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Partisan Politics, Ability-Tracking, and the Composition of
Public Education Spending¹

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Abstract

This article reconsiders partisan theory in public education. Given a well-established link between students' secondary track choice and parental background, political parties – which are overrepresented among high- or low-income households – may use ability-tracking as a means to concentrate benefits from public resources on their constituencies. In Germany, very early tracking and a strong link between students' track choice and parental background coincide. Evidence from a panel of 10 West German states over the 1981-2006 period suggests that ability-tracking is supported by political parties that are overrepresented among high-income/education households and that parties, when in office, increase the share of public education spending on tracks in which their constituencies are overrepresented.

Keywords: Political Economy, Partisan theory, Educational finance, Public expenditures

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1. Introduction

An individual's education is a major factor contributing to his/her future income and social mobility. At the same time, education and human capital are widely considered to bear important social economic and non-economic benefits, such as promoting social cohesion and contributing to equality of opportunity, lowering engagement in criminal activities and contributing to economic growth. In the absence of capital markets that allow borrowing against future earnings, these are important arguments to justify public intervention in the finance of education, which is, hence, a common feature of the education systems in virtually all industrialized countries: In fact, a quite significant share of between 10% and 20% of total public expenditures are devoted to educational institutions in OECD countries (OECD, 2007, 224). This combination of *public decision-making and financing* in education on the one hand and the *paramount, essentially private, importance of education* (for individual professional success, income and social status) on the other hand, converts the education system in an attractive field for partisan engagement. Subgroups of the electorate may want to concentrate the benefits of public education on themselves while spreading the financial burden of these services across the entire population.

One important feature of public education systems in industrialized countries is ability-tracking. Students are grouped according to their ability from the age of 10 (Austria and Germany) up to the age of 15 or 16 (France, Japan, Norway; for an overview see OECD, 2005). Recent empirical evidence suggests that a student's track choice is significantly determined by her/his parents' background in terms of income and education (Dustmann, 2004; Contini, Scagni and Riehl, 2007). In particular, *ceteris paribus*, a student from a high-education or high-income background has a higher probability of attending a high-ability track.³

Given this well-established link between parental background and secondary school track choice, ability-tracking can be understood as a means of concentrating the benefits of public education on subgroups of the electorate. High/low income households or parents with higher/lower educational background may be looked upon as such

³ This link holds also for education achievement in general (Hanushek, 1986, 1163; Ermisch and Francesconi, 2001 or Wößmann, 2004).

subgroups. Political parties representing high- or low-income constituencies may engage in concentrating public education spending on a track in which their constituency is overrepresented. Thus, distributional conflicts arise as to which specific track of public education should be given priority. Moreover, tracking or non-tracking itself may involve important distributional effects working through the concentration of positive peer-group effects from high-performance students within the high-ability track.⁴

Germany is widely considered to be a country with very early tracking of students (generally from age 10). At the same time, recently presented evidence suggests that in Germany the correlation of a child's educational achievement/track choice with parental background is comparatively strong (OECD, 2007 and Federal Ministry of Education and Research, 2007b; Contini, Scagni and Riehl, 2007). These stylized facts coincide with intensive ideological debates concerning the education system in Germany. While the Conservatives have argued in favor of early tracking of students according to their ability and thereby focusing on the promotion of gifted students, Social Democrats have traditionally advocated comprehensive schools, offering joint education for all tracks (Stern, 2000, 29, 116, 119 and 125). Regarding the political settings in Germany, ideological differences between the political parties have actually translated into a variety of different policy outcomes as a consequence of the fact that the states (Bundesländer) are responsible for education. Before (after) German Reunification, Germany consisted (consists) of 11 (16) federal states. As such, different ideologies have had more opportunities of being implemented. In addition, legislation at the state level is usually easier and faster because laws are not subject to a bicameral legislation process, thus contributing to diverse policy outcomes across Germany.

Against this background, the present study sets up a simple framework for studying partisan politics in public education by incorporating the core partisan assumption and ability-tracking into the standard model on voting on public education (Stiglitz, 1974). This framework is applied to the German education system: Hypotheses for the impact of German political parties on the allocation of public resources across tracks and on the intensity of ability-tracking itself are derived. The hypotheses are tested using data on teacher/student ratios in lower secondary education in 10 German states over the 1981-

⁴ As a matter of course, such reasoning does not only apply to differences across tracks of public education but also across levels of education, such as primary education vs. tertiary education.

2006 period. The results support the hypotheses. I find quite clear partisan effects in German public education on the composition of spending across tracks and on the intensity of tracking. In particular, political parties always act in the predicted direction although estimated confidence intervals are somewhat large for the smaller parties.

The article is organized as follows. The following section develops a simple synthesis of partisan theory and models on voting on public education. Section 3 presents institutional settings and stylized facts of the key features of both the German education and political system. Partisan hypotheses for Germany are derived in Section 4 while Section 5 describes the data and the econometric models. Section 6 discusses the results and Section 7 concludes.

2. Theoretical background: Partisan theory in public education

Studies investigating partisan politics in public education can build on two strong strands of theoretical literature, namely the literature on partisan theory (see Alesina, Roubini and Cohen, 1997 for an overview) and the literature on voting on public education (see Gradstein, Justman and Meier, 2005 for an overview).

Partisan theory

A natural start when analyzing the effects of party ideology on public education is the literature on partisan theory, which dates back to Hibbs (1977) and Tufte (1978), the former article being among the most heavily cited work in political science (Sigelman, 2006). Generally, the essence of partisan theory is the assumption that political parties' policies are shaped by ideology and that different political parties, when in office, pursue quite different goals and policies. In economics and political science, this assumption is not as commonplace as one might suspect. Very prominent strands of the literature on voting and electoral cycles assume that parties are only engaged in maximizing votes and winning elections, thereby giving no room for party ideology (Median voter theorem, Downs, 1957 or opportunistic political cycles, see e.g. Nordhaus, 1975 or Rogoff and Sibert, 1988). As opposed to these "opportunistic" models, partisan theory highlights the ideological motivation of politicians and their parties. As Alesina et al. (1997, 45) put it "*opportunistic policymakers choose policies solely to win elections, [whereas] partisan policymakers want to win in order to implement their desired policies*". Thus, different parties are assumed to represent certain clienteles in the electorates and, when in office, pursue mainly the interests of their core constituencies. The typical hypothesis is that left-wing parties pursue policies benefiting lower-middle class households, such as lowering unemployment, increasing growth and following less strict inflation policies. In contrast, right-wing governments are usually predicted to focus on containing inflation while being less concerned about unemployment. Tufte (1978) and Hibbs (1987a) substantiate these hypotheses by empirical evidence on the relative costs and benefits of inflation and growth/unemployment for low- and high-income households and on party members and electoral constituencies.

Alesina (1987) formalizes and modifies Hibbs' work such that voters and workers etc. form expectations rationally (rational partisan theory), which limits the governing parties' possibilities to exploit the trade-off between inflation and unemployment stated by the short-run Phillips-curve. Nevertheless, the qualitative predictions of Hibbs' model hold also in Alesina's framework.

In empirical tests, party ideology has been tested in its impact on macroeconomic outcomes and performed quite well compared to other political-economic theories. Partisan theory has also been tested in its impact on policy instruments such as monetary or fiscal policy and performed somewhat better in fiscal policy (see Alesina et al., 1997). Of course, politically motivated manipulations of fiscal policy may not only affect unemployment/inflation but can also impose more direct fiscal benefits and costs on specific socioeconomic subgroups of the population.

Fewer studies test partisan theory in public education. Generally, most of those studies focus on testing the general hypothesis that left-wing governments spend more resources on public education than right-wing governments, thereby merely borrowing the original hypothesis by Hibbs and Tufte for the education sector. Studies testing this hypothesis for OECD countries tend to confirm it (Castles, 1989, Boix, 1997; Busemeyer, 2006 and 2007) whereas empirical evidence on data for the U.S., France and Germany is rather mixed (Fusarelli, 2002 and Saeki, 2005 as well as Colburn and Horowitz, 2003 for the U.S.; Bilek, 2005 for France and Galli and Rossi, 2002; Potrafke, 2006; Schmidt et al., 2006; Tepe, 2007 and Oberndorfer and Steiner, 2006 for Germany).⁵

From a theoretical point of view, the general hypothesis that left-wing governments spend more public resources on education is not entirely convincing. This hypothesis bears the implicit assumption that low-income households are always better off demanding higher public expenditures on education. However, the redistributive character of public education and thus an individual's net benefit from public education is a rather complex function of the level of public spending on education, the national tax system, the degree of publicness of the education system, individual educational

⁵ Note that there is some evidence on the influence of Socialists on public education spending for the Nordic countries, which use the Socialists' share in parliament/council as a control variable (Falch and Rattsø, 1997 and 1999 for Norway or Heinesen, 2004 for Denmark). They usually find positive effects of the Socialists' share in parliament/council on education spending.

participation as well as the social returns to education, etc. The distributional effects of increases in public education spending are therefore not clear-cut and a theoretical prediction for the preferences of left/right-wing governments on the overall level of education spending is nontrivial.⁶ Better founded hypotheses may be derived from incorporating partisan theory in models of voting on public education.

Voting on public education

This literature – pioneered by Stiglitz (1974) and carried on by Epple and Romano (1996a) – is more directly focused on public education and incorporates its financing. In both models households are assumed to maximize utility $U_i = U_i(G, C_i)$ over publicly provided education services for the households' children, G , and all other private consumption C_i or just after tax income. Households i only differ in their exogenously given income or – what is equivalent – in parents' education. Furthermore, both models share some common assumptions: *First*, it is standard in the literature to assume a proportional income tax rate τ for financing public education, which yields the public budget constraint $G = T = \tau \sum_i Y_i$. The progressive income tax and the regressive effects of the consumption taxes are assumed to result in taxation proportional to income. *Second*, voters are assumed to be identical to taxpayers. *Third*, the utility functions are assumed to be identical across the individuals and assumed to be quasi-concave, which yields single-peaked preferences and thus, the existence of a majority voting equilibrium (see Mueller, 2003, 87). *Fourth*, generally, a uniform public service is assumed, i.e. participation rates do not differ between high-income and low-income households.⁷

In a system in which education services are exclusively provided by the *public sector*, the voting outcome is straightforward, namely households vote for the level of public education such that the marginal rate of substitution between public education G and private consumption C_i equals the ratio of the household's income, Y_i , to average income, Y_{mean} , i.e. the household's tax price of public education (Stiglitz, 1974, 354). Since a single-dimensional issue is considered, a majority voting equilibrium exists.

⁶ Deriving such a hypothesis becomes even more complex in cross-country studies given the important differences in political, fiscal and education institutions (see Schmidt, 1996; Alesina et al., 1997, 247 and Franzese, 2002, 44).

⁷ It is standard in the literature on voting in public education to consider the public spending on public education G as a proxy for the quality of schooling. Thus, discussions on the effect of resources on educational achievement are suppressed (see e.g. Hanushek, 1986).

Under the assumption that preferences for education G are monotonic in income Y_i , the decisive voter is the voter with median income, Y_{median} .⁸ The public education budget and the income tax rate thus depend on the median voter's income relative to average income.

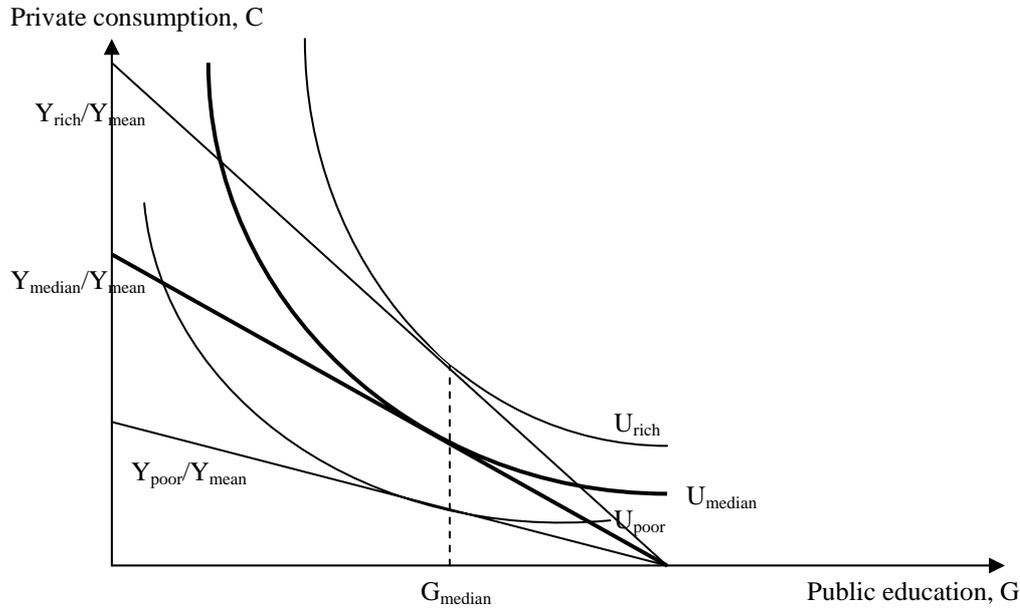


Figure 1: Predictions for spending preferences on public education of high-income ($Y_{\text{rich}}/Y_{\text{mean}}$), median-income ($Y_{\text{median}}/Y_{\text{mean}}$) and low-income groups ($Y_{\text{poor}}/Y_{\text{mean}}$). Source: Based on Stiglitz (1974) and evidence by Bergström, Rubinfeld and Shapiro (1982), see text.

Partisan theory's core assumption, namely that political parties differ, in particular, right-wing parties represent rich households whereas left-wing governments represent poor households, is easily accounted for in this framework by analyzing rich and poor households' voting decisions. Their voting is shaped by an income effect (relatively wealthier households demand more public education) and by a substitution effect, which works through the higher tax price for public education (due to the proportional tax rate relatively wealthier households demand less public education). Which effect dominates is an empirical question. Evidence from U.S. survey data suggests that the two effects cancel out each other, i.e. higher income and lower income households do not differ significantly in their preferences for the level of public education, see Figure 1 (see Bergstrom, Rubinfeld and Shapiro, 1982; for more evidence see Gradstein, Justman and Meier, 2005, 50). When there are *private alternatives*, i.e. high-income households

⁸ The existence of the voting equilibrium is not contingent on G_i being monotonic in Y_i , however, the household earning median income Y_{median} will generally no longer be the pivotal voter (Stiglitz, 1974, 355).

can opt out of public schooling – while still having to contribute to public education – high-income households do not necessarily support public education (see Epple and Romano, 1996a or the presentation in Gradstein, Justman and Meier, 2005, ch. 7). The decisive voter is then a household with income below the median income. Given the empirical estimates on the dominance of the substitution/income effect, this result suggests that high-income households are the only group voting for lower public education spending whereas middle- and low-income groups are supporting comparable levels of public education spending.⁹

In summary, incorporating the core partisan assumption in standard voting models for public education casts some doubt on the validity of a general “partisan-hypothesis” in public education. At least, the discussion reveals some underlying assumptions of this hypothesis; studies claiming this hypothesis implicitly assume either that there is sufficient private education for high-income households to opt out of the public system or that the substitution effect dominates the income effect for high-income households or that the income tax rate is sufficiently progressive for rich households to vote against public education.

A simple extension permits to take into account ability-tracking in the education system.¹⁰ This is important in testing partisan theory because recent empirical evidence suggests a strong link between educational participation in tracks for high-performance students and family background; in particular, children with a favorable parental background in terms of education or income generally have higher probabilities of participating in higher educational tracks (see e.g. Dustmann, 2004 or Contini, Scagni and Riehl, 2007). Ability-tracking is introduced by splitting education spending, G , into spending on tracks for high-performance students, G^H , and low-performance students, G^L , such that $G = G^H + G^L$.

⁹ This result holds also for the case when private education may be added on top of public education services (Epple and Romano, 1996b and Gouveia, 1997).

¹⁰ Note that the extension of the standard model developed here is highly stylized. It assumes that the size of the total education budget is decided separately from the distribution of public resources between two educational tracks, see below.

The modified utility function is:

$$(1) \quad U_i = U_i(G^H, G^L, C_i)$$

Given the empirical evidence, children from rich households have an above average participation in the track for high-performance students whereas educational participation of poor households' offspring is biased towards the low-performance track. Specifically, it is assumed here that more than 50% of rich households' offspring is enrolled in the high-performance track whereas more than 50% of the poor households' offspring is enrolled in the low-performance track.¹¹ Thus, an average rich household derives comparatively greater utility from increases in G^H than from increases in G^L :

$$(2) \quad \frac{\partial U_{\text{rich}}}{\partial G^H} > \frac{\partial U_{\text{rich}}}{\partial G^L}$$

U_{rich} denotes utility for a high-income household. An inverse statement holds for the poor households. Yet, as in Stiglitz (1974), this model does not permit a theoretical prediction on poor and rich households' voting decisions with respect to the level of public education. If, for example, G^H is increased, a rich household's utility change is:

$$(3) \quad \frac{dU_{\text{rich}}}{dG^H} = \frac{\partial U_{\text{rich}}}{\partial G^H} + \frac{\partial U_{\text{rich}}}{\partial C} \frac{\partial C}{\partial \tau} \frac{\partial \tau}{\partial G^H} \stackrel{?}{\leq} 0$$

It is not clear if the positive effect on utility, derived from an increase in G^H , the first argument on the right-hand side of (3), dominates the negative effect from an increase in taxes necessary for financing increased spending, the second argument on the right-hand side of (3). Thus, a rich household's utility change is unclear even if G^H is increased. However, if overall spending on public education, $G = G^H + G^L$, is held constant (and thus, also the income tax rate τ), there is no increase in the tax burden, i.e.

¹¹ Moreover, it is assumed that public expenditures on G^H and G^L are both financed out of general public sector budgets and that the private returns to education dominate the social returns. In addition, it is assumed that educational participation is exogenous with respect to the level of spending in the high- and low-performance track, which is of course rather justified in the short- to medium-run.

the second term on the right-hand side of (3) is equal to zero. In this case, necessarily, G^L will fall given that $G = G^H + G^L$. The change in utility for a rich household is:

$$(4) \quad \frac{dU_{\text{rich}}}{dG^H} = \frac{\partial U_{\text{rich}}}{\partial G^H} + \frac{\partial U_{\text{rich}}}{\partial G^L} \frac{\partial G^L}{\partial G^H} > 0$$

Generally, the second term on the right-hand side of (4) will be negative since rich households' enrollment in the lower track is not necessarily zero; moreover, there may be positive social returns from a good quality of education services in the lower track even if rich household's enrollment in this track is zero. However, it is natural to assume that the positive effect on rich households' utility from the first term on the right-hand side of (4) will generally outweigh the negative effect from the second term. This is justified by the higher participation of rich households' offspring in the high-ability track and the empirical observation that private returns from education generally exceed the social returns. Note that increased G^H in equation (4) is equivalent to increasing the share of spending on G^H while G is held constant.

Thus, under plausible assumptions, one should expect that high-income households vote for relative increases in public spending on high-performance tracks irrespective of the total level of education spending. The opposite should hold for low-income households. In the framework of partisan theory, this implies that right-wing parties, which are elected by high-income households, advocate that a higher share of public education spending is targeted towards high-performance tracks whereas left-wing parties advocate the opposite. Note that only the focus on the composition of education spending ensures identification of the partisan effect because available empirical evidence on the redistributive character of the tax system and on the importance of social returns to education do not allow predictions on poor and rich households' preferences for the *overall level* of education spending.

System design

The previous discussion has taken the education system with ability-tracking as given. However, note that ability-tracking is a prerequisite for focusing public resources on specific constituencies and that it is subject to political intervention. As such, the education system itself, in particular the practice of tracking or non-tracking may be an

attractive field for partisan engagement. Due to the presumed existence of peer-group effects, which describe spillover effects such that the performance of a student is not only determined by her/his ability and the quality of education services, but also by mean ability of students in her/his class, it is often argued that high-ability students profit from tracking while low-ability students lose (see e.g. Epple, Newlon and Romano, 2002), which is consistent to empirical evidence (see e.g. Hanushek and Wößmann, 2006). Given the link between parental background in terms of income/education and student educational achievement this leads to the prediction that predominantly high-income groups support ability-tracking whereas low-income groups engage in abolishing ability-tracking.

The rest of this paper develops and implements empirical tests of this framework for the German education system, in particular for German lower secondary education, which is characterized by very early tracking in international standards. The next chapter reports evidence for Germany on important stylized facts of the framework presented above.

3. Institutions and stylized facts: Education and politics in Germany

The education system

As in most OECD countries, the German education system is dominated by the public sector. In primary and secondary education about 97% and 93% of students attend public schools, respectively (see Table 1). Moreover, note that in Germany private institutions also operate under state regulation, and typically wages of teaching staff are paid by the state governments. Thus, private education cannot be looked upon as independent private but must be viewed as government-dependent private education (see also OECD, 2006).

Table 1:
Percentage of students enrolled in public primary/secondary schools

	Primary	Lower secondary	Upper secondary
Germany	97.1	92.7	92.1
France	85.3	78.6	69.4
UK	95.0	93.6	25.7
Italy	93.1	96.5	94.6
mean EU19	87.0	84.3	78.5
Norway	98.1	97.7	89.8
USA	89.7	91.2	91.2
Japan	99.1	93.8	69.7
mean OECD	89.1	82.5	79.5

Source: OECD (2006)

Primary and secondary schools are a major responsibility of the state government level, which shares this responsibility with the local level. About 80% of primary and secondary education expenditures accrue to the state government level and 20% are borne by the local government level. While the states are in charge of teaching staff, local governments have to provide school infrastructure and pay for non-teaching staff. This represents a significant part of total public expenditures, both at the state and local level. On average, primary and secondary education spending makes up 36% of the total wage bill at the state level (excl. city states) and 14% of total capital spending at the local level.¹² Although local governments are involved in providing primary and

¹² However, local governments receive a considerable amount of state grants to finance school expenditures. Expenditure data refers to 2004.

secondary education, the state level assumes the general power of decision, which is stated by the German Constitution (30 GG).

State responsibility involves important differences in education institutions across the 16 German states. Nevertheless, it is possible to highlight some common features (see also Appendix 1). Students enter primary schools at the age of six and leave the joint primary education after the fourth grade, at the age of ten. In lower secondary education, students are tracked into three types of schools according to their ability. High performing students are educated in “Gymnasium” (Grammar school), medium performing students are grouped into “Realschule” (Intermediate school) and lower performing students are grouped into “Hauptschule” (Secondary general school).¹³ Teachers give a recommendation regarding every student’s track choice at the end of primary school. Generally, about 75% of track choices are in accordance with the recommendations of teachers (Cortina and Trommer, 2003, 357). If the student’s parents do not agree with the teacher recommendation, states differ in the regulation of who takes up the final decision. It may either be taken by the parents or by the school administration; in 11 out of 16 states the parents take the final decision.¹⁴ Mobility between the educational tracks is possible and has increased in the second half of the last century. At the end of the 1960s, the (cumulative) share of pupils in one cohort having changed from one track to another has been far below 10% (Blossfeld, 1990). This share has increased to about 14% in 2000. However, about 75% of this mobility was downward mobility (Cortina and Trommer, 2003, 375; Bellenberg, 2005 and the literature cited therein).¹⁵

¹³ Some states start to track after 6 years of primary education (Brandenburg and Berlin, which are not in the sample) while some schools in a minority of states have a so-called orientation stage for two years (“Orientierungsstufe”) following primary school. Students are then tracked after the 6th grade.

¹⁴ As an example, I give an overview of the regulation in North-Rhine Westphalia, the largest state: The decision concerning the choice of the school track is usually assumed by the parents provided they roughly follow the primary school teacher’s advice. If parents’ request and teacher’s advice is not even roughly in accordance, then the decision is taken by the school administration after test lectures (Schulgesetz NRW, §11 and Ausbildungsordnung Grundschule, §8). For an extensive overview of the transition regulation from primary schools to lower secondary schools in all German states see Standing Conference of the German Education Ministries (2006a).

¹⁵ From an international perspective, ability-tracking in Germany starts very early: Across OECD countries only Austria tracks students as early as Germany (OECD, 2005). The present system has a long history and its origins date back to the 19th century. In the postwar period, tracking was reestablished replacing a comprehensive school, which had been implemented directly after the war, under influence of the Allied occupation (Baumert, Cortina and Leschinsky, 2003, 54).

In 2006, about 37% of all students in lower secondary education attended a Gymnasium with some variation across states (see Figure 2). This percentage has increased from about 30% since 1981. Due to important differences in education systems across the states (see below), information on the relative importance of the other two types of schools is not easy to give; the share of students enrolled in Hauptschule is reported to be roughly about 20% (Solga and Wagner, 2000, 3).

Some states provide comprehensive schools (“integrierte Gesamtschulen”), which generally comprise all three tracks in lower secondary education. Students are educated in one organizational unit and share common lectures in some subjects whereas tracking is held up in other subjects. Mobility between these “tracks” is much higher in comprehensive schools than in the traditional system. As Köller (2003, 458) points out, the model of the comprehensive school, introduced in the early 1970s and accompanied by an unprecedented ideological, political and pedagogical discussion, has been originally designed as a replacement of the tracked education system, not as a complement. This leaves comprehensive schools with a strategic disadvantage in the competition for gifted students. Thus, the composition of students in comprehensive schools is biased towards middle and lower performance students (Köller, 2003, 468). Students less than proportionately graduate with “Abitur” (A-level) degrees, which permit unrestricted access to higher education, although there is some variation across states (Köller, 2003, 479). Besides comprehensive schools, some states also provide a school-type, which combines two tracks, generally Haupt- and Realschule, the two lower educational tracks, in one school (“Schulen mit mehreren Bildungsgängen”, Standing Conference of the German Länder Education Ministers, 2006b, 7). In these schools, there is joint and tracked education in varying proportions across the Länder.

Aggregating the students enrolled in the latter schooltype (“Schulen mit mehreren Bildungsgängen”) and the students enrolled in comprehensive schools gives the number of students who are educated in some type of cooperative education, which is labeled as students enrolled in *joint schooling* in the following. Figure 2 reports the share of students in lower secondary education who are enrolled in joint schooling and – alternatively – the share of students, who are enrolled in comprehensive schools. Both shares may be interpreted as measures of the degree of comprehensive schooling in lower secondary education. It is obvious that there is considerable variation in the

adoption of joint schooling. While some states offer virtually no joint education (Bavaria, Baden-Württemberg) other states provide important fractions of lower secondary education in the form of joint schooling (Saarland, Hamburg) such that up to 60% of students in secondary education are educated in schools, which comprise at least two tracks, see also Köller (2003, 465).

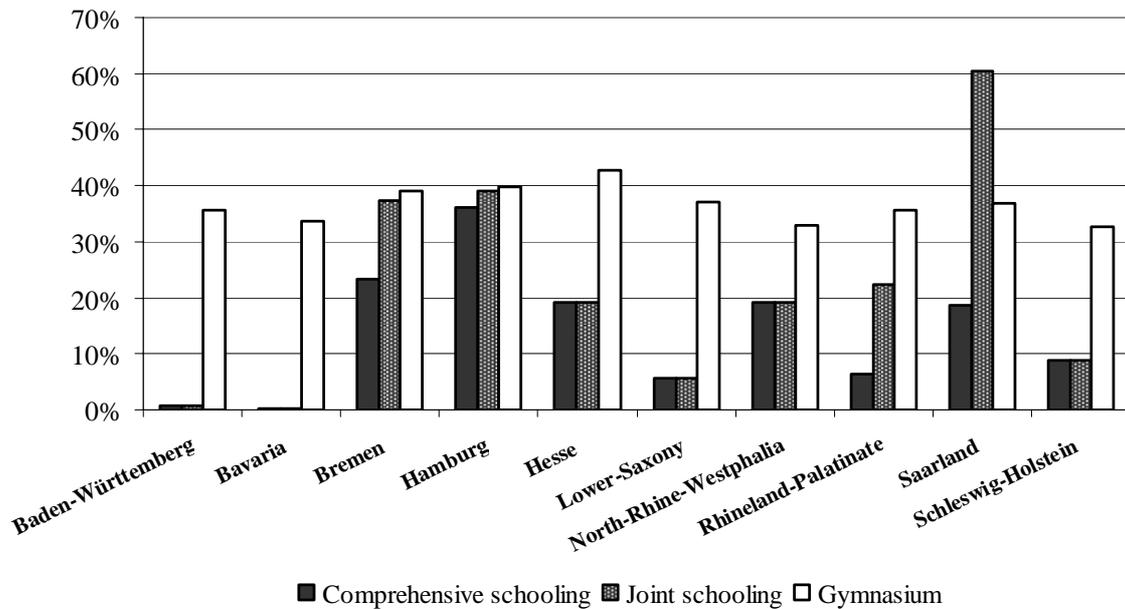


Figure 2: The share of students enrolled in comprehensive schools, joint education institutions and in Gymnasium, 2006

Data source: Standing Conference of German Länder Education Ministers.

Compulsory education ends at the end of lower secondary education, after 9th or 10th grade. Students can then opt for additional schooling in higher secondary education, which may either be one of the various types of vocational training (In-company training in combination with part-time vocational schooling is the most important type) or two additional years in Gymnasium if the student has been educated in Gymnasium or in Realschule (under certain conditions) in lower secondary education. Students generally leave the educational system after 12 years of schooling at the age of 19 with a vocational degree or with “Abitur” degree (A-level-examinations, high school diploma), which permits to enroll in higher education.

Parental background and track choice

In Germany, even more than in most other OECD countries, there is a strong correlation between parents’ educational background, income and profession on the one hand and educational achievements of their children on the other hand. This applies to

educational achievements of the students in general (see e.g. Wößmann, 2004) but – more importantly for this study – also with respect to *track choice* in the transition from primary school to lower secondary school (Cortina and Trommer, 2003, 358). Baumert and Schümer (2001, 462) report that the share of students from a blue-collar parental background in Hauptschule and ‘Schulen mit mehreren Bildungsgängen’ is about 63%, while it is about 51% in comprehensive schools, 43% in Realschule and 22% in Gymnasium. The share of students from households with university degree varies from 62% in Gymnasium to 13% in Hauptschule. Stanat et al. (2002, 20) report that there are important differences in the probability of attending a Gymnasium for blue collar workers’ offspring and the children of civil servants, self-employed and white collar workers. Across all the states, the latter households have a three times higher probability of sending their children to a Gymnasium compared to blue collar workers. In some states (Bavaria, Schleswig-Holstein), this differential is even six-fold. Interestingly, socioeconomic status of students in comprehensive schools, measured by the fathers’ professions, is considerably below that of students enrolled in Gymnasium (Köller, 2003, 481; Baumert and Schümer, 2001). In accordance with these results, Schimpl-Neimanns (2000), Schnabel et al. (2002) and Dustmann (2004) consistently report that – although the correlation of parental background with track choice and educational achievement has somewhat weakened over the last 50 years – the correlation is still very important (see above). The link holds for parental background in terms of education as well as income. Evidence presented by Contini, Scagni and Riehl (2007) suggests that the correlation between parental background and track choice is more important in Germany than in other countries, such as the Netherlands or Italy. Moreover, evidence presented by Schnepf (2002) suggests that parental socioeconomic background also dominates the negative effect from being a migrant.¹⁶

The political parties

In Germany, traditionally, two parties have been dominating. The Social Democrats (SPD) and the Christian Democrats/Conservative Party (CDU) have always – alone or in coalition governments with smaller parties – formed the governments at the federal and at the state level. The most important smaller parties are the Liberal Democrats (FDP) and an environmentalist party, the Green Party. Typically, the Green Party has

¹⁶ Similar correlations also hold for the transition from lower secondary to higher secondary education (see e.g. Federal Ministry of Education and Research, 2007b) and with respect to the question whether children obtain tertiary education or not (see e.g. OECD, 2007, 116).

formed coalition governments with the SPD whereas the FDP has formed coalition governments with both the CDU and the SPD. Recently a fifth party has achieved considerable importance, a Socialist party, “Die Linke.PDS”. This party has arisen out of the Socialist Unity Party in the former German Democratic Republic. Although this party has achieved some government participations in the East German states, it has been without any importance in the West German states in the sample period and will therefore not be further discussed in this study.

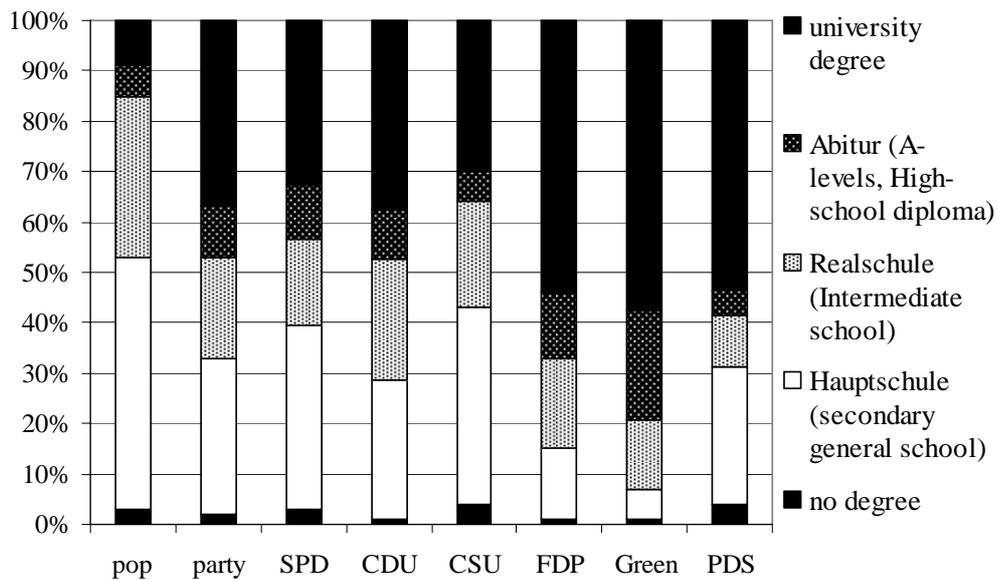


Figure 3: Party members' education in 2002
 Source: Data taken from Heinrich, Lübker and Biehl (2002)

In order to impose some structure on possible partisan influence by the most prominent political parties in Germany, I will present descriptive evidence on the composition of party members as well as on the composition of parties' electorates in the recent general federal elections. Figure 3 shows that party members of the Social Democrats (SPD) and of the Conservatives (CDU) do not differ that much in terms of higher educational degrees such as university degrees, CDU members holding somewhat more university degrees. However, there is a significant difference at the lower end of educational degrees. While about 40% of SPD members do not hold an educational degree higher than from Hauptschule, this share is less than 30% for CDU party members.¹⁷ Another significant difference is between party members of CDU/SPD and the two smaller parties, the liberal party, FDP, and the Green Party. Generally, FDP – and even more so

¹⁷ Note, however, that the party members of the Bavarian CDU, “CSU”, have a quite similar structure to that of the SPD.

– Green Party members have a much higher probability of holding a university degree and a much lower probability of having completed only Hauptschule.

Table 2:
Electoralates of the political parties with respect to education in 2005 Federal Elections

	SPD	CDU/CSU	Green Party	FDP	PDS
Hauptschule (secondary general school)	38%	38%	5%	8%	7%
Realschule (intermediate school)	33%	35%	7%	10%	10%
Abitur (A-levels, high school diploma)	34%	31%	13%	11%	9%
University degree	29%	33%	15%	12%	10%
ELECTION	34.2%	35.2%	8.1%	9.8%	8.7%

Source: Data taken from Neu (2006)

Table 3:
Electoralates of the political parties with respect to profession in the 2005 Federal Elections

	SPD	CDU/CSU	Green Party	FDP	PDS
Blue collar worker	37%	32%	5%	8%	12%
White collar worker	35 %	35%	9%	9%	9%
Civil servants	33%	38%	11%	10%	5%
Farmer	13%	65%	2%	9%	6%
Self-employed	22%	41%	10%	20%	5%
ELECTION	34.2%	35.2%	8.1%	9.8%	8.7%

Source: Data taken from Neu (2006)

A similar pattern is found in survey data for the 2005 federal election. Generally the FDP and especially the Green Party are overrepresented among voters holding a university degree or having completed high school (A-levels, Abitur) (see Table 2). Differences between the SPD and CDU/CSU voters are rather small, also with respect to lower educational degrees. Both parties are underrepresented among highly educated voters although the CDU/CSU has a somewhat better result among university graduates. Differences between SPD and CDU/CSU are more pronounced when looking at the professional status of the electoralates (Table 3). While blue collar worker seem to vote more frequently for the SPD, support for the CDU/CSU is more pronounced among

self-employed and farmers (and civil servants). Self-employed and civil servants are, however, highly overrepresented in the electorates of the Green Party and FDP.

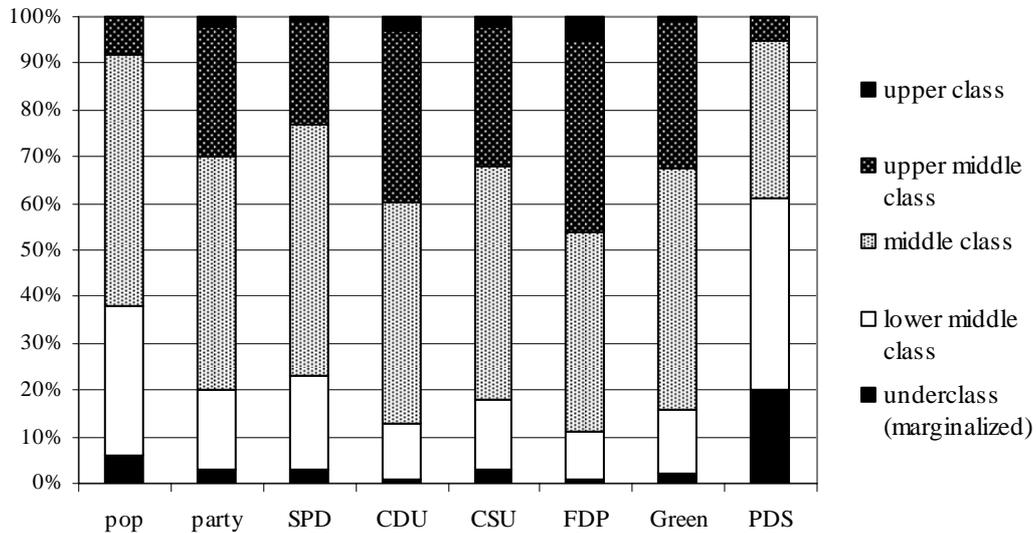


Figure 4: Party members' belonging to social classes (self-assessment)
 Source: Data taken from Heinrich, Lübker and Biehl (2002)

While being plausible proxies for partisan orientation, professional and educational status of party members and electorates are, as a matter of course, crude measures of partisan orientation. A good complement to these rather mechanical measures of party positions may be the self assessment of party members. Party members have been asked to which social class they belong as they perceive (see Figure 4; Heinrich, Lübker and Biehl, 2002, 10f.). Generally, here, one observes that the self-perceptions of party members are quite different across the two important political parties, SPD and CDU. Party members of the CDU see themselves more frequently as upper middle class citizens while SPD members see themselves more frequently as members of the working class, which reaffirms the findings from party members' educational degrees and electorates' professional status.

Overall, the presented evidence in conjunction with the traditional left-right schemes suggest that CDU, FDP and the Green party can be expected to have preferences for spending on Gymnasium in lower secondary education when compared to SPD.

4. Hypotheses: Partisan politics in German public education

This section derives hypotheses for political parties' influence on resource allocation across the tracks, taking the education system as given. Then, some simple predictions for the influence of political parties on the design of the education system, specifically on the scope of ability-tracking, are set up.

Regarding party influence on the *allocation of public spending across the educational tracks*, generally, the framework by Stiglitz (1974) in which education is exclusively provided by the public sector, may be considered adequate for the German educational settings because about 93% of students attend public schools in lower secondary education (also Kemnitz and von Weizsäcker, 2003). One may argue that the existence of *one* private school is sufficient for the theoretical possibility of opting out of the public system for high-income households. However, in reality, a reasonable quantity of private schools is necessary for the practical availability of alternatives – spatially as well as with respect to contents or religious orientation.

Given the evidence on the tracking-system in lower secondary education and on the link between parental background and track choice, one may apply the theoretical prediction for partisan influence as given in equation (4). High-income or highly educated households are predicted to support that a higher share of public resources is directed towards higher educational tracks. Note that this prediction requires that at least 50% of high-income households' offspring is enrolled in the high-performance track. The exact empirical implementation of this assumption is not entirely clear a priori, such that either Gymnasium or 'Gymnasium + Realschule' may be tested as representation of the "high-performance track". Accordingly, high-income households are expected to advocate a lower share of public resources being devoted to Hauptschule. As set out in the previous section, joint schooling is made up of 'Schulen mit mehreren Bildungsgängen', which combine Haupt- and Realschule in one school-type and of comprehensive schools, which have a student body that is also biased towards low- to middle performance students. Consequently, one should expect that high-income households also vote for lower shares of public education spending being directed to joint schooling.

Taking into account the evidence on political party members and constituencies, one may postulate that CDU, FDP and the Green Party, when in office, spend more resources on Gymnasium or on ‘Gymnasium+Realschule’ when compared to SPD. Table 4 summarizes the theoretical predictions for partisan influence of German parties on relative resource-use in lower-secondary education.

Table 4: Hypotheses for partisan influence on the composition of education spending

Composition of education spending	CDU	FDP	Green Party
$\text{Resources}^{\text{GYM}} / \text{Resources}^{\text{TOTAL}}$	+	+	+
$\text{Resources}^{\text{GYM+REAL}} / \text{Resources}^{\text{TOTAL}}$	+	+	+
$\text{Resources}^{\text{HAUPT}} / \text{Resources}^{\text{TOTAL}}$	-	-	-
$\text{Resources}^{\text{JOINT}} / \text{Resources}^{\text{TOTAL}}$	-	-	-

Note: Social Democrats (SPD) are the reference group, i.e. state governments under participation of CDU, FDP and the Green Party are predicted to increase the share of spending on Gymnasium and/or on Gymnasium+Realschule out of spending on lower secondary education relative to state governments under participation of the SPD.

$\text{Resources}^{\text{GYM}}$ denotes resource-use on Gymnasium (GYM), relative to resource-use in overall lower secondary education, $\text{Resources}^{\text{TOTAL}}$. ‘GYM+REAL’ denotes ‘Gymnasium+Realschule’, ‘HAUPT is Hauptschule and JOINT denotes joint schooling. Note that Social Democrats are the reference group, thus a plus/minus indicates that state governments under participation of CDU, FDP or the Green party are predicted to increase/decrease the proportion of spending on the educational track in question out of spending on all tracks in lower-secondary education, relative to SPD state governments.

Regarding the *design of the education system*, the present study cannot explain the establishment of ability-tracking in Germany in the 19th century and its reestablishment in the early 1950s. However, existing data allows analyzing the question whether ability-tracking is supported and reaffirmed by political parties or whether parties engage in the abolishment of ability-tracking. As described in the previous section, the introduction of comprehensive schools in the 1970s was subject to heavy ideological debates: Social Democrats argued in favor of comprehensive schools while the Conservatives defended ability-tracking. These positions may be explained by the existence of positive peer group effects from high-performance students. High-income households/Conservatives are interested in focusing positive spillovers from high-performance students within the tracks for high-performance students, given that their children are overrepresented in these tracks. Moreover, of course, the establishment of

ability-tracking is a prerequisite for focusing education spending on specific tracks. Under this reasoning, one should expect that, relative to SPD governments, governments under participation of CDU, FDP and the Green Party engage in reaffirming ability-tracking, which may be measured by their influence on the share of students enrolled in joint education (St^{JOINT} / St^{TOTAL}), where St^{JOINT} denotes the number of students enrolled in joint schooling and St^{TOTAL} is the total number of students in lower secondary education. An alternative proxy is the share of students enrolled in comprehensive schools (St^{GESAMT} / St^{TOTAL}), where St^{GESAMT} denotes the number of students in comprehensive schools, see Table 5.

Table 5: Hypotheses for partisan influence on the structure of the education system.

Intensity of ability-tracking	CDU	FDP	Green Party
St^{JOINT} / St^{TOTAL}	-	-	-
St^{GESAMT} / St^{TOTAL}	-	-	-

Note: Social Democrats (SPD) are the reference group

5. Econometric specification and data

The goal of the empirical analysis is to test the hypotheses for the impact of political parties' government participation on relative resource allocation across the tracks in lower secondary education and on the extent of ability-tracking in 10 West German states over the 1981-2006 period (as set out in Tables 4-5).

Resource allocation across tracks (Table 4)

The empirical model relates relative resource use in specific tracks of lower secondary education to political parties' time in office. *Relative resource use* is captured by teacher/student ratios, TSt, in single educational tracks, e.g. Gymnasium, relative to the teacher/student ratio in all lower secondary education, TSt^{GYM}/TSt^{TOTAL} . Of course, spending per student would be a natural choice; however, these data is not available in a comparable definition across the German states.¹⁸ Teacher/student ratios are widely considered to be good resource indicators given that teacher wages are quite homogenous across Germany. In particular this interpretation is explicitly recommended by the Standing Conference of German Länder Education Ministers (Standing Conference of German Länder Education Ministers, 2002, 96). The *relative* definition of resource use, e.g. TSt^{GYM}/TSt^{TOTAL} , is derived from the theoretical discussion. It allows separation from confounding factors like the tax price and thus ensures identification of partisan effects. *Political parties' time in office* is captured by a vector of dummy variables, POLITICAL, for government participation of CDU, FDP, the GREEN party and other political parties, OTHER. Social Democrats, SPD, are the reference category. These dummy variables take the value of 1 if the political party participated in a state government and 0 if it did not. If the election took place during the first 6 month of the year, government participation of this party is – admittedly simplified – coded for the full year. If the election took place during the last 6 month of the year, government participation is assumed to start from January of the next year. As an additional control, coalition size COALSIZE captures the number of political parties that form the state government.

¹⁸ At the end of the 1990s, the Federal Statistical Office started to publish expenditures per student for single levels of schooling such as primary education. However, a change in the accounting design makes it impossible to compare pre and post 2002 years.

Unit root tests quite clearly show that all of the tested endogenous variables, i.e. relative resource use in different educational tracks, are non-stationary variables. The tests also clearly indicate that first-differencing yields stationary series.¹⁹ However, first-differencing is not only enforced by econometric concerns, but is also better suited to capture the effect of political parties' time in office on public spending because taking first-differences removes the state's political history from the coefficients. Consider the example of a change in state government. The newly governing political party inherits the spending composition across tracks from its predecessor and can only slowly change allocation, which translates better into the first-difference than into the level of spending.²⁰ Thus, the regressions are run on first-differenced data with the exception of the political variables, which are not differenced to allow for identification of political parties' time in office. The following equations are estimated for 10 West German states i over the 1981-2006 period t :

$$(5) \quad \Delta \frac{\text{TS}_{it}^{\text{GYM}}}{\text{TS}_{it}^{\text{TOTAL}}} = \Delta X_{it} \beta + \text{POLITICAL}_{it} \gamma + \eta_i + \theta_t + v_{it}$$

where X denotes a standard demand model for public education, which incorporates a relative measure of educational demand for a specific track. For example, in the case of Gymnasium, given in equation (5), X contains the ratio of students enrolled in Gymnasium over the number of students in total lower secondary education, $\text{St}^{\text{GYM}}/\text{St}^{\text{TOTAL}}$. X also contains the natural logarithm of real state public revenue per capita, PR , to account for the state's financial resources. Due to the strong fiscal equalization across the German states and federal aid to the East German states, public revenue per capita is a much better resource proxy compared to state-level GDP per capita. The state unemployment rate, UR , proxies the overall socioeconomic situation of the states. The natural logarithm of population density, PD , controls for states with less densely populated areas, which makes the provision of comprehensive schooling more attractive. Furthermore, O60 accounts for the share of state populations over sixty years of age in order to control for possible generational conflict. However, this variable is

¹⁹ Unit root tests have been conducted with and without trends. It may come as a surprise that relative resource use in different tracks of public education turn out to be non-stationary variables. However, these variables exhibit trends as is described in the data section of this chapter. Moreover, running the regressions on data in levels yields clearly spurious results, e.g. correcting for serial correlation in those estimations dramatically changes standard errors.

²⁰ However, effects of long incumbencies are better captured by the level than by the first difference.

not expected to be of great importance (see also Baum and Seitz, 2003). Note that PR and PD enter the model as natural logarithms while the other variables of X are defined as ratios, which permits the interpretation of all coefficients as elasticities, of course with the exception of POLITICAL. PR is deflated using the government consumption deflator supplied by the German Council of Economic Experts (2007).

State effects η_i are included to control for state-specific spending preferences in education or state-specific administration of public schools, which can be assumed to stay constant over time. This unobserved heterogeneity can, however, not be assumed to be uncorrelated with explanatory variables like public revenue per capita or population density. Thus, the η_i are treated as fixed. Fixed year effects θ_t are included to account for common shifts/shocks in education spending, which are potentially quite important because the considered time period is rather long, including German Reunification. This econometric setup implies that the coefficients are identified from variation within states that is not explained by country-wide shocks/shifts. Finally, v_{it} denotes a classical, zero mean, constant variance, error term.

System design (Table 5)

In order to test the impact of political parties on the system of ability-tracking itself, similar empirical models are estimated. Alternative endogenous variables are the share of students enrolled in joint schooling, St^{JOINT}/St^{TOTAL} and the share of students enrolled in comprehensive schooling, St^{GESAMT}/St^{TOTAL} , both proxies for the intensity of ability-tracking in a state. POLITICAL denotes the same vector of dummy variables as set out above. The vector of control variables, W , is identical to X with the exception of the definition of educational demand. W contains the natural logarithm of the number of students in lower secondary education, $\ln(St^{TOTAL})$ as a measure for educational demand in a state. The error components are the same as described above. For the example of joint schooling, the estimation equation is:

$$(6) \quad \Delta \frac{St_{it}^{JOINT}}{St_{it}^{TOTAL}} = \Delta W_{it} \beta + POLITICAL_{it} \gamma + \eta_i + \theta_t + v_{it}$$

Data

Information about students and teachers has been taken from various editions of annual school statistics edited by the Standing Conference of the German Länder Education Ministers. Other data has been taken from various publications by the Federal Statistical Office of Germany and from the Federal Employment Office (UR).

Table 6: Summary statistics

Variable	Variable description	Mean	S.d.	Min / Max
$\Delta (Tst^{GYM}/Tst^{TOTAL})$	1st diff of teacher/student ratio in Gymnasium relative to all lower sec. edu.	-0.003	0.016	-0.088 / 0.043
$\Delta (Tst^{REAL+GYM}/Tst^{TOTAL})$	1st diff of teacher/student ratio in Gymnasium and Realschule relative to all lower sec. edu.	-0.002	0.010	-0.039 / 0.035
$\Delta (Tst^{HAUPT}/Tst^{TOTAL})$	1st diff of teacher/student ratio in Hauptschule relative to all lower sec. edu.	0.005	0.039	-0.311 / 0.296
$\Delta (Tst^{JOINT}/Tst^{TOTAL})$	1st diff of teacher/student ratio in joint education relative to all lower sec. edu.	-0.006	0.037	-0.167 / 0.157
$\Delta (St^{GYM}/St^{TOTAL})$	1st diff of share of students in lower sec. edu. enrolled in Gymnasium	0.002	0.006	-0.025 / 0.034
$\Delta (St^{GYM+REAL}/St^{TOTAL})$	1st diff of share of students in lower sec. edu. enrolled in Gymnasium and Realschule	0.001	0.010	-0.041 / 0.044
$\Delta (St^{HAUPT}/St^{TOTAL})$	1st diff of share of students in lower sec. edu. enrolled in Hauptschule	-0.007	0.009	-0.042 / 0.019
$\Delta (St^{JOINT}/St^{TOTAL})$	1st diff of share of students in lower sec. edu. enrolled in joint education	0.006	0.012	-0.023 / 0.068
$\Delta (St^{GESAMT}/St^{TOTAL})$	1st diff of share of students in lower sec. edu. enrolled in Gesamtschule	0.003	0.006	-0.021 / 0.046
$\Delta \ln (St^{TOTAL})$	Growth rate of the number of Students in lower secondary edu.	-0.006	0.048	-0.123 / 0.368
$\Delta \ln (PR)$	Growth rate of public revenue p.c.	0.003	0.042	-0.125 / 0.222
$\Delta \ln (PD)$	Growth rate of population density	0.003	0.007	-0.022 / 0.021
ΔUR	1st diff of state unemployment rate	0.002	0.010	-0.028 / 0.039
$\Delta O60$	1st diff of share of state population over 60 years old	0.002	0.002	-0.004 / 0.007
SPD	SPD participation in state government = 1, otherwise = 0	0.58	0.49	0 / 1
CDU	CDU participation in state government = 1, otherwise = 0	0.48	0.50	0 / 1
FDP	FDP participation in state government = 1, otherwise = 0	0.24	0.43	0 / 1
GREEN	Green Party participation in state government = 1, otherwise = 0	0.16	0.37	0 / 1
OTHER	Participation in state government by any other party = 1, otherwise = 0	0.02	0.15	0 / 1
COALSIZ	Coalition size (number of political parties)	1.49	0.54	1 / 3

Note: Public revenue per capita is reported in 2000 euros, with deflation across years using the deflator for government consumption taken from the 2007 Report of the German Council of Economic Experts. The sample contains the West German states, excluding Berlin, over the 1981-2006 period.

Table 6 reports summary statistics. If first differences are used in the estimation, those are reported here as well. Teacher/student ratios in Gymnasium relative to teacher/student ratios in total lower secondary education, TSt^{GYM}/TSt^{TOTAL} , have decreased over the sample period by about 0.3% per year. Decreasing relative teacher endowment per student is somewhat less pronounced if looking at the aggregate of Gymnasium and Realschule (-0.2% per year). When looking at relative teacher/student ratios in Hauptschulen, one observes increasing resource use per student (+0.5%). Relative teacher endowments per student have decreased considerably in joint schooling, i.e. in comprehensive schools and “Schulen mit mehreren Bildungsgängen” (-0.6% per year). This reveals that resource endowments per student exhibit more or less pronounced trends, which highlights the importance of year fixed effects and gives an intuition for the results of the unit root tests. The coefficient of variation is quite pronounced for relative teacher/student ratios in Hauptschulen, which takes the value of almost 8 while it takes a value of around 5 for Gymnasium and ‘Gymnasium + Realschule’, showing somewhat higher relative volatility in relative resource endowment per student in Hauptschulen.

One observes that the share of students enrolled in Gymnasium, St^{GYM}/St^{TOTAL} , and joint schooling has increased by about 0.2% and 0.6% per year, respectively, whereas relative enrollment in Hauptschule has decreased by an annual average of about 0.7% over the sample period. This suggests that part of the trends in relative teacher/student ratios may be explained by sluggish resource adjustment or cohort size effects, as discussed in Poterba (1997), Harris, Evans and Schwab (2001) or Kempkes (2007).

State public revenue per capita and population density have increased moderately over the sample period (0.3% per year). Some states experienced pronounced increases and decreases in public revenue per capita. However, the extreme maxima of more than 20% increase in public revenue per capita reflect beginning federal bailout transfers to the states Saarland and Bremen in 1994. The slightly positive trends of the unemployment rate and the elderly share (+0.2% per year) reflect the increasing structural unemployment and an aging society in Germany across the sample period. Note the comparatively smooth development of the elderly share in comparison with

high coefficients of variation in the case of public revenue or the unemployment rate, which are also driven by business cycles.

The summary statistics of the key exogenous variables, the political dummies, reveal that the four political parties have formed 98% of governing parties across the Western states and across the sample period. Other parties have had almost no importance (“Statt-Partei” in Hamburg). One observes, moreover, that the Social Democrats have participated in almost 60% of state governments while the Christian Democrats have participated in almost 50% of state governments. The two smaller political parties have formed part of state governments somewhat less frequent (FDP 24%, the Green Party 16%). Average coalition size has been 1.5 over the sample period, highlighting the importance of coalition governments in the proportional political system in Germany.

6. Empirical results

The first subsection of this chapter reports the results for political parties' effect on the allocation of public resources across tracks, while the second part presents the findings for the impact of political parties on the intensity of ability-tracking.

Resource allocation across tracks

Table 7 presents simple correlations of German political parties' time in office and the measure for relative resource endowments per student in different tracks, e.g., in the case of Gymnasium, the first difference of teacher/student ratios in Gymnasium relative to teacher/student ratios in all lower secondary education, $\Delta(\text{TS}_t^{\text{GYM}}/\text{TS}_t^{\text{TOTAL}})$. SPD state governments are negatively correlated with growth in resource endowments for higher educational tracks, and weakly positively correlated with growth of resource endowments in lower educational tracks. CDU state governments in turn are positively correlated with growth of teacher/student ratios in higher educational tracks, and weakly negatively correlated with growth of resource endowments in lower educational tracks. This pattern is in accordance with the hypotheses formulated in Section 4. Simple correlations, however, indicate that the Green Party is weakly positively associated with relative spending on all tracks, and that FDP government participation is positively correlated with spending on lower tracks (Hauptschule) as well as with spending on higher tracks ('Gymnasium+Realschule'), and thus do not show a clear pattern.

Table 7: Correlations of political parties' times in office with relative teacher/student ratios across tracks the share of students enrolled in joint schooling, 10 West German Länder, 1981-2006.

	SPD	CDU	FDP	Green Party	OTHER
$\Delta(\text{TS}_t^{\text{GYM}}/\text{TS}_t^{\text{TOTAL}})$	-0.09	0.06	-0.04	0.03	0.00
$\Delta(\text{TS}_t^{\text{REAL+GYM}}/\text{TS}_t^{\text{TOTAL}})$	-0.15*	0.13*	0.05	0.02	0.04
$\Delta(\text{TS}_t^{\text{HAUPT}}/\text{TS}_t^{\text{TOTAL}})$	0.03	-0.02	0.08	0.05	0.11*
$\Delta(\text{TS}_t^{\text{JOINT}}/\text{TS}_t^{\text{TOTAL}})$	0.09	-0.07	-0.04	0.02	-0.06

Note: * denotes significance at the 10%-level.

Table 8 reports the results of the regression models as set out in equation (5). Models I to IV differ in the endogenous variables and in the corresponding exogenous student variable. For example, Model I tests the effect of political parties on the growth of teacher/student ratios in Gymnasium relative to teacher/student ratios in all lower

secondary education, $\Delta(\text{TS}t^{\text{GYM}}/\text{TS}t^{\text{TOTAL}})$, of course accounting for the growth of relative student-demand for Gymnasium, $\Delta(\text{St}^{\text{GYM}}/\text{St}^{\text{TOTAL}})$. Models II to IV then test relative resource use in other tracks (Model II: Gymnasium+Realschule, Model III: Hauptschule, Model IV: joint schooling), recall the corresponding hypotheses in Table (4).

Table 8: Relative resource allocation across tracks, 10 West German Länder, 1981-2006

Exogenous variables	Model, Endogenous variables			
	I, $\Delta(\text{TS}t^{\text{GYM}}/\text{TS}t^{\text{TOTAL}})$	II, $\Delta(\text{TS}t^{\text{GYM+REAL}}/\text{TS}t^{\text{TOTAL}})$	III, $\Delta(\text{TS}t^{\text{HAUPT}}/\text{TS}t^{\text{TOTAL}})$	IV, $\Delta(\text{TS}t^{\text{JOINT}}/\text{TS}t^{\text{TOTAL}})$
$\Delta(\text{St}^{\text{GYM}}/\text{St}^{\text{TOTAL}})$	-0.681** (0.306)	-	-	-
$\Delta(\text{St}^{\text{GYM+REAL}}/\text{St}^{\text{TOTAL}})$	-	-0.244* (0.129)	-	-
$\Delta(\text{St}^{\text{HAUPT}}/\text{St}^{\text{TOTAL}})$	-	-	-0.661 (0.456)	-
$\Delta(\text{St}^{\text{JOINT}}/\text{St}^{\text{TOTAL}})$	-	-	-	-0.553 (0.439)
$\Delta \ln(\text{PR})$	0.011 (0.029)	0.020 (0.018)	0.058 (0.061)	0.003 (0.080)
$\Delta \ln(\text{PD})$	0.351 (0.293)	0.089 (0.151)	0.604 (0.499)	0.134 (0.827)
ΔUR	0.110 (0.240)	-0.077 (0.205)	-0.403 (0.694)	0.543 (0.745)
ΔO60	2.612 (1.755)	2.234** (0.918)	-1.361 (4.168)	-4.766 (4.260)
CDU	0.007** (0.003)	0.005*** (0.002)	-0.008 (0.010)	-0.016* (0.009)
FDP	0.000 (0.006)	0.003 (0.003)	-0.006 (0.013)	-0.021 (0.018)
Green Party	0.008 (0.006)	0.006 (0.004)	-0.008 (0.015)	-0.020 (0.020)
OTHER	0.004 (0.010)	0.004 (0.008)	0.021 (0.016)	-0.030 (0.022)
COALS	-0.002 (0.006)	-0.002 (0.004)	0.012 (0.013)	0.020 (0.019)
State dummies	Yes	Yes	Yes	Yes
Year dummies	Yes	Yes	Yes	Yes
N	240	240	240	240

Note: Robust standard errors in parentheses. ***, ** and * denote statistical significance at the 1%, 5% and 10%-level.

The first finding is that all effects of political parties on relative resource allocation across tracks have the predicted signs. The results suggest that state governments under participation of CDU, FDP or the Green Party raise the growth of teacher/student ratio in Gymnasium or ‘Gymnasium+Realschule’ relative to other tracks (Models I and II)

and compared to SPD governments. As predicted, these parties – compared to SPD – also decrease the growth of teacher/student ratios in Hauptschule or joint schooling institutions relative to other tracks (models III and IV). However, whereas the coefficients estimated for the CDU-dummy are significantly different from zero in Models I, II and IV, the coefficients estimated for the FDP and Green Party dummies are not. Specifically, the FDP dummy is far from indicating significant differences compared to SPD government participation whereas the dummy for the Green Party is only marginally insignificant in Model II (p-value = 11.5%). Note that the point estimate of the coefficient for the Green Party dummy even exceeds that for the CDU in all models.

The magnitude of political parties' effect on the growth of relative resource endowments across tracks is quite considerable. For example, according to the estimates, a shift of government from SPD to CDU increases the growth of teacher/student ratios in Gymnasium relative to overall teacher/student ratios by 0.7%, which is half a standard deviation. Evaluated at the sample mean, this implies a change from -0.3% to +0.4% in the growth of teacher/student ratios in Gymnasium relative to overall teacher/student ratios. Likewise, CDU participation in government increases average growth of resource endowments in 'Gymnasium+Realschule' from -0.2% to +0.3%. The effect is strongest in joint schooling. Here, a shift of government from SPD to CDU involves a 1.6% decrease from average -0.6% to -2.2% in the growth rate of teacher/student ratios in joint schools relative to overall teacher/student ratios. In real policy outcomes, these ceteris paribus partisan effects have been moderated by the fact that German states governments are frequently governed by coalitions of up to three political parties. Recall that average coalition size over the sample period has been 1.5. In particular, traditional coalition patterns in the German political landscape, i.e. coalitions of CDU-FDP, and SPD-CDU involve important moderating forces. My estimates suggest that also in coalitions of SPD and the Green Party educational policy is shaped by a moderation of partisan tendencies.²¹

Regarding the control variables, the coefficients estimated for student demand (-0.5 – -0.7) in Models I, III and IV fit well into estimates by previous studies (see Baum and Seitz, 2003 or Kempkes, 2007). These estimates suggest that there is considerable

²¹ This finding is in accordance with the literature on partisan theory, which highlights the moderating effect of proportional political systems, see e.g. Alesina et al. (1997, 7).

sluggishness in the adjustment of resources in a specific track in response to changing student numbers. Smaller student cohorts benefit from higher teacher/student ratios, at least in the short run. The student coefficient estimated in Model II (-0.25) is rooted in a different student-elasticity of resources per student in Realschulen, which is somewhat surprising. As to the other control variables, it is not really surprising that there are little significant effects because the specification of the regressions is driven by theoretical considerations. Quite surprisingly, the elderly share has a significant effect in Model II suggesting that an increasing share of elderly in the state populations is associated with increasing relative resource endowment of ‘Gymnasium+Realschule’ as opposed to decreasing relative resource endowments in lower educational tracks.

System design

Table 9 reports simple correlations between political parties’ time in office and the first difference of the share of students enrolled in joint schooling, $\Delta(\text{St}^{\text{JOINT}}/\text{St}^{\text{TOTAL}})$, which is used as a proxy for the intensity of ability-tracking.

Table 9: Correlations of political parties’ times in office with the first difference of the share of students enrolled in joint schooling, 10 West German Länder, 1981-2006.

	SPD	CDU	FDP	Green Party	OTHER
$\Delta(\text{St}^{\text{JOINT}}/\text{St}^{\text{TOTAL}})$	0.35*	-0.26*	-0.07	-0.14*	0.05
$\Delta(\text{St}^{\text{GESAMT}}/\text{St}^{\text{TOTAL}})$	0.40*	-0.34*	-0.12*	-0.07	0.07

Note: * denotes significance at the 10%-level.

The correlations are quite well in accordance with the hypotheses set out in Table 5 – for joint schooling as well as for comprehensive schools. While SPD governments are associated with an increasing share of students enrolled in joint education or comprehensive schools, CDU, FDP and the Green Party are associated with a decreasing intensity of ability-tracking in the state. Note that the most important difference arises between SPD and CDU governments. The correlation coefficient of the Green Party indicates that this party advocates ability-tracking, which is quite surprising given that the Green Party’ electoral manifestos support joint/comprehensive schooling (Stern, 2000).²²

²² Part of this result is explained by the fact that the correlation is computed in differences: Recall that the Green Party has only participated in state governments in coalitions with SPD. Those states have higher shares of joint schooling on average. Thus, the correlation between the share of jointly educated students (not the first difference) and Green Party’s time in office is positive because it is *not net of the political history* of that state. First differencing removes this link to the state’s political history.

**Table 10: Intensity of ability-tracking,
10 West German Länder, 1981-2006**

Exogenous variables	Specification, endogenous variable	
	I $\Delta(\text{St}^{\text{JOINT}}/\text{St}^{\text{TOTAL}})$	II $\Delta(\text{St}^{\text{GESAMT}}/\text{St}^{\text{TOTAL}})$
$\Delta \ln(\text{St}^{\text{TOTAL}})$	0.042 (0.076)	-0.028 (0.020)
$\Delta \ln(\text{PR})$	-0.013 (0.027)	-0.014 (0.019)
$\Delta \ln(\text{PD})$	-0.229 (0.166)	-0.026 (0.097)
ΔUR	0.089 (0.227)	-0.128 (0.117)
ΔO60	-0.939 (1.081)	0.573 (0.453)
CDU	-0.007*** (0.002)	-0.003*** (0.001)
FDP	-0.006 (0.004)	-0.003 (0.002)
Green Party	-0.012*** (0.004)	-0.006** (0.002)
OTHER	-0.004 (0.005)	-0.005* (0.003)
COALS	0.005 (0.004)	0.004 (0.002)
State dummies	Yes	Yes
Year dummies	Yes	Yes
N	240	240

Note: Robust standard errors in parentheses. ***, ** and * denote statistical significance at the 1%, 5% and 10%-level.

The results of the econometric models, as in equation (6), are presented in Table 10. Model I regresses the first difference of the share of students enrolled in joint schooling on the natural logarithm of the number of students enrolled in all lower secondary education and on the political dummy variables. Model II is a similar regression with the first difference of the share of students enrolled in comprehensive schools as endogenous variable. Thus, two different measures of the intensity of ability-tracking in the states are regressed on the same set of exogenous variables.

Again, all coefficients are in accordance with the hypotheses derived from partisan theory, see Table 5. State governments under participation of CDU, FDP and the Green Party decrease the share of students enrolled in joint schooling and in comprehensive schools. While the coefficients estimated for CDU and the Green Party are significantly

different from zero, the effect estimated for FDP is not, which again confirms the finding that state governments under participation of the FDP do not pursue an educational policy significantly different from that of Social Democrats. Given electoral manifestos, it is not surprising that Christian Democrats engage in maintaining ability-tracking. CDU participation in a state government eliminates the upward trend of enrollment in joint schooling ($0.6\%-0.7\% \approx 0\%$) and in comprehensive schools ($+0.3\%-0.3\% \approx 0\%$). Anecdotal examples are found in the states Bavaria and Baden-Württemberg. Both states have been dominated by CDU governments and both states merely have joint or comprehensive schooling: Less than 1% of students are enrolled in comprehensive schools in Baden-Württemberg and Bavaria compared to a West German average of about 14% (excl. Berlin). It is, however, quite surprising that the Green Party pursues a similar policy. The estimates suggest that the Green Party is the strongest proponent of ability-tracking. Green Party participation in a state government reduces the growth of enrollment in joint schooling by one standard deviation. Evaluated at the mean, this implies that a state government under participation of the Green Party reduces the growth of enrollment in joint schooling (comprehensive schools) from $+0.6\%$ to -0.6% ($+0.3\%$ to -0.3%). However, for real policy outcomes, note that the Green Party has only participated in state governments in coalitions with the SPD, which exerts strong moderating effects.

The estimates further suggest that the share of students enrolled in joint education or comprehensive schools is a characteristic of the state education system that is strongly influenced by policy. Other factors are of negligible importance. In particular, cohort size and population density do not have significant effects on the intensity of ability-tracking although the estimated coefficient for population density has the expected sign. States with decreasing population density may find that joint schooling makes the provision of accessible schools less costly, e.g. by merging different tracks in one building. However, this argument is particularly strong in the East German states, which are not in the sample. Moreover, from an econometric point of view, population density is a slowly moving variable, the impact of which is hardly identified in a FE environment. Much of the relevant variation is between states. Surprisingly, the share of students enrolled in comprehensive schools is also not affected by public revenue per capita even though some comprehensive schools are associated with rather cost-intensive full-time schooling.

7. Conclusions

Education is of essential social importance for a country's social and human capital, an important foundation for its democratic society and its economic prosperity. Across industrialized countries, the public sector therefore assumes a major role in financing and/or providing education. At the same time, education is of paramount importance for private professional success/social mobility. Publicly financed education systems are therefore an attractive arena for partisan politics to exploit the common pool by focusing benefits from public education on specific constituencies. The previous literature applying partisan theory to public education has primarily focused on testing the general hypothesis that left-wing governments prefer higher education spending than right-wing governments, imposing strong implicit assumptions on the national tax systems, on educational participation rates across the income distribution of households or on opting-out behavior by high-income households.

This article has two basic contributions to this literature. *First*, it incorporates partisan theory's core assumption, namely that political parties are not all equal and that they engage in benefiting their core constituencies, into the standard model on voting on public education. Quite importantly, this model explicitly takes into account the financing of public education. Moreover, an important stylized fact of most education systems in industrialized countries, ability-tracking, is incorporated in a very simple extension. Given that educational participation in different tracks is not uniformly distributed across the income distribution of households, ability-tracking may be used as a means to exploit the common pool by political parties that are overrepresented among high/low-income households. *Second*, the hypotheses derived from this simple setup are tested for 10 West German states over the 1981-2006 period. Contrary to earlier studies, I find quite clear partisan effects in the *composition* of German public education spending across tracks. In particular, political parties always act in the predicted direction although estimated confidence intervals are somewhat large for the smaller parties.

In principal, similar distributional conflicts could also exist in other countries. In some ways partisan cycles could even be more accentuated in countries with majoritarian political systems. However, education systems in the U.S. or in other European

countries are significantly different in several aspects. For example, in countries where educational finance is local and tracking is less prevalent, the distributional conflicts highlighted in the present paper may be virtually nonexistent. In those countries, distributional conflicts, however, may arise along other dimensions. For example, partisan politics may focus on the allocation of public resources across different levels of public education. Conflicts may then evolve along the lines sketched by Fernandez and Rogerson (1995). Alternatively, conflicts may arise along the spatial distribution of education resources, which is particularly relevant in the U.S. (Fernandez and Rogerson, 1996 or Murray, Evans and Schwab, 1998).

My results may – to some extent – explain the high persistence of the German system of ability-tracking. Its abolishment would imply important redistributions of the benefits from public education and therefore faces resistance from a rather broad alliance of socioeconomic groups ranging from the middle class to the elites.

From a welfare point of view, the cycles in spending that are associated with the partisan effects, particularly strong in “swing-states”, may involve some loss in efficiency, which are, however, moderated by the high prevalence of coalition governments in Germany.

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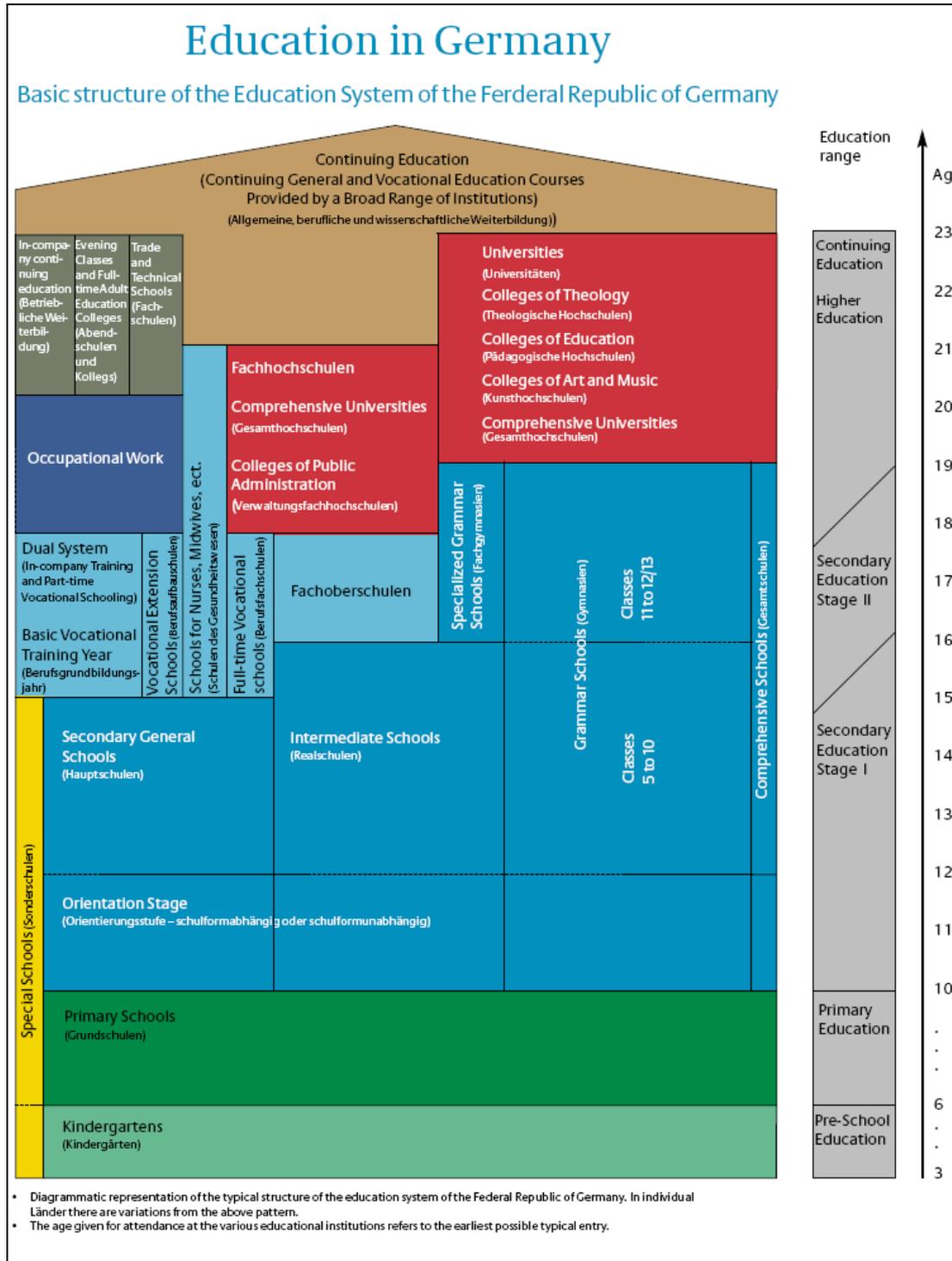
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Appendix 1: Structure of the German education system



Source: Federal Ministry of Education and Research (2007a)