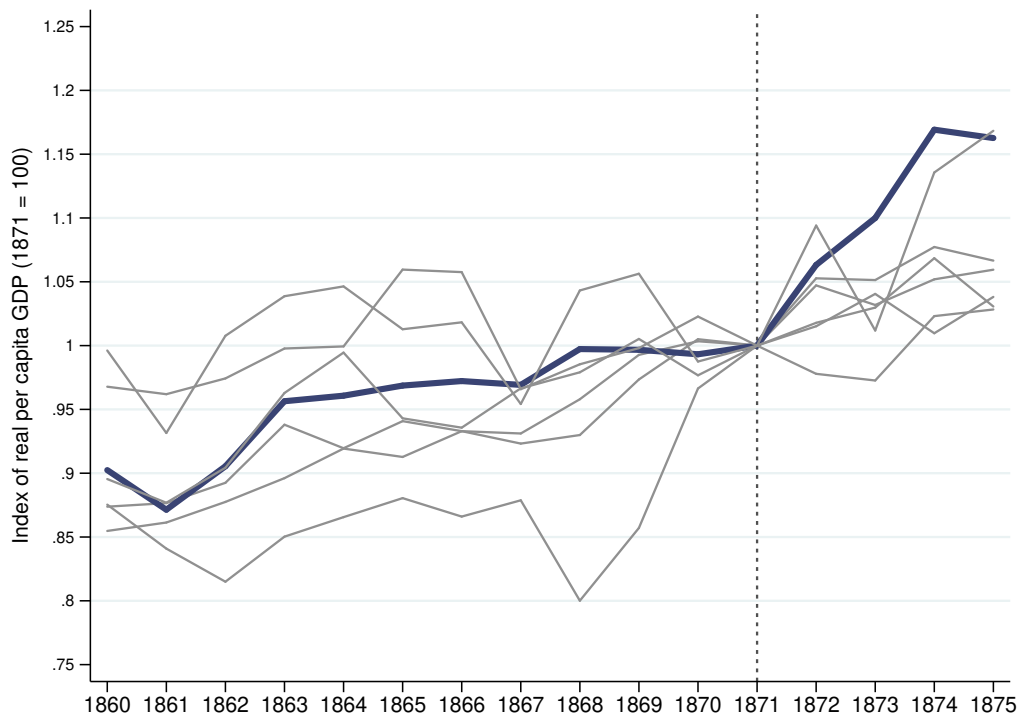
Figure C-5 FISCAL RULES IN THE GERMAN EMPIRE, ROBUSTNESS ANALYSIS, 1860–1875.
Notes: The figure shows the development of real per capita GDP in the German Empire (bold blue line) and in all countries included in the donor pool (Belgium, Denmark, the United States, France, Italy, and Sweden; grey lines). Each time series is indexed with base year 100 = 1871 (the year of the treatment).
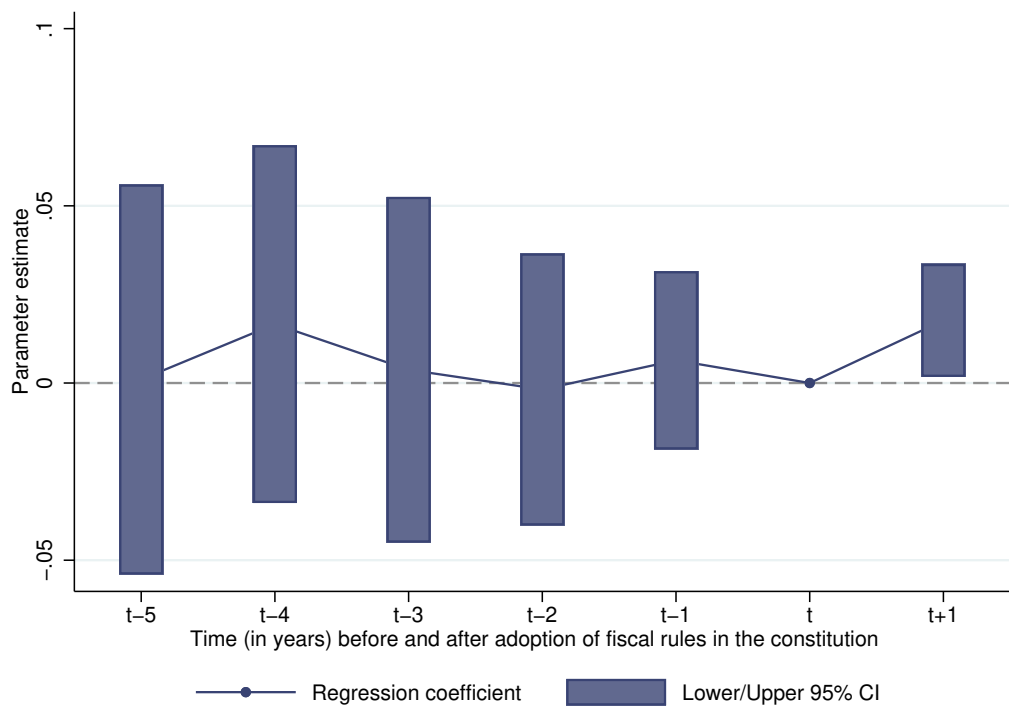
Figure C-6 EVENT STUDY ANALYSIS, FISCAL RULES AND ECONOMIC GROWTH, SAMPLE OF MODERN ECONOMIC GROWTH.
Notes: The figure shows trends in real per capita GDP (log scale) before the introduction of constitutional fiscal rules. The figure plot yearly point estimates of our model of modern economic growth (Equation 2) on the effect of the adoption of a fiscal rule in the constitution in year t on real per capita GDP.

D. Supplementary Lists (for online publication)

Table D-1 LIST OF REGIONAL GOVERNMENTS, FISCAL RULES, PERIODS, AND DATA SOURCES

| ID	Country	Region	FR	Period	Source
AU1	Australia	New South Wales	Yes	1995-2020	Liu and Webb (2011)
AU2	Australia	Victoria	Yes	1994-2020	Financial Management Act 1994
AU3	Australia	Queensland	Yes	2009-2020	Financial Accountability Act 2009
AU4	Australia	South Australia	No	-	-
AU5	Australia	Western Australia	Yes	2000-2020	Government Financial Responsibility Act 2000
AU6	Australia	Tasmania	Yes	2007-2020	Budget Responsibility Act 2007
AT11	Austria	Burgenland	Yes	1999-2020	Österreichischer Stabilitätspakt 1999,2008,2012
AT21	Austria	Kärnten	Yes	1999-2020	Österreichischer Stabilitätspakt 1999,2008,2012
AT12	Austria	Niederösterreich	Yes	1999-2020	Österreichischer Stabilitätspakt 1999,2008,2012
AT31	Austria	Oberösterreich	Yes	1999-2020	Österreichischer Stabilitätspakt 1999,2008,2012
AT32	Austria	Salzburg	Yes	1999-2020	Österreichischer Stabilitätspakt 1999,2008,2012
AT22	Austria	Steiermark	Yes	1999-2020	Österreichischer Stabilitätspakt 1999,2008,2012
AT33	Austria	Tirol	Yes	1999-2020	Österreichischer Stabilitätspakt 1999,2008,2012
AT34	Austria	Vorarlberg	Yes	1999-2020	Österreichischer Stabilitätspakt 1999,2008,2012
AT13	Austria	Wien	Yes	1999-2020	Österreichischer Stabilitätspakt 1999,2008,2012
CH-AG	Switzerland	Aargau	Yes	2006-2020	Kirchgässner (2013)
CH-AI	Switzerland	Appenzell Innerrhoden	No	-	-
CH-AR	Switzerland	Appenzell Ausserrhoden	Yes	1996-2020	Kirchgässner (2013)
CH-BL	Switzerland	Basel-Landschaft	Yes	2009-2020	Kirchgässner (2013)
CH-BS	Switzerland	Basel-Stadt	Yes	2007-2020	Kirchgässner (2013)
CH-BE	Switzerland	Bern	Yes	2003-2020	Kirchgässner (2013)
CH-FR	Switzerland	Fribourg (Freiburg)	Yes	1985-2020	Kirchgässner (2013)
CH-GE	Switzerland	Genève (Genf)	Yes	2007-2020	Kirchgässner (2013)
CH-GL	Switzerland	Glarus	Yes	2012-2020	Kirchgässner (2013)
CH-GR	Switzerland	Graubünden	Yes	1988-2020	Burret and Feld (2016)
CH-JU	Switzerland	Jura	Yes	2001-2020	Burret and Feld (2016)
CH-LU	Switzerland	Luzern	Yes	1996-2020	Burret and Feld (2016)
CH-NE	Switzerland	Neuchatel (Neuenburg)	Yes	2006-2020	Kirchgässner (2013)
CH-NW	Switzerland	Nidwalden	Yes	2002-2020	Kirchgässner (2013)
CH-OW	Switzerland	Obwalden	Yes	2007-2020	Kirchgässner (2013)
CH-SG	Switzerland	Sankt Gallen	Yes	1985-2020	Kirchgässner (2013)
CH-SH	Switzerland	Schaffhausen	Yes	1985-2020	Burret and Feld (2016)
CH-SZ	Switzerland	Schwyz	Yes	1993-1997	Geschäftsordnung des Kantonsrates (GOKR) Art.87
CH-SZ	Switzerland	Schwyz	Yes	2013-2017	Geschäftsordnung des Kantonsrates (GOKR) Art. 87
CH-SZ	Switzerland	Schwyz	Yes	2019-2020	Geschäftsordnung des Kantonsrates (GOKR) Art. 87
CH-SO	Switzerland	Solothurn	Yes	1987-2020	Kirchgässner (2013)
CH-TG	Switzerland	Thurgau	Yes	2013-2020	Kirchgässner (2013)

ID	Country	Region	FR	Period	Source
CH-TI	Switzerland	Ticino (Tessin)	Yes	2015-2020	Verfassung von Republik und Kanton Tessin, Art. 34
CH-UR	Switzerland	Uri	Yes	2013-2020	Kirchgässner (2013)
CH-VS	Switzerland	Valais (Wallis)	Yes	2006-2020	Kirchgässner (2013)
CH-VD	Switzerland	Vaud (Waadt)	Yes	2007-2020	Burret and Feld (2016)
CH-ZG	Switzerland	Zug	Yes	2018-2020	Gesetz über den Finanzhaushalt des Kantons und der Gemeinden
CH-ZH	Switzerland	Zürich	Yes	2002-2020	Kirchgässner (2013)
DE1	Germany	Baden-Württemberg	Yes	2019-2020	Grundgesetz der Bundesrepublik Deutschland Art. 9
DE2	Germany	Bayern	Yes	2014-2020	Verfassung des Freistaates Bayern Art. 82
DE3	Germany	Berlin	Yes	2019-2020	Grundgesetz der Bundesrepublik Deutschland Art. 9
DE4	Germany	Brandenburg	Yes	2019-2020	Verfassung des Landes Brandenburg Art. 103
DE5	Germany	Bremen	Yes	2016-2020	Landesverfassung der Freien Hansestadt Bremen Art. 103 a-c, Art. 146
DE6	Germany	Hamburg	Yes	2013-2020	Verfassung der Freien und Hansestadt Hamburg Art. 72, Art. 72a
DE7	Germany	Hessen	Yes	2012-2020	Verfassung des Landes Hessen Art. 141
DE8	Germany	Mecklenburg-Vorpommern	Yes	2012-2020	Verfassung des Landes Mecklenburg-Vorpommern Art. 65 (2), Art. 79a
DE9	Germany	Niedersachsen	Yes	2019-2020	Grundgesetz der Bundesrepublik Deutschland Art. 9
DEA	Germany	Nordrhein-Westfalen	Yes	2018-2020	Landeshaushaltsordung NRW Art.18a
DEB	Germany	Rheinland-Pfalz	Yes	2011-2020	Verfassung für Rheinland-Pfalz Art. 116 (3-5), Art. 117
DEC	Germany	Saarland	Yes	2019-2020	Grundgesetz der Bundesrepublik Deutschland Art. 9
DED	Germany	Sachsen	Yes	2014-2020	Verfassung des Freistaates Sachsen Art. 95
DEE	Germany	Sachsen-Ahnhalt	Yes	2019-2020	Grundgesetz der Bundesrepublik Deutschland Art. 9
DEF	Germany	Schleswig-Holstein	Yes	2011-2020	Verfassung des Landes Schleswig-Holstein Art. 61, Art. 67
DEG	Germany	Thüringen	Yes	2019-2020	Grundgesetz der Bundesrepublik Deutschland Art. 9
CA48	Canada	Alberta	Yes	1992-2010	Canadian Fiscal Rules Database (Office of the Parliamentary Budget Officer)
CA59	Canada	British Columbia	Yes	1991	Taxpayer Protection Act; Balance Budget Act; Balanced Budget and Ministerial Accountability Act
CA59	Canada	British Columbia	Yes	2001-2020	Taxpayer Protection Act; Balance Budget Act; Balanced Budget and Ministerial Accountability Act
CA46	Canada	Manitoba	Yes	1995-2020	The Balanced Budget, Debt Repayment and Taxpayer Protection Act; The Fiscal Responsibility and Taxpayer Protection Act
CA13	Canada	New Brunswick	Yes	1993-2015	Balanced Budget Act; Fiscal Responsability and Balanced Budget Act
CA10	Canada	Newfoundl. & Labrador	No	-	-

ID	Country	Region	FR	Period	Source
CA61	Canada	Northwest Territories	Yes	1996-2020	Deficit Elimination Act
CA12	Canada	Nova Scotia	Yes	1993-1998	Expenditure Control Act; Financial Measures Act
CA12	Canada	Nova Scotia	Yes	2000-2008	Expenditure Control Act; Financial Measures Act
CA62	Canada	Nunavut	No	-	-
CA35	Canada	Ontario	Yes	1999-2020	Balanced Budget Act; Taxpayer Protection Act; Fiscal Transparency and Accountability Act; Fiscal Sustainability, Transparency and Accountability Act
CA11	Canada	Prince Edward Island	No	-	-
CA24	Canada	Quebec	Yes	1996-2020	An Act respecting the elimination of the deficit and a balanced budget; Balanced Budget Act; An Act to Reduce the debt and establish the Generations Fund
CA47	Canada	Saskatchewan	Yes	1995-2016	Balanced Budget Act; Fiscal Stabilization Fund Act; Growth and Financial Security Act
CA60	Canada	Yukon	Yes	1996-2020	Taxpayer Protection Act
BE2	Belgium	Flanders	Yes	1985-2020	Geißler et al. (2019)
BE3	Belgium	Wallonia	Yes	1985-2020	Geißler et al. (2019)
BE1	Belgium	Brussels	Yes	1985-2020	Geißler et al. (2019)
BR01	Brazil	Acre	Yes	2001-2020	Lei de Responsabilidade Fiscal e Finanças Publicas Municipais
BR08	Brazil	Alagoas	Yes	2001-2020	Lei de Responsabilidade Fiscal e Finanças Publicas Municipais
BR02	Brazil	Amapá	Yes	2001-2020	Lei de Responsabilidade Fiscal e Finanças Publicas Municipais
BR03	Brazil	Amazonas	Yes	2001-2020	Lei de Responsabilidade Fiscal e Finanças Publicas Municipais
BR09	Brazil	Bahia	Yes	2001-2020	Lei de Responsabilidade Fiscal e Finanças Publicas Municipais
BR10	Brazil	Ceará	Yes	2001-2020	Lei de Responsabilidade Fiscal e Finanças Publicas Municipais
BR24	Brazil	Distrito Federal	Yes	2001-2020	Lei de Responsabilidade Fiscal e Finanças Publicas Municipais
BR17	Brazil	Espírito Santo	Yes	2001-2020	Lei de Responsabilidade Fiscal e Finanças Publicas Municipais
BR25	Brazil	Goiás	Yes	2001-2020	Lei de Responsabilidade Fiscal e Finanças Publicas Municipais
BR11	Brazil	Maranhão	Yes	2001-2020	Lei de Responsabilidade Fiscal e Finanças Publicas Municipais
BR26	Brazil	Mato Grosso	Yes	2001-2020	Lei de Responsabilidade Fiscal e Finanças Publicas Municipais
BR27	Brazil	Mato Grosso do Sul	Yes	2001-2020	Lei de Responsabilidade Fiscal e Finanças Publicas Municipais
BR18	Brazil	Minas Gerais	Yes	2001-2020	Lei de Responsabilidade Fiscal e Finanças Publicas Municipais
BR04	Brazil	Pará	Yes	2001-2020	Lei de Responsabilidade Fiscal e Finanças Publicas Municipais
BR12	Brazil	Paraíba	Yes	2001-2020	Lei de Responsabilidade Fiscal e Finanças Publicas Municipais

ID	Country	Region	FR	Period	Source
BR21	Brazil	Paraná	Yes	2001-2020	Lei de Responsabilidade Fiscal e Finanças Publicas Municipais
BR13	Brazil	Pernambuco	Yes	2001-2020	Lei de Responsabilidade Fiscal e Finanças Publicas Municipais
BR14	Brazil	Piauí	Yes	2001-2020	Lei de Responsabilidade Fiscal e Finanças Publicas Municipais
BR19	Brazil	Rio de Janeiro	Yes	2001-2020	Lei de Responsabilidade Fiscal e Finanças Publicas Municipais
BR15	Brazil	Rio Grande do Norte	Yes	2001-2020	Lei de Responsabilidade Fiscal e Finanças Publicas Municipais
BR22	Brazil	Rio Grande do Sul	Yes	2001-2020	Lei de Responsabilidade Fiscal e Finanças Publicas Municipais
BR05	Brazil	Rondônia	Yes	2001-2020	Lei de Responsabilidade Fiscal e Finanças Publicas Municipais
BR06	Brazil	Roraima	Yes	2001-2020	Lei de Responsabilidade Fiscal e Finanças Publicas Municipais
BR23	Brazil	Santa Catarina	Yes	2001-2020	Lei de Responsabilidade Fiscal e Finanças Publicas Municipais
BR20	Brazil	São Paulo	Yes	2001-2020	Lei de Responsabilidade Fiscal e Finanças Publicas Municipais
BR16	Brazil	Sergipe	Yes	2001-2020	Lei de Responsabilidade Fiscal e Finanças Publicas Municipais
BR07	Brazil	Tocantins	Yes	2001-2020	Lei de Responsabilidade Fiscal e Finanças Publicas Municipais
MEX	Mexiko	Mexico	Yes	2017-2020	Ley de Disciplina Financiera de Entidades Federativas y Municipios
ME09	Mexiko	Mexico City	Yes	2017-2020	Ley de Disciplina Financiera de Entidades Federativas y Municipios
ME30	Mexiko	Veracruz	Yes	2017-2020	Ley de Disciplina Financiera de Entidades Federativas y Municipios
ME14	Mexiko	Jalisco	Yes	2017-2020	Ley de Disciplina Financiera de Entidades Federativas y Municipios
ME21	Mexiko	Puebla	Yes	2017-2020	Ley de Disciplina Financiera de Entidades Federativas y Municipios
ME11	Mexiko	Guanajuato	Yes	2017-2020	Ley de Disciplina Financiera de Entidades Federativas y Municipios
ME07	Mexiko	Chiapas	Yes	2017-2020	Ley de Disciplina Financiera de Entidades Federativas y Municipios
ME19	Mexiko	Nuevo Leon	Yes	2017-2020	Ley de Disciplina Financiera de Entidades Federativas y Municipios
ME16	Mexiko	Michoacan	Yes	2017-2020	Ley de Disciplina Financiera de Entidades Federativas y Municipios
ME20	Mexiko	Oaxaca	Yes	2017-2020	Ley de Disciplina Financiera de Entidades Federativas y Municipios
ME08	Mexiko	Chihuahua	Yes	2017-2020	Ley de Disciplina Financiera de Entidades Federativas y Municipios
ME12	Mexiko	Guerrero	Yes	2017-2020	Ley de Disciplina Financiera de Entidades Federativas y Municipios
ME28	Mexiko	Tamaulipas	Yes	2017-2020	Ley de Disciplina Financiera de Entidades Federativas y Municipios
ME03	Mexiko	Baja California Sur	Yes	2017-2020	Ley de Disciplina Financiera de Entidades Federativas y Municipios
ME02	Mexiko	Baja California Norte	Yes	2017-2020	Ley de Disciplina Financiera de Entidades Federativas y Municipios

ID	Country	Region	FR	Period	Source
ME05	Mexiko	Coahuila	Yes	2017-2020	Ley de Disciplina Financiera de Entidades Federativas y Municipios
ME25	Mexiko	Sinaloa	Yes	2017-2020	Ley de Disciplina Financiera de Entidades Federativas y Municipios
ME13	Mexiko	Hidalgo	Yes	2017-2020	Ley de Disciplina Financiera de Entidades Federativas y Municipios
ME26	Mexiko	Sonora	Yes	2017-2020	Ley de Disciplina Financiera de Entidades Federativas y Municipios
ME24	Mexiko	San Luis Potosi	Yes	2017-2020	Ley de Disciplina Financiera de Entidades Federativas y Municipios
ME27	Mexiko	Tabasco	Yes	2017-2020	Ley de Disciplina Financiera de Entidades Federativas y Municipios
ME31	Mexiko	Yucatan	Yes	2017-2020	Ley de Disciplina Financiera de Entidades Federativas y Municipios
ME22	Mexiko	Queretaro	Yes	2017-2020	Ley de Disciplina Financiera de Entidades Federativas y Municipios
ME17	Mexiko	Morelos	Yes	2017-2020	Ley de Disciplina Financiera de Entidades Federativas y Municipios
ME10	Mexiko	Durango	Yes	2017-2020	Ley de Disciplina Financiera de Entidades Federativas y Municipios
ME32	Mexiko	Zacatecas	Yes	2017-2020	Ley de Disciplina Financiera de Entidades Federativas y Municipios
ME23	Mexiko	Quintana Roo	Yes	2017-2020	Ley de Disciplina Financiera de Entidades Federativas y Municipios
ME01	Mexiko	Aguascalientes	Yes	2017-2020	Ley de Disciplina Financiera de Entidades Federativas y Municipios
ME29	Mexiko	Tlaxcala	Yes	2017-2020	Ley de Disciplina Financiera de Entidades Federativas y Municipios
ME18	Mexiko	Nayarit	Yes	2017-2020	Ley de Disciplina Financiera de Entidades Federativas y Municipios
ME04	Mexiko	Campeche	Yes	2017-2020	Ley de Disciplina Financiera de Entidades Federativas y Municipios
ME06	Mexiko	Colima	Yes	2017-2020	Ley de Disciplina Financiera de Entidades Federativas y Municipios
US01	USA	Alabama	Yes	1985-2020	Smith and Hou (2013)
US02	USA	Alaska	Yes	1985-2020	Smith and Hou (2013)
US04	USA	Arizona	Yes	1985-2020	Smith and Hou (2013)
US05	USA	Arkansas	Yes	1985-2020	Smith and Hou (2013)
US06	USA	California	Yes	1985-2020	Smith and Hou (2013)
US08	USA	Colorado	Yes	1985-2020	Smith and Hou (2013)
US09	USA	Connecticut	Yes	1985-2020	Smith and Hou (2013)
US10	USA	Delaware	Yes	1985-2020	Smith and Hou (2013)
US12	USA	Florida	Yes	1992-2020	Smith and Hou (2013)
US13	USA	Georgia	Yes	1985-2020	Smith and Hou (2013)
US15	USA	Hawaii	Yes	1994-2020	Smith and Hou (2013)
US16	USA	Idaho	Yes	1985-2020	Smith and Hou (2013)
US17	USA	Illinois	Yes	1985-2020	Smith and Hou (2013)
US18	USA	Indiana	Yes	1985-2020	Smith and Hou (2013)
US19	USA	Iowa	Yes	1985-2020	Smith and Hou (2013)
US20	USA	Kansas	Yes	1985-2020	Smith and Hou (2013)
US21	USA	Kentucky	Yes	1985-2020	Smith and Hou (2013)
US22	USA	Louisiana	Yes	1985-2020	Smith and Hou (2013)
US23	USA	Maine	Yes	1985-2020	Smith and Hou (2013)
US24	USA	Maryland	Yes	1985-2020	Smith and Hou (2013)
US25	USA	Massachusetts	Yes	1985-2020	Smith and Hou (2013)

ID	Country	Region	FR	Period	Source
US26	USA	Michigan	Yes	1985-2020	Smith and Hou (2013)
US27	USA	Minnesota	No	-	Smith and Hou (2013)
US28	USA	Mississippi	Yes	1985-2020	Smith and Hou (2013)
US29	USA	Missouri	Yes	1985-2020	Smith and Hou (2013)
US30	USA	Montana	Yes	1985-2020	Smith and Hou (2013)
US31	USA	Nebraska	Yes	1985-2020	Smith and Hou (2013)
US32	USA	Nevada	Yes	1985-2020	Smith and Hou (2013)
US33	USA	New Hampshire	No	-	Smith and Hou (2013)
US34	USA	New Jersey	Yes	1985-2020	Smith and Hou (2013)
US35	USA	New Mexico	Yes	1985-2020	Smith and Hou (2013)
US36	USA	New York	Yes	1985-2020	Smith and Hou (2013)
US37	USA	North Carolina	Yes	1985-2020	Smith and Hou (2013)
US38	USA	North Dakota	Yes	1985-2020	Smith and Hou (2013)
US39	USA	Ohio	Yes	1985-2020	Smith and Hou (2013)
US40	USA	Oklahoma	Yes	1985-2020	Smith and Hou (2013)
US41	USA	Oregon	Yes	1985-2020	Smith and Hou (2013)
US42	USA	Pennsylvania	Yes	1985-2020	Smith and Hou (2013)
US44	USA	Rhode Island	Yes	1986-2020	Smith and Hou (2013)
US45	USA	South Carolina	Yes	1985-2020	Smith and Hou (2013)
US46	USA	South Dakota	Yes	1985-2020	Smith and Hou (2013)
US47	USA	Tennessee	Yes	1985-2020	Smith and Hou (2013)
US48	USA	Texas	Yes	1985-2020	Smith and Hou (2013)
US49	USA	Utah	Yes	1985-2020	Smith and Hou (2013)
US50	USA	Vermont	No	-	Smith and Hou (2013)
US51	USA	Virginia	Yes	1985-2020	Smith and Hou (2013)
US53	USA	Washington	No	-	Smith and Hou (2013)
US54	USA	West Virginia	Yes	1985-2020	Smith and Hou (2013)
US55	USA	Wisconsin	Yes	1985-2020	Smith and Hou (2013)
US56	USA	Wyoming	Yes	1985-2020	Smith and Hou (2013)
AR-C	Argentina	Buenos Aires	Yes	2005-2020	Ley 25.917 Articulo 21; Ley 27428 Articulo 15
AR-B	Argentina	Buenos Aires	Yes	2005-2020	Ley 25.917 Articulo 21; Ley 27428 Articulo 15
AR-K	Argentina	Catamarca	Yes	2005-2020	Ley 25.917 Articulo 21; Ley 27428 Articulo 15
AR-H	Argentina	Chaco	Yes	2005-2020	Ley 25.917 Articulo 21; Ley 27428 Articulo 15
AR-U	Argentina	Chubut	Yes	2005-2020	Ley 25.917 Articulo 21; Ley 27428 Articulo 15
AR-X	Argentina	Córdoba	Yes	2005-2020	Ley 25.917 Articulo 21; Ley 27428 Articulo 15
AR-W	Argentina	Corrientes	Yes	2005-2020	Ley 25.917 Articulo 21; Ley 27428 Articulo 15
AR-E	Argentina	Entre Ríos	Yes	2005-2020	Ley 25.917 Articulo 21; Ley 27428 Articulo 15
AR-P	Argentina	Formosa	Yes	2005-2020	Ley 25.917 Articulo 21; Ley 27428 Articulo 15
AR-Y	Argentina	Jujuy	Yes	2005-2020	Ley 25.917 Articulo 21; Ley 27428 Articulo 15
AR-L	Argentina	La Pampa	Yes	2005-2020	Ley 25.917 Articulo 21; Ley 27428 Articulo 15
AR-F	Argentina	La Rioja	Yes	2005-2020	Ley 25.917 Articulo 21; Ley 27428 Articulo 15
AR-M	Argentina	Mendoza	Yes	2005-2020	Ley 25.917 Articulo 21; Ley 27428 Articulo 15

ID	Country	Region	FR	Period	Source
AR-N	Argentina	Misiones	Yes	2005-2020	Ley 25.917 Articulo 21; Ley 27428 Articulo 15
AR-Q	Argentina	Neuquén	Yes	2005-2020	Ley 25.917 Articulo 21; Ley 27428 Articulo 15
AR-R	Argentina	Río Negro	Yes	2005-2020	Ley 25.917 Articulo 21; Ley 27428 Articulo 15
AR-A	Argentina	Salta	Yes	2005-2020	Ley 25.917 Articulo 21; Ley 27428 Articulo 15
AR-J	Argentina	San Juan	Yes	2005-2020	Ley 25.917 Articulo 21; Ley 27428 Articulo 15
AR-D	Argentina	San Luis	Yes	2005-2020	Ley 25.917 Articulo 21; Ley 27428 Articulo 15
AR-Z	Argentina	Santa Cruz	Yes	2005-2020	Ley 25.917 Articulo 21; Ley 27428 Articulo 15
AR-S	Argentina	Santa Fe	Yes	2005-2020	Ley 25.917 Articulo 21; Ley 27428 Articulo 15
AR-G	Argentina	Santiago del Estero	Yes	2005-2020	Ley 25.917 Articulo 21; Ley 27428 Articulo 15
AR-V	Argentina	Tierra del Fuego	Yes	2005-2020	Ley 25.917 Articulo 21; Ley 27428 Articulo 15
AR-T	Argentina	Tucumán	Yes	2005-2020	Ley 25.917 Articulo 21; Ley 27428 Articulo 15

Table D-2 INTERNATIONAL EXPERT SURVEY—LIST OF POLLED COUNTRIES AND EXPERTS

Country	No. of Experts	% of Data	Cumulative
Afghanistan	1.0	0.1	0.1
Albania	3.0	0.2	0.3
Algeria	3.0	0.2	0.6
Argentina	9.0	0.7	1.3
Armenia	1.0	0.1	1.4
Australia	14.0	1.1	2.5
Austria	34.0	2.8	5.3
Azerbaijan	4.0	0.3	5.6
Bangladesh	2.0	0.2	5.8
Belgium	23.0	1.9	7.7
Benin	1.0	0.1	7.8
Bolivia	4.0	0.3	8.1
Bosnia and Herzegovina	2.0	0.2	8.3
Brazil	18.0	1.5	9.7
Bulgaria	7.0	0.6	10.3
Cambodia	1.0	0.1	10.4
Canada	26.0	2.1	12.5
Cape Verde	4.0	0.3	12.8
Chile	7.0	0.6	13.4
China	11.0	0.9	14.3
Colombia	8.0	0.7	15.0
Costa Rica	1.0	0.1	15.0
Croatia	7.0	0.6	15.6
Cyprus	3.0	0.2	15.8
Czech Republic	14.0	1.1	17.0
Côte d'Ivoire	1.0	0.1	17.1

Country	No. of Experts	% of Data	Cumulative
Democratic Republic of the Congo	1.0	0.1	17.2
Denmark	12.0	1.0	18.1
Dominican Republic	1.0	0.1	18.2
Ecuador	2.0	0.2	18.4
Egypt	3.0	0.2	18.6
El Salvador	2.0	0.2	18.8
Estonia	3.0	0.2	19.0
Eswatini	1.0	0.1	19.1
Ethiopia	1.0	0.1	19.2
Finland	19.0	1.6	20.8
France	41.0	3.3	24.1
Georgia	9.0	0.7	24.8
Germany	173.0	14.1	39.0
Greece	16.0	1.3	40.3
Guatemala	2.0	0.2	40.4
Hong Kong SAR, China	4.0	0.3	40.8
Hungary	13.0	1.1	41.8
Iceland	1.0	0.1	41.9
India	11.0	0.9	42.8
Indonesia	2.0	0.2	43.0
Ireland	8.0	0.7	43.6
Israel	8.0	0.7	44.3
Italy	63.0	5.1	49.4
Japan	22.0	1.8	51.2
Kazakhstan	2.0	0.2	51.4
Kenya	3.0	0.2	51.6
Korea, Rep.	11.0	0.9	52.5
Kosovo	1.0	0.1	52.6
Kyrgyz Republic	2.0	0.2	52.8
Latvia	9.0	0.7	53.5
Lebanon	1.0	0.1	53.6
Lesotho	2.0	0.2	53.8
Liechtenstein	1.0	0.1	53.8
Lithuania	3.0	0.2	54.1
Luxembourg	2.0	0.2	54.2
Madagascar	2.0	0.2	54.4
Malaysia	1.0	0.1	54.5
Mauritania	1.0	0.1	54.6
Mauritius	2.0	0.2	54.7
Mexico	10.0	0.8	55.6
Mongolia	1.0	0.1	55.6
Morocco	2.0	0.2	55.8
Mozambique	1.0	0.1	55.9
Namibia	2.0	0.2	56.0
Netherlands	33.0	2.7	58.7
New Zealand	6.0	0.5	59.2
Niger	1.0	0.1	59.3
Norway	25.0	2.0	61.4
Pakistan	9.0	0.7	62.1
Paraguay	1.0	0.1	62.2
Peru	6.0	0.5	62.7
Philippines	5.0	0.4	63.1
Poland	14.0	1.1	64.2
Portugal	17.0	1.4	65.6

INTERNATIONAL EXPERT SURVEY—LIST OF POLLED COUNTRIES AND EXPERTS—CONTINUED

Country	No. of Experts	% of Data	Cumulative
Romania	15.0	1.2	66.8
Russian Federation	24.0	2.0	68.8
Senegal	1.0	0.1	68.9
Serbia	2.0	0.2	69.0
Sierra Leone	3.0	0.2	69.3
Singapore	2.0	0.2	69.4
Slovakia	15.0	1.2	70.7
Slovenia	9.0	0.7	71.4
South Africa	14.0	1.1	72.5
Spain	41.0	3.3	75.9
Sri Lanka	2.0	0.2	76.1
Sudan	2.0	0.2	76.2
Sweden	24.0	2.0	78.2
Switzerland	37.0	3.0	81.2
Taiwan	4.0	0.3	81.5
Thailand	3.0	0.2	81.8
Togo	1.0	0.1	81.9
Trinidad and Tobago	1.0	0.1	81.9
Tunisia	1.0	0.1	82.0
Turkey	14.0	1.1	83.2
Uganda	3.0	0.2	83.4
Ukraine	7.0	0.6	84.0
United Arab Emirates	1.0	0.1	84.1
United Kingdom	62.0	5.1	89.1
United States	120.0	9.8	98.9
Uruguay	5.0	0.4	99.3
Uzbekistan	2.0	0.2	99.5
Zambia	3.0	0.2	99.8
Zimbabwe	3.0	0.2	100.0
Total	**1,224**	100.0	100.0

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