

Discussion Paper Series – CRC TR 224

Discussion Paper No. 207
Project C 01

The Fall of the Aspirations Wall: Educational Aspirations,
Achievement and Societal Change

Ghazala Azmat *
Katja M. Kaufmann**

August 2020

*Ghazala Azmat, Sciences Po and Centre for Economic Performance (LSE). Email: ghazala.azmat@sciencespo.fr;

** Katja M. Kaufmann, Faculty of Law and Economics, Johannes Gutenberg University Mainz,
Jakob-Welder-Weg 9, 55128 Mainz, Germany. Email: kkaufman@uni-mainz.de.

Funding by the Deutsche Forschungsgemeinschaft (DFG, German Research Foundation)
through CRC TR 224 is gratefully acknowledged.

The Fall of the Aspirations Wall: Educational Aspirations, Achievement and Societal Change

Ghazala Azmat

Katja M. Kaufmann

August 2020

Abstract

We use the German Reunification “experiment” to study how an exogenously changed environment (from state socialism to capitalist democracy) affects aspirations and future outcomes. We analyze whether, and how quickly, individuals’ educational aspirations adapt, their long-term impact and the underlying mechanisms. Using differences across cohorts induced by Reunification timing, we show that shortly after, educational aspirations among high school students in East Germany increase substantially and translate into sizable increases of completing university entrance certificate five years later. Perceived educational returns, economic preferences (“consumerism”), socio-political attitudes (“individualism”) and psychological well-being adapt quickly and are directly linked to changes in aspirations.

JEL-Classification: I21, D72, D91

Keywords: Aspirations; education; perceived returns; economic, social and political preferences; psychological well-being; German Reunification.

*Ghazala Azmat, Sciences Po and Centre for Economic Performance (LSE). Email: ghazala.azmat@sciencespo.fr; Katja M. Kaufmann, Faculty of Law and Economics, Johannes Gutenberg University Mainz, Jakob-Welder-Weg 9, 55128 Mainz, Germany. Email: kkaufman@uni-mainz.de. Ghazala Azmat gratefully acknowledges funding from the Agence Nationale de la Recherche (ANR). Katja Kaufmann gratefully acknowledges funding by the German Research Foundation (DFG) through CRC TR 224 (Project C01).

1 Introduction

Since aspirations early in life shape one's behavior and investment choices, they are likely to have important consequences for future outcomes. Despite their importance, little is known, however, about how aspirations are formed and how quickly they adjust to new circumstances, such as changes to one's environment involving new opportunities. Similarly, it is not clear how aspirations depend on beliefs, preferences and constraints or how important they are for actual long-run outcomes. Given their potential role in economic success later in life, it is crucial to shed light on the source and impact of aspirations as a means to understanding the creation and persistence of inequality.

The seminal work on models of aspiration adaptation (Simon, 1957; Selten, 1998; Karandikar et al., 1998) and aspiration formation (Ray, 1998; Ray, 2006; Genicot and Ray, 2017) highlights the importance of resource constraints and reference groups. Aspirations can be depressed due to existing (resource and internal) constraints but also due to "aspiration gaps", if the social distance between an individual's characteristics and the characteristics of her reference group is too large. The environment in which one's aspirations are formed and to which they adjust is, however, typically endogenous to the individual's characteristics, making it difficult to disentangle its effect on aspirations.

In this paper, we study how an exogenous change in the political and economic environment affects youths' educational aspirations and – importantly – how this feeds back into their future educational investments. To shed light on the mechanisms behind aspiration adaptation, we explore the role played by changes in beliefs, preferences and constraints. We use the natural experiment of German Reunification in October 1990 to study a change in regime on youth aspirations. Through Reunification, Germany witnessed some of the most important structural changes in recent history, which implied a convergence for East Germany to the existing regime in the West (see Hunt, 2002, and Krueger and Pischke, 1995, for a detailed overview). In particular, East Germany transitioned from a socialist system with a planned economy to the capitalistic and democratic system of West Germany.

We estimate the causal influence of a regime change on student aspirations and subsequent outcomes by using unique data on two cohorts of adolescents in East Germany. The students were interviewed annually for several years - before and after Reunification - when they were aged 9 to 20. By the end of grade 10, when students are around 16 years old, they make important decisions regarding their further educational career – in particular, whether they will undertake the "Abitur", which is the entrance certificate to university education. We use variation in the timing of Reunification for different cohorts of students, who have a four-year age gap, to identify its effect on the aspiration to pursue an "Abitur" certificate in the future. We then link early aspirations to

later actual “Abitur” take-up. In particular, we analyze the change in aspirations for the younger cohort between January 1990 and January 1991, using as the counterfactual trend the evolution of the older cohort’s aspirations between the same grades (before Reunification).

We show that the change in the political and economic environment had large and important effects on educational aspirations already in the very short run. In particular, shortly after Reunification (compared with before), the likelihood of aspiring to obtain the “Abitur” increases by 22 percentage points. Importantly, this short-run change in aspirations translates strongly into longer-run outcomes: aspirations strongly predict attainment and the increase in educational aspirations does indeed lead to a strong increase in the likelihood of completing the “Abitur” five years later.

We supplement our analysis to study, more broadly, the causal impact of Reunification on longer-run educational outcomes. Using (less-detailed) data that cover several cohorts of students in East and West Germany, we show that the aggregate trends in these data are consistent with one of our main findings – an increase in educational attainment following the change in regime. Moreover, we are able to establish a persistent and stable gap in Abitur completion between East and West Germans prior to Reunification (almost a 50 percent difference) that closes completely after Reunification for younger cohorts studying under the new regime. We document that East German cohorts that experience Reunification towards the end of high school, but before Abitur completion, do not fully adjust their educational decisions to the new economic environment. That is, students with some possibility to adjust their Abitur take-up to the new economic conditions do not do so, in line with their prior aspirations. This highlights that the timing of macro events can be crucial for individuals’ lifetime outcomes.

What drives changes in educational aspirations? A standard education model suggests that there are three main factors determining educational decisions: (1) expected returns to education, (2) economic preferences, and (3) constraints. These factors are likely to play an important role in the formation of youths’ educational aspirations, which eventually, influence actual educational investment. Information on each component is often not readily available, making it difficult to understand the importance of these different components. In our study, however, we are able to separately examine these factors to help shed light on the mechanisms behind our main findings. We analyze the impact of Reunification on the three potential drivers: on youths’ expected returns to education; their economic, as well as social and political, preferences; and on the role of potential constraints, such as constraints in the access to (higher) education, in terms of the quality and content of education and in terms of access to different fields of study. Additionally, we investigate a forth, potentially important, factor on aspiration formation – the role of the youths’ psychosocial functioning. For each of the mechanisms, we explore both, the impact of Reunification on them and their link to changes in aspiration.

Reunification implied a sizable increase in the returns to education for East Germans.¹ While a change in expected returns can be an important driver of changes in educational investments (Jenson, 2010; Abramitzky and Lavy, 2014), it is often difficult to measure whether, and how quickly, this information becomes salient to those that are likely to be affected. Moreover, the link between perceived returns and early educational aspirations has not been tested, despite their importance for later educational decisions. We show that Reunification did, indeed, increase students' expected returns to education, and this change occurred relatively quickly after Reunification. In particular, the stated importance of education for future earnings increased substantially (by 0.45 of a standard deviation). Moreover, when we link this to changes in aspirations, we find that aspirations increase more among those whose perceived educational returns increased to a greater extent. This suggests that changes in expected returns were an important driver of the increase in educational aspirations, which eventually impacted long-run educational outcomes.

Turning to economic, social and political preferences, we find important changes following Reunification and links to aspirations. Consumption and economic preferences (“desire for luxury” and “enjoying life”) increased sizably (by 0.12 and 0.35 of a standard deviation, respectively). Additionally, the change in terms of social and political preferences suggests a move towards more “individualism”. The importance of doing deeds that “help many people”, of the “judgement of peers” and the importance of “studying because it is a duty as a student” all decreased (by 0.19, 0.17 and 0.11 of a standard deviation, respectively). Similarly, the importance of being part of a collective and of supporting socialism decreased substantially (by 0.51 and 0.86 of a standard deviation, respectively). When linking the change in aspirations to the changes in these different factors, we show that aspirations increased more among those whose social preferences became more individualistic – those whose values converged more to those of the West.

With respect to the role of psychological wellbeing, we show that Reunification led to an increase in anger and anxiety (by 0.40 and 0.42 of a standard deviation, respectively) and to a decrease in self-confidence (by 0.40 of a standard deviation). How would we expect this to affect individuals' aspirations? On the one hand, psychological constraints (such as lower self-confidence and higher stress) could lead to a decrease in aspirations. On the other hand, increases in (perceived) uncertainty –as reflected by increased anxiety and anger and decreased self-confidence– could lead to increases in educational investments and aspirations in order to insure against uncertainty. Linking the change in aspirations to changes in psychological measures, we find that increases in anger and anxiety and decreases in self-confidence are positively related to increases in aspirations, consistent with the second explanation.

Finally, we investigate the importance of constraints (or the relaxation thereof) in explaining

¹For instance, the average net income of individuals with a university degree in the East was only 15 percent higher than that of blue-collar workers, compared to 70 percent in the West (see, e.g., Alesina and Fuchs-Schündeln (2007)).

changes in aspirations resulting from Reunification. Since some students might not “expect” to do the Abitur, they might not aspire for it. We examine the role of constraints in several ways. First, the role of changes in access to higher education (overall, and for certain groups who were facing constraints due to educational attainment or the socialist regime). Second, in access to certain fields (due to a relative focus on STEM fields under the previous regime). Third, in the changes in educational quality or content. Overall, we find little evidence for these explanations.

Our study breaks new ground on understanding aspiration formation and adaptation and highlights how the political and economic landscape influences youths’ aspirations and decisions. We contribute to the literature in several important ways. First, using detailed micro-data, we link aspirations during childhood and adolescence to longer-run outcomes, allowing us to investigate how predictive aspirations are for later decisions. Second, we link the evolution of educational aspirations during childhood to the evolution of youths’ perceived educational returns, preferences, constraints and measures of psychosocial functioning/well-being. This enables us to investigate the determinants of youths’ aspirations and how they are formed. Third, we identify whether, and how quickly, youths’ aspirations adapt to a change in their environment, which imply important changes in labor market and consumption opportunities. Finally, we show that timing is key – students’ closeness to the completion of an educational degree is an important determinant for aspiration adaptation.

Our study contributes to several literatures. In education, we contribute to a recent literature that analyzes the effect of interventions or educational programs on the educational aspirations of children from disadvantaged backgrounds (Heckman et al., 2013; Carlana et al., 2017; Guyon and Hulliary, 2019; Rizzica, 2019) or in developing countries (Beaman et al. 2012; Chiapa et al., 2012; Macours and Vakis, 2019) by showing the importance of political and economic changes in the formation and adaptation of aspirations. Moreover, while it is often difficult to understand the importance of the different components that enter into educational investment decisions, our study allows for a detailed investigation into the mechanisms behind these effects and, since we can track students over several years, it allows us to study the longer-run implications of changes to educational aspirations on acquired educational degrees.

We also add to the growing body of literature showing that culture and one’s environment more generally affect preferences and can be persistent (Fernandez and Fogli, 2006, 2009; Fernandez, 2007; Figlio et al, 2018). Alesina and Fuchs-Schündeln (2007), using German Reunification as an experiment, show that political regime change influences preferences for redistribution.² While they find differences between East and West Germans in terms of these preferences, they show a

²Other papers have also used German Reunification as a natural experiment to investigate issues such as saving behavior (Fuchs-Schündeln, and Schündeln, 2005; Fuchs-Schündeln, 2008), consumption behavior (Bursztyl and Cantoni, 2012), the economic impact of market access and networks (Redding and Sturm, 2008; Burchardi and Hassan, 2013) and the effect on fertility decisions (Chevalier and Marie, 2017).

convergence, albeit slow, to West German views when comparing different cohorts. We show that in the case of young individuals, economic, social and political preferences adapt quite rapidly in response to the change in regime. In particular, we find that preferences for consumption increase following Reunification, converging to the tastes of the more capitalist society. Similarly, social values shift towards being more individualistic, and political preferences move away from socialism/communism. A likely contributing factor to why preferences change after Reunification is the change in the reference group and a convergence to that new group (Genicot and Ray, 2017). Moreover, our findings suggest that these changes in preferences have a quantitatively important impact on economic outcomes – in our case, educational outcomes. Our findings also relate to recent evidence demonstrating the role of exposure to markets, in shaping social values and political preferences. In a field experiment, Margalit and Shayo (2017) show that an exogenous increase in terms of engagement in financial markets led subjects to adopt a more right-leaning social outlook on issues of fairness and deservingness, redistribution, and the role of luck vs merit in explaining individual success. Relatedly, Jha and Shayo (2019) show that increased exposure to the financial market led individuals to vote and support choices that promoted peace.

In the context of poverty and developing countries, it has been shown that psychological (“internal”) constraints, such stress and low self-confidence, can impact decision-making (see, for instance, Bertrand et. al., 2004; Duflo, 2012 and Mullainathan, 2005). Our study contributes to this small literature, showing that Reunification affects youths’ psyche – the level of anxiety and anger increase and self-confidence decreases. Furthermore, in the context of educational choices, we shed light on the important link between aspirations and psychological measures. We find that increased (perceived) uncertainty –as reflected by increased anxiety and anger and decreased self-confidence– leads to increases in educational investments and aspirations. This is consistent with the theory that educational investments are used to insure against increases in uncertainty (see, e.g., Heckman, Lochner and Todd, 2006).

Finally, regarding policy implications, it has been well established that early investments in children are critical for long-run economic success (see, for instance, the seminal papers by Cunha and Heckman (2008) and Cunha, Heckman and Schennach (2010)). It is, therefore, important to understand whether such investments depend on parents or youths’ aspirations early in life, as well as whether, and to what extent, aspirations are malleable and can adjust to new circumstances. More generally, it is crucial to shed light on how aspirations are formed and how they depend on family background, skills, beliefs, preferences and constraints to understand their role in the creation and persistence of different types of inequalities.

2 Background

Historic events

Until 1945, East and West Germany were united as a single country. When separation occurred after Germany's defeat in the Second World War, it was exogenously imposed by the winning Allies. In the Fall 1989, change swept through Eastern Europe and led to the fall of the Berlin Wall in November 1989. Importantly, East Germany and former German Democratic Republic (GDR), instead of experiencing a change of government within its borders or newfound independence like other countries in this area, ceased to exist as a separate state. On October 3, 1990, East Germany joined the Federal Republic of Germany (FRG), creating a sovereign unified German state ("Reunification"). In this process, East Germany changed from state socialism to liberal-democratic capitalism in a short period of time and without a gradual transition (as detailed below).

In the period prior to Reunification a series of protests by East Germans ("The Peaceful Revolution"), led to the removal of the Berlin Wall in November 1989. A few weeks after the fall of the Wall, West German Chancellor Helmut Kohl announced a 10-point program calling for the two Germanies to expand their cooperation. However, the Socialist Unity Party was still in place in the German Democratic Republic and there was a great deal of uncertainty until late in the process as to whether Reunification would ultimately take place, as well as what it would mean, due to strong international opposition. In particular, among the Four Powers that had imposed separation on Germany after World War II and who had a direct say in whether Germany would be allowed to reunify or not. For example, briefly before the fall of the Berlin Wall, British Prime Minister Margaret Thatcher told Soviet General Secretary Mikhail Gorbachev that neither the United Kingdom nor Western Europe desired the reunification of Germany. Thatcher also clarified that she wanted the Soviet leader to do what he could to stop it, telling Gorbachev "We do not want a united Germany".³ Although she gradually softened her opposition, as late as March 1990, Thatcher summoned historians and diplomats to a seminar at Chequers to ask "How dangerous are the Germans?"⁴

During the election in the GDR in March 1990, the former Socialist Unity Party of Germany was heavily defeated. A grand coalition was formed under Lothar de Maizière, leader of the East

³Michael Binyon (11 September 2009). "Thatcher told Gorbachev Britain did not want German reunification". *The Times*. London.

⁴See Kundnani, Hans (28 October 2009). "Margaret Thatcher's German war". *The Times*. See also Volkery, Carsten (9 November 2009). "The Iron Lady's Views on German Reunification/'The Germans Are Back!'". *Der Spiegel*. The pace of events also surprised the French, whose Foreign Ministry had concluded in October 1989 that reunification "does not appear realistic at this moment", see Knight, Ben (8 November 2009). "Germany's neighbors try to redeem their 1989 negativity". *Deutsche Welle*. Ultimately, the key ally was the United States. Although some top American officials opposed rapid unification, Secretary of State James A. Baker and President George H. W. Bush provided strong and decisive support for Kohl's proposals.

German wing of Kohl's Christian Democratic Union. On August 31, 1990, the "German Reunification Treaty" (Einigungsvertrag), declaring the accession (Beitritt) of the German Democratic Republic to the Federal Republic of Germany, was signed by representatives of the two Governments to be effective as of October 3, 1990. Following the "Two Plus Four Talks" (between the Federal Republic of Germany, the German Democratic Republic, and the Four Powers: France, the Soviet Union, the United Kingdom, and the United States), the "Treaty on the Final Settlement with Respect to Germany" was signed in Moscow, Soviet Union, on 12 September 1990, and paved the way for German Reunification on 3 October 1990.

Education structure before and after Reunification

The East and West German educational systems grew from the same educational roots and shared a common language. During the forty years (1949-1990) of separation, they were characterized by different educational and political philosophies, however, similar elements always remained or came to the fore in various periods of reform. One key feature of the secondary school system that remained the same in West and East Germany was the selective university-preparatory education and the "Abitur" degree as the certificate necessary to enter university. The "Abitur" degree, therefore, is the ideal outcome for our analysis since it stayed in place and the same throughout, before and after Reunification, in both parts of Germany.⁵

East Germany had a unified school system in which there was one common school, which almost every East German student attended from grades one through ten, the polytechnical school ("Polytechnische Oberschule", POS). Students were taught in heterogeneous core groups, tracking was not permitted, and electives were few. After the tenth grade, most students continued with vocational training, implying three years of apprenticeship in a business and part-time study in vocational schools. A minority of the students entered the academic track spending two additional years in extended secondary schools ("Erweiterte Oberschule", EOS) to obtain the Abitur, allowing them access to university. These students were selected on the basis of grades (GPA) and political attitudes (see Baske (1990)).⁶ East Germany's unified school system only began to align with the West German three-track system from the 1991/92 school year. The three-track system consisted of a college-preparatory Gymnasium (grammar school), a technical-clerical oriented Realschule and a manual labor oriented Hauptschule (vocational secondary schools). Despite these changes within a short period, the transition was marked by relatively high continuity (see Weishaupt and Zedler (1994) and Mintrop and Weiler (1994)). Schools retained most of their personnel (only

⁵See the survey on the development of the East and West German education system before and after Reunification by Mintrop and Weiler (1994) and the comparison of the education system of the FRG and GDR by Anweiler et al. (1990).

⁶In Section 6.4 we investigate whether the relaxation of such constraints led to (or contributed to) the change in educational aspirations and attainment.

approximately 10 percent of the teaching force lost their jobs in the years after Reunification) and proceeded to operate without much interruption. Moreover, there was complete continuity in the secondary school system with respect to the selective university-preparatory education and the “Abitur” degree (which was already the same in both East and West Germany).⁷

Until shortly before Reunification, there were sizable differences in educational attainment between East and West Germany. In the West, approximately 30 percent of school-aged students completed the Abitur; in the East, less than 20 percent completed the Abitur (Below et al., 2013). However, after Reunification, East German Abitur completion rates began to converge to West German rates, as we will show below and discuss in more detail (see Section 5).

3 Data

3.1 Longitudinal Study of Students in East Germany

The data used in the following analysis come from the Longitudinal Study of Students (1985-1995).⁸ The study follows students in two parallel cohorts in East Germany from 1985 to 1995. Students in the younger cohort were surveyed between grade 3 in 1986 and grade 12 in 1995 (i.e., between ages 9 and 18), while students in the older cohort were surveyed between grade 6 (in 1985) and up to three years after grade 12 in 1995 (i.e., between ages 12 and 21).⁹

The goal of the study was to understand the determinants of the development of cognitive abilities, as well as of the values, goals and attitudes of children and teenagers and was continued after German Reunification. The data are ideal for our purpose in that the survey followed the same individuals from before to after Reunification, covering a wide range of topics, including educational achievement and attainment, as well as values and goals, family development, social relations and psychological well-being measures. Importantly, it asks students about their educational aspirations at several points in time and follows them over time, allowing us to study how well these measures translate into actual outcomes.

The focus of our main analysis is on students in grades 7 and 8. We observe 1,887 children from the younger and 1,247 children from the older cohort. Given the longitudinal nature of the study, we can link the individual *change* in perceived returns, attitudes (economic, social, political)

⁷Our data also allow us to investigate the short-run effects of Reunification *before* the changes in the school system took place, since in our analysis we compare outcomes before Reunification (in January 1990) to after Reunification (in January 1991)

⁸The data are available at the Central Archive for Empirical Social Research (University Cologne). A description of the Longitudinal Study of Students can be found in the survey on “Youth studies in the East” (“Jugend im Osten”) (see Kuhnke (1997)).

⁹As an exception, the “older” cohort was not surveyed in 1991, and neither cohort was surveyed in 1994. The set of survey questions varied somewhat from wave to wave.

and psychosocial functioning (anxiety, stress and self-confidence) to the change in aspirations prior versus post Reunification. Moreover, we track students until in grade 12 to study their eventual Abitur decision, linking it to their early aspirations.¹⁰

Variable description and summary statistics

In Table 1 (a), we present summary statistics for the main variables used in our analysis. Our main outcome variable of interest is the aspiration to acquire the “Abitur”, which is the university entrance certificate necessary for admission to university.

To investigate the potential mechanisms behind the short-run changes in Abitur aspirations following the regime change, we examine the different components of an educational production function, exploring the perceived returns to study, economic (consumption) preferences (such as the desire to “afford luxury” and “enjoy life”), social and political attitudes (such as the importance of “socialism” and the “collective” and doing “good deeds”). We further consider changes in short-run psychosocial functioning, such as anxiety, anger and self-confidence.

With respect to perceived returns, students are asked, on a scale from one to four, the importance of education for later earnings (where 1 is “not very important” and 4 is “very important”). The same scale is used in the questions for all other measures discussed below. Since these measures do not have a natural unit, we standardize them, i.e., subtract the mean and divide by the standard deviation to be able to interpret regression coefficients in terms of standard deviation changes.

In terms of preferences, we investigate the role of the following measures. With respect to economic goals, students are asked about how important it is to “enjoy life” and to consume “luxury goods” (again expressed on a scale from one to four; see above). To proxy for social attitudes and preferences, we use questions on the importance of doing “good deeds”, of “being valued by peers” and the importance of “duty as a student” for an individual’s study motivation. Finally, political preferences and values are measured via the importance of “supporting socialism” and “being part of a collective”. We complement our analysis on the political views with other questions that also reflect individualism versus collectivism, such as how important people find it to do “good/important deeds” and how important it is for study motivation to believe studying is a “duty as a student”.

To understand the role of psychosocial function, such as anxiety, anger and self-confidence, we use youths’ answers to several questions/items related to the different psychological measures, in particular whether they agree with different statements. Possible answers for each item are 4 “very strongly” to 1 “not at all”. We use factor analysis to combine the different items in the case of

¹⁰A good overview of the methodology and implementation of sociological analysis concerning the education system in the East can be found in the survey on “Youth in the East” by Brislinger et al. (1997).

anxiety and anger, where there is more than one variable.¹¹ We express all psychological measures in terms of standard deviations from the mean (as discussed above).

In Table 1 (b), we present survey questions and summary statistics of the variables used in the heterogeneity analysis to shed light on the importance of different types of constraints. In particular, we examine constraints on access to higher education that could be related to their academic ability, interests and regime constraints.

To examine the importance of ability-based constraints in access to university, we measure youths' academic performance in school, that is their GPA (the grading scale is from one to five, where one is the best grade). In terms of constraints in the access to certain fields/majors, we measure whether an individual's relative strength or interest is in the mathematical (technical) area or in the non-mathematical (verbal) area.¹² We measure "relative objective performance" in terms of relative grades in German versus Math. "Relative subjective performance" is measured in terms of the ratio of one's own evaluation of one's performance in German and Math (on the scale for the absolute measures, 1 is "very good" and 4 is "bad"). "Relative academic interest" is the ratio of the measures of interest in topics related to German versus Math (with the scale of the absolute measures ranging from 1 for "strongly interested" to 4 for "not at all interested").

The regime-relevant variables are whether an individual was an "FDJ member", i.e., a member of the communist youth organization "Free German Youth" ("Freie Deutsche Jugend (FDJ)"), which was asked under the socialist regime (before Reunification) and whether the individual was an "FDJ member with function", i.e., a member of the communist youth organization with a leading role (such as "FDJ secretary" of the group, of the school, or at the municipal or higher level). Finally, we also split the sample by whether an individual's mother has an Abitur certificate. Although eventually abolished and not relevant for the cohorts in our study, the declared goals of the socialist regime (at least at its origins) were to promote children from less-privileged families (i.e., with less-educated parents, with parents who were workers or farmers, or other such statuses).

3.2 German Socio-Economic Panel (GSOEP)

We supplement our analysis on the causal effect of Reunification on Abitur completion using a well-known and widely used dataset, the German Socio-Economic Panel (GSOEP). The data do

¹¹In terms of the measure "anger", individuals are asked whether they agree with the following statements: "I have destroyed things out of anger. "; "When provoked, I lose my temper. "; "I can become so angry that I do not recognize myself." In terms of the measure for "anxiety", individuals are asked whether they agree with the following statements: "Sometimes I am too nervous to speak in class." and "I am afraid of being laughed at by my classmates". Finally, to measure "self-confidence", individuals are asked if they agree with the statement "I struggle with low self-confidence." To interpret higher values as higher self-confidence, while in the raw data higher-value answers about the statement imply lower self-confidence, we revert the scale.

¹²As discussed below, East Germany before Reunification had a strong focus on STEM fields, in particular engineering, so that access to more verbally/less mathematically oriented fields might have been relatively more constrained.

not contain information on Abitur aspirations around Reunification necessary for the main part of our analysis, but they provide us with information on completed educational attainment for more cohorts in East Germany, as well as information on West Germany. GSOEP is an annual household panel, started in West Germany in 1984, while from 1990 on, it also covers the territory of the former German Democratic Republic. The GSOEP is one of the main tools for social science and economic research in Germany and was used –among other examples– by Alesina and Fuchs-Schündeln (2007) in their analysis of the effect of Reunification on redistribution preferences.¹³ Some of the many topics include household composition, educational and occupational biographies, employment, earnings, health and satisfaction indicators.

We use the original sample established in 1984, and the sub-sample covering the territory of the former GDR that began in 1990. Our analysis is based on individuals born between 1969 and 1980, i.e., individuals who were between 10 and 21 years old at the time of Reunification, and thus were differentially able to respond to the event of Reunification in terms of educational decisions. For the purpose of our study, we are interested in whether they obtained the university entrance certificate, the Abitur.

4 Empirical Methodology

4.1 Short-Run Effects of Reunification on Aspirations

Students' cohort of birth and the timing of Reunification jointly determine exposure to the change in regime. We use this variation to identify the effect of regime change on various outcomes – starting with educational aspirations. In particular, we analyze the change in Abitur aspirations of the younger cohort before and after Reunification, using as the counterfactual trend the evolution of the older cohort's aspirations between the same academic years (grades) (before Reunification). As discussed above, the Abitur degree (the entrance certificate for university) stayed the same in East (and West) Germany before and after Reunification and is thus the ideal outcome to look at.

The students are asked repeatedly – in most grades – about their educational goals. In particular, they are asked whether they aspire to obtain the “Abitur”. The data allow us to see how students' aspirations evolve over their “educational” lifecycle (i.e., across grades). The data follow two cohorts - one being four years older than the other cohort. We exploit the structure of the data and comparability across cohorts to identify the effect of regime change on student outcomes and choices. The “treatment” of interest is that of regime change on educational aspirations of the younger cohort. The older cohort serves as the “control” group, capturing how aspirations would have evolved if there had been no Reunification. For instance, the older cohort when in grade 8

¹³For an overview of the data, sampling, topics and so forth, see, e.g., Goebel et al (2018).

(in 1987, aged 14) is in the pre-Reunification period, while the younger cohort when in grade 8 (in 1991, aged 14) is in the post-Reunification period.

We estimate the change in aspirations for the younger cohort, in the short period before and after Reunification (i.e. in January 1990 versus January 1991), using the older cohort as a control for the (counterfactual) trend across grades for the younger cohort. The empirical design is such that we focus closely on the grades directly pre- and post-Reunification for the younger cohort (i.e., when in grades 7 and 8), which allows us to identify the short-run effects of Reunification and helps compute the correct standard errors (Bertrand, Duflo, Mullainathan, 2003). More generally, we estimate the following equations:

$$A_{icg} = \beta_0 + \beta_1 C_i + \beta_2 G_{ic} + \beta_3 (C_i G_{ic}) + X_{ic} \delta + \epsilon_{icg} \quad (1)$$

$$A_{icg} = \beta_0 + \beta_2 G_{ic} + \beta_3 (C_i G_{ic}) + D_i + \epsilon_{icg} \quad (2)$$

where A_{icg} is the educational aspiration of student i in cohort c in grade g . C_i is a dummy indicating whether the individual belongs to the younger cohort, and G_{ic} represents the student's academic grade. Since we restrict the analysis to grades 7 and 8, G_{ic} is a dummy variable that takes value one if the academic grade is 8 (where grade 7 is the excluded category). The variable of interest is $(C_i G_{ic})$, which interacts cohort and academic grade and measures the effect of a change in regime. It takes value one if a student is from the younger cohort and in grade 8, which is in the post-Reunification period for the young cohort. X_{ic} is a vector of pre-determined, individual-specific characteristics. Additionally, we include individual fixed effects D_i (see equation (2)) and estimate equations (1) and (2) using ordinary least squares.

To investigate potential mechanisms behind the effect of Reunification on aspirations, we estimate the same equations (1) and (2) with different outcome variables, such as “perceived returns to education”, different measures of “economic, social and political preferences” and “psychological measures”. In a second step, we link changes in those measures to changes in aspirations.

One possible way to apply the Differences-in-Differences approach is to compare the young and old cohorts in the same years before and after Reunification. However, the older cohort is also likely to be directly affected by Reunification. In turn, we might expect a potential response by the “control” group. Using different grades (but the same calendar years), is also less reliable when aspiration trends are non-linear.

In our application of the Differences-in-Differences approach, we compare the younger and older cohorts in the same grade (but different years). In this way, the older cohort is not affected by Reunification since the relevant grades are all before Reunification. We, therefore, use the change in the educational aspirations of the control group over the same grades, which controls for how the younger cohorts outcomes would have changed without Reunification. Moreover, the key outcome

variable “Abitur” aspirations is very similar in levels across cohorts in the pre-treatment period, such that we employ a “Matched” Difference-in-Differences design. While this is not a necessary condition for using a DID approach since time-constant differences across cohorts are “differenced out”, it is evidence in favor of the necessary “parallel trends” assumption being satisfied.¹⁴ We explicitly test for the “parallel trends” assumption in Section 5.1, showing that the pre-trends of the two cohorts are indeed parallel.

4.2 Linking Aspirations to Long-run Educational Attainment

Does the increase in educational aspirations in response to the regime change translate into higher educational attainment in the longer run? In this section, we study the link between educational aspirations and educational attainment. We measure whether educational aspirations – and changes in educational aspirations – impact students’ likelihood of completing the university entrance certification at age 18 (in grade 12), several years after they are asked about their educational aspirations (in grades 7 and 8).

We test four main hypotheses. First, aspirations predict attainment. If aspirations measure something meaningful, they should predict longer-run educational attainment. Second, aspirations in grade 8 are better predictors than those in grade 7. This should be the case if aspirations change as students progress through grades, for example due to learning about own ability and whether academic performance is sufficient to enter university. Third, the relationship between aspirations and later attainment is stronger for the young cohort. The younger cohort is exposed to fundamentally new information about the structural break of Reunification by grade 8, while the older cohort is only exposed by grade 11 – the time when the decision to enter the track to the Abitur has been made. Fourth, the grade 8 aspirations of the younger cohort fully incorporate the information on the structural break of Reunification, which explains all of the cross-cohort differences.

We begin by estimating the following equation:

$$E_{ic} = \gamma_0 + \gamma_1 A_{icg} + \gamma_2 C_i + \epsilon_{icg} \quad (3)$$

where E_{ic} takes value 1 if individual i in cohort c undertakes a degree that provides college access (i.e., the “Abitur”). We are primarily interested in γ_1 , which measures the relationship between academic aspirations, A_{icg} , and ultimate educational attainment. We consider both educational aspirations in grade 7 (before Reunification for both cohorts) and grade 8 (after Reunification for the younger cohort but still before Reunification for the older cohort). Controlling for cohort, C_i , allows us to determine whether there are important cohort differences in educational attainment

¹⁴Matched-DID is often used when examining variables that are bounded from above or below because the (pre-)trends in such variables are unlikely to be the same if the pre-treatment outcome levels are very different.

after controlling for students aspirations and how this depends on whether we use grade 7 or grade 8 aspirations.

With this specification, we test hypotheses one and two: (1) $\gamma_1 > 0$ and (2) $\gamma_1(\text{grade8}) > \gamma_1(\text{grade7})$. Hypothesis (1) predicts a positive relationship between aspirations and later educational achievement. For prediction (2), it follows simply that as students advance through their educational trajectory, their educational aspirations are more closely linked to their actual educational choices (e.g. due to learning/updating).

To test hypotheses three and four, we need to allow the effect of aspirations to vary by cohort. We therefore also estimate the following equation:

$$E_{ic} = \gamma_0 + \gamma_1 A_{icg} + \gamma_2 C_i + \gamma_3 (A_{ic} C_i) + \epsilon_{icg} \quad (4)$$

In regression (4), we estimate the differential effect of educational goals by cohort ($A_{ic} C_i$). In this case, γ_3 will measure whether the link between educational aspirations and attainment differs by cohort. We test: (3) $\gamma_3 > 0$ (i.e., aspirations are more strongly tied to outcomes for the younger cohort since they have more information about structural change). (4) $\gamma_2(\text{grade8}) = 0$. This would imply that the effect of Reunification on educational attainment is fully captured by its effect on the younger cohort’s aspirations in grade 8 (after Reunification). In other words, the grade 8 aspirations of the younger cohort fully incorporate the information on the structural changes induced by Reunification.

4.3 External Validity and Long-Run Effects of Reunification on Education

In this section, we supplement our analysis by investigating the causal effect of Reunification on longer-run educational outcomes using the well-known and widely used GSOEP data. Although it lacks information on youths’ aspirations, it allows us to measure the impact of Reunification on completed educational attainment for more cohorts of East German students, as well as to use cohorts of West German students as the counterfactual.

We apply a Difference-in-Differences approach, comparing, across different cohorts, the Abitur completion rates of East German students to those of West German students. In particular, we compare the completion rates for individuals aged between 10 and 21 at the time of Reunification. This allows for variation in the point at which they were impacted, during their academic life-cycle, by the regime change. Within these cohorts, we have our “older” and “younger” cohorts, as well as cohorts that were even older (Abitur completion occurred before Reunification) and even younger (education completion occurred even later, with more exposure to the new regime). We use West German cohorts as the counterfactual group.¹⁵ Since the political and economic regime

¹⁵This method has been widely applied in other studies using the German Reunification as a natural experiment, for

and the school system remained unchanged in West Germany, while East Germany adopted the West German regime, it seems plausible that West Germans were (relatively) unaffected in their educational decisions by the event of Reunification.

We estimate the following equation:

$$Ab_{icr} = \beta_0 + \beta_1 C_i + \beta_2 R_{ic} + \beta_3 (C_i R_{ic}) + X_{ic} \delta + \epsilon_{icr} \quad (5)$$

where Ab_{icr} is the decision to complete the Abitur of student i in cohort c in region r (i.e., East or West Germany). C_i is a dummy indicating whether the individual belongs to the younger cohort (i.e., individuals aged 13 to 15 as opposed to 16 to 18), and R_{ic} represents the student's region, i.e., whether she attended school in East or West Germany. The variable of interest is $(C_i R_{ic})$, which interacts cohort and region (East/West) and measures the effect of the change in regime. It takes value one if a student is from the younger cohort and East Germany. X_{ic} is a vector of pre-determined, individual-specific characteristics. To provide evidence in support of the parallel trends assumption, we also use the cohort of individuals aged 19 to 21 to compare it to the Abitur attainment of individuals aged 16 to 18 and analyze whether the difference between the two cohorts is the same in East and West Germany. Finally, we also use the cohort of individuals aged 10 to 12 to shed further light on the rate of convergence.

5 Results

In this section, we identify and quantify the effect of Reunification on educational aspirations. We proceed to analyze the effects of regime change on longer-run educational outcomes (Abitur completion) and directly explore the relevance of youths' aspirations for their actual longer-run decisions. In the following section, we shed light on the mechanisms through which Reunification affected educational aspirations and decisions. In particular, we investigate the role of youths' expected returns to education, economic, social, and political preferences, the role of psychological well-being, and the importance of potential constraints, all of which we link to changes in aspirations.

5.1 Short-Run Effects of Reunification on Educational Aspirations

5.1.1 Graphical Representation of Educational Aspirations

We begin by graphically exploring the effect of Reunification on youths' aspirations. The graphs provide insight into the identification strategy we use for the regression analysis later and highlight

example, Alesina and Fuchs-Schündeln (2007)

the compliance to the necessary parallel trends assumption. Students are asked repeatedly about their educational goals – in particular, whether they aspire to complete the Abitur. Figures 1 to 3 plot - across different academic years/grades - the means and confidence intervals of the educational aspirations of the older cohort, the younger cohort, and both cohorts together, respectively.

Figure 1 shows the evolution of educational aspirations for the older cohort between grades 6 and 10. By grade 11, students would have decided on their pursuit of Abitur. Importantly, all grades we observe for the older cohort are before Reunification (October 1990). We see that for this cohort, educational aspirations fall –and at an increasing rate– as the date to choose approaches. One likely explanation for this pattern is that as students progress through the grades, they learn about their skills and update their beliefs with respect to their match with the Abitur track (see Stinebrickner and Stinebrickner, 2014, on learning about one’s ability and college dropout).

Figure 2 plots the educational aspirations of the younger cohort. For this cohort, we observe the evolution of educational aspirations across grades before and after Reunification. The tight band around Reunification is when the younger cohort is in grade 7 (just before Reunification in January 1990) and when they are in grade 8 (just after Reunification in January 1991). Similar to the older cohort, we see a fall in aspirations in the period prior to the regime change. However, in the post-regime period, there is a striking break in this trend, and aspirations increase substantially.

In Figure 3, we superimpose, by academic grade, the educational aspirations of the older cohort on to those of the younger cohort, showing that in the pre-Reunification period, there is no significant difference in educational aspirations. The likelihood of individuals aspiring an Abitur degree in grade 7, which is pre-Reunification for both cohorts, is almost identical at approximately 38 percent.

However, in grade 8, which is pre-Reunification for the older cohort and post-Reunification for the younger cohort, the aspirations of younger and older cohorts are sizably and significantly different. The likelihood of aspiring to complete the Abitur is 55 percent for the younger cohort (who just experienced Reunification) versus only 35 percent for the older cohort in grade 8 (who had not (yet) experienced Reunification).

In support of the parallel trends assumption, Figure 3 shows that the pre-trends are not only close to parallel but also nearly overlapping, suggesting that the cohorts are closely “matched” in the pre-period. The figures show that - in addition to similar levels in terms of aspirations of the two cohorts in grade 7 (i.e., before treatment) - the pre-trends between the two cohorts are also the same. We will test this formally in the following subsection.

5.1.2 Quantifying the Effect on Educational Aspirations

We now proceed to quantify the effect of Reunification on educational aspirations. We begin with a Difference-in-Differences estimation strategy, as described in Section 4.1, in which we compare

the educational aspirations of different cohorts across grades. We then combine this with a fixed effects model.

We estimate the effect of regime change, focusing only on the grade before (grade 7) and the grade after (grade 8) Reunification for the young cohort. The older cohort, considered in the same grades, controls for the (counterfactual) trend - i.e., the way in which the aspirations of the younger cohort would have evolved between grades 7 and 8 had Reunification not taken place.

In Table 2, columns (1) and (2), we report the results from this estimation using two different specifications: Differences-in-Differences (DID) and fixed effects (FE), respectively. The two specifications suggest similar effects. In particular, comparing aspirations prior to Reunification (January 1990) with shortly afterwards (January 1991), the likelihood of aspiring to complete the “Abitur” increases substantially by 19 percentage points without fixed effects and 22 percentage points when fixed effects are included.¹⁶¹⁷

In Table 2, columns (3) and (4), we test whether the pre-trends in aspirations were similar for the two cohorts. We estimate a Differences-in-Differences specification (without and with fixed effects, respectively) comparing the evolution of youths’ aspirations before grade 7. We show that the parallel trends assumption holds since pre-trends are not significantly different and, in fact, are extremely similar (the estimated coefficient is close to zero).

We have shown that Reunification had a sizable effect on youths’ educational aspirations. We find that aspirations can adapt very quickly to large shocks (the post-period is within months after Reunification). In the following sections, we show that aspiration adaptation has significant implications for longer-run educational decisions. This highlights the importance of the politico-economic environment in which one forms educational aspirations and, subsequently, decides on educational investments and attainment.

The regime change implied a move to a system in which educational investments were more highly rewarded, which could have prompted students to raise their educational aspirations. However, beyond the changes in returns, educational decisions could have changed because of uncertainty, changes in economic preferences or changes in constraints after Reunification. In Section 6, we provide an extensive analysis of possible mechanisms making use of information on students’ perceived returns, their economic, political social preferences, and psychological well-being. All

¹⁶As discussed in Section 2, the fall of the Wall took place in November 1989, which culminated in the collapse of the communist regime when the Socialist Unity Party lost the elections in the GDR in March 1990. If people started expecting an increase in economic freedom already in November 1989 (while the socialist regime was still in place and Reunification highly uncertain), i.e. a few weeks before our pre-Reunification survey in January 1990, this would lead us to underestimate the full extent of the effect of the regime change on aspirations. Thus our estimates are conservative and –if anything– a lower bound for the full effect of the regime change.

¹⁷By using fixed effects, our estimates rely on individuals who remain in the sample until grade 8, i.e. after Reunification for the young cohort. For this sample we show below that the older and younger cohort not only exhibit the same pre-trends but also the level of aspirations is virtually the same.

of these factors are then linked directly to the students' change in aspiration.

5.2 Long-Run Effects of Reunification on Educational Outcomes and Links to Aspirations

5.2.1 Link between Aspirations and Educational Outcomes

In this section, we study the direct link between educational aspirations and longer-run educational attainment. We measure whether educational aspirations – and changes in educational aspirations – impact students' likelihood of obtaining the university entrance certificate at age 18 (in grade 12), several years after they were asked about their educational aspirations (in grades 7 and 8).

As discussed in Section 4.2, we test four hypotheses. First, aspirations predict attainment. Second, grade 8 aspirations are better at predicting outcomes than grade 7 aspirations. Third, the relationship between aspirations and later attainment is stronger for the younger cohort. Fourth, the grade 8 aspirations of the younger cohort fully incorporate the information on the structural break of Reunification, which explains all of the cross-cohort differences.

Table 3 provides evidence for all four hypotheses. First, educational aspirations are a strong predictor of achieving the Abitur. Second, grade 8 aspirations better predict attainment than grade 7 aspirations. Those aspiring to obtain the Abitur in grade 7 have a 47 percentage-point higher chance of actually doing so (column 1), while those aspiring to obtain the Abitur in grade 8 have a 61 percentage-point higher chance of doing so (column 2). The coefficient on the cohort dummy shows that students from the young cohort are 33 (17) percentage points more likely to acquire the Abitur.

In columns (3) and (4), we add interaction terms between aspirations and cohort for grade 7 and grade 8 aspirations, respectively. As predicted by our third hypothesis, the coefficient on the interaction term is positive and significant, suggesting that aspirations are more strongly linked to actual educational attainment for the younger cohort. This link is stronger for grade 8 aspirations, as expected, because for the young cohort, grade 8 aspirations are measured directly after Reunification. Fourth, once we allow for heterogeneous effects of grade 8 aspirations on attainment by cohort, the cohort dummy is no longer significant. In other words, the grade 8 aspirations of the younger cohort fully incorporate the information on the structural break of Reunification and explain all cross-cohort differences ($\gamma_2 = 0$). This highlights the relevance of aspirations, such that they fully absorb the differential effect of all the structural changes on longer-run outcomes.

Investigating the link between youths' aspirations in grade 7 and 8 and actual Abitur completion five years later, our sample size is reduced due to some attrition from the sample. To address concerns of differential attrition potentially driving our results, we conduct the following two robustness checks. First, we show that –using only those individuals that remain in the sample

between grade 7 and grade 12 and that have non-missing information on aspirations (in grades 7 and 8) and actual outcomes— our main results of the effect of Reunification on aspirations remain very similar both in the Difference-in-Differences specification and in the Fixed effects specification (see columns (1) and (2) in Table A.1). Again we show that pre-trends are virtually identical (see columns (3) and (4)). In Table A.2, we show that the results on the link between aspirations and final Abitur completion are qualitatively the same. Second, to provide further evidence on the robustness and the external validity of our results, we complement our analysis using the widely used GSOEP data (discussed in more detail in the following section). We show that Reunification did, indeed, have a strong effect on Abitur completion rates for the cohorts we focus on, supporting our findings for a strong increase in aspirations as well as on the strong link between aspirations and final outcomes.

5.2.2 External Validity and the Effect of Reunification on Educational Outcomes

We now present the results related to the analysis described in Section 4.3. Using the GSOEP data, we causally identify and quantify the effect of Reunification on the likelihood of Abitur completion for several cohorts of East German students using West German students as a control group.

Figure A.1 displays the fraction of Abitur completion for four different cohorts. These include two younger cohorts who were, at the time of Reunification, aged 10 to 12 and 13 to 15. In addition, the two older cohorts were aged 16 to 18 and 19 to 21. The solid line represents the Abitur completion rates of individuals from East Germany (the “treatment group”), while the dashed line represents individuals from West Germany (the “control group”). The gray bars represent 95% confidence intervals.

Comparing Abitur completion rates of the cohort aged 19 to 21 with that aged 16 to 18 in East and West Germany, Figure A.1 supports the parallel trends assumption necessary for credible identification based on a Difference-in-Differences approach. Moreover, one can see that the Abitur completion rate of East Germans is substantially (and significantly) below that of West Germans. For those in the oldest cohort (19 to 21), who would have completed education at the time of Reunification, the completion rate is almost 50 percent lower for East Germans than West Germans. The 16- to 18-year-old cohort, which represents a similar age group to the “older” cohort in our analysis with the longitudinal data, is at a stage where, although education is not completed, they would have already made a decision (or the relevant investments) to pursue the Abitur.

Comparing this cohort to the 13- to 15-year-old cohort (similar to our “younger” cohort), we see that there is a sizable jump in Abitur completion and there is clear convergence. While the difference between East and West Germany is 13 percentage points for the older cohort, the difference is only 4 percentage points for the younger cohort and no longer significant, suggesting a causal effect of Reunification of approximately 9 percentage points. The youngest cohort (aged 10

to 12 at Reunification) shows complete convergence in that East and West German rates of Abitur completion, which are both approximately 32 percent.

Table 4 presents the coefficients from estimating the Difference-in-Differences regression, that is, equation 5. According to column (1), the coefficient on the interaction of “East x Younger Cohort” is 0.09, suggesting that Reunification significantly increased the likelihood of Abitur completion by 9 percentage points. Column (2) presents results from a placebo test and shows that the pre-trends in Abitur completion rates are not statistically different (and very similar) in East and West Germany, underlining the validity of our approach.

This section highlights several important findings. First, it provides robustness to one of our main findings, which is that educational attainment increases sizeably among those who have time, in terms of educational choices, to adjust to a change in regime. Second, using the data on West Germany, we document that the gap in educational attainment closes completely within a few years of Reunification. Third, more generally, the analysis highlights that the timing of macro events can be crucial for one’s lifetime outcomes. This has been shown in other contexts, such as graduating during a recession (see, for instance, the seminal paper by Baker et al. (1994)). Since East German cohorts that experience Reunification at the end of high school, but before the completion of the Abitur, do not fully adjust their educational decisions to the new economic environment, it suggests that students with the possibility to adjust their Abitur take-up to the new economic conditions do not do so, in line with their prior aspirations.

6 Mechanisms

In this section, we explore the mechanisms behind the effect of Reunification on educational aspirations and, consequently, on longer-run educational decisions. A standard education model includes three (main) components that drive educational decisions: first, expected returns to education; second, (economic) preferences; third, constraints in the access to (higher) education. Another potentially important factor that may also serve as a different form of constraint, is the role of the youths’ psychological wellbeing. Empirically, due to data limitations, it is often difficult to identify the importance of the various components. A recent literature has focused on eliciting people’s subjective expectations about returns to schooling – see, for example, the seminal papers by Dominitz and Manski (1997) and Jensen (2010). A different literature has investigated the role of economic preferences in (educational) decisions such as altruism and trust in addition to time and risk preferences (for recent evidence see, e.g., Falk et al., 2018). However, there is relatively little overlap in terms of data sources that permit the exploration of both expected returns and preferences, nor other potential drivers.

In what follows, we relate changes in (perceived) returns to education and economic prefer-

ences to students' educational goals. Beyond economic preferences, we study whether changes in social and political preferences that might reflect a convergence to the West German culture (e.g., being more individualistic and less likely to be part of a collective) play a role. Moreover, we study changes in psychosocial functioning following Reunification and link those to youths' aspirations, to study whether individuals are subject to psychological (or internal) constraints in terms of their educational aspirations. At the end of the section, we explore the importance of the relaxation of other forms of constraints and a number of alternative mechanisms.

For all the analyses in the section, we employ the same identification strategy as in Section 5.1 to causally estimate the effect of regime change on each of the components. We measure the change for the younger cohort using the older cohort as the counterfactual trend. We then link all factors directly to changes in educational aspirations to better understand their relevance in the process that subsequently changed educational choice. Once again, an important feature of the analysis is that we can measure the changes in a narrow period just before and after Reunification.

6.1 Perceived Returns to Education

Studies have shown that education is highly responsive to changes in redistribution schemes that increase the rate of return to education (Abramitzky and Lavy, 2014). Reunification implied an increase in the returns to a college degree. A convergence to the West suggested an increase in earning disparity linked to educational levels. The average net income of individuals with university degrees in the East was only 15 percent higher than that of blue-collar workers, compared to 70 percent in the West (Alesina and Fuchs-Schündeln, 2007). Since a change in actual returns does not necessarily imply an (immediate) change in perceived returns, we make use of repeated information in our survey on how important youths perceive education to be for later earnings. We explore how this perception evolves over time and, in particular, how it changes after Reunification.

In Panel A of Table 5, columns (1) and (2), we show that in the narrow period before and after Reunification, there is a dramatic change in perceived returns (see Section 3 for variable definitions and summary statistics). We show that the importance of schooling for earnings increased substantially by 0.45 (without fixed effects) and 0.47 (with fixed effects) of a standard deviation, respectively.

As we further discuss below and show in Table 6, the increase in perceived returns is strongly linked to an increase in youths' aspirations. Those who most changed their perceived importance of schooling for later earnings are those who also most increased their educational aspirations. This highlights the importance of changes in perceived returns to education in contributing to the increase in educational aspirations and, ultimately, longer-run educational attainment. However, it is important to consider other components of the educational production function. In the next

section, we turn our attention to changes in economic, social and political preferences contributing to the change in education.

6.2 Economic, Social and Political Preferences

There is a growing body of literature that seeks to understand the role of culture in preference formation (Fernandez and Fogli, 2006, 2009). While cultural values have been shown to be persistent, they have also been shown to converge and adapt to a new status quo over time (Alesina and Fuchs-Schündeln, 2007). In this section, we examine economic, social and political preferences in the narrow period before and after the regime change to understand the rate at which they adapt and the importance of such changes, as reflected by actual (educational) decisions.

Causally estimating the impact of culture on preferences is often complicated by reverse causality concerns. The unanticipated Fall of the Berlin Wall allows us to examine this. Following a similar identification strategy to that presented in Section 4.1, we consider the impact of Reunification on students' economic, social and political preferences. At several points in time, students are asked about their preferences – for instance, their goals in life. We explore how these goals evolve over time and, in particular, how they change after Reunification (for the younger cohort relative to the older cohort).

In Panel A of Table 5 (columns (3) to (6)), we show that there is a dramatic change in economic preferences following Reunification. The importance of consuming “luxury goods” and of “enjoying life” increased substantially. In columns (3) and (5), we show that (without fixed effects), relative to being under the communist regime, the desire for these outcomes increased by 0.12 and 0.34 of a standard deviation, respectively. The results in columns (4) and (6), in which we include fixed effects, are very similar. These results suggest a rapid convergence in terms of individuals' economic preferences to the more capitalist regime.

With respect to social preferences, we see that students reduce the importance they place on their role with respect to others. One goal or value that we consider is the importance of performing good deeds that “help people” in addition to the importance of being “valued by peers” or the importance of “studying because it is a duty as a student.” From Panel B of Table 5, we see that all decrease (by -0.19, -0.17, and -0.11 of a standard deviation, respectively), although “duty as a student” does not decrease significantly. It is often discussed whether capitalist societies foster more individualistic traits. Our findings are consistent with the hypothesis that they do.

With respect to political preferences, we observe a convergence to the more democratic regime. When asked about the importance of supporting socialism (or the GDR) and supporting, or being part of, a collective, there is a sharp decline just after Reunification. In the short period following Reunification, these decrease by 0.51 and 0.86 of a standard deviation, respectively (see Table 5,

Panel C).

In Table 6, we link the change in aspirations to the change in perceived returns and in economic, social and political preferences. We find that the perceived return to schooling is of particular importance, as are changes in social and political preferences. We find that educational aspirations increase more among those who believed education had become more important for future earnings, suggesting that a change in perceived returns to schooling was an important driver for the increase in educational aspirations and investments. Similarly, aspirations increase more among those whose social and political preferences reflect more individualism – converging more to Western attitudes.

This section highlights that the politico-economic regime change led to an important adjustment in perceptions of returns and preferences, and for these young individuals, adaptation occurred soon thereafter. Our results are consistent with these changes being a contributing factor for why educational aspirations increase (and are later translated into increased attainment). There is a convergence in behavior and tastes to the more capitalist society, which appears to have contributed to a quick convergence in terms of educational aspirations and actual educational attainment.

6.3 Psychosocial Functioning

While the evidence in economics remains limited, there is growing evidence that psychological phenomena affect economic decisions – in particular, in the context of poverty – acting as an “internal” constraint in decision-making (see, for instance, Bertrand, Mullainathan, and Shafir, 2004; Duflo, 2012). Psychological well-being might also reflect an individual’s perception of uncertainty. An increase in (perceived) uncertainty might, for instance, lead people to increase their educational aspirations as an insurance device (see, for example, Heckman, Lochner and Todd, 2006) on the role of uncertainty in educational decisions).

In this section, we examine the effect of the economic and political regime change accompanying Reunification on youths’ anger, anxiety and self-confidence shortly after and then link the observed changes in these measures to changes in their educational aspirations. Students are repeatedly asked (before and after Reunification) about their psychological well-being with respect to anger, anxiety and self-confidence (see Section 3 for variable definitions and summary statistics).

Using the same identification strategy as in the previous section, we show, in Table 7, that comparing the period prior to Reunification with the period afterwards, and using the older cohort as a counterfactual trend for the younger cohort, Reunification impacted students’ psychosocial functioning. In the baseline, there was no difference across cohorts or –in the case of anxiety– the younger cohort was even less anxious. After Reunification, students of the young cohort became angrier (0.40 standard deviation) and more anxious (0.42 standard deviation) as compared to the

older cohort, while self-confidence fell (-0.39 standard deviation).

Furthermore, in Table 8, we demonstrate, in the context of aspirations, the importance of changes in these psychological measures. In particular, changes in educational aspirations are significantly higher among those who become angrier and more anxious and among those who become less self-confident. While the prediction of economic theory is unclear, as discussed above, we show that measures reflecting higher perceived uncertainty are positively linked to educational aspirations, suggesting that education is perceived as insurance against the downside of increased uncertainty (such as a higher risk of unemployment).¹⁸

6.4 Constraints

Beyond changes in economic expectations, preferences and uncertainty, constraints (or the relaxation thereof) might have contributed to changes in educational aspirations. It might be that some students did not expect to obtain the Abitur, and, therefore, might not have aspired to it. We study the importance of constraints in several ways – for instance, changes in access to university, changes in educational quality, or changes in educational content. Overall, we find little evidence for these factors.

In principle, changes in access to university - or a change in the expected supply of university places - might contribute to a change in educational aspirations. To understand the importance of this potential mechanism, we focus on potentially “constrained” individuals. While the actual supply of university places did not change in the very short run, changes in the expected supply, especially among those who were more constrained under the Socialist regime, could potentially feed into one’s aspirations. We might expect a change in aspirations among these individuals following a(n) (expected) increase in the supply of education. We focus on several forms of constraints in two broad categories: (c1) ability and academic interests and (c2) regime constraints. In Table 9, we report the heterogeneity of aspiration change following Reunification, depending on whether individuals are likely to be “constrained” or “unconstrained”.

Under the GDR, access to university was based on academic performance (in addition to political ties, as we will discuss later). We might expect that low-ability students will not aspire to go to college if they do not expect to be able to attend due to constraints (even if they truly desire to go). In such a case, we would expect college aspirations to only increase among these students (or to increase by more than among high ability students). We classify individuals as “high” versus “low” ability based on their academic grades (GPA) before the regime change. Similarly, given the focus on more technical subjects at university under the GDR, we might expect that those with a stronger

¹⁸Before Reunification, East Germany had an unemployment rate of zero, while there was a substantial increase in the rate of unemployment after Reunification, in particular among less educated workers (see, e.g. Canova and Ravn, 2000; Nickell, 2006).

interest (or better performance) in non-math courses relative to math courses might increase their educational aspirations with the expectation that more non-math courses would be available.¹⁹ In columns (1) to (4) of Table 9, we report the heterogeneity analysis and show that there is no differential effect of Reunification on educational aspirations of the potentially “constrained” and “unconstrained”.

In Table 9, columns (5) to (7), we examine how two other potential regime constraints could differentially impact students’ aspirations. First, colleges gave priority access to those with strong political ties and commitment. Thus, we might expect a greater increase in aspirations among the non-party members. However, we do not find evidence for this (see Table 9, columns (5) and (6)). Since the majority of students were members of the youth organization, we also split the sample into those with (leading) functions in the youth organization versus those without functions and find very similar changes in aspirations. Finally, although long abolished, the GDR had initially given priority in university access to individuals from less-educated families. To assess whether this still held some potential constraint, we classify students based on whether their mother obtained the Abitur. In column (7), we show that aspirations did not change differentially among these students either.

Finally, educational content or quality might have changed, leading (or contributing) to an increase in educational aspirations. While educational content became less focused on socialism (Fuchs-Schündeln and Masella, 2016; Cantoni et al., 2017), the timing of our analysis shows that –in our context– differences in years of socialism are not responsible for changes in (short-run) educational aspirations. In our study, the pre-period that measures educational aspirations for the younger cohort was in early 1990, i.e., after the fall of the Berlin Wall (but before Reunification). Socialist teaching had already been discontinued by then. To provide further evidence on the role of changes in content or education quality for the observed (short-run) changes in aspirations, we investigate the effect of Reunification on students’ grades relying on a DID approach as discussed in Section 4.1. Online Appendix Table A.3 shows that Reunification did not have an effect on short-run GPA (and there are no differential pre-trends for the old and young cohorts). These results suggest that there were no noticeable improvements in content or quality that could explain the increase in students’ aspirations in response to Reunification.

¹⁹For example, Fuchs-Schündeln and Masella (2016) highlight that the teaching of mathematics was of similar importance in East and West. However, GDR schools devoted significantly more time to natural sciences, while FRG schools devoted more time to “softer” subjects, such as foreign languages, arts and music. Ammermueller and Weber (2005) compare the distribution of subjects in tertiary education in East and West Germany and find that the main difference is the share of graduates in engineering, which is approximately 30 percent in the East compared to 22 percent in the West.

7 Conclusion

Recent political turbulence in the US and Europe has raised a number of policy-relevant questions about inequality and globalization at the macro, as well as micro, level. Increased economic uncertainty at the international level coupled with changes in leadership are expected to influence policy preferences and direction. How do political regimes shape individuals' aspirations? Does the political environment influence attitudes? Do these attitudes feed back into the choices made by an individual? Analyzing changes in political regimes is typically complicated by the endogeneity of the process.

Using the natural experiment of German Reunification, we provide causal evidence in this paper that a change in political and economic regime can have an important effect on educational aspirations and that these have a lasting impact on students' outcomes. While it is often difficult to understand the importance of the different components that enter into educational investment decisions, our study allows for a detailed investigation into a wide spectrum of factors. To understand why educational aspirations changed so dramatically soon after the regime change, we explore various channels: changes in expected returns to education; economic, social and political preferences; psychosocial wellbeing; and changes in constraints.

Convergence to the West implied an increase in the returns to education. We show that students in grade 8 at the time of Reunification very quickly understood the increased importance of a university degree for future earnings. This change in perceived returns was strongly linked to changes in educational aspirations, which ultimately led to an increase in longer-run educational investments. Beyond the changes in returns, we identify changes in educational aspirations that are linked to changes in economic, social and political preferences. While it is typically difficult to measure preferences and values, especially in the short periods around a regime change, our paper sheds light on how these evolve and adapt to those of the capitalist and democratic West, as well as their links to changes in aspirations. Finally, we show that "internal" wellbeing is strongly linked to one's "external" environment. We find that the regime change had a substantial impact on individuals' levels of anxiety, anger and self-confidence, which, in turn, affected their aspirations. Overall, the results highlight the importance of perceived returns as well as preferences and psychological measures, thereby shedding light on the process of how aspirations are formed as well as their role in the educational decision-making process.

More generally, our study highlights how a political landscape influences educational and professional decisions, especially of the young, with long-lasting and irreversible consequences. It identifies the long-term effects of politics and policies that politicians may not incorporate into their decisions, suggesting implications that are delayed by many years.

References

- [1] Abramitzky, R., and Lavy, V. 2014. "How Responsive Is Investment in Schooling to Changes in Redistribution Policies and in Returns?" *Econometrica*, 82(4), 1241-1272.
- [2] Alesina, A. and Fuchs-Schündeln, N. 2007. "Good-bye Lenin (or Not?): the Effect of Communism on People's Preferences," *American Economic Review*, 97(4), 1507-1528.
- [3] Ammermueller, A. and A. M. Weber. 2005. "Educational Attainment and Returns to Education in Germany - An Analysis by Subject of Degree, Gender and Region." ZEW DP 05-17.
- [4] Anweiler, O., Mitter, W., Peisert, H., Schaefer, H.-P., Stratenwerth, W. 1990. "Vergleich von Bildung und Erziehung in der BRD und in der DDR. Verlag Wissenschaft und Politik, Koeln.
- [5] Baker, G., Gibbs, M. and Holmstrom, B. 1994. "The Wage Policy of a Firm." *Quarterly Journal of Economics*, 109: 881-919.
- [6] Baske, Siegfried. 1990. "Die erweiterte Oberschule in der DDR." In *Vergleich von Bildung und Erziehung in der BRD und in der DDR*, edited by Bundesministerium für innerdeutsche Beziehungen. Cologne, Germany: Verlag Wissenschaft und Politik.
- [7] Beaman, L., Duflo, E., Pande, R. and Topalov, P. 2012. "Female Leadership Raises Aspirations and Educational Attainment for Girls: A Policy Experiment in India." *Science* 335.
- [8] Below, S., Powell, J. and Roberts, L. 2013. "Educational Systems and Rising Inequality: Eastern Germany after Unification," *Sociology of Education* 86(4), 362-375.
- [9] Bertrand, M., Duflo, E., and S. Mullainathan. 2004. "How Much Should We Trust Differences-in-Differences Estimates?" *Quarterly Journal of Economics*.
- [10] Bertrand, M., Mullainathan, S. and E. Shafir. 2004. "A Behavioral-Economics View of Poverty." *American Economic Review* 94 (2), 419-23.
- [11] Besley, T. 2016. "Aspirations and the political economy of inequality," *Oxford Economic Papers*, 69 (1), 1-35.
- [12] Burchardi, K. and T. Hassan, 2013. "The Economic Impact of Social Ties: Evidence from German Reunification," *Quarterly Journal of Economics*, 128 (2013), 1219-1271.
- [13] Bursztyjn, L. and D. Cantoni, 2016. "A Tear in the Iron Curtain: The Impact of Western Television on Consumption Behavior," *Review of Economics and Statistics*, 98 (1), 25-41.

- [14] Canova, F. and M. Ravn (2000) “The Macroeconomic Effects of German Unification: Real Adjustments and the Welfare State”, *Review of Economic Dynamics*, 3, 423-460.
- [15] Cantoni, D., Chen, Y., Yang, D., Yuchtman, N. and Zhang, Y. J. 2017. “Curriculum and Ideology.” *Journal of Political Economy*, 125(2), 338-392.
- [16] Carlana, M., La Ferrara, E. and Pinotti, P. 2017. “Goals and Gaps: Educational Careers of Immigrant Children.” CEPR Discussion Paper No. 12538.
- [17] Chevalier, A. and O. Marie, 2017. “Economic Uncertainty, Parental Selection, and Children’s Educational Outcomes”, *Journal of Political Economy*, 125, 393-430.
- [18] Chiapa, C., Garrido, J. L. and Prina, S. 2012. “The effect of social programs and exposure to professionals on the educational aspirations of the poor”, *Economics of Education Review* 31, 778-798.
- [19] Cunha, F. and J.J. Heckman. 2008. “Formulating, Identifying, and Estimating the Technology for the Formation of Skills,” *Journal of Human Resources*, 43(4), 738-782.
- [20] Cunha, F., J.J. Heckman and S. M. Schennach. 2010. “Estimating the Technology of Cognitive and Non-Cognitive Skill Formation,” *Econometrica*, 78(3), 883-931.
- [21] Dominitz, J. and Manski, C. 1997. “Perceptions of Economic Insecurity: Evidence from the Survey of Economic Expectations,” *Public Opinion Quarterly*, 61(2), 261-287.
- [22] Duflo, E., 2012. “Human Values and the Design of the Fight against Poverty,” Tanner Lecture.
- [23] Falk, A.; A. Becker; T. Dohmen; B. Enke; D. Huffman and U. Sunde. 2018. “Global Evidence on Economic Preferences”, *The Quarterly Journal of Economics*, 133 (4), 1645-1692.
- [24] Fernández, R. 2007. “Women, Work and Culture.” *Journal of the European Economic Association* 24(4), 329-30.
- [25] Fernández, R. and Fogli, A. 2006. “Fertility: The Role of Culture and Family Experience.” *Journal of the European Economic Association* 4(2-3): 552-61.
- [26] Fernández, R. and Fogli, A. 2009. “Culture: An Empirical Investigation of Beliefs, Work, and Fertility.” *American Economic Journal: Macroeconomics* 1(1), 146-77.
- [27] Figlio, D; P. Giuliano; U. Ozek and P. Sapienza, 2019. “Long Term Orientation and Educational Performance.” *American Economic Journal: Economic Policy*.

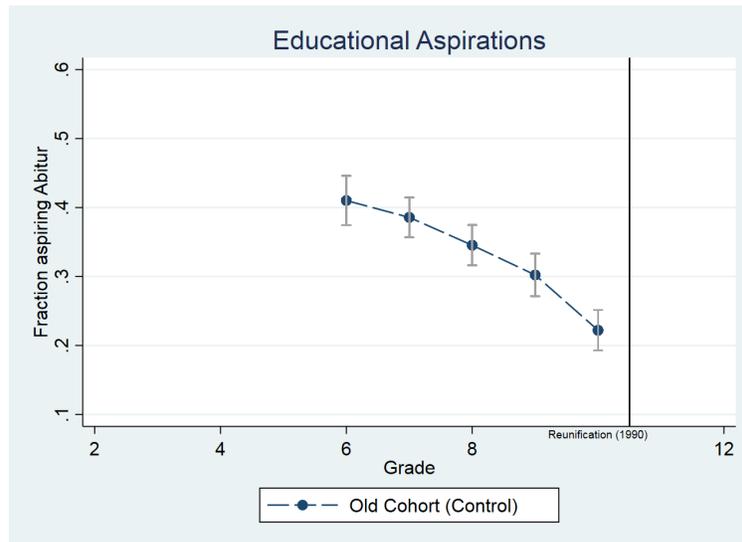
- [28] Friedrich, W. "Zur inhaltlichen und methodischen Forschung am ZIJ Leipzig," In: *Jugend im Osten (Youth in the East)*, edited by Brislinger, Hausstein, Riedel, 1997.
- [29] Fuchs-Schündeln, N. and Schündeln, M. 2005. "Precautionary Savings and Self-Selection: Evidence for the German Reunification Experiment," *Quarterly Journal of Economics*, 120.
- [30] Fuchs-Schündeln, N. 2008. "The Response of Household Saving to the Large Shock of German Reunification," *American Economic Review*, 98, 1798-1828.
- [31] Fuchs-Schündeln, N. and Masella, P. 2016. "Long-Lasting Effects of Socialist Education." *The Review of Economics and Statistics*, 98(3), 428-441
- [32] Genicot, G. and Ray, D. 2017. "Aspirations and Inequality," *Econometrica*, 85(2).
- [33] Goebel, J.; M. Grabka, S. Liebig, M. Kroh, D. Richter, C. Schroeder and J. Schupp. 2018. "The German Socio-Economic Panel Study (SOEP)." *Journal of Economics and Statistics*.
- [34] Guyon, N. and Hulliary, E. 2019. "Biased Aspirations and Social Inequality at School: Evidence from French Teenagers." *LIEPP Working Paper no. 44*.
- [35] Heckman, J. J., L. J. Lochner, and P. E. Todd. 2006. "Earnings Functions, Rates of Return and Treatment Effects: The Mincer Equation and Beyond." In *Handbook of the Economics of Education*, Vol. 1, ed. Erik Hanushek and Finis Welch, 307-458. Amsterdam: Elsevier.
- [36] Heckman, J.J., R. Pinto, and P. Savelyev. 2013. "Understanding the mechanisms through which an influential early childhood program boosted adult outcomes." *American Economic Review* 103 (6), 2052-86.
- [37] Hunt, J., 2008. "The Economics of German Unification: an Introduction." In: Durlauf, S. N., Blume, L. E. (Eds.), *The New Palgrave Dictionary of Economics*. Palgrave Macmillan.
- [38] Jensen, R. 2010. "The (Perceived) Returns to Education and the Demand for Schooling," *The Quarterly Journal of Economics*, 125(2), 515-548.
- [39] Karandikar, R., Mookherjee, D., Ray, D., and Vega-Redondo, F. 1998 "Evolving Aspirations and Cooperation," *Journal of Economic Theory*, 80, 292-331.
- [40] Krueger, A. B. and Pischke., J-S. 1995. "A Comparative Analysis of East and West German Labor Markets: Before and After Unification," in R. Freeman and L. Katz, eds., "Differences and changes in wage structures." University of Chicago Press, 405-45.
- [41] Kuhnke, R. 1997 "Anlage und Weiterfuehrung der dritten Laengsschnittsstudie," In: *Jugend im Osten (Youth in the East)* edited by Brislinger, Hausstein, Riedel.

- [42] Macours, K. and Vakis, R. 2019. "Sustaining Impacts When Transfers End: Women Leaders, Aspirations and Investment in Children." in Barret, CB, MR Carter and JP Chavas, *The economics of poverty traps*, NBER.
- [43] Margalit, Y. and M. Shayo, 2018. "How Do Markets Shape Preferences? Evidence from a Field Experiment." *American Journal of Political Science*, forthcoming.
- [44] Mintrop, H. and Weiler, H. 1994. "The Relationship between Educational Policy and Practice: The Reconstitution of the College-Preparatory Gymnasium in East Germany," *Harvard Educational Review*, 64(3), 247-278.
- [45] Mullainathan, S. 2005. "Development Economics through the Lens of Psychology." Paper presented at the 2005 Annual World Bank Conference in Development Economics.
- [46] Nickell, S. (1996). "The Low Skill, Low-Pay Problem: Lessons from Germany for Britain and the US," *Policy Studies* 17 1,7-23.
- [47] Ray, D. 1998. "Development economics," Princeton University Press.
- [48] Ray, D. 2006. "Aspirations, poverty, and economic change," *Understanding Poverty*.
- [49] Redding S, Sturm D. 2008. "The Cost of Remoteness: Evidence from German Division and Reunification," *American Economic Review*, 98 (5), 1766-1797.
- [50] Rizzica, L. 2019. "Raising Aspirations and Higher Education: Evidence from the UK's Widening Participation Policy," *Journal of Labor Economics*.
- [51] Selten, R. 1998. "Aspiration Adaptation Theory," *Journal of Mathematical Psychology* 42.
- [52] Shayo, M. and S. Jha, 2019. "Valuing Peace: The Effects of Financial Market Exposure on Votes and Political Attitudes," *Econometrica*.
- [53] Simon, H. A., 1957. "Models of Man; Social and Rational," John Willey and Sons.
- [54] Stinebrickner, S and Stinebrickner, T. 2014. "A Major in Science? Initial Beliefs and Final Outcomes for College Major and Dropout," *Review of Economic Studies*, 81(1), 426-472.
- [55] Weishaupt, H.; Zedler, P. 1994 "Aspekte der aktuellen Schulentwicklung in den neuen Laendern" In: *Jahrbuch der Schulentwicklung*, Weinheim: Juventa.

Appendix

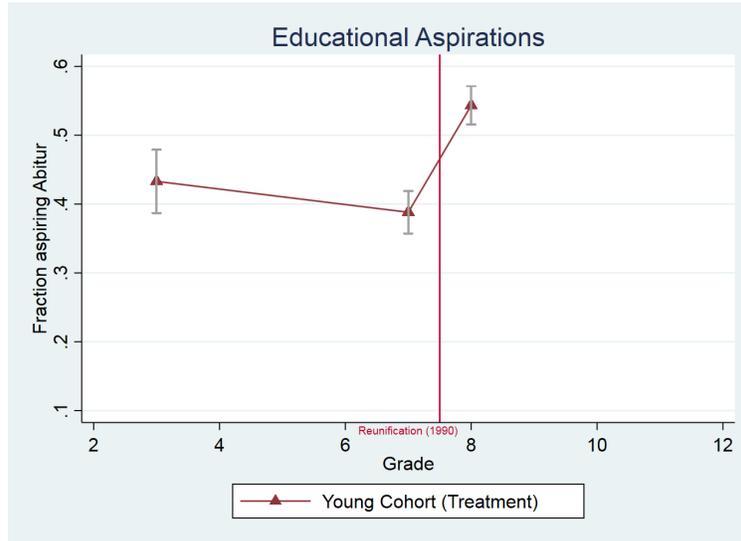
Figures and Tables

Figure 1: Evolution of Aspirations: Older Cohort



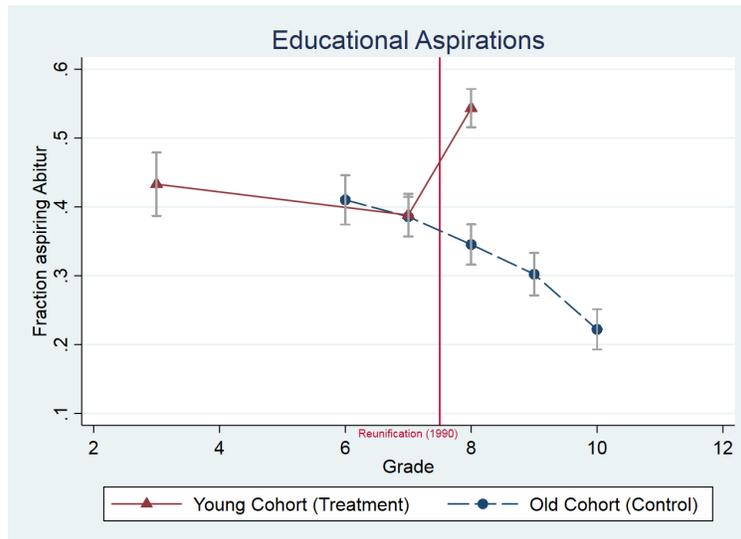
Notes: The figure displays the older cohort's aspirations to acquire the Abitur degree (college entrance certificate) and how they evolve over time, i.e. when youths are in different grades. The dots represent the average fraction of youths aspiring the Abitur in the different grades and the gray bars represent the 95% confidence intervals. Reunification took place in October 1990, when youths of the old cohort had just started grade 11. Aspirations were elicited in grades 6 to 10 for the old cohort.

Figure 2: Evolution of Aspirations: Younger Cohort



Notes: The figure displays the younger cohort's aspirations to acquire the Abitur degree (college entrance certificate) and how they evolve over time, i.e. when youths are in different grades. The dots represent the average fraction of youths aspiring the Abitur in the different grades and the gray bars represent the 95% confidence intervals. Reunification took place in October 1990, when youths of the young cohort had just started grade 8. Aspirations were elicited in grades 3, 7 and 8.

Figure 3: The Effect of Reunification on Aspirations



Notes: The figure displays the younger and older cohort's aspirations to acquire the Abitur degree (college entrance certificate) and how they evolve over time, i.e. when youths are in different grades. The dots represent the average fraction of youths aspiring the Abitur in the different grades and the gray bars represent the 95% confidence intervals.

Table 1: Descriptive Statistics

(a) Variables - Main Analysis

	Question	Answers	Mean	Std.Dev.	N.Ind.
<i>Educ. Aspirations</i>	Do you aspire to obtain the Abitur?	0 1	0.4231	0.4941	2893
<i>Perceived Returns</i>	How important is education for later earnings?	1 4	3.1071	0.8123	3134
<i>Economic Prefs.</i>					
Afford Luxury	How important is it to be able to afford some luxury?	1 4	3.0398	0.8309	3134
Enjoy life	How important is it to enjoy life as much as possible?	1 4	3.0860	0.8045	3134
<i>Social Prefs.</i>					
Good Deed	How important is it to do good/important deeds?	1 4	2.9547	0.7985	3134
Valued by Peers	How important is it to be valued by peers?	1 4	2.4576	0.8134	3134
Duty as Student	Motivation for studying: duty as a student.	1 4	2.8349	0.8586	3134
<i>Political Prefs.</i>					
Socialism	How important is it to support socialism?	1 4	2.4898	0.8886	3134
Collective	How important is it to support/be part of the collective?	1 4	3.2280	0.6687	3134
<i>Psych. Measures</i>					
Anger	Combined score.		-0.0013	1.3777	3106
Anxiety	Combined score.		-0.0045	1.7508	3106
Self-Confidence	Question on self-confidence.	1 4	3.3008	0.7669	3106

(b) Variables - Heterogeneity Analysis

	Question	Answers	Mean	Std.Dev.	N.Ind.
<i>Academic Ability/Interests</i>					
Acad. Performance	GPA of Math and German.	1 5	3.6773	0.8436	2660
Relative Obj. Performance	Relative grades German/Math		0.9398	0.3481	1909
Relative Subj. Performance	Own evaluation of relative performance German/Math		1.1224	0.4832	1909
Relative Acad. Interest	Relative interest German/Math		1.3671	0.7314	1909
<i>Regime-Relevant Variables</i>					
FDJ Member	Member of youth organization of communist party	0 1	0.9648	0.1843	1929
FDJ Member with func.	Member with function	0 1	0.4434	0.4969	1929
Abitur Mother	Mother completed Abitur	0 1	0.1817	0.3857	1125

Notes: The psychological measures anger and anxiety are created using factor analysis based on different items ranging from 1 to 4 (for further details see Section 3). In the analysis all categorical variables that are not binary are used as standardized scores.

Table 2: Short-Run Analysis: The Effect of Reunification on Educational Aspirations

	Educational Aspirations			
	Main		Placebo Test (Pre-Trend)	
	[1]	[2]	[3]	[4]
Cohort x Grade (Reunification)	0.193***	0.221***	-0.010	0.005
	[0.022]	[0.023]	[0.029]	[0.031]
Cohort	0.005		0.015	
	[0.022]		[0.027]	
Grade	-0.040***	-0.045***	-0.021	0.049***
	[0.014]	[0.013]	[0.018]	[0.018]
Constant	0.386***	0.383***	0.407***	0.368***
	[0.015]	[0.006]	[0.018]	[0.009]
N Observations	4309	4309	3413	3413
N Individuals	2893	2893	2362	2362
Individual FE	NO	YES	NO	YES
R-squared	0.025	0.071	0.001	0.011

Notes: Standard errors in brackets. “Cohort” takes value one (zero) if in the younger (older) cohort. “Grade” takes value one if in academic grade 8 (1987 for older and 1991 for younger) and value zero if in grade 7 (1986 for older and 1990 for younger cohort). “Cohort x Grade” is the “Reunification treatment”, which indicates how the outcome variable has changed for the younger cohort after versus before Reunification (in January 1991 versus January 1990). The placebo test compares the trends in aspirations prior to grade 7.

Table 3: Long-Run Analysis: Abitur Completion and Educational Aspirations

	Abitur Completion			
	[1]	[2]	[3]	[4]
Cohort	0.331*** [0.025]	0.170*** [0.024]	0.250*** [0.033]	0.019 [0.025]
Aspiration in Grade 7	0.476*** [0.025]		0.394*** [0.035]	
Asp. Grade 7*Cohort			0.169*** [0.050]	
Aspiration in Grade 8		0.614*** [0.022]		0.445*** [0.038]
Asp. Grade 8*Cohort				0.297*** [0.046]
Constant	0.041** [0.017]	0.017 [0.016]	0.081*** [0.017]	0.086*** [0.016]
N Observations	1027	1220	1027	1220
N Individuals	1027	1220	1027	1220
R-squared	0.338	0.454	0.345	0.475

Notes: Standard errors are in brackets. Educational Aspirations are measured in grades 7 and 8, as indicated in the table, while Abitur completion is measured at age 18 (i.e. in 1992 for the older and 1995 for the younger cohort).

Table 4: Long-Run Analysis (External Validity): The Effect of the Reunification on Abitur Completion

	Abitur Completion	
	Main [1]	Placebo Test (Pre-Trend) [2]
Cohort x East (Reunification)	0.088* [0.048]	-0.035 [0.045]
East Germany	-0.126*** [0.033]	-0.091*** [0.032]
Cohort	-0.001 [0.032]	0.064** [0.029]
Constant	0.308*** [0.021]	0.244*** [0.021]
N Observations	1378	1435
N Individuals	1378	1435
R-squared	0.012	0.020

Notes: Standard errors in brackets. “Cohort” takes value one if in the younger cohort (i.e. youths ages 13 to 15 at Reunification for the main specification and youths ages 16 to 18 for the placebo test) and value zero if in the older cohort (i.e. youths ages 16 to 18 at Reunification for the main specification and youths ages 19 to 21 for the placebo test). “East” takes value one if individuals attend school in East Germany and value zero if they attend school in West Germany. “Cohort x East” is the “Reunification treatment”, which indicates how the outcome variable has changed for the younger cohort versus the older cohort in East Germany controlling for the difference in Abitur completion between the same cohorts in West Germany.

Table 5: Mechanisms: The Effect of Reunification on Perceived Returns and Preferences

<i>Panel A</i>	Perceived Returns		Economic Preferences			
	Earn a Lot		Afford Luxury		Enjoy Life	
	[1]	[2]	[3]	[4]	[5]	[6]
Cohort x Grade (Reunification)	0.448*** [0.053]	0.469*** [0.062]	0.125** [0.053]	0.121* [0.065]	0.342*** [0.055]	0.334*** [0.069]
Cohort	-0.174*** [0.045]		-0.144*** [0.046]		-0.148*** [0.045]	
Grade	-0.116*** [0.038]	-0.103*** [0.040]	0.200*** [0.039]	0.161*** [0.041]	-0.086** [0.040]	-0.120*** [0.044]
N Observations	4500	4500	4500	4500	4500	4500
N Individuals	3134	3134	3134	3134	3134	3134
Individual FE	NO	YES	NO	YES	NO	YES
R-squared	0.017	0.042	0.020	0.032	0.010	0.016
<i>Panel B</i>	Social Preferences					
	Good/Important Deed		Valued by Peers		Duty as Student	
	[1]	[2]	[3]	[4]	[5]	[6]
Cohort x Grade (Reunification)	-0.028 [0.054]	-0.189*** [0.065]	-0.141*** [0.053]	-0.174*** [0.064]	-0.086 [0.055]	-0.114 [0.070]
Cohort	0.012 [0.044]		-0.156*** [0.044]		-0.209*** [0.042]	
Grade	-0.351*** [0.040]	-0.339*** [0.043]	-0.184*** [0.037]	-0.164*** [0.040]	-0.364*** [0.040]	-0.349*** [0.044]
N Observations	4500	4500	4500	4500	4500	4500
N Individuals	3134	3134	3134	3134	3134	3134
Individual FE	NO	YES	NO	YES	NO	YES
R-squared	0.034	0.108	0.031	0.042	0.059	0.090
<i>Panel C</i>	Political Preferences					
	Collective		Socialism			
	[1]	[2]	[3]	[4]		
Cohort x Grade (Reunification)	-0.525*** [0.055]	-0.509*** [0.070]	-0.949*** [0.050]	-0.863*** [0.064]		
Cohort	0.095** [0.045]		-0.018 [0.042]			
Grade	0.076* [0.040]	0.073* [0.043]	0.014 [0.036]	0.012 [0.039]		
N Observations	4500	4500	4500	4500		
N Individuals	3134	3134	3134	3134		
Individual FE	NO	YES	NO	YES		
R-squared	0.035	0.045	0.179	0.172		

Notes: Standard errors are in brackets. “Cohort” takes value one (zero) if in the younger (older) cohort. “Grade” takes value one if in grade 8 (1987 for older and 1991 for younger) and value zero if in grade 6 (1985 for older and 1989 for younger cohort). “Cohort x Grade” is the “Reunification treatment”, which indicates how the outcome variable has changed for the younger cohort after versus before Reunification (in 1991 versus 1989) controlling for how the older cohort has evolved over the same grades.

Table 6: Link between Change in Aspirations and Changes in Returns and Preferences

Link to Change in	Change in Educational Aspirations							
	Perc Returns [1]	Afford Luxury [2]	Enjoy Life [3]	Good Deed [4]	Valued Peer [5]	Duty Student [6]	Collective [7]	Socialism [8]
	0.076*** [0.028]	0.011 [0.031]	0.036 [0.029]	0.011 [0.030]	-0.021 [0.030]	-0.068** [0.029]	-0.093*** [0.030]	-0.138*** [0.030]
N Observations	1133	1133	1133	1133	1133	1133	1133	1133
N Individuals	1133	1133	1133	1133	1133	1133	1133	1133
R-squared	0.006	0.000	0.001	0.000	0.000	0.005	0.008	0.018

Notes: Standard errors in brackets. The table relates the changes in educational aspirations between grade 7 and grade 8 (for younger and older cohort) with the changes in perceived returns and in terms of economic, social and political preferences.

Table 7: Mechanisms: The Effect of Reunification on Psychological Measures

	Psychological Measures					
	Anger		Anxiety		Self-Confidence	
	[1]	[2]	[3]	[4]	[5]	[6]
Cohort x Grade (Reunification)	0.433*** [0.050]	0.403*** [0.059]	0.436*** [0.050]	0.418*** [0.057]	-0.430*** [0.052]	-0.394*** [0.061]
Cohort	-0.076* [0.042]		-0.048 [0.044]		0.021 [0.041]	
Grade	-0.128*** [0.033]	-0.121*** [0.034]	-0.201*** [0.034]	-0.185*** [0.034]	0.027 [0.035]	0.006 [0.036]
Constant	-0.019 [0.029]	-0.055*** [0.015]	-0.000 [0.030]	-0.028* [0.015]	0.097*** [0.028]	0.108*** [0.016]
N Observations	4564	4564	4564	4564	4564	4564
N Individuals	3106	3106	3106	3106	3106	3106
Individual FE	NO	YES	NO	YES	NO	YES
R-squared	0.019	0.034	0.019	0.037	0.032	0.045

Notes: Standard errors are in brackets. “Cohort” takes value one (zero) if in the younger (older) cohort. “Grade” takes value one if in grade 8 (1987 for older and 1991 for younger) and value zero if in grade 6 (1985 for older and 1989 for younger cohort). “Cohort x Grade” is the “Reunification treatment”, which indicates how the outcome variable has changed for the younger cohort after versus before Reunification (in 1991 versus 1989) controlling for how the older cohort has evolved over the same grades.

Table 8: Link between Changes in Aspirations and Changes in Psychological Measures

Link to Change in	Change in Educational Aspirations		
	Anger [1]	Anger [2]	Self-Confidence [3]
	0.092*** [0.032]	0.054* [0.031]	-0.072** [0.032]
N Observations	1133	1133	1133
N Individuals	1133	1133	1133
R-squared	0.007	0.003	0.005

Notes: Standard errors are in brackets. The table relates the changes in educational aspirations between grade 7 and grade 8 (for younger and older cohort) with the changes in the psychological measures: anger, anxiety and self-confidence.

Table 9: Heterogeneous Effects of Reunification on Educational Aspirations: Constraints

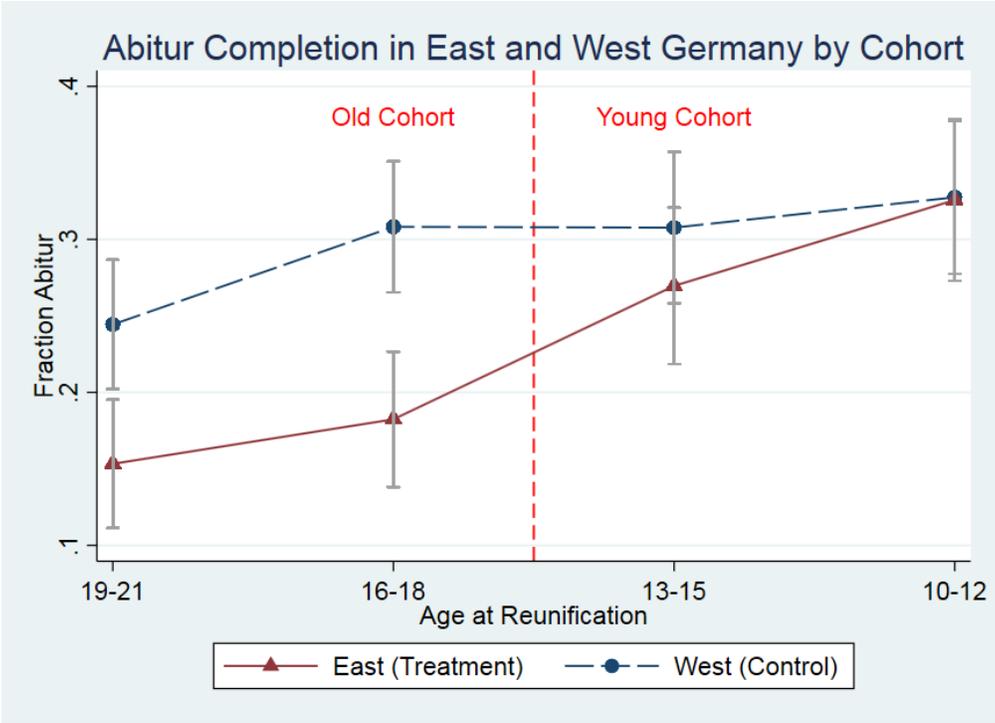
	Educational Aspirations				By Regime Constraints	
	By Ability/Interest Constraints	Rel.		Membership of	Mother	
	GPA	Relative Performance objective German vs. Math	subjective German vs. Math	Interest German vs. Math	youth organization of communist party	Abitur
	[1]	[2]	[3]	[4]	[5]	[6]
						[7]
Triple Interactions: Cohort x Grade						
x GPA above Median	-0.064 [0.055]					
x Relative Obj. Perf. ab. Med.	0.020 [0.090]					
x Relative Subj. Perf. ab. Med.			-0.024 [0.057]			
x Rel. Acad. Interests ab. Med.				0.033 [0.055]		
x FDJ Member					0.259 [0.160]	
x FDJ Member with func.						-0.014 [0.054]
x Abitur Mother						-0.096 [0.093]
Cohort x Grade (Reunification)	0.247*** [0.034]	0.209** [0.086]	0.242*** [0.045]	0.209*** [0.040]	-0.017 [0.157]	0.235*** [0.037]
N Observations	3771	3009	3009	3009	3040	3040
N Individual	2660	1909	1909	1909	1929	1929
Individual FE	YES	YES	YES	YES	YES	YES
R-squared	0.073	0.070	0.071	0.071	0.079	0.071

Notes: Standard errors are in brackets. "Cohort" takes value one (zero) if in the younger (older) cohort. "Grade" takes value one if in grade 8 (1987 for older and 1991 for younger) and value zero if in grade 7 (1986 for older and 1990 for younger cohort). "Cohort x Grade" is the "Reunification treatment", which indicates how the outcome variable has changed for the younger cohort after versus before Reunification (in January 1991 versus January 1990).

ONLINE APPENDIX – For Online Publication

A. Figures and Tables

Figure A.1: External Validity: The Effect of Reunification on Abitur Completion



Notes: The figure displays the evolution of the likelihood of Abitur completion across different cohorts in West and East Germany. The dots represent the average fraction of individuals with completed Abitur for different cohorts (by age at Reunification) in West and East Germany and the gray bars represent the 95

Table A.1: Robustness: The Effect of the Reunification on Educational Aspirations

	Educational Aspirations			
	Main		Placebo Test (Pre-Trend)	
	[1]	[2]	[3]	[4]
Cohort x Grade (Reunification)	0.214*** [0.048]	0.154*** [0.040]	-0.044 [0.065]	-0.003 [0.072]
Cohort	-0.102** [0.048]		-0.058 [0.062]	
Grade	-0.057*** [0.020]	-0.057*** [0.020]	-0.010 [0.027]	0.025 [0.026]
Constant	0.473*** [0.023]	0.455*** [0.009]	0.483*** [0.028]	0.444*** [0.015]
N Observations	1227	1227	993	993
N Individuals	700	700	625	625
Individual FE	NO	YES	NO	YES
R-squared	0.009	0.024	0.006	0.003

Notes: Standard errors in brackets. “Cohort” takes value one (zero) if in the younger (older) cohort. “Grade” takes value one if in grade 8 (1987 for older and 1991 for younger) and value zero if in grade 7 (1986 for older and 1990 for younger cohort). “Cohort x Grade” is the “Reunification treatment”, which indicates how the outcome variable has changed for the younger cohort after versus before Reunification (in 1991 versus 1990). The placebo test compares the trends in aspirations prior to grade 7.

Table A.2: Robustness - Abitur Completion and Educational Aspirations

	Abitur Completion			
	[1]	[2]	[3]	[4]
Cohort	0.369*** [0.031]	0.227*** [0.033]	0.266*** [0.048]	0.035 [0.043]
Aspiration in Grade 7	0.476*** [0.030]		0.405*** [0.038]	
Asp. Grade 7*Cohort			0.204*** [0.061]	
Aspiration in Grade 8		0.546*** [0.032]		0.452*** [0.040]
Asp. Grade 8*Cohort				0.306*** [0.061]
Constant	0.045** [0.018]	0.044** [0.017]	0.079*** [0.017]	0.083*** [0.017]
N Observations	700	700	700	700
N Individuals	700	700	700	700
R-squared	0.381	0.428	0.390	0.447

Notes: Standard errors are in brackets. Educational Aspirations are measured in grades 7 and 8, as indicated in the table, while Abitur completion is measured at age 18 (i.e. in 1992 for the older and 1995 for the younger cohort).

Table A.3: The Effect of Reunification on Academic Performance

	GPA (Math and German)			
	Pre-Trend		Main	
	[1]	[2]	[3]	[4]
Cohort x Grade (Reunification)	0.018 [0.032]	0.028 [0.022]	-0.041 [0.047]	-0.003 [0.038]
Cohort	0.001 [0.040]		0.038 [0.047]	
Grade	-0.094*** [0.021]	-0.099*** [0.015]	-0.144*** [0.029]	-0.188*** [0.021]
Constant	0.044 [0.028]	0.046*** [0.005]	0.122*** [0.032]	0.154*** [0.011]
N Observations	4607	4607	3771	3771
N Individuals	2645	2645	2660	2660
Individual FE	NO	YES	NO	YES
R-squared	0.002	0.032	0.007	0.094

Notes: Standard errors are in brackets. “Cohort” takes value one (zero) if in the younger (older) cohort. “Grade” takes value one if in grade 8 (1987 for older and 1991 for younger) and value zero if in grade 6 (1985 for older and 1989 for younger cohort). “Cohort x Grade” is the “Reunification treatment”, which indicates how the outcome variable has changed for the younger cohort after versus before Reunification (in 1991 versus 1989) controlling for how the older cohort has evolved over the same grades (i.e. from grade 6 to grade 8) before Reunification.