

Mandel, Philipp; Süßmuth, Bernd

Working Paper

Public education, accountability, and yardstick competition in a federal system

Working Paper, No. 138

Provided in Cooperation with:

University of Leipzig, Faculty of Economics and Management Science

Suggested Citation: Mandel, Philipp; Süßmuth, Bernd (2015) : Public education, accountability, and yardstick competition in a federal system, Working Paper, No. 138, Universität Leipzig, Wirtschaftswissenschaftliche Fakultät, Leipzig

This Version is available at:

<https://hdl.handle.net/10419/110608>

Standard-Nutzungsbedingungen:

Die Dokumente auf EconStor dürfen zu eigenen wissenschaftlichen Zwecken und zum Privatgebrauch gespeichert und kopiert werden.

Sie dürfen die Dokumente nicht für öffentliche oder kommerzielle Zwecke vervielfältigen, öffentlich ausstellen, öffentlich zugänglich machen, vertreiben oder anderweitig nutzen.

Sofern die Verfasser die Dokumente unter Open-Content-Lizenzen (insbesondere CC-Lizenzen) zur Verfügung gestellt haben sollten, gelten abweichend von diesen Nutzungsbedingungen die in der dort genannten Lizenz gewährten Nutzungsrechte.

Terms of use:

Documents in EconStor may be saved and copied for your personal and scholarly purposes.

You are not to copy documents for public or commercial purposes, to exhibit the documents publicly, to make them publicly available on the internet, or to distribute or otherwise use the documents in public.

If the documents have been made available under an Open Content Licence (especially Creative Commons Licences), you may exercise further usage rights as specified in the indicated licence.

UNIVERSITÄT LEIPZIG

Wirtschaftswissenschaftliche Fakultät
Faculty of Economics and Management Science

Working Paper, No. 138

Philipp Mandel / Bernd Süßmuth

**Public education, accountability, and
yardstick competition in a federal
system**

Mai 2015

ISSN 1437-9384

Public education, accountability, and yardstick competition in a federal system

Philipp Mandel ^a and Bernd Süßmuth ^{a b}

^a *University of Leipzig**

^b *CESifo*

Abstract

Against the backdrop of a growing national and international accountability movement in education outcomes, this study sets up a simple model of yardstick competition with incumbent-disciplining effects through voters comparing performance measures of public education both across nations and federal states. It implies a potential strategic dilemma where a single top-performance state can block reform measures that could benefit low-performance states more than would do for itself. The linchpin predictions of the model are tested by analyzing announcement effects of student achievement tests on vote and popularity (VP) functions of German national and state government incumbents.

JEL classification: H75, H77, I28

Keywords: Yardstick competition, public education, VP-functions

*Correspondence: Institute for Empirical Research in Economics (IEW) | Econometrics, University of Leipzig, Grimmaische Str. 12, D-04109 Leipzig, Germany; Email: mandel@wifa.uni-leipzig.de, suessmuth@wifa.uni-leipzig.de

We thank the editor and two anonymous referees for their very helpful comments and suggestions. We also appreciate many valuable comments and suggestions by Alessandra Casarico, Niklas Potrafke, Marco Sunder, and participants of the CESifo Workshop on Political Economy.

1 Introduction

In general, the formal education system of a federal political system acts as the primary source of literacy and numeracy acquisition. Literacy and, in particular, numeracy significantly determine labor market outcomes of individuals; see, e.g., Charette and Meng (1998). In reality, we observe hybrid forms of federal governance in public education, i.e., forms that are neither strictly decentralized nor strictly centralized. Political decisions on educational standards in a federation of jurisdictions are generally taken in a parliamentary chamber representing the second tier jurisdictions. In an international context, this is for example the Senate of Canada for Canada or the *Bundesrat* for Germany.

Recently, Germany reformed its federal structures in 2006 to a less standardized organization of the formal education system. Major parts of decision-making authorities have been allocated from the upper-tier government (*Bund*) to the lower-tier governments of federal states (*Laender*). For public schooling an implication is decentralization and an imminent heterogeneity with regard to some structural cornerstones such as tracking norms or the classification of education levels. The opposite applies, for example, to Switzerland, where the advisory board of education directors in the 26 cantons¹ opted for a reform designed to “harmonize” and standardize existing cantonal education practices. The so-called HarmoS reform program was enacted in 2009 in the form of a legally binding state treaty. Among others, it defines superordinate targets for compulsory schooling, sets out guidelines of quality assurance, and decrees mandatory educational standards across cantons. Thus, while Switzerland moves away from a purely decentralized form of federal governance of the education system, Germany seems to move towards it. Actually, more than ever in its post-war history German education seems to consist of 16 states sharing the same cultural and legal system but pursuing idiosyncratic education policies (Schulte 2004, Wössmann 2010).

According to Goldin and Katz (2001) the high school movement, establishing the United States 20th century leadership in human capital (Goldin 2001, 2003) by rigor-

¹*Schweizerische Konferenz der kantonalen Erziehungsdirektoren* (EDK).

ously expanding secondary school to the masses and spreading over the Western world in the post-war decades, will be replaced by an extensive accountability movement of education in the 21st century. Against this background of growing accountability, transparency, benchmarking, and yardstick competition both at the provincial or federal and national level, the question of optimal allocation of public education responsibilities has not been thoroughly addressed in the economic literature. In particular, it is unclear whether a federal government should decide for either one of the polar forms of governance (centralized or decentralized) or for a hybrid form of governance, where some rights that are more or less residual in nature are left at either the government or the provincial level.

Our study addresses this question from a political economy perspective for a two-tiered government in a representative democracy. To this end we set up a simple model of political yardstick competition (Salmon 1987, Besley and Case 1995, Sand-Zantman 2004, Bodenstein and Ursprung 2005) with a Salmon-Mechanism both at the upper-tier as well as at the lower-tier government level. In our model voters are assumed to compare performance measures of public education both across nations and across federal states. Voting is supposed to be the main incentive mechanism to discipline incumbents with regard to an efficient education policy. This is achieved by voters appraising incumbent governments' relative performances. The model results in a strategic dilemma as a single state belonging to the top flight in terms of its students' test achievements can block Pareto-improving policies if they imply lost grounds in the pecking order for this particular state. We find evidence for the central drivers behind this finding, i.e., for relative performances in student achievement tests impacting on vote and popularity (VP) functions of German national and state government incumbents.

The remainder of the paper is structured as follows. Section 2 describes the route from yardstick competition to strategic dilemma for the hybrid form of federal governance in German public education policy and sets out our model. The empirical strategy and findings are outlined and discussed in Section 3. Finally, Section 4 discusses and concludes.

2 From yardstick competition to strategic dilemma

2.1 The international accountability movement

In the following, we consider the national extensions of the OECD Programme of International Student Assessment (PISA) studies to illustrate the international accountability movement, in particular, at the sub-national level of federally organized nations. The PISA studies underlies a standardized test of 15-year-olds' literacy in reading, math, and science. As of 2000, the OECD repeated the test every three years. In Germany, the national extensions of the worldwide test are referred to as PISA-E or *Laendervergleich*. They test the cognitive achievement of representative samples of 15-year-old students as a general rule also in math, science, and reading literacy. Habitually, the national extensions use the same tests as the international PISA study. The sample size of the German extension of the PISA test is several times the one of the international test comprising two overlapping samples of 15-year-olds and ninth graders. Each sample covers about 40,000 students made of state samples ranging from 1,600 to 5,000 students for the 16 German federal states. Results are published several months after the international test results. Performance at the state-level is measured on a standardized scale as is the case at the supra-national level. For any OECD nation participating in PISA and/or testing at the level of state or province, scores for each subject and year are for the sake of comparability centered to an OECD mean of 500 and a standard deviation of 100.

In general, models of yardstick competition (Salmon 1987, Besley and Case 1995, Sand-Zantman 2004, Bodenstein and Ursprung 2005) assume voters to make comparisons between jurisdictions. In this type of models voting is the main incentive mechanism to discipline incumbents with regard to an efficient policy, for example, to an efficient education policy. Voters discipline incumbent governments by appraising their relative performance. This mechanism requires transparency, in the sense that voters can gain access to information about what other incumbents are doing and the corresponding achievements of some other entities' students to serve as a benchmark for their own incumbent government's policy. These entities can be nations or federal entities such as

federal states or provinces. As regards the OECD PISA test and its regional extensions, full information on student achievement even just at the state-level is generally rather the exception than the rule in an international comparison of federally organized countries (Table 1). Frequently also confidentiality requirements preclude the use of student-level data across states as is the case for German *Laender*. Yet, for example, in Germany *Laender*-comparing PISA-E tests are widely published and extensively discussed in the media and in political debates (Tillmann *et al.* 2008, Pütz 2008).

Table 1. National extensions of PISA test participation of OECD countries 2000-2006

	GER	BEL	AUS	CH	CAN	BRA	AUL	MEX
No. federal entities	16	3	9	26	10	26	8	32
PISA-E tested entities								
All types of schools	14-16	2	–	12-14	10	–	8	32
High schools	16	2	–	12-14	10	–	8	32
Coverage (minimum)	87.5%	66.7%	0%	53.8%	100%	0%	100%	100%

Notes:

GER – Germany, BEL – Belgium, AUS – Austria, CH – Switzerland, CAN – Canada, BRA – Brazil, AUL – Australia, MEX – Mexico; PISA-E – national extension of PISA test

Brazil participated in PISA, although it is not an OECD economy; considered are only countries (a) with federally organized public education sectors and (b) for which public education is the primary form of education (for all type of schools).

2.2 Hybrid forms of federal governance: Germany

In this subsection we give a brief overview of the highly idiosyncratic federal structures of secondary education policy in Germany. This might seem at odds with official political parameters as school policy is formally under exclusive *Laender* jurisdiction through the constitutional premise of *Laender* “cultural sovereignty” (*Kulturhoheit*) according to Article 30 of the German Basic Law (*Grundgesetz*). Additionally, Article 79(iii) stipulates that the federal character of the German Republic, Article 20(i), can not be altered even not by constitutional amendment. However, Article 70 of the Basic Law states that the *Laender* have the ability to exercise governmental responsibilities only as far as the Basic

Law does not provide or allow for any other arrangements or confer legislative power to the federal government. Thus, in fact, German (secondary) education policy is a “matter of subsidiarity” coined by non-constitutional institutional arrangements (Niemann 2009) bypassing to some extent the federal division of responsibilities (Erk 2003, p. 310). Hence, modification of the cultural sovereignty and the putatively exclusive jurisdiction of states is possible through implementation and legal interpretation which is justified e.g. by extra-constitutional moral principles. Erk (2003) sees the emergence of an “all-German” education policy in a system of exclusive provincial jurisdiction in four major circumstances: the rather artificial coming-into-being of German states, a strong public demand for harmonization and standardization following patterns of path dependency,² no ethno-linguistic diversity (as given, for example, for Switzerland, Belgium, Spain, and Canada), and –similar to Austria and Australia– no distinct provincial “identity” in general. Against this backdrop, some critical political scientists refer to the German form of federalism as an “interlocking system of functional federalism”, a “federal state with a non-federal society” or even a “unitary federal state” (Erk 2003, Niemann 2009). In the context of contemporary German education policy, labels like “co-operative cultural federalism” or federal governance with a federal government endowed with “participatory rights” are quite convenient among political scientists.

Regarding the finance of education, Germany originally installed a separate system (*Trennsystem*) for *Laender* and *Bund*. Nevertheless, up to the late 1950s the unwritten extra-constitutional principles of “federal friendly behavior” (*bundesfreundliches Verhalten*) and “federal comity” (*Bundestreue*) given through Federal Constitutional Court (*Bundesverfassungsgericht*) rulings guided education policy in practice. In 1955, the fiscal scheme changed to financial equalization (*Länderfinanzausgleich*), where income tax, corporate income tax, and value added tax revenues are both horizontally shared among

²German education policy before World War II can be divided into three regimes (Niemann 2009): exclusive authority of the *Laender* during the German Empire (1871-1919), followed by a first nationwide framework of education policy in the Weimar Republic (1919-1933) and a complete abusive centralization during the Nazi regime. After the German defeat, some schools started teaching again on the basis of the relatively centralized Weimar principles at the end of the year 1945, that is, before the allies’ efforts to restructure the German education system following principles of democratization and re-education took effect.

the *Laender* and vertically between *Laender* and *Bund*.

Interestingly, Erk (2003) notes that in the same year the 1948/49 founded Standing Conference of Ministers of Education and Cultural Affairs (KMK)³ dropped the parts of its charter that contained the adherence to the clear-cut division of responsibilities of *Laender* and *Bund* in all its decisions. *De jure*, KMK resolutions and recommendations are formally not legally binding for *Laender* but require state legislation to be put into practice. However, since decisions are based on the principle of unanimity, they have *de facto* applicability. Many committees, commissions, and agreements followed in the German post-war history (Erk 2003, p. 303-313). Most of them implied a standardization of the input side of education across states. For example, the Düsseldorf Agreement of 1955 standardized educational assessment, timing and duration of the study year, curricula and recognition of qualifications in order to ease the substantial state-to-state migration at the time. In 1969 by transforming the existing federal Ministry of Scientific Research into the Ministry of Education and Science (BMBF) the federal government created a ministry in a policy area where it officially does not have a constitutional jurisdiction. One year later, the *Bund-Laender-Kommission für Bildungsplanung und Forschungsförderung* (BLK) established. It was the first official joint body of decision-making as it included the federal government as partner of the *Laender*. Since the time, the focus of concerted education policy of *Laender* and *Bund* has been on educational planning and the joint promotion, organization, and evaluation of nationwide pilot projects. In early 1991 the Western structures of the education system were imposed on the newly created East German *Laender*. Since the second half of the 1990s, joint educational planning efforts have led to a series of output-oriented education standards across *Laender*. In the first half of the 2000s, on initiative of the KMK the *Laender* and the federal government established a central agency of monitoring compliance with education standards (Institute for Educational Progress, IQB) and committed themselves to systematically evaluating the output side, i.e., in particular, student performance in standardized assessments. In

³The Standing Conference unites the ministers and senators of the states responsible for education, higher education and research as well as cultural affairs. It was founded on the initiative of representatives of all the zones of occupation in 1948/49, i.e. before the Federal Republic of Germany was actually constituted.

mid-2006 the first stage of reform of German federalism (*Föderalismusreform*) dissolved the *Bund-Laender* joint task (“*Gemeinschaftsaufgabe*”) of education planning including the suspension of financial support from the federal government, e.g. for the construction of school buildings. In the present paper, we will focus on the first half of the 2000s up to 2006, which witnessed a regime of hybrid decision-making in German education policy.

Summing up the status quo for our period of analysis, the federal structure of the German education system is coined by collective decision-making with institutionalized veto power of each federal state. The federal level (e.g. through the BMBF) mainly has its competences in coordinating educational planning in cooperation with the *Laender*. Decision-making in education policy at the federal level requires consensus among each of the federal states. Thus, overarching decision-making is formally highly vulnerable to the veto power of each single state in the German Council, i.e. the house of the German parliament that represents the lower-tier state governments (*Bundesrat*) and in committees, i.e., in particular, in the KMK and in the Conference of the Prime Ministers (MPK) of the *Laender*. Additionally, it can be influenced by the formal veto points of (constitutional) courts in the *Laender*; see Niemann (2009, p. 5). A final caveat concerns indirect hybrid decision making through a supranational channel: Although the European Commission (EC) follows a so-called ‘soft law’ strategy, which seeks to protect national sovereignty and to keep EC influence as low as possible, it is the German federal government (Article 32(i), Basic Law) that represents German interests in Brussels, including education. Obviously, this circumstance counteracts the formal supremacy of states in this policy area; see Walkenhorst (2005). In sum, the usual policy process consists of proposals made at the federal government and/or centralized committee level and/or indirectly by an adopted recommendation at the supranational level. In any case, proposals require an unanimity vote by the *Laender* to get approved.⁴

For our period of analysis a prominent example of a non-approved policy is the proposed nationwide dilution of the tripartite German school structure planned to be com-

⁴Note, the (empirical) political and education science literature sees no evidence of partisan issues, in the sense of states whose governments belong to the same party as the federal government always aligning with it, in the German case (Erk 2003, Zierer 2012).

plemented by the introduction of a comprehensive school (*Gesamtschule*) track across states. The existing tripartite system separates students fairly early, usually at the age of 10 or 11 years, according to their abilities in different school types. Its opponents, thus, display it as prone to inequity. Niemann (2009) argues that this proposal, representing an indirect recommendation of the OECD, actually is an example for a proposal implicitly stemming from the indirect supranational channel described above. Modifying or even abolishing the tripartite system was not approved by the state of Bavaria and, hence, not uniformly realized at the federal level. An example of unanimously approved policies are binding education standards for intermediate school graduation (*Mittlere Reife*) in subjects reading, math, and first foreign language in 2004. The standards have been extended to subjects physics, chemistry, and biology as well as to secondary general schools and primary school leavers in 2005. Another example is the approval of the German orthography reform passed by the KMK in 1995. It was enacted –after some individual adjustment period for some states– nationwide as of the end of 2006. A substantial program with total costs amounting to approximately four billion Euros that was approved by all states and realized nationwide from 2003 to 2011 is the all-day school program (*Ganztagsschulprogramm*). It required, among others, the massive construction of canteens and re-arrangements of public transport for students in some of the *Laender*. A further unanimously approved policy is the reform of the KMK and its operating range in 2004 with its cornerstones output-orientation, streamlining of core administrative tasks and processes, and centralizing competences of international and European Union wide student exchange. Also the joint initiative of *Bund* and *Laender* to test the female muslim teacher’s scarf wearing ban (originating in legal action at the administrative court of the state of Baden-Württemberg) at the *Bundesverfassungsgericht* in 2003 is an example. It was seen as necessary in order to find a solution applicable in all German states. Finally, a proposal from the indirect supranational channel and at the interface of secondary and higher education policy that was approved, too, is the re-structuring and harmonization of teacher training across states. It was part of the European “Bologna Reform” process and realized in gradual steps in the second half of the 2000s.

Let us briefly turn to the alternatives of hybrid decision-making. Proponents of a decentralized structure with full autonomy at the federal state level argue along the following lines.⁵ A centralization or harmonization in the sense of nationwide agreeing on and setting of binding educational norms, for instance, in the form of a minimum average student achievement in standardized tests, would necessarily lead to a substandard decree (Schwager 2005). This unavoidable result is attributed to an externality of democratic decision-making inherent to the federal system. The argument is simple and can straightforwardly be illustrated by the following scenario of a hypothetical majority vote on a subordinate target value for student performance in the *Bundesrat*. Suppose that for reasons of an unspecified x-inefficient inertia each federal state wants to stick to its realized (average) level of student performance and proposes the respective figure as the new superordinate target. The total number of seats in the council corresponds to the accumulated number of votes of states. Seats range from three to six, depending on the size of population in the respective Bundesland. In total, seats and corresponding votes in the council sum up to 69. As can be seen from Table 2, the highest educational standard capable of winning an absolute majority (≥ 35 votes) in the *Bundesrat* would correspond to the proposal made by the council members of the state of Hesse (H), Rhineland-Palatinate (RP), and Brandenburg (BB) for PISA-E tests in 2000, 2003, and 2006, respectively. In all three cases, the correspondingly proposed standard would fall below both the average student performance of all test-participating states (penultimate row in Table 2) and the German students' average performance in the international test (ultimate row in Table 2) for the respective test year.⁶

As can be seen from Table 2 and Figure 1, there has been some dynamics with regard to states changing ranks over the three considered test years from 2000 to 2006. However, there is also some persistence as regards the top flight and bottom group of *Laender* in

⁵See, for example, Schwager (2005) for the German education system and Rodden (2003) in the more general context of fiscal federalism.

⁶As can be seen from Table 1 and Table 2, the city states of Hamburg and Berlin did not (fully) participate in the PISA-E 2000 national extension of the international PISA study. The only basis of comparison for these *Laender* in 2000 is given for high school students' test achievements.

terms of PISA test achievements (upper-right and lower-left quadrant of Figure 1).

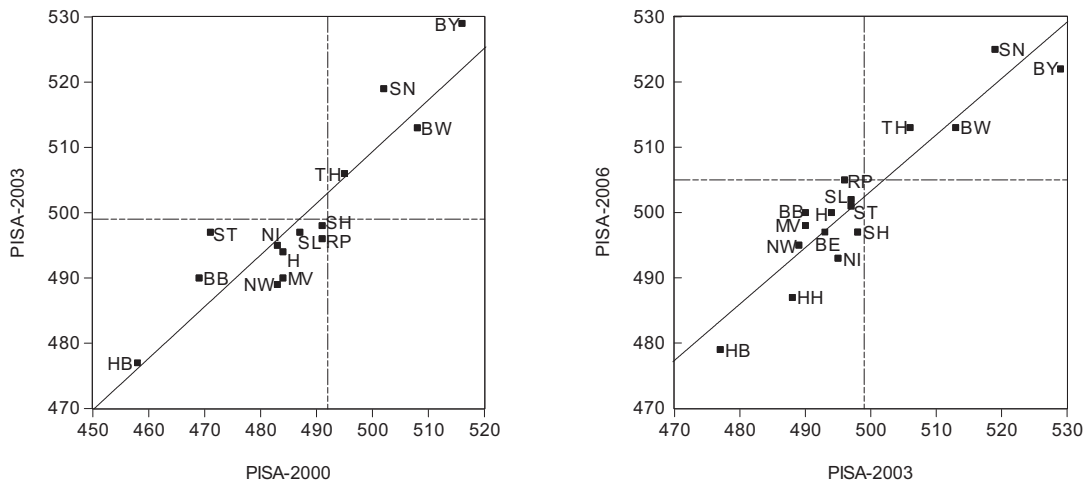
Table 2. German Laender PISA-E performances and seats in the Bundesrat.

Federal state	PISA-E 2000	PISA-E 2003	PISA-E 2006
Bavaria (BY)	516 [1 6 6]	529 [1 6 6]	522 [2 6 10]
Baden-Württemberg (BW)	508 [2 6 12]	513 [3 6 16]	513 [3 6 16]
Saxony (SN)	502 [3 4 16]	519 [2 4 10]	525 [1 4 4]
Thuringia (TH)	495 [4 4 20]	506 [4 4 20]	513 [4 4 20]
Rhineland-Palatinate (RP)	491 [5 4 24]	496 [8 4 35]	505 [5 4 24]
Schleswig-Holstein (SH)	491 [6 4 28]	498 [5 4 24]	497 [11 4 47]
Saarland (SL)	487 [7 3 31]	497 [7 3 31]	502 [6 3 27]
Hesse (H)	484 [8 5 36]	494 [10 5 46]	500 [9 5 40]
M.-West Pomerania (MV)	484 [9 3 39]	490 [13 3 57]	498 [10 3 43]
North Rh.-Westphalia (NW)	483 [10 6 45]	489 [14 6 63]	495 [13 6 57]
Lower Saxony (NI)	483 [11 6 51]	495 [9 6 41]	493 [14 6 63]
Saxony-Anhalt (ST)	471 [12 4 55]	497 [6 4 28]	501 [7 4 31]
Brandenburg (BB)	469 [13 4 59]	490 [12 4 54]	500 [8 4 35]
Bremen (HB)	458 [14 3 62]	477 [16 3 69]	479 [16 3 69]
Hamburg (HH)		488 [15 3 66]	487 [15 3 66]
Berlin (BE)		493 [11 4 50]	497 [12 4 51]
Average (PISA national)	487	498	501
Germany (PISA international)	492	499	505

Notes:

Figures in squared brackets [a, b, c] denote a) rank, b) votes which correspond to seats in the council, and c) cumulative votes, accumulated according to respective test year's ranking.

Figure 1. PISA-E test achievements across German Laender: 2000, 2003, 2006



Note positively sloped lines in Figure 1 are not angle bisectors but regression lines.

2.3 Hybrid forms of federal governance: A basic model

In the following basic model, we assume voters to compare states both at the national as well as at the supra-national level with regard to one of their major concerns: a successful education policy. As in the seminal models by Salmon (1987) and Besley and Case (1995), voting is the main incentive mechanism to discipline incumbents in order to follow a best practice education policy. To this end, we assume voters to be able to appraise incumbents' relative performance. This is a reasonable assumption as voters have access to information about the educational success of other incumbents both in a national and international comparison of student achievement rankings based on standardized tests such as PISA-E and PISA. This fact forces incumbents both at the federal state level and at the national level into a yardstick competition in which they care about what other incumbents are doing. A straightforward rationalization of this fact is first to let the reelection probability of both the upper-tier government U and lower-tier government L depend on the relative performance of students in an international (OECD-wide) and national (across federal states) comparison of student cognitive achievement, respectively. Hence, let

$$\Pr_j^U (\text{re-elect} = 1) = f(\mu_a^n - \mu_a^w), \quad (1)$$

where $f' > 0$, i.e., the reelection probability of the national (n) incumbent upper-tier government U increases with an above worldwide (w) average performance of students; $\mu_a^n \equiv \frac{1}{F} \sum_{i=1}^F a_i$ for $i = 1, \dots, F$ federal states, where a is denoting achievement, and $\mu_a^w \equiv \frac{1}{C} \sum_{j=1}^C a_j$ for $j = 1, \dots, C$ countries participating in the student assessment program. Thus, $\mu_a^n \subset a_j$. And

$$\Pr_i^L (\text{re-elect} = 1) = f(a_i - \mu_a^n), \quad (2)$$

where again $f' > 0$, i.e., the reelection probability of the incumbent lower-tier government L in state i increases with an above national (n) average performance of students.⁷

⁷Note, a_i is finite and heterogeneous. For simplicity reasons the expenditure side to reach a_i is abstracted from.

Residual or “participatory” rights of U are such that the upper-tier government is allowed to make proposals with regard to education policies that federal governments i can either accept or reject. However, as the proposal requires unanimity to pass, U has an incentive to make only a subset of Pareto efficient proposals, that is, only proposals that make every state better off, i.e., $a_{i,1} > a_{i,0}$ for all $i = 1, \dots, F$ federal states, where index **1** denotes all periods after and **0** all periods before the reform is enacted. The reform suggested by U will not be approved when policy vector $\{a_i\}_{i=1}^F$ is perceived as engineered by the proposal in a way that achievements in only a subset of states will improve. As the reelection probability of states \notin this subset necessarily falls, these states will refuse their vote. However, even the qualifying subset of Pareto efficient proposals that makes each federal state better off is not guaranteed to get approved.

There will be a strategic dilemma if for a federal state with $a_i^* > \mu_a^n$

$$E \left(\frac{\mu_{a,1}^n - \mu_{a,0}^n}{a_1^* - a_0^*} \right) > 1, \quad (3)$$

i.e., if one state of the leading group of states expects the national average of student achievements to grow faster and, hence, the bottom group to catch up faster than the top students’ states advance. Put it differently, in growth rate notation, the dilemma sets in for

$$\lim_{t \rightarrow T} E \left(\frac{\Delta \ln \mu_{a,t}^n}{\Delta \ln a_{i,t}^*} \right) > 1, \quad (4)$$

where T denotes end of incumbent period. In this case, where the national average student achievement increases by more than the state-mean of student test scores increases in, at least, one of the leading group of states, even the all-states better-off scenario fails. This is due to the fact that, at least, one of the above national average performing states improves its performance index by less than student performances in below-average performing states would be improved. As it is the relative difference that matters with regard to the reelection probability of a federal state incumbent government (eq. 2), the proposal might end up being not unanimously approved. In sum, although U might only propose strong Pareto-improving policies for the federally organized public education system, a strategic dilemma at the L -level can prevent the realization of these policies.

The reason for this rather cynical result or behavior lies in the fact that U does neither internalize VP function (2) of L in the sense of a Nash-equilibrium nor consider any distributional concerns across *Laender* in its objective function. However, the fact that Bavaria of all states did not approve the reform proposal of the dilution of the tripartite German school structure (perceived as prone to inequity) sketched in Section 2.2 may serve as some indicative evidence of such behavior. As can be seen from Table 2 above, Bavaria always ranked among the top-2 states in the PISA-E state performance ranking between 2000 and 2006. Bavarian officials' justification of their state acting as a veto player in this decision is twofold. First, it is argued that the Bavarian school system does not need to be reformed as it achieves top results in the national comparisons despite –or even because of– its strict system of separating students at relatively young age (Niemann 2009, p. 20-21). Secondly, Bavarian politicians also justify their position in this matter by pointing to the substantial cost of the reform. Following their argument, the cost would have to be beared to a relatively large extent by Bavarian taxpayers as Bavaria is used to be a net payer in the fiscal equalization scheme since the 1970s.

The linchpin mechanism of our basic model possibly implying the above sketched strategic dilemma for hybrid forms of federal governance consists of eqs. (1) and (2). The central empirical question, hence, is to analyze whether these functions are in accordance with data of a public education system which adhered to such a hybrid form of federal governance in the 2000-2006 period.

3 Evidence

In the following, we rely on polls data on stated voting intention to gauge actual voting intentions and the popularity of ruling parties in Germany. Ultimately, we use these data to proxy the reelection probability of incumbent governments. This is a frequent practice of the empirical strand of the political economy literature; see Kirchgässner (1985) for German federal elections, Carlsen (1997) for the US, and Wolfers and Leigh (2002) for federal elections in Australia. Wolfers and Leigh (2002) comparing popularity polls out-

comes with projections from economic models and betting market data find that polls do a good job in accurately assessing both the popularity and reelection probabilities of incumbents. This holds in particular over short-run, i.e. close to election, time horizons which are the relevant ones with regard to our empirical strategy. Adhering to the definition of “VP-functions” in the survey by Nannestad and Paldam (1994), our strategy consists in conditioning VP-functions of both the *Bundesregierung* (upper-tier government level) as well as the *Landesregierungen*, i.e., the federal states’ incumbent governments (lower-tier government level) on relative performances in the outlined international (PISA) and national (PISA-E) tests. Given the nature of our data, this is respectively done in the framework of an event study analysis.

3.1 Upper-tier government

As our period of investigation at the *U*-level, we choose the period from the month following the election to the *Bundestag* in fall 1998 to the month of the first advance notice of the PISA 2009 test results in June 2010. The dotted vertical lines in Figure 2 mark the months corresponding to the three elections covered by our sample, while the vertical solid lines give the months in which the PISA test scores have been published.⁸ As our proxy of reelection probabilities we consider data on stated voting intentions from the most popular popularity poll in Germany, referred to as “*Sonntagsfrage*.”⁹ The poll is run by one of the major psephological institutes in Germany. The same source of polls data (now: Infratest-dimap — then: Infratest) has been used by Kirchgässner (1985) to measure voting intentions of German voters and to estimate VP-functions of parties for the Federal Republic of Germany from 1971 to 1982. The underlying sample is representative and the poll has been conducted, at least, once a month over our period of observation. If there is more than one figure on voting intention per month, we take

⁸Notice, these dates do not correspond to the announcements of results from the national extensions of tests, i.e., PISA-E 2000, PISA-E 2003 and PISA-E 2006, that were announced later and independently.

⁹This is due to the fact that the central question in the poll reads: “Who would you vote if elections were next Sunday?”.

monthly averages of voting shares attracted by parties.

In order to assess the impact of German students' relative performance in the three national PISA test results (μ_a^n) on stated voting intention, we estimate a stylized Fair-type model (Fair 1978, 1996, Feld and Kirchgässner 2000, Lewis-Beck and Stegmaier 2000) of the incumbents' percentage of votes and include a term to capture the announcement of the relative performance in the international PISA 2000, 2003, and 2006 test, respectively.¹⁰

$$V_t = \bar{V} + \beta \mathbf{X}_t + \mathbf{b}_1 [A_{2000} (\mu_{2000}^n - \mu_{2000}^w)] + \gamma_1 A_{2003} + \gamma_2 A_{2006} + \delta GK_t + \epsilon_t, \quad (5)$$

$$V_t = \bar{V} + \beta \mathbf{X}_t + \mathbf{b}_2 \left[\sum_{j_1} A_{j_1} (\mu_{j_1}^n - \mu_{j_1}^w) \right] + \gamma A_{2006} + \delta GK_t + \epsilon_t, \quad (6)$$

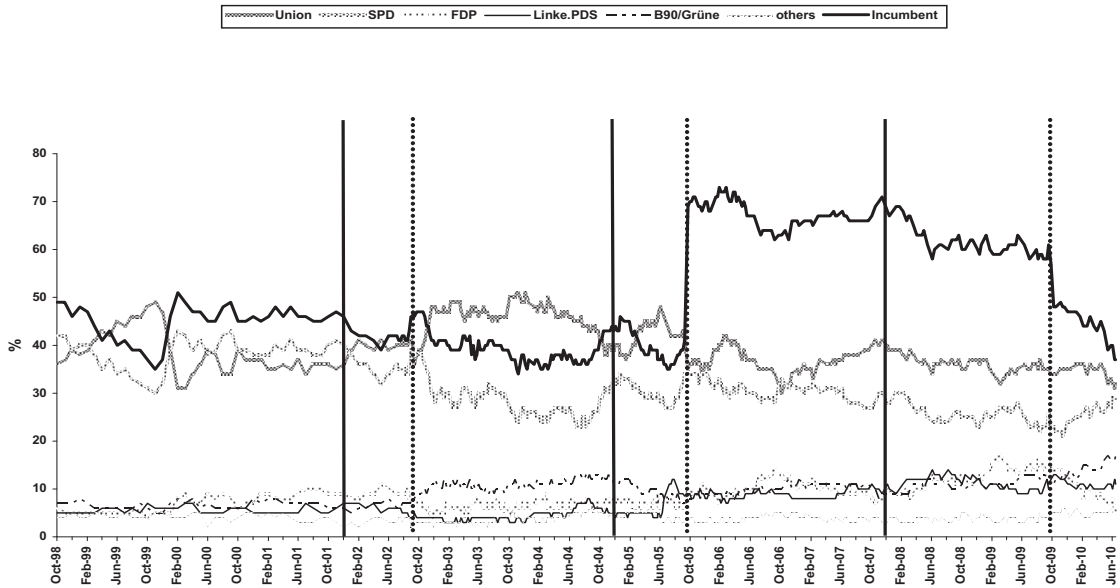
$$V_t = \bar{V} + \beta \mathbf{X}_t + \mathbf{b}_3 \left[\sum_{j_2} A_{j_2} (\mu_{j_2}^n - \mu_{j_2}^w) \right] + \delta GK_t + \epsilon_t, \quad (7)$$

where $j_1 = 2000, 2003$; $j_2 = 2000, 2003, 2006$, and \mathbf{X}_t denotes the Fair-set of conditioners made up by monthly figures of the unemployment rate, the inflation rate (computed from growth rates of the CPI), and the growth rate in real total production. Corresponding time series in monthly frequency were obtained from the German Federal Employment Agency (*Bundesagentur für Arbeit*) and the Federal Statistics Office (*Statistisches Bundesamt*). Summary statistics are given in Table A.1 in the Appendix. GK_t represents a dummy, taking on a value of one during the time of the coalition formed by the two dominating German post-war parties, CDU and SPD, i.e., during the so-called “*Große Koalition*.” As can be seen from Figure 2, it is obviously necessary to control for this coalition due to the higher incumbent government's VP-shares after October 2005. To some degree it also controls for a change in government ideology, which Potrafke (2011a, 2011b) recently found to hardly have a bearing on public spending on education. For the considered period, V_t corresponds to the share of voters intending to vote the incumbent government or coalition. For an event study analysis, the choice of the time slot for

¹⁰The following specification disregards several central determinants of popularity discussed in voting theory, including campaigns, issues, candidates, quality of challengers, and party identification (PID). However, given scarcity of aggregate data and the notoriously good performance of Fair-type models in predicting election outcomes, we are confident to rely on a fairly good second best choice.

investigation is critical. In our case, we focus on the time window from the month of the respective PISA test results announcement to the month of the next *Bundestag* election. The idea is to check for a structural break in the form of a permanent shock¹¹ beginning with the announcement of the PISA test score to the month of the next announcement or to the month of the next election: A_{2000} identifies the period from the announcement of PISA 2000 (December 2001) to the announcement of PISA 2003 (December 2004), A_{2003} identifies the period from the announcement of PISA 2003 to the following election of September 2005, which was lost by the incumbent (Red/Green) coalition. Finally, A_{2006} identifies the period from the announcement of PISA 2006 (December 2007) and the month when first information about the PISA 2009 results were published (June 2010).

Figure 2. Voting intentions and PISA-announcements: Infratest-dimap, 10:98-06:10



Note: Dotted (solid) vertical lines mark months of elections (of PISA results publication)

In specifications (5) to (7), the relative performance of German students is measured by the expression in round brackets, where the respective μ^n denotes the national and

¹¹Basic tests to check, whether the announcement effect is temporary rather than permanent in nature, speak in favor of a permanent effect. Additionally, the inclusion of a time trend into our specifications does qualitatively not alter our results.

μ^w the corresponding international mean test score. With regard to the sign of coefficients \mathbf{b} , estimates consistent with our basic model require in any case a positive sign. Discriminating specifications (5) to (7) allows us to assess whether the effect of relative performance was particularly pronounced for the early PISA tests, especially, the first one ever in 2000, compared to the later ones. The stigmatization of German education policy by the first “PISA shock” is a widely held belief (Schwager 2005, Tillmann *et al.* 2008). For all three equations, we also consider as alternative specifications, the replacement of the Fair-set of conditioners with a first order autoregressive, AR(1), part of the dependent variable V_t . Estimation results are summarized in Table 3.

Table 3. Announcement effects of relative test performance on incumbent government VP-functions: International PISA 2000, 2003, 2006

	Fair-type model		Autoregressive model		
	incl. outliers	excl. outliers		incl. outliers	excl. outliers
\mathbf{b}_1	0.42*** (3.78)	0.45*** (3.97)	AR(1)	0.52*** (2.89)	0.50*** (2.78)
adj. R^2	0.92	0.92	\mathbf{b}_1	0.20* (1.92)	0.22** (2.00)
\mathbf{b}_2	0.29*** (2.95)	0.31*** (3.13)	adj. R^2	0.95	0.95
adj. R^2	0.90	0.90	AR(1)	0.58*** (3.67)	0.57*** (3.56)
\mathbf{b}_3	0.12 (1.25)	0.13 (1.32)	\mathbf{b}_2	0.11 (1.56)	0.12 (1.64)
adj. R^2	0.88	0.88	adj. R^2	0.95	0.95
			AR(1)	0.63*** (3.84)	0.61*** (3.70)
			\mathbf{b}_3	-0.00 (-0.11)	-0.00 (-0.01)
			adj. R^2	0.94	0.94
N obs.	142	133		142	133

Notes:

t -values in parentheses (Newey and West 1987): *, **, *** significant at 10, 5, 1% level.

\mathbf{b}_1 measures the announcement effect of an incremental change in relative performance (measured in international standard deviation units) in PISA 2000 on the voting intention share (measured in percent) attracted by the incumbent government.

\mathbf{b}_2 is this effect for jointly considering announcements of PISA 2000 and 2003.

\mathbf{b}_3 is this effect for jointly considering announcements of PISA 2000, 2003, and 2006.

One may be concerned that some serious omitted variable bias plagues these estimates

as central domestic and foreign-policy events and shocks were not controlled for. In particular, there were several major influential events associated with the months September/October 2001, March/April 2002, August/September 2002, March/April 2003 and September/October 2008 that require a special treatment. The political momentousness of the 09/11 attacks and the shoulder-to-shoulder stance of Chancellor Schröder with President Bush should have contributed exceptionally to the popularity of the incumbent government. As a result of the following military actions, in March 2002 the first German soldiers died in Afghanistan, triggering a discussion about the political need of the mission. In the summer before the 2002 federal election Germany witnessed a hundred year flood, where due to the flooding of the Elbe River mainly East German regions were concerned. During August and September 2002 30,000 people got evacuated and more than 20 died. The incumbent government promised transfers and reconstruction funds amounting to 10 billion Euros. The planned tax reform for 2003 was officially delayed due to this exceptional event. The gain in popularity for the incumbents through this taking measures is common knowledge today. In March 2003 the second Persian Gulf War started. After a massive air strike coalition ground forces invaded Iraq. By mid-April, Saddam Hussein's army and government had collapsed. The German incumbents' corporate position against the invasion of Iraq also most probably affected its popularity. Finally, in September 2008 the financial crisis started to spread over the world with the bankruptcy of Lehman Brothers, which also reasonably affected the popularity of the incumbent coalition. In event study analyses, a straightforward practice to treat exceptional and influential events simply consists of dropping these observations from the sample; see, for example, Bernanke and Kuttner (2005). Leaving out our monthly data associated with 09/11, the Afghanistan conflict, the Elbe Flood, the Persian Gulf War, and the bankruptcy of Lehman Brothers decreases our sample from 142 to 133 events. As can be seen from columns three and six in Table 3, our results are nearly unaffected by excluding these outliers.

3.2 Lower-tier governments

As polls data for German *Laender* governments are available at discontinuous frequency only, the 16 different voting intention series at the federal state-level rarely consist of more than 100 observations for our period of investigation.¹² As they are constituted of in-equidistant events at the state-level, pooling the data and using within-estimators that control for fixed effects is not feasible. Thus, we have to resort to state-by-state estimations to test linchpin mechanism (2) of our basic model. An event study practice that has been successfully applied in similar empirical models, though in widely different contexts, is a one stage specification with a lower order autoregressive term and a dummy variable introducing events like announcements, accidents as the Chernobyl nuclear accident, etc. For our state-level event study analysis it appears to be the appropriate one. It is followed, for example, in Kalra *et al.* (1997), Berman *et al.* (2000), and Veraros *et al.* (2004). In analogy to the preceding section's estimates, we specify

$$V_{i,\tau} = \bar{V}_i + \alpha_{1,i}V_{i,\tau-1} + \mathbf{b}_{1,i} \left[(f_{i,\tau+1}^{2000} - f_{i,\tau}^{2003}) (a_{i,2000} - \mu_{2000}^n) \right] + \gamma_1 f_{i,\tau}^{2003} + \gamma_2 f_{i,\tau}^{2006} + \delta GK_{i,t} + \epsilon_t, \quad (8)$$

$$V_{i,\tau} = \bar{V}_i + \alpha_{2,i}V_{i,\tau-1} + \mathbf{b}_{2,i} \left[\sum_{j_1} \Delta f^{j_1} (a_{i,j_1} - \mu_{j_1}^n) \right] + \gamma f_{i,\tau}^{2006} + \delta GK_{i,t} + \epsilon_t, \quad (9)$$

$$V_{i,\tau} = \bar{V}_i + \alpha_{3,i}V_{i,\tau-1} + \mathbf{b}_{3,i} \left[\sum_{j_2} \Delta f^{j_2} (a_{i,j_2} - \mu_{j_2}^n) \right] + \delta GK_{i,t} + \epsilon_t, \quad (10)$$

where $j_1 = 2000, 2003$; $j_2 = 2000, 2003, 2006$, for all $i = 1, \dots, 16$ *Laender* over the different discontinuous points of observation τ . $V_{i,\tau}$ represents the voting intentions in terms of vote percentages for the incumbent coalition or single ruling party.¹³

In event study analyses interaction terms as, for instance, the direction (cut vs. increase) or reversals of interest rate target changes by the central bank (Bernanke and Kuttner 2005) usually are of particular interest. In our case this concerns the discrep-

¹²We draw our series from the wahlrecht.de database which comprises opinion polls data for the 16 *Laender* from different sources, i.e. from various psephological institutes. For detail see <http://wahlrecht.de/umfragen/landtage>.

¹³Note, we account for in-sample changes in the *Laender* governments by simply adjusting the figures to the respective newly elected party or newly formed coalition.

ancies in average student test scores across the *Laender*: $f_{i,\tau}$ denotes a binary variable that equals zero until the respective popularity poll observation which corresponds to the nearest neighbor month of, or in other words the closest following event to, each PISA-E announcement and equals one until the announcement of the next PISA-E result's publication or state election. Variables a_i denote the average students' test scores in each PISA-E test.¹⁴ Again, model-consistent estimates of coefficients \mathbf{b}_i require a positive sign. In analogy to the event study analysis at the national level, we use specification (8) to assess whether relative performances in PISA-E 2000 had a particularly stigmatizing effect on the incumbent governments of *Laender* at the time. In specification (9), we do so for PISA-E 2000 and 2003, while in specification (10) the stigmatizing effect of relative performance is assumed to be spread across all three considered PISA-E tests. Results are summarized on a state-by-state basis in the Appendix (Table A.2). In nearly two third of cases, i.e., in 10 out of the 16 states, we find indications of announcements effects by relying on specification (8) that are statistically significant at conventional levels. For specification (9) and (10), corresponding significant effects are found in one fourth and about one third of states, respectively. We can interpret $\mathbf{b}_{1,i}$ as a short-run multiplier, that is, multiplied with the relative performances ($X_{i,\tau} = a_{i,2000} - \mu_{2000}^n$ for PISA-E 2000) it gives the individual effect on the respective VP-function in the short run ($(\partial V_{i,\tau} / \partial X_{i,\tau}) X_{i,\tau}$), while the corresponding long-run multiplier ($(dV_{i,\tau} / dX_{i,\tau}) X_{i,\tau}$) is calculated as

$$\frac{dV_{i,\tau}}{dX_{i,\tau}} X_{i,\tau} = \frac{\mathbf{b}_{1,i}}{1 - \alpha_{1,i}} (a_{i,2000} - \mu_{2000}^n)$$

for $\mathbf{b}_{1,i}$ (Table 4).¹⁵ For $\mathbf{b}_{2,i}$ and $\mathbf{b}_{3,i}$, we calculate them at the respective mean of relative performances in the considered set of tests for states i with significantly estimated announcement effects in specification (10) and (11), respectively (Table 5 and Table 6). As $V_{i,\tau}$ is expressed in percent and we measure short-run as well as long-run effects

¹⁴In PISA-E 2000 results were published both for 15 year-olds as well as for ninth graders. We rely on the mean of the two scores in this case. Missing values for overall PISA-E 2000 scores for the city states of Hamburg and Berlin were approximated by the average score of high school (*Gymnasium*) students' test results that are available for the two states for this test year.

¹⁵Due to small sample size, we abstracted from computing a long-run multiplier for the city state of Bremen (HB).

of relative performance by $(dV_{i,\tau}/dX_{i,\tau}) X_{i,\tau}$ and $(\partial V_{i,\tau}/\partial X_{i,\tau}) X_{i,\tau}$ for each state, both measures are in percentage points. For example, $(\partial V_{i,\tau}/\partial X_{i,\tau}) X_{i,\tau} = +2.7$ represents a 2.7 percentage point increase of the VP-function of the Bavarian incumbent government implied by an incremental increase of relative performance of Bavarian students that amounted to 24.5 percent of an international standard deviation (normed to 100) in PISA-E 2000. The corresponding long-run multiplier is +5.3 percentage points.

Table 4. Significant short-run and long-run effects of relative performance I

	$a_{i,2000} - \mu_{2000}^n$	$\alpha_{1,i}$	$\mathbf{b}_{1,i}$	$(\partial V_{i,\tau}/\partial X_{i,\tau}) X_{i,\tau}$	$(dV_{i,\tau}/dX_{i,\tau}) X_{i,\tau}$
BY	24.5	0.49	0.11	+2.7	+5.3
BW	16.2	0.3	0.25	+4.1	+5.8
TH	3.4	0.08	0.96	+3.3	+3.5
RP	-0.5	0.69	4.86	-2.4	-7.8
SH	-1.2	0.41	2.21	-2.7	-4.5
NW	-8.4	0.55	0.34	-2.9	-6.3
NI	-9.0	0.34	0.89	-8.0	-12.1
ST	-21.2	0.61	0.25	-5.3	-13.6
HB	-34.0	1.15	0.06	-2.0	-
BE	-8.0	0.61	0.51	-4.1	-10.5

Note: $(\partial V_{i,\tau}/\partial X_{i,\tau}) X_{i,\tau}$; $(dV_{i,\tau}/dX_{i,\tau}) X_{i,\tau}$: %-points; underlying specification: (9)

Table 5. Significant short-run and long-run effects of relative performance II

	$\sum_{j_1} (a_{i,j_1} - \mu_{j_1}^n)$	$\alpha_{2,i}$	$\mathbf{b}_{2,i}$	$(\partial V_{i,\tau}/\partial X_{i,\tau}) X_{i,\tau}$	$(dV_{i,\tau}/dX_{i,\tau}) X_{i,\tau}$
BW	15.5	0.46	0.14	+2.2	+4.0
SH	-1.0	0.32	2.92	-2.9	-4.3
HB	-28.0	0.86	0.10	-2.8	-
BE	-4.3	0.64	0.50	-2.2	-6.0

Note: $(\partial V_{i,\tau}/\partial X_{i,\tau}) X_{i,\tau}$; $(dV_{i,\tau}/dX_{i,\tau}) X_{i,\tau}$: %-points; underlying specification: (10)

Table 6. Significant short-run and long-run effects of relative performance III

	$\sum_{j_2}(a_{i,j_2}-\mu_{j_2}^n)$	$a_{3,i}$	$\mathbf{b}_{3,i}$	$(\partial V_{i,\tau}/\partial X_{i,\tau})X_{i,\tau}$	$(dV_{i,\tau}/dX_{i,\tau})X_{i,\tau}$
BW	12.1	0.46	0.14	+1.7	+3.1
SH	-3.2	0.32	1.24	-4.0	-5.8
NI	-8.3	0.66	0.55	-4.6	-13.4
ST	-8.8	0.74	0.14	-1.2	-4.7
BE	-5.5	0.64	0.51	-2.8	-7.8

Note: $(\partial V_{i,\tau}/\partial X_{i,\tau})X_{i,\tau}$; $(dV_{i,\tau}/dX_{i,\tau})X_{i,\tau}$: %-points; underlying specification: (11)

Similar multipliers are reported in Table 5 and Table 6 for $\mathbf{b}_{2,i}$ and $\mathbf{b}_{3,i}$, respectively. For our interpretation of the size of effects, we have to keep in mind that they refer to an incumbent government and, hence, not necessarily to a single party. As expected, PISA-E 2000 had the most stigmatizing effect on German education policy makers at the state-level, inasmuch as combined relative performance and announcement effects are found in nearly two third of states, ranging between -8.0 (NI) and $+4.1$ (BW) percentage points. These statistically significant Salmon-Mechanism effects shrink to sub-groups of state incumbent governments concerned by the announcement of PISA-E 2000, when we additionally consider relative performances also for PISA-E 2003 (Table 5). The same applies to considering all PISA-E test announcements (Table 6). However, both implied short-run and long-run effects are still sizable. On average, over all considered specifications significant short-run effects of relative performances cost below-average performing state-government incumbents 3.4 percentage points of voting shares. The corresponding average long-run multiplier (< 0) amounts to a loss of 8.3 percentage points. Similarly, incumbents of above-average performing states on average gain 2.8 percentage points of voting shares in the short run and 4.3 percentage points in the long run. As expected, there are more than twice as many below-average performing and, hence, voting percentages losing state incumbents than there are above-average performing and, hence, voting percentages attracting ones.

In sum, though facing suboptimal data at the level of federal states, our event study exercises found substantial indications for the central driving mechanisms of our model.

Reelection probabilities of incumbent governments both at the national and state level, at least partially, are associated with relative performances in national and intra-national student achievement tests.¹⁶

4 Discussion and concluding remarks

In mid-2006 the first stage of the recent reform of German federalism (*Föderalismusreform*) dissolved major parts of shared decision-making in education policy of federal government and federal states. By then Germany witnessed a highly idiosyncratic hybrid form of federal governance in public education. Some fairly basic theoretical thoughts considering the two idiosyncrasies of residual rights of the federal government in the form of making proposals on the one hand and the requirement of a unanimous approval of states on the other, led to a potential strategic dilemma: If both the national and sub-national governmental VP functions depend on relative educational achievements, as we showed in the empirical parts of our study, a state belonging to the top flight might disapprove all-states better-of policies if the catch-up of low-performance states implies even just a slight loss of its ground in the pecking order. This cynical result hinges on the federal government neither internalizing the VP functions of state incumbents in the sense of a Nash-equilibrium nor considering any distributional aspects in its objective function. There are several routes to remedy this potential demerit of shared decision-making. Cutting down participatory rights of the federal government as done through the *Föderalismusreform* seems, given the historical development of constantly finding ways of bypassing the formal *Laender* autonomy in education policy, the least promising. Similarly, path dependency would not allow to turn back time and allow Germany to abstain from standardized student assessments at the national and sub-national level, as other federally organized countries do and did in the past, in order to obscure

¹⁶Notice, results are not sensitive to alternative functional forms of arguments $[\cdot]$ in equations (5) to (7) and (8) to (10). This holds, in particular, for use of ranks instead of relative performances that do not generate statistically significant results. There are also no indications that suggest a nonlinear impact of relative performances on voting intentions.

comparison and preclude yardstick competition. Also the unanimity vote requirement that proved successful in cutting down on partisan issues in the past is not disposable. Internalizing voters' preferences more directly through referendums as in the Swiss political system of direct democracy seems for similar reasons infeasible. It remains that the problem is solved simply by a repeated game structure and the learning of the players, i.e. the federal government and the federal states, to mutually internalize reaction functions. Against the backdrop of the recent experience with disapproved proposals, the paralleling of the decentralization of responsibilities with fiscal decentralization seems a promising supportive measure to avoid the sketched dilemma.

According to the fiscal federalism literature, decentralized systems, although bearing the danger of relying on bailouts (Wildasin 1997, De Mello 2000, Goodspeed 2002) and of implying impediments of coordination due to an increased number of veto-players and political actors in general (Tsebelis 1995, Wibbels 2000), also have several advantages. These include enhanced preference matching or local needs responsiveness (Oates 1999, Faguet 2004) and enhanced accountability, political participation as well as reduced rent seeking and informal activity (Seabright 1996). Additionally, in the traditional public choice literature fiscal decentralization fosters competition among sub-national entities, tames Leviathan governments, and forces local governments to implement optimal policies in terms of technical and allocative efficiency (Tiebout 1965, Brennan and Buchanan 1980, Baskaran 2010, 2012).

References

- [1] Baskaran, T. (2010), On the Link between Fiscal Decentralization and Public Debt in OECD countries, *Public Choice* 145, 351-378.
- [2] Baskaran, T. (2012), Tax Decentralization and Public Deficits in OECD countries, *Publius: Journal of Federalism* 42, 688-707.
- [3] Berman, B., Brooks, R., and S. Davidson (2000), The Sydney Olympic Games Announcement and Australian Stock Market Reaction, *Applied Economics Letters* 7, 781-784.
- [4] Bernanke, B. S. and K.N. Kuttner (2005), What Explains the Stock Market's Reaction to Federal Reserve Policy?, *Journal of Finance* 60, 1221-1257.
- [5] Besley, T. and A. Case (1995), Incumbent Behavior: Vote-Seeking, Tax-Setting, and Yardstick Competition, *American Economic Review* 85, 25-45.
- [6] Bodenstein, M. and H.W. Ursprung (2005), Political yardstick competition, economic integration, and constitutional choice in federation, *Public Choice* 124, 329-352.
- [7] Brennan, G. and J. M. Buchanan (1980), *The Power to Tax: Analytical Foundations of a Fiscal Constitution*, Cambridge University Press, Cambridge.
- [8] Carlsen, F. (1997), Opinion polls and political business cycles: Theory and evidence for the United States, *Public Choice* 92, 387-406.
- [9] Charette, M.F. and R. Meng (1998), The Determinants of Literacy and Numeracy, and the Effect of Literacy and Numeracy on Labour Market Outcomes, *Canadian Journal of Economics* 31, 495-517.
- [10] De Mello, L.R. (2000), Fiscal Decentralization and Intergovernmental Fiscal Relations: A Cross Country Analysis, *World Development* 28, 365-380.
- [11] Erk, J. (2003), Federal Germany and its non-federal society: emergence of an all-German educational policy in a system of exclusive provincial jurisdiction, *Canadian Journal of Political Science* 36, 295-317.
- [12] Faguet, J.-P. (2004), Does Decentralization Increase Government Responsiveness to Local Needs? Evidence from Bolivia, *Journal of Public Economics* 88, 867-893.
- [13] Fair, R. (1978), The effect of economic events on votes for president, *Review of Economics and Statistics* 60, 159-173.
- [14] Fair, R. (1996), Econometrics and Presidential Elections, *Journal of Economic Perspectives* 10, 89-102.

- [15] Feld, L.R. and G. Kirchgässner (2000), Official and hidden unemployment and the popularity of government: an econometric analysis of the Kohl government, *Electoral Studies* 19, 333-347.
- [16] Goldin, C. (2001), The Human Capital Century and American Leadership: Virtues of the Past, *Journal of Economic History* 61, 263-292.
- [17] Goldin, C. (2003), The Human Capital Century, *Education Next* 3, 73-78.
- [18] Goldin, C. and L. Katz (2001), The Legacy of U.S. Educational Leadership: Notes on Distribution and Economic Growth in the 20th Century, *American Economic Review* 91, 18-23.
- [19] Goodspeed, T.J. (2002), Bailouts in a Federation, *International Tax and Public Finance* 9, 409-421.
- [20] Kalra, R., Henderson, G.V., and G.A. Raines (1997), Effects of the Chernobyl nuclear accident on utility share prices, *Quarterly Journal of Business and Economics* 32, 52-77.
- [21] Kirchgässner, G. (1985), Causality testing of the popularity function: An empirical investigation for the Federal Republic of Germany, 1971-1982, *Public Choice* 45, 155-173.
- [22] Lewis-Beck, M.S. and M. Stegmaier (2000), Economic Determinants of Electoral Outcomes, *Annual Review of Political Science* 3, 183-219.
- [23] Nannestadt, P. and M. Paldam (1994), The VP function: a survey of the literature on vote and popularity functions after 25 years, *Public Choice* 79, 213-245.
- [24] Newey, W. and K. West (1987), A simple positive semi-definite, heteroskedasticity and autocorrelation consistent covariance matrix, *Econometrica* 55, 703-708.
- [25] Niemann, D. (2009), Changing patterns in German education policy making: the impact of international organizations, TranState (DFG-SFB 597) Working Paper, No. 99
- [26] Oates, W.E. (1999), An Essay on Fiscal Federalism, *Journal of Economic Literature* 37, 1120-1149.
- [27] Potrafke, N. (2011a), Does government ideology influence budget composition? Empirical evidence from OECD countries, *Economics of Governance* 12, 101-134.
- [28] Potrafke, N. (2011b), Public Expenditures on Education and Cultural Affairs in the West German States: Does Government Ideology Influence the Budget Composition?, *German Economic Review* 12, 124-145.
- [29] Potrafke, N. (2012), Economic Freedom and Government Ideology Across the German States, forthcoming in *Regional Studies*.

- [30] Pütz, M (2008), *PISA und die Reaktionen der Bildungspolitik*, Munich: Grin.
- [31] Rodden, J. (2003), Reviving Leviathan: Fiscal Federalism and the Growth of Government, *International Organization* 57, 695-729.
- [32] Salmon, P. (1987), Decentralisation as an incentive scheme, *Oxford Review of Economic Policy* 3, 24-43.
- [33] Sand-Zantman, W. (2004), Economic integration and political accountability, *European Economic Review* 48, 1001-1025.
- [34] Schulte, B. (2004), Teaching subjects and time allocation in the German school system, *Prospects: Quarterly Review of Comparative Education* 34, 335-351.
- [35] Schwager, R. (2005), PISA-Schock und Hochschulmisere - Hat der deutsche Bildungsföderalismus versagt?, *Perspektiven der Wirtschaftspolitik* 6, 189-205.
- [36] Seabright, P. (1996), Accountability and Decentralisation in Government: An Incomplete Contracts Model, *European Economic Review* 40, 61-89.
- [37] Tiebout, C. (1956), A Pure Theory of Local Expenditures, *Journal of Political Economy* 64, 416-424.
- [38] Tillmann, K.-J., Dederich, K., Kneuper, D., Kuhlmann, C., and I. Nessel (2008), *PISA als bildungspolitisches Ereignis: Fallstudien in vier Bundesländern*, Wiesbaden: VS Verlag.
- [39] Tsebelis, G. (1995), Decision Making in Political Systems: Veto Players in Presidentialism, Parliamentarism, Multicameralism, Multipartyism, *British Journal of Political Science* 25, 289-325.
- [40] Veraros, N., Kasimati, E., and P. Dawson (2004), The 2004 Olympic Games announcement and its effect on the Athens and Milan Stock Exchanges, *Applied Economics Letters* 11, 749-753.
- [41] Walkenhorst, H. (2005), Europeanisation of the German education system, *German Politics* 14, 470-486.
- [42] Wibbels, E. (2000), Federalism and the Politics of Macroeconomic Policy and Performance, *American Journal of Political Science* 44, 687-702.
- [43] Wildasin, D. (1997), Externalities and Bailouts: Hard and Soft Budget Constraints in Intergovernmental Fiscal Relations, World Bank Policy Research Working Paper, No. 1843.
- [44] Wössmann, L. (2010), Institutional determinants of school efficiency and equity: German states as a microcosm for OECD countries, *Journal of Economics and Statistics (Jahrbücher für Nationalökonomie und Statistik)* 230, 234-270.

- [45] Wolfers, J. and A. Leigh (2002), Three Tools for Forecasting Federal Elections: Lessons from 2001, *Australian Journal of Political Science* 37, 223-240.
- [46] Zierer, K. (2012), Wer bestimmt aktuell, wo es lang geht? Eine biographische Analyse der Mitglieder der KMK-Konferenz, *Erziehungswissenschaft und Beruf* 60, 131-144.

Appendix

Table A.1 Summary statistics of federal government event study sample

	A_{2000}	A_{2003}	A_{2006}	GK	CPI	PI	UER	V	$\mu^n - \mu^w$
Mean	0.25	0.07	0.22	0.34	99.12	99.08	9.74	50.03	-4.10
Std. dev	0.44	0.26	0.41	0.47	5.45	9.27	1.27	11.35	9.58
Min	0	0	0	0	90.70	79.40	7.10	35.00	-13.00
Max	1	1	1	1	108.10	122.70	12.70	73.25	8.33
Range	1	1	1	1	17.40	43.30	5.60	38.25	21.33
N obs	142	142	142	142	142	142	142	142	142

Note: First four columns refer to dummy variables as defined in the text; UER – unemployment rate, PI – production index of total real production, V – share of stated voting intention attracted by incumbent government (percent), inflation rate is computed from growth rates of the consumer price index (CPI).

Sources: Bundesagentur für Arbeit, Statistisches Bundesamt, Infratest-dimap

Table A.2 VP-function estimates: PISA-E test result announcements (left: significant results)

	BY	BW	TH	RP	SH	NW	NI	ST	HB	BE ¹	SN	SL	HE	MV	BB	HH ²
$\alpha_{1,i}$	0.49*** (4.70)	0.30* (1.76)	0.08 (0.92)	0.69*** (6.53)	0.41*** (3.19)	0.55*** (7.96)	0.34** (2.08)	0.61*** (7.37)	1.15** (2.57)	0.61*** (7.10)	0.54*** (4.84)	0.56*** (3.35)	0.62*** (3.68)	0.66*** (6.37)	0.81*** (10.18)	0.37*** (2.65)
$\mathbf{b}_{1,i}$	0.11** (2.40)	0.25** (2.28)	0.96** (2.64)	4.86** (2.42)	2.21* (1.76)	0.34** (2.51)	0.89** (2.51)	0.25** (2.27)	0.06* (2.08)	0.51*** (2.61)	-0.06 (-0.40)	-0.33 (-0.70)	-0.20 (-1.16)	0.14 (0.64)	-0.00 (-0.04)	-0.07 (-1.64)
adj. R ²	0.52	0.49	0.67	0.75	0.91	0.71	0.69	0.70	0.92	0.86	0.43	0.70	0.79	0.51	0.62	0.57
$\alpha_{2,i}$	0.66*** (7.42)	0.46*** (4.08)	0.39*** (3.40)	0.75*** (9.26)	0.32** (2.01)	0.78*** (15.16)	0.55** (7.96)	0.76*** (7.65)	0.86** (13.83)	0.64*** (7.65)	0.54*** (4.93)	0.84*** (8.89)	0.84*** (11.80)	0.66*** (6.48)	0.81*** (9.96)	0.70*** (7.68)
$\mathbf{b}_{2,i}$	-0.05 (-1.60)	0.14** (2.60)	-0.85* (-1.87)	0.38 (1.39)	2.92* (2.01)	0.05 (0.78)	0.63 (1.63)	0.13 (1.62)	0.10** (5.95)	0.50** (2.36)	-0.06 (-0.66)	-0.01 (-0.27)	-0.04 (-0.24)	0.16 (0.78)	-0.00 (-0.05)	-0.04 (-0.99)
adj. R ²	0.46	0.44	0.54	0.74	0.91	0.67	0.61	0.68	0.93	0.86	0.44	0.67	0.77	0.52	0.63	0.50
$\alpha_{3,i}$	0.66*** (7.49)	0.46*** (4.03)	0.41*** (4.00)	0.85*** (13.78)	0.32* (1.96)	0.78*** (15.25)	0.66** (5.18)	0.74*** (7.37)	0.55** (7.66)	0.64*** (7.66)	0.55*** (4.97)	0.82*** (7.57)	0.87*** (15.12)	0.60*** (5.06)	0.81*** (10.35)	0.70*** (7.73)
$\mathbf{b}_{3,i}$	-0.05 (-1.64)	0.14** (2.65)	-0.67** (-2.03)	0.06 (0.26)	1.24*** (3.06)	0.05 (0.82)	0.55* (1.68)	0.14* (1.78)	0.08 (1.39)	0.51** (2.49)	-0.06 (-0.62)	-0.15 (-0.42)	-0.06 (-0.34)	0.18 (0.84)	-0.01 (-0.14)	-0.04 (-0.87)
adj. R ²	0.47	0.45	0.53	0.73	0.91	0.67	0.62	0.68	0.87	0.86	0.45	0.68	0.77	0.50	0.64	0.50
N obs	93	45	66	80	56	131	52	45	13	202	71	38	64	55	60	94

Note: HAC Student t -values in parantheses (Newey and West 1987), all estimates include a constant, *, **, *** denotes significance at 10, 5, 1% level of significance, respectively

¹ Dropping the announcement of PISA-E 2000 due to missing achievement data for all school-types for this state does not qualitatively change results.

² Dropping the announcement of PISA-E 2000 due to missing achievement data for all school-types for this state generates model-consistent, statistically significant estimates for PISA-E 2003 and PISA-E 2006 events.

Universität Leipzig

Wirtschaftswissenschaftliche Fakultät

Nr. 1	Wolfgang Bernhardt	Stock Options wegen oder gegen Shareholder Value? Vergütungsmodelle für Vorstände und Führungskräfte 04/1998
Nr. 2	Thomas Lenk / Volkmar Teichmann	Bei der Reform der Finanzverfassung die neuen Bundesländer nicht vergessen! 10/1998
Nr. 3	Wolfgang Bernhardt	Gedanken über Führen – Dienen – Verantworten 11/1998
Nr. 4	Kristin Wellner	Möglichkeiten und Grenzen kooperativer Standortgestaltung zur Revitalisierung von Innenstädten 12/1998
Nr. 5	Gerhardt Wolff	Brauchen wir eine weitere Internationalisierung der Betriebswirtschaftslehre? 01/1999
Nr. 6	Thomas Lenk / Friedrich Schneider	Zurück zu mehr Föderalismus: Ein Vorschlag zur Neugestaltung des Finanzausgleichs in der Bundesrepublik Deutschland unter besonderer Berücksichtigung der neuen Bundesländer 12/1998
Nr. 7	Thomas Lenk	Kooperativer Förderalismus – Wettbewerbsorientierter Förderalismus 03/1999
Nr. 8	Thomas Lenk / Andreas Mathes	EU – Osterweiterung – Finanzierbar? 03/1999
Nr. 9	Thomas Lenk / Volkmar Teichmann	Die fiskalischen Wirkungen verschiedener Forderungen zur Neugestaltung des Länderfinanzausgleichs in der Bundesrepublik Deutschland: Eine empirische Analyse unter Einbeziehung der Normenkontrollanträge der Länder Baden-Württemberg, Bayern und Hessen sowie der Stellungnahmen verschiedener Bundesländer 09/1999
Nr. 10	Kai-Uwe Graw	Gedanken zur Entwicklung der Strukturen im Bereich der Wasserversorgung unter besonderer Berücksichtigung kleiner und mittlerer Unternehmen 10/1999
Nr. 11	Adolf Wagner	Materialien zur Konjunkturforschung 12/1999
Nr. 12	Anja Birke	Die Übertragung westdeutscher Institutionen auf die ostdeutsche Wirklichkeit – ein erfolg-versprechendes Zusammenspiel oder Aufdeckung systematischer Mängel? Ein empirischer Bericht für den kommunalen Finanzausgleich am Beispiel Sachsen 02/2000
Nr. 13	Rolf H. Hasse	Internationaler Kapitalverkehr in den letzten 40 Jahren – Wohlstandsmotor oder Krisenursache? 03/2000
Nr. 14	Wolfgang Bernhardt	Unternehmensführung (Corporate Governance) und Hauptversammlung 04/2000
Nr. 15	Adolf Wagner	Materialien zur Wachstumsforschung 03/2000
Nr. 16	Thomas Lenk / Anja Birke	Determinanten des kommunalen Gebührenaufkommens unter besonderer Berücksichtigung der neuen Bundesländer 04/2000
Nr. 17	Thomas Lenk	Finanzwirtschaftliche Auswirkungen des Bundesverfassungsgerichtsurteils zum Länderfinanzausgleich vom 11.11.1999 04/2000
Nr. 18	Dirk Büttel	Continuous linear utility for preferences on convex sets in normal real vector spaces 05/2000
Nr. 19	Stefan Dierkes / Stephanie Hanrath	Steuerung dezentraler Investitionsentscheidungen bei nutzungsabhängigem und nutzungsunabhängigem Verschleiß des Anlagenvermögens 06/2000
Nr. 20	Thomas Lenk / Andreas Mathes / Olaf Hirschfeld	Zur Trennung von Bundes- und Landeskompentzen in der Finanzverfassung Deutschlands 07/2000
Nr. 21	Stefan Dierkes	Marktwerte, Kapitalkosten und Betafaktoren bei wertabhängiger Finanzierung 10/2000
Nr. 22	Thomas Lenk	Intergovernmental Fiscal Relationships in Germany: Requirement for New Regulations? 03/2001
Nr. 23	Wolfgang Bernhardt	Stock Options – Aktuelle Fragen Besteuerung, Bewertung, Offenlegung 03/2001

Nr. 24	Thomas Lenk	Die „kleine Reform“ des Länderfinanzausgleichs als Nukleus für die „große Finanzverfassungs-reform“? 10/2001
Nr. 25	Wolfgang Bernhardt	Biotechnologie im Spannungsfeld von Menschenwürde, Forschung, Markt und Moral Wirtschaftsethik zwischen Beredsamkeit und Schweigen 11/2001
Nr. 26	Thomas Lenk	Finanzwirtschaftliche Bedeutung der Neuregelung des bundestaatlichen Finanzausgleichs – Eine allokoative und distributive Wirkungsanalyse für das Jahr 2005 11/2001
Nr. 27	Sören Bär	Grundzüge eines Tourismusmarketing, untersucht für den Südraum Leipzig 05/2002
Nr. 28	Wolfgang Bernhardt	Der Deutsche Corporate Governance Kodex: Zuwahl (comply) oder Abwahl (explain)? 06/2002
Nr. 29	Adolf Wagner	Konjunkturtheorie, Globalisierung und Evolutionsökonomik 08/2002
Nr. 30	Adolf Wagner	Zur Profilbildung der Universitäten 08/2002
Nr. 31	Sabine Klinger / Jens Ulrich / HansJoachim Rudolph	Konjunktur als Determinante des Erdgasverbrauchs in der ostdeutschen Industrie? 10/2002
Nr. 32	Thomas Lenk / Anja Birke	The Measurement of Expenditure Needs in the Fiscal Equalization at the Local Level Empirical Evidence from German Municipalities 10/2002
Nr. 33	Wolfgang Bernhardt	Die Lust am Fliegen Eine Parabel auf viel Corporate Governance und wenig Unternehmensführung 11/2002
Nr. 34	Udo Hielscher	Wie reich waren die reichsten Amerikaner wirklich? (US-Vermögensbewertungsindex 1800 – 2000) 12/2002
Nr. 35	Uwe Haubold / Michael Nowak	Risikoanalyse für Langfrist-Investments Eine simulationsbasierte Studie 12/2002
Nr. 36	Thomas Lenk	Die Neuregelung des bundesstaatlichen Finanzausgleichs auf Basis der Steuerschätzung Mai 2002 und einer aktualisierten Bevölkerungsstatistik 12/2002
Nr. 37	Uwe Haubold / Michael Nowak	Auswirkungen der Renditeverteilungsannahme auf Anlageentscheidungen Eine simulationsbasierte Studie 02/2003
Nr. 38	Wolfgang Bernhard	Corporate Governance Kodex für den Mittel-Stand? 06/2003
Nr. 39	Hermut Kormann	Familienunternehmen: Grundfragen mit finanzwirtschaftlichen Bezug 10/2003
Nr. 40	Matthias Folk	Launhardtsche Trichter 11/2003
Nr. 41	Wolfgang Bernhardt	Corporate Governance statt Unternehmensführung 11/2003
Nr. 42	Thomas Lenk / Karolina Kaiser	Das Prämienmodell im Länderfinanzausgleich – Anreiz- und Verteilungsmittelnwirkungen 11/2003
Nr. 43	Sabine Klinger	Die Volkswirtschaftliche Gesamtrechnung des Haushaltsektors in einer Matrix 03/2004
Nr. 44	Thomas Lenk / Heide Köpping	Strategien zur Armutsbekämpfung und –vermeidung in Ostdeutschland: 05/2004
Nr. 45	Wolfgang Bernhardt	Sommernachtsfantasien Corporate Governance im Land der Träume. 07/2004
Nr. 46	Thomas Lenk / Karolina Kaiser	The Premium Model in the German Fiscal Equalization System 12/2004
Nr. 47	Thomas Lenk / Christine Falken	Komparative Analyse ausgewählter Indikatoren des Kommunalwirtschaftlichen Gesamt-ergebnisses 05/2005
Nr. 48	Michael Nowak / Stephan Barth	Immobilienanlagen im Portfolio institutioneller Investoren am Beispiel von Versicherungsunternehmen Auswirkungen auf die Risikosituation 08/2005

Nr. 49	Wolfgang Bernhardt	Familiengesellschaften – Quo Vadis? Vorsicht vor zu viel „Professionalisierung“ und Ver-Fremdung 11/2005
Nr. 50	Christian Milow	Der Griff des Staates nach dem Währungsgold 12/2005
Nr. 51	Anja Eichhorst / Karolina Kaiser	The Institutional Design of Bailouts and Its Role in Hardening Budget Constraints in Federations 03/2006
Nr. 52	Ullrich Heilemann / Nancy Beck	Die Mühlen der Ebene – Regionale Wirtschaftsförderung in Leipzig 1991 bis 2004 08/2006
Nr. 53	Gunther Schnabl	Die Grenzen der monetären Integration in Europa 08/2006
Nr. 54	Hermut Kormann	Gibt es so etwas wie typisch mittelständige Strategien? 11/2006
Nr. 55	Wolfgang Bernhardt	(Miss-)Stimmung, Bestimmung und Mitbestimmung Zwischen Juristentag und Biedenkopf-Kommission 11/2006
Nr. 56	Ullrich Heilemann / Annika Blaschzik	Indicators and the German Business Cycle A Multivariate Perspective on Indicators of Ifo, OECD, and ZEW 01/2007
Nr. 57	Ullrich Heilemann	“The Soul of a new Machine” zu den Anfängen des RWI-Konjunkturmodells 12/2006
Nr. 58	Ullrich Heilemann / Roland Schuhr / Annika Blaschzik	Zur Evolution des deutschen Konjunkturzyklus 1958 bis 2004 Ergebnisse einer dynamischen Diskriminanzanalyse 01/2007
Nr. 59	Christine Falken / Mario Schmidt	Kameralistik versus Doppik Zur Informationsfunktion des alten und neuen Rechnungswesens der Kommunen Teil I: Einführende und Erläuternde Betrachtungen zum Systemwechsel im kommunalen Rechnungswesen 01/2007
Nr. 60	Christine Falken / Mario Schmidt	Kameralistik versus Doppik Zur Informationsfunktion des alten und neuen Rechnungswesens der Kommunen Teil II Bewertung der Informationsfunktion im Vergleich 01/2007
Nr. 61	Udo Hielscher	Monti della città di firenze Innovative Finanzierungen im Zeitalter Der Medici. Wurzeln der modernen Finanzmärkte 03/2007
Nr. 62	Ullrich Heilemann / Stefan Wappler	Sachsen wächst anders Konjunkturelle, sektorale und regionale Bestimmungsgründe der Entwicklung der Bruttowertschöpfung 1992 bis 2006 07/2007
Nr. 63	Adolf Wagner	Regionalökonomik: Konvergierende oder divergierende Regionalentwicklungen 08/2007
Nr. 64	Ullrich Heilemann / Jens Ulrich	Good bye, Professir Phillips? Zum Wandel der Tariflohndeterminanten in der Bundesrepublik 1952 – 2004 08/2007
Nr. 65	Gunther Schnabl / Franziska Schobert	Monetary Policy Operations of Debtor Central Banks in MENA Countries 10/2007
Nr. 66	Andreas Schäfer / Simone Valente	Habit Formation, Dynastic Altruism, and Population Dynamics 11/2007
Nr. 67	Wolfgang Bernhardt	5 Jahre Deutscher Corporate Governance Kodex Eine Erfolgsgeschichte? 01/2008
Nr. 68	Ullrich Heilemann / Jens Ulrich	Viel Lärm um wenig? Zur Empirie von Lohnformeln in der Bundesrepublik 01/2008
Nr. 69	Christian Groth / Karl-Josef Koch / Thomas M. Steger	When economic growth is less than exponential 02/2008
Nr. 70	Andreas Bohne / Linda Kochmann	Ökonomische Umweltbewertung und endogene Entwicklung peripherer Regionen Synthese einer Methodik und einer Theorie 02/2008
Nr. 71	Andreas Bohne / Linda Kochmann / Jan Slavík / Lenka Slavíková	Deutsch-tschechische Bibliographie Studien der kontingenten Bewertung in Mittel- und Osteuropa 06/2008

Nr. 72	Paul Lehmann / Christoph Schröter-Schlaack	Regulating Land Development with Tradable Permits: What Can We Learn from Air Pollution Control? 08/2008
Nr. 73	Ronald McKinnon / Gunther Schnabl	China's Exchange Rate Impasse and the Weak U.S. Dollar 10/2008
Nr. 74	Wolfgang Bernhardt	Managervergütungen in der Finanz- und Wirtschaftskrise Rückkehr zu (guter) Ordnung, (klugem) Maß und (vernünftigem) Ziel? 12/2008
Nr. 75	Moritz Schularick / Thomas M. Steger	Financial Integration, Investment, and Economic Growth: Evidence From Two Eras of Financial Globalization 12/2008
Nr. 76	Gunther Schnabl / Stephan Freitag	An Asymmetry Matrix in Global Current Accounts 01/2009
Nr. 77	Christina Ziegler	Testing Predictive Ability of Business Cycle Indicators for the Euro Area 01/2009
Nr. 78	Thomas Lenk / Oliver Rottmann / Florian F. Woitek	Public Corporate Governance in Public Enterprises Transparency in the Face of Divergent Positions of Interest 02/2009
Nr. 79	Thomas Steger / Lucas Bretschger	Globalization, the Volatility of Intermediate Goods Prices, and Economic Growth 02/2009
Nr. 80	Marcela Munoz Escobar / Robert Holländer	Institutional Sustainability of Payment for Watershed Ecosystem Services. Enabling conditions of institutional arrangement in watersheds 04/2009
Nr. 81	Robert Holländer / WU Chunyou / DUAN Ning	Sustainable Development of Industrial Parks 07/2009
Nr. 82	Georg Quaas	Realgrößen und Preisindizes im alten und im neuen VGR-System 10/2009
Nr. 83	Ulrich Heilemann / Hagen Findeis	Empirical Determination of Aggregate Demand and Supply Curves: The Example of the RWI Business Cycle Model 12/2009
Nr. 84	Gunther Schnabl / Andreas Hoffmann	The Theory of Optimum Currency Areas and Growth in Emerging Markets 03/2010
Nr. 85	Georg Quaas	Does the macroeconomic policy of the global economy's leader cause the worldwide asymmetry in current accounts? 03/2010
Nr. 86	Volker Grossmann / Thomas M. Steger / Timo Trimborn	Quantifying Optimal Growth Policy 06/2010
Nr. 87	Wolfgang Bernhardt	Corporate Governance Kodex für Familienunternehmen? Eine Widerrede 06/2010
Nr. 88	Philipp Mandel / Bernd Süßmuth	A Re-Examination of the Role of Gender in Determining Digital Piracy Behavior 07/2010
Nr. 89	Philipp Mandel / Bernd Süßmuth	Size Matters. The Relevance and Hicksian Surplus of Agreeable College Class Size 07/2010
Nr. 90	Thomas Kohstall / Bernd Süßmuth	Cyclic Dynamics of Prevention Spending and Occupational Injuries in Germany: 1886-2009 07/2010
Nr. 91	Martina Padmanabhan	Gender and Institutional Analysis. A Feminist Approach to Economic and Social Norms 08/2010
Nr. 92	Gunther Schnabl / Ansgar Belke	Finanzkrise, globale Liquidität und makroökonomischer Exit 09/2010
Nr. 93	Ulrich Heilemann / Roland Schuhr / Heinz Josef Münch	A "perfect storm"? The present crisis and German crisis patterns 12/2010
Nr. 94	Gunther Schnabl / Holger Zemanek	Die Deutsche Wiedervereinigung und die europäische Schuldenkrise im Lichte der Theorie optimaler Währungsräume 06/2011
Nr. 95	Andreas Hoffmann / Gunther Schnabl	Symmetrische Regeln und asymmetrisches Handeln in der Geld- und Finanzpolitik 07/2011
Nr. 96	Andreas Schäfer / Maik T. Schneider	Endogenous Enforcement of Intellectual Property, North-South Trade, and Growth 08/2011
Nr. 97	Volker Grossmann / Thomas M. Steger / Timo Trimborn	Dynamically Optimal R&D Subsidization 08/2011

Nr. 98	Erik Gawel	Political drivers of and barriers to Public-Private Partnerships: The role of political involvement 09/2011
Nr. 99	André Casajus	Collusion, symmetry, and the Banzhaf value 09/2011
Nr. 100	Frank Hüttner / Marco Sunder	Decomposing R^2 with the Owen value 10/2011
Nr. 101	Volker Grossmann / Thomas M. Steger / Timo Trimborn	The Macroeconomics of TANSTAAFL 11/2011
Nr. 102	Andreas Hoffmann	Determinants of Carry Trades in Central and Eastern Europe 11/2011
Nr. 103	Andreas Hoffmann	Did the Fed and ECB react asymmetrically with respect to asset market developments? 01/2012
Nr. 104	Christina Ziegler	Monetary Policy under Alternative Exchange Rate Regimes in Central and Eastern Europe 02/2012
Nr. 105	José Abad / Axel Löffler / Gunther Schnabl / Holger Zemanek	Fiscal Divergence, Current Account and TARGET2 Imbalances in the EMU 03/2012
Nr. 106	Georg Quaas / Robert Köster	Ein Modell für die Wirtschaftszweige der deutschen Volkswirtschaft: Das "MOGBOT" (Model of Germany's Branches of Trade)
Nr. 107	Andreas Schäfer / Thomas Steger	Journey into the Unknown? Economic Consequences of Factor Market Integration under Increasing Returns to Scale 04/2012
Nr. 108	Andreas Hoffmann / Björn Urbansky	Order, Displacements and Recurring Financial Crises 06/2012
Nr. 109	Finn Marten Körner / Holger Zemanek	On the Brink? Intra-euro area imbalances and the sustainability of foreign debt 07/2012
Nr. 110	André Casajus / Frank Hüttner	Nullifying vs. dummifying players or nullified vs. dummified players: The difference between the equal division value and the equal surplus division value 07/2012
Nr. 111	André Casajus	Solidarity and fair taxation in TU games 07/2012
Nr. 112	Georg Quaas	Ein Nelson-Winter-Modell der deutschen Volkswirtschaft 08/2012
Nr. 113	André Casajus / Frank Hüttner	Null players, solidarity, and the egalitarian Shapley values 08/2012
Nr. 114	André Casajus	The Shapley value without efficiency and additivity 11/2012
Nr. 115	Erik Gawel	Neuordnung der W-Besoldung: Ausgestaltung und verfassungsrechtliche Probleme der Konsumtionsregeln zur Anrechnung von Leistungsbezügen 02/2013
Nr. 116	Volker Grossmann / Andreas Schäfer / Thomas M. Steger	Migration, Capital Formation, and House Prices 02/2013
Nr. 117	Volker Grossmann / Thomas M. Steger	Optimal Growth Policy: the Role of Skill Heterogeneity 03/2013
Nr. 118	Guido Heineck / Bernd Süßmuth	A Different Look at Lenin's Legacy: Social Capital and Risk Taking in the Two Germanies 03/2013
Nr. 119	Andreas Hoffmann	The Euro as a Proxy for the Classical Gold Standard? Government Debt Financing and Political Commitment in Historical Perspective 05/2013
Nr. 120	Andreas Hoffmann / Axel Loeffler	Low Interest Rate Policy and the Use of Reserve Requirements in Emerging Markets 05/2013
Nr. 121	Gunther Schnabl	The Global Move into the Zero Interest Rate and High Debt Trap 07/2013
Nr. 122	Axel Loeffler / Gunther Schnabl / Franziska Schobert	Limits of Monetary Policy Autonomy and Exchange Rate Flexibility by East Asian Central Banks 08/2013
Nr. 123	Burkhard Heer / Bernd Süßmuth	Tax Bracket Creep and its Effects on Income Distribution 08/2013
Nr. 124	Hans Fricke / Bernd Süßmuth	Growth and Volatility of Tax Revenues in Latin America 08/2013
Nr. 125	Ulrich Volz	RMB Internationalisation and Currency Co-operation in East Asia 09/2013

Nr. 126	André Casajus / Helfried Labrenz	A property rights based consolidation approach 02/2014
Nr. 127	Pablo Duarte	The Relationship between GDP and the Size of the Informal Economy: Empirical Evidence for Spain 02/2014
Nr. 128	Erik Gawel	Neuordnung der Professorenbesoldung in Sachsen 03/2014
Nr. 129	Friedrun Quaas	Orthodoxer Mainstream und Heterodoxe Alternativen Eine Analyse der ökonomischen Wissenschaftslandschaft 04/2014
Nr. 130	Gene Callahan / Andreas Hoffmann	The Idea of a Social Cycle 05/2014
Nr. 131	Karl Trela	Klimaanpassung als wirtschaftspolitisches Handlungsfeld 06/2014
Nr. 132	Erik Gawel / Miquel Aguado	Neuregelungen der W-Besoldung auf dem verfassungsrechtlichen Prüfstand 08/2014
Nr. 133	Ulf Papenfuß / Matthias Redlich / Lars Steinhauer	Forschend und engagiert lernen im Public Management: Befunde und Gestaltungsanregungen eines Service Learning Lehrforschungsprojektes 10/2014
Nr. 134	Karl Trela	Political climate adaptation decisions in Germany - shortcomings and applications for decision support systems 11/2014
Nr. 135	Ulf Papenfuß / Lars Steinhauer / Benjamin Friedländer	Beteiligungsberichterstattung der öffentlichen Hand im 13-Länder-Vergleich: Erfordernisse für mehr Transparenz über die Governance und Performance öffentlicher Unternehmen 02/2015
Nr. 136	Gunther Schnabl	Japans Lehren für das Schweizer Wechselkursdilemma 02/2015
Nr. 137	Ulf Papenfuß / Christian Schmidt	Determinants of Manager Pay in German State-Owned Enterprises and International Public Policy Implications: 3-Year Study for Sectors, Performance and Gender 02/2015
Nr. 138	Philipp Mandel / Bernd Süßmuth	Public education, accountability, and yardstick competition in a federal system 05/2015