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The Impact of Remittances and Foreign Aid on Education in Iraq

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Abstract

The developmental impact of remittances and foreign aid has attracted the attention of researchers and policy-makers alike. Many studies have been devoted to the comparative effect of different forms of international capital flows on economic growth and other developmental outcomes. Contributing to this literature, this study considers the relative impact of remittances and foreign assistance on micro-level education outcomes in a conflict-affected country using newly released data. Employing a difference-in-differences approach in a case study of Iraq, the investigation assesses the contributions of, on the one hand, remittances and, on the other hand, two forms of foreign aid on the probability of continuing in intermediate education. Using data from the Iraq Household Socio-Economic Survey (IHSES), it finds support for a positive causal impact of remittances. However, it detects an unexpected negative causal effect of foreign aid received directly by households on the probability of continued enrollment beyond primary education. The findings further indicate that remittances are more effective at reaching children risking dropping out of school. Furthermore, analysis of georeferenced education aid projects from the AidData initiative fails to confirm any statistically significant effect on continued school participation. Hence, by implication, the study concludes that, in the Iraqi context, encouragement of remittances has the potential to be the most effective means of assisting in human capital formation. Nonetheless, additional comparative studies of remittances and foreign aid are required in order to establish their importance for education in Iraq and other conflict-affected states.

Keywords: remittances, foreign aid, education, schooling, Iraq

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Introduction

Increasing globalization has strengthened the interest in the developmental impacts of international capital flows, including remittances, official development assistance (ODA) and foreign direct investments (FDI), in developing countries. Nevertheless, although the relative effect of these financial flows on economic growth has previously attracted attention in research (e.g. Benmamoun & Lehnert 2013, Driffield & Jones 2013, Anwar & Cooray 2015), the evidence presented for their comparative impact on education is to date scarce. While cross-country evidence has been introduced (Cooray, forthcoming), micro-level education outcomes remain, to the best of my knowledge, unexplored in this respect.

Remittances may encourage education through the income effect, thus working on the demand side. On the other hand, foreign aid has the ability to affect either the demand or supply of education depending on whether it targets households directly or takes the form of assistance projects, such as building a new school. Thus, this study considers both measures, utilizing newly released data. The purpose of this thesis is to enhance the understanding of the developmental aspects of, on the one hand, remittances and, on the other hand, two forms of foreign aid in terms of their role in education. Consequently, I combine several strands of research, in particular economics of migration, evaluation of aid effectiveness, and economics of education. To address the outlined purpose, I employ a difference-in-differences approach to assess the probability of continued schooling after the primary level, i.e. in intermediate education, in a case study of Iraq.

The importance of education relies on its effect on the stock of human capital and positive association with economic development. According to endogenous growth theory (e.g. Romer 1990, Lucas 1988), human capital is crucial for economic growth. Hence, by contributing to a favorable environment for innovation and scientific discovery, education can raise the speed of growth of a country's economy (Hanushek 2002 p. 8). Testifying to the importance attached to education for development, achieving universal primary education for both genders was one of the internationally agreed Millennium Development Goals (MDGs).

This investigation of the Iraqi context is made possible by recently published data from the Iraq Household Socio-Economic Survey (IHSES) and geocoded data on aid projects from the AidData initiative. Given its status as a fragile and conflict-affected state (Global Knowledge Partnership on Migration and Development (KNOMAD) 2015, Brannelly *et al.* 2009), Iraq is a relevant case study object. By contrast to the general improvement of primary school enrollment in developing countries since the start of the millennium, conflict-affected countries have registered an increase in out-of-school children (United Nations 2015). Donor engagement to the benefit of education may serve to promote equality, stability, tolerance, and governance (Brannelly *et al.* 2009 pp. 48–52). Likewise, given the potential for the diaspora to support their country of origin, understanding the role of remittances during and in the aftermath of war and conflict is of crucial interest. An increase in education expenditures among remittance-receiving households may contribute to the acceleration of economic growth (Adams 2005 p. 14).

The main research question addressed in this study is: what is the impact of remittances and foreign aid on enrollment in intermediate education in Iraq? My ambition is further to create a basis for future research into the effect of remittances and foreign aid on developmental outcomes in conflict-affected states.

The study is structured as follows. The next section introduces the concepts of migration, remittances, and foreign aid, as well as the Iraqi context with respect to migration, remittances, foreign aid, and education. The third section reviews the previous literature on the developmental impact of remittances and foreign assistance, the separate effects of remittances and foreign aid on education, as well as the research conducted thus far on education in Iraq. Successively, in the fourth section, I present my contributions to the current state of knowledge. The data used for the study are described in the fifth section and the method employed for the analysis is explained in section six. The seventh section presents the specifications for the empirical analysis, the results of which are reported in section eight. These findings are interpreted, together with a discussion of limitations, in the penultimate section. Finally, the last section discusses the results in light of the study's purpose as well as previous research and points to some areas for future examination.

Background

Migration, Remittances and Foreign Aid

Migration is generally induced, on the one hand, by pull factors in terms of economic opportunities away from home and, on the other hand, by push factors, including conflicts and droughts (United Nations Development Programme (UNDP) 2015 p. 160). The concept of migration includes international as well as internal migration. Correspondingly, remittances, i.e. income received by households from migrant workers, may take the form of domestic or international transfers. Whereas international remittances signify income received by domestic households from abroad, often as a result of international labor migration, domestic remittances may result from migration for work from rural to urban areas within the same country. Remittances are one-sided transactions of cash or in-kind resources, not as part of an exchange or payment, transmitted through formal or informal channels (Yang 2011 p. 132, World Bank 2006 p. 4).¹ Although remittance transactions most frequently occur between relatives, the definition does not exclude other transaction parties (Yang 2011 p. 133). As opposed to other types of international financial flows to developing countries, e.g. ODA, FDI, and portfolio investments, remittances are sent in higher frequency and smaller amounts per transaction (Yang 2011 p. 142).² It is worth emphasizing that remittances and migration are two distinct phenomena. Although migration may be a necessary prerequisite for sending remittances, it is not sufficient for receiving the transfers as not all migrants send remittances. Moreover, empirical evidence

¹ Formal channels include for instance money transfer operators, banks, and credit unions (Yang 2011 p. 132).

² In remittance-receiving countries' balance-of-payments data, remittances are represented by the sum of the categories workers' remittances and compensation of employees, the main difference being that workers' remittances are sent by relatives residing in the host country whereas compensation of employees refers to income earned by non-resident temporary international workers assumed to return to the home country with the earnings (Yang 2011 pp. 132–133).

suggests that households may receive remittances although they do not have any migrant household member (Amuedo-Dorantes & Pozo 2010).

According to World Bank estimates, in 2015 inward remittances exceeded USD 601 billion globally.³ Remittances constitute one of the most prominent forms of international capital flows to developing countries. The proportion of the total remittances accruing to developing countries, about USD 441 billion, correspond to almost three times the volume of official development assistance. However, the true value of remittances, including informal and unregistered transactions, is presumed to be much larger (KNOMAD 2015).

As for Iraq, the World Bank estimates that remittances received amounted to USD 277 million in 2015 and have exceeded USD 270 million annually since 2012.⁴ In 2006, inward remittance flows reached USD 389 million (KNOMAD 2015).⁵ The lack of a comprehensive official census since 1987 prevents reliable assessment of internal migration between rural and urban areas and across the Iraqi governorates, i.e. provinces.⁶ However, the population concentration in the large cities is evident with implied imbalances in the burden of social services, e.g. education, health, and housing (Ministry of Planning 2014 p. 45). In light of the insecure situation with violence, political problems, and terrorist acts, the armed conflict during the past ten years constitutes the single most important factor for population movement, with accompanying family and work reasons as other justifications for changing area of residence (p. 46). The number of internally displaced persons (IDPs) across Iraq due to violence is estimated to 3.2 million (United Nations Office for the Coordination of Humanitarian Affairs (OCHA) 2015). Moreover, given the substantial increase in Iraqi refugees abroad, Iraq is among the ten main source countries for refugees (KNOMAD 2015).⁷

The concept of foreign aid encompasses various strategies by which donor countries grant support to a partner country. First, aid may be given bilaterally or in coordination with several donors. Moreover, the funds are either managed by the recipient country authorities, United Nations bodies, the donor, or an NGO. Development assistance may be provided in the form of projects, budget support, and multi-donor trust funds (MDTFs). While projects generally support a specific investment or pilot-test during a limited time period under the management of the donor or an NGO, budget support flows are usually at the direct disposal of the recipient government for general or sector-specific use. By

³ The primary remittance-recipient countries in 2015 were India, China, the Philippines, Mexico, and France. The largest recipients in terms of remittances as a share of GDP were Tajikistan, the Kyrgyz Republic, Nepal, Tonga, and Moldova (KNOMAD 2015).

⁴ In 2014, remittances constituted 0.12 percent of GDP, based on inward remittances of USD 271 million (KNOMAD 2015) and GDP data from the World Bank (2015b).

⁵ World Bank estimates indicate that inward remittances amounted to a mere USD 3 million in 2007 (KNOMAD 2015).

⁶ Iraq is divided administratively into 18 or 19 *muhafazat*, which in English translates into *governorates* (provinces). Governorates are further subdivided into 120 *qadhas* (districts) and subsequently into *nahiyas* (subdistricts) (AidData 2015b). Until 2014 there were 18 governorates (Statoids 2015): Duhok, Nainawa, Sulaimaniya, Kirkuk, Erbil, Diyala, Anbar, Baghdad, Babylon, Kerbela, Wasit, Salah-al-Deen, Najaf, Qadisiya, Muthanna, Thi-Qar, Maysan, and Basrah. This is the spelling used in the IHSES. The autonomous Kurdistan Region of Iraq encompasses Sulaimaniya, Duhok, and Erbil. In March 2014, the Kurdistan Regional Government (KRG) announced the creation of Halabja as a governorate separate from Sulaimaniya. The formation of three new governorates has also been discussed in the Iraqi cabinet (Statoids 2015).

⁷ Based on the stock of migrants and 2014 figures.

contrast, funding by MDTFs is normally managed by United Nations agencies or the World Bank (Brannelly *et al.* 2009 p. 83–84).

In general, fragile states have large inflows of official development assistance. Iraq in particular has belonged to the so called donor darlings among the fragile states in terms of net ODA receipts (Organisation for Economic Co-operation and Development (OECD) 2013 p. 66).⁸ The peak was attained in 2005, with USD 22 billion in net ODA inflows, and a level of between USD 8.9 to 9.9 billion annually was maintained over the period 2006 to 2008, before falling considerably. In 2012 and 2013, ODA flows to Iraq amounted to USD 1.30 billion and 1.54 billion respectively (World Bank 2015b). Moreover, with an average ODA-to-GDP ratio of 22.8 percent over the period 2000 to 2010, Iraq has been ranked among the world’s most aid-dependent countries (OECD 2013 p. 44).

The Structure of the Iraqi Education System

Iraq’s formal education system consists of four levels and is illustrated in table 1. Starting at the age of six, mandatory primary education lasts for six years and culminates in a Primary Certificate or Primary Baccalaureate. The primary education sector comprises approximately 16,500 schools in 13,000 buildings. In primary education, the Baghdad governorate accounts for 15.4 percent of the schools and 24.6 percent of the pupils (Geopolicy 2009 p. 5).

Table 1. Structure of Iraq's formal education system

Level of Education	Grades	Ages	Degree Awarded
Primary	1–6	6–11	Primary Certificate / Primary Baccalaureate
Intermediate	7–9	12–14	Intermediate Baccalaureate
Preparatory/Vocational Secondary	10–12	15–17	Secondary School Certificate / Vocational Baccalaureate
Higher	Depending on program	Depending on program	Technical Diploma, Bachelor’s Degree, Master’s Degree, Ph.D. Degree

Source: Nuffic (2015), adapted by the author.

Primary education is followed by three years of intermediate education, at the end of which an Intermediate Baccalaureate is awarded. Successively, children may enroll in one of the two secondary school forms. While preparatory secondary school allows the best students from intermediate education to follow a literary or scientific orientation granting access to higher education (Nuffic 2015), vocational secondary education in technology, commerce, or agriculture is to a larger extent focused on practical subjects and preparation for the labor market (Nuffic 2015, Geopolicy 2009). Higher

⁸ Strategic priorities have governed much of donors’ aid allocation to conflict-affected states, resulting in heavy emphasis on Afghanistan, Iraq, and Pakistan (UNESCO 2011 p. 7).

education comprises public and private universities and technical institutes. Most of the students who enroll in universities represent middle- or higher-income families (Ministry of Planning 2014 p. 86).

The school year generally runs from September to June, and the study week is from Saturday to Thursday morning. The government is an important actor in the education sector. Pre-school, primary, and secondary education are the responsibilities of the Ministry of Education and higher education is managed mainly by the Ministry of Higher Education and Scientific Research (Nuffic 2015 p. 6).

Development and Current State of Education in Iraq

“Education is a fundamental factor for the progress of society and is a right guaranteed by the state. Primary education is mandatory and the state guarantees that it shall combat illiteracy.”

“Free education at all its stages is a right for all Iraqis.”⁹

Since ancient times, Iraq has had strong educational traditions. The education system was held as one of the Arab region’s best as recently as in the 1980’s (United Nations Educational, Scientific and Cultural Organization (UNESCO) 2004 p. 9). However, for the last 35 years, Iraq has been a country ravaged by war and conflicts. Through the Iran-Iraq War 1980–1988, the sector still managed well thanks to oil revenues and support from the international community (Shafiq 2013 p. 131). As described by UNESCO (2003): “The Education system in Iraq, prior to 1991, was one of the best in the region, with over 100% Gross Enrolment Rate for primary schooling and high levels of literacy, both of men and women. The Higher Education, especially the scientific and technological institutions, were of an international standard, staffed by high quality personnel.”

However, following Iraq’s invasion of Kuwait and the resulting Gulf War of 1991, the Iraqi education system began to lose ground. The war was followed by a period of sanctions, resulting in a substantial fall in oil revenues and external assistance (Shafiq 2013 p. 131). Public expenditures on education decreased further during the war to compensate for increases in military spending.¹⁰ Given the already resource-deprived education sector, dilapidated infrastructure, and lack of teaching materials, the start of a new war in 2003 further thwarted the progress in education, girls’ schooling being the most severely affected (United Nations Children’s Fund (UNICEF) 2006). Although the education allocations per student and school have nearly doubled over the last few years, it has not accelerated educational progress.¹¹ Inefficiencies are reflected in prioritizing higher education over the lower levels, as well as favoring urban areas and males over rural areas and females (Ministry of Planning 2010 p. 116). Furthermore, in spite of constructing additional universities and colleges over the period 2009 to 2012, lack of room and quality prevents the admission of all secondary school graduates, constituting a grave concern for the ambition for youth empowerment through education (Ministry of Planning

⁹ Article 34, paragraph 1 and 2, of the Iraqi Constitution (World Intellectual Property Organization (WIPO) 2005).

¹⁰ According to the Ministry of Planning (2014 p. 96), public spending on education was maintained at over 20 percent of the total general budget during the 1970’s and through 1983, thus enabling schooling for all school-aged children, but were reduced to 11.2 percent in 1990, 10.8 percent in 1997, and 5.7 percent by 2002.

¹¹ For instance, the prevalence of schools operating at dual-shift increased by four times between 2006–2007 and 2007–2008, indicating a failure to use the increased funds efficiently (Ministry of Planning 2014 p. 97).

2014 p. 92). Moreover, youth literacy rates declined from 85 percent in 2000 to 82 percent in 2013 (World Bank 2015a).

Overall, primary enrollment rates are now improving, but the rate is higher for males (94 percent) than for females (90 percent). The gender gap is even wider for enrollment in secondary education with 52.5 and 44.6 percent respectively. Approximately 28 percent have completed secondary school and 7 percent have finished post-secondary education (Ministry of Planning 2014 p. 85). The share of students continuing from primary to intermediate education increased from 29.6 percent in 2004–2005 to 34.4 percent in 2011–2012, albeit with large differences between governorates (Ministry of Planning 2014 p. 90).¹² This situation of gradual improvement is confirmed by Iraq Household Socio-Economic Survey data, which convey a picture of increasing enrollment rates for all school ages from the survey round in 2006–2007 to that in 2012–2013 (figure 1). The development of enrollment for males and females separately is illustrated in figures 4 and 5 in the appendix. Figures 2 and 3 display the gender disparities in school participation in 2006–2007 and 2012–2013 respectively.

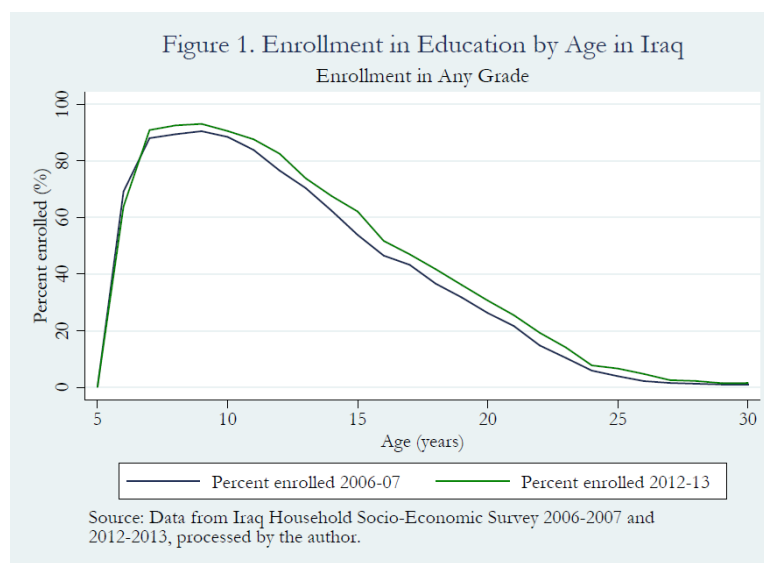


Figure 1. Enrollment in education by age in Iraq

Data from the IHSES indicate that the aggregate enrollment in education increased for all relevant school ages between the survey waves (figure 1). The effect is particularly pronounced for 15-year olds, recording an increase in enrollment of about 8.3 percentage points, as well as for 14- and 16-year olds, with additions of 5.2 percentage points.

Looking at the differences in enrollment disaggregated by education level, primary education attendance improved for children aged seven and older. The effect was particularly strong for 11-year olds with an approximate 5.8 percentage points increase.¹³ Moreover, participation in intermediate

¹² The share is highest in Baghdad with between 39.5 and 47.4 percent (different areas) and lowest in Nainawa (21.8 percent), Maysan (21.9 percent), and Muthanna (22.1 percent). The proportion of students continuing from intermediate to secondary education was fairly stable at around 69.2 percent over the same period, with differences among governorates (Ministry of Planning 2014 p. 90).

¹³ The results from the disaggregated analysis are not presented graphically for reasons of space.

education gained among children from age twelve, i.e. the formal age to start intermediate education, and in particular for 14-year olds with enhancements of 4.8 percentage points. Preparatory education exhibited its largest increase among 19- to 22-year olds, amounting to between 4 and 5 percentage points.

The IHSES data also confirm the considerable gender gap in education. The sample of children from the 2006–2007 survey round suggest that the disparity between males and females peaks for 13- and 14-year olds with 23.1 and 23.7 percentage points respectively and starts levelling off for children aged 20 or older. As for the second survey sample, the maximum difference between males and females is even larger, 28.8 percentage points for 14-year olds before the gap gradually reduces.

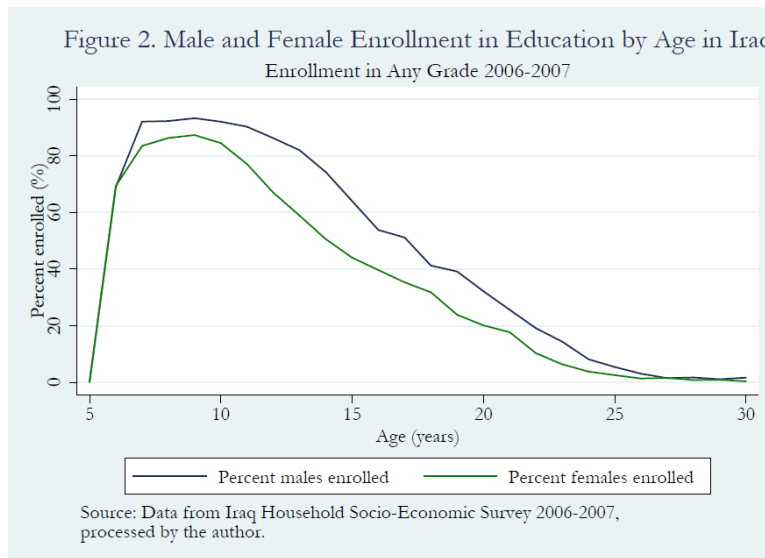


Figure 2. Male and female enrollment in education by age in Iraq, 2006–2007

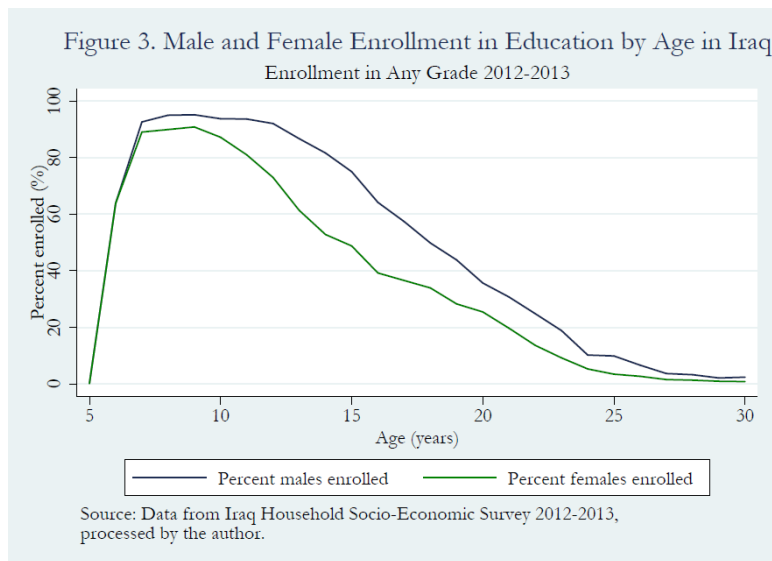


Figure 3. Male and female enrollment in education by age in Iraq, 2012–2013

Previous Research

The developmental impact of remittances and ODA has been the subject of substantial debate. This section is devoted to a review of the previous literature on the effect of remittances and foreign aid on development and education as well as the existing research on education in Iraq.

The Developmental Impact of Remittances and Foreign Aid

Remittances may be conducive to development at different levels: within households, for poverty reduction, and in promoting sustainable economic growth. The most direct way by which migration and remittances shape living standards is through the income effect of remittances' contribution to aggregate household income (McKenzie & Sasin 2007 p. 3). Nevertheless, the pattern of use of remittances is disputed. Although it has been frequently argued that remittances are mainly used to increase the consumption of the recipient households, several studies have found that remittances also support productive investments by the households (e.g. Adams 2005, Woodruff & Zenteno 2007).¹⁴ Assuming that remittances are temporary income, this is in line with the permanent income hypothesis, which implies that temporary income is more likely to be saved or invested than permanent income (Friedman 1957, McKenzie & Sasin 2007 p. 6).

As private capital transfers received directly by households, as opposed to most ODA, remittances may be channeled to the most urgent needs. Nevertheless, in contrast to other household income, the use of remittances is often constrained by a joint decision of the sender and recipient (De & Ratha 2012 p. 163).¹⁵ In general, the evidence indicates that international migration and remittances have an important impact on reducing poverty in developing countries (e.g. Adams & Page 2005).¹⁶ Poverty reduction through remittances further contributes to promoting economic growth by enabling reallocation of time and effort from the fulfillment of basic needs to engagement in productive and growth-enhancing economic activities. Moreover, the countercyclical character of remittances flows, tending to increase in economic and political crises and natural disasters as opposed to private capital flows, makes remittances a stable source of foreign credit. Hence, remittances from migrant household members may serve as a form of insurance against adverse financial events (Ratha 2013 pp. 5–7).

Nevertheless, although De and Ratha (2012) show that income from remittances may improve the situation for the poorer groups in society in particular, the considerable costs associated with migration imply that the benefits of remittances may not always reach the poorest households. Generally,

¹⁴ Using household data from Guatemala, Adams (2005) shows that, at the margin, remittance-recipient households spend relatively less on consumption goods and more on investment in education and housing. In a study of microenterprises in Mexico, Woodruff and Zenteno (2007) find evidence that migration is related to higher levels of investment as well as higher profits.

¹⁵ The rich literature on the reasons for sending remittances falls beyond the scope of this study. It ranges from altruistic motives, such as increasing the consumption level of the recipients, providing insurance against shocks, or investments in human or physical capital, to more self-interested motives, such as the repayment of costs associated with the migration venture (see Yang 2011 pp. 135–136 for further reference).

¹⁶ Analyzing data for 71 developing countries, Adams and Page's (2005) results indicate that an increase in international remittances reduces poverty by about twice as much as a rise in other sources of household income.

international migration is associated with greater costs than internal migration due to financial costs related to distance and barriers to entry as well as psychological costs from leaving relatives and friends behind. Incurring higher costs is motivated by the expectation of greater earnings abroad. As a result, remittances from abroad are higher and have a larger impact than domestic remittances (King & Skeldon 2010 p. 1639). However, for many developing countries the link between development and internal migration is quantitatively more important (p. 1637).

The debate on the effectiveness of foreign aid for development is underpinned by a number of studies claiming diverging evidence. Although aid is generally considered to have a positive impact on economic growth, macro-level empirical studies have often failed to identify robust positive effects. Whereas some studies (e.g. Hansen & Tarp 2000) find a positive impact, others do not discern any robust relationship, whether positive or negative, of aid on growth (e.g. Rajan & Subramanian 2008).¹⁷ Easterly (2007) holds the opposing view and presents arguments of why development assistance has not been successful in achieving growth. However, Burnside and Dollar (2000) study the impact of aid on economic growth conditional on economic policy and find that aid has a beneficial effect on growth in good monetary and fiscal policy environments, but little impact on average.

As for the allocation of aid, it may be a reflection both of donors' economic interests and recipients' needs (e.g. Fielding 2014). Regarding the relative importance of the different determinants of aid flow patterns, Alesina and Dollar (2000) find that political and strategic factors and past colonial ties between donors and recipients are more influential considerations than recipients' political institutions. Furthermore, Frot *et al.* (2014) argue that the motivation governing aid flows to a recipient country may evolve over the duration of the donor-recipient relationship. Concerning the allocation of aid at the subnational level, Briggs (2015) reveals that assistance flows in terms of aid projects are directed disproportionately to regions with more of the richest rather than poorest population, thus contradicting a pro-poor distribution.¹⁸

Another strand of literature investigates comparatively how economic growth is affected by different forms of overseas capital flows: remittances, ODA, and FDI. The findings from the cross-country investigations by Benmamoun and Lehnert (2013), Driffield and Jones (2013), and Anwar and Cooray (2015) all support a positive effect of remittances on economic growth. Benmamoun and Lehnert (2013) find that in low-income countries the positive association with the economic growth rate is greater for remittances than for both ODA and FDI. Taking the importance of institutions for development into account by interacting institutional variables with the measures of FDI, ODA, and remittances, Driffield and Jones' (2013) analysis yields positive and significant estimates for all three sources of foreign capital, indicating that aid may promote growth conditional on the bureaucratic quality in the recipient developing country (p. 186). Further evidence in this direction is provided by Anwar and Cooray (2015), suggesting that development aid may positively influence per capita income in low- and middle-income countries in the presence of effective public spending. Overall, these findings are congruent with those of e.g. Burnside and Dollar (2000).

¹⁷ Hansen and Tarp (2000) survey evidence from three generations of cross-country studies of the effectiveness of aid and conclude that there is support for a positive association between aid and economic growth.

¹⁸ The study includes 1,400 aid projects in 17 African countries.

However, to the best of my knowledge, Cooray (forthcoming) presents the only comparative analysis of the effects of remittances and of other forms of international financial flows on education.¹⁹ The results indicate that remittances have an immediate and robust positive significant effect on secondary enrollment of girls and boys in low- and middle-income countries, the effect being slightly more pronounced for girls than for boys. However, ODA and FDI positively affect enrollment only after a significant lag. Cooray stresses that FDI and ODA may take time to influence enrollment through the supply side since they, as opposed to remittances, are not directly received by households (forthcoming, p. 13).

Given the scarcity of research investigating the comparative influences of remittances and foreign aid on education, we now turn our attention to the evidence found for their respective contributions.

Effects of Remittances on School Enrollment

Remittance transactions may be conditional and earmarked for specific investment and spending purposes and thereby enable both higher consumption and investment, notably in human capital.²⁰ Although the research supporting a significant positive impact of remittances on investment in human capital is considerable, the net effect is not determined a priori and depends on numerous relationships.

First, remittances may influence children's schooling through the income effect as they contribute to overcome liquidity and borrowing constraints. A large number of micro-level studies testify to the benefit of remittances in relaxing budget constraints and encouraging investment in human capital (Yang 2008, Alcaraz *et al.* 2012, Acharya & Leon-Gonzalez 2014). Yang (2008) exploits the exogenous increase in remittances to Philippine households during the 1997 Asian financial crisis and finds that the additional funds are used to raise educational expenditures and yield more child schooling in migrants' households.²¹ The reversed experiment is presented by Alcaraz *et al.* (2012), who use the negative income shock experienced by Mexican migrant households during the United States recession of 2008–2009 and find that the decrease in remittances caused a significant and large reduction in the probability of children's school attendance.²² Moreover, Acharya and Leon-Gonzalez (2014) show that remittances positively impact both the quantity and quality of schooling of Nepalese children in the sense that poor remittance-receiving families are assisted in enrolling their children, while non-poor households invest in private school enrollment and higher education. Lopez *et al.* (2007) present further evidence in this direction in a cross-country study of eleven Latin American countries. They find a positive and statistically significant association between remittance-receipt and educational attainment, a relationship which varies by country, gender, and living environment and is sometimes restricted to children with low levels of mothers' education.

¹⁹ Total aid, FDI, and remittances are included as the main independent variables both in per-pupil terms (Dreher *et al.* 2008) and as a proportion of GDP (Burnside & Dollar 2000).

²⁰ Remittances may cover both the direct costs, such as tuition fees, school uniforms, teaching material, and transportation, and the opportunity cost of children's schooling, thereby making school participation more optimal than child labor.

²¹ Yang (2008) utilizes the variation in the size of exogenous positive income shocks for remittance-recipient households implied by the appreciation of the migrants' currencies against the Philippine peso during the Asian financial crisis.

²² During the recession, the unemployment rates of Mexican migrants in the United States increased and the amount of remittances sent decreased sharply.

Nevertheless, the potential benefits of receiving remittances may be outweighed by the adverse consequences of migration on family life and left-behind children (e.g. Amuedo-Dorantes & Pozo 2010).²³ Migration of household members may increase the need for children to work, whether in unpaid household activities or paid labor. Moreover, reduced supervision of the children's education and impaired emotional well-being may result from parental absence due to migration. However, migration may serve the purpose of transmitting knowledge to migrants of the value and returns to education and consequently to their households at home. Under certain circumstances, this result of the migration experience may outweigh the negative consequences of parental absence on schooling (Acharya & Leon-Gonzalez 2014).

The effects of migration and remittances on education may be further influenced by intra-household priorities. First, parents' preferences due to opportunity costs and expected returns to education may affect the allocation of household resources between the genders and ages of children (Amuedo-Dorantes & Pozo 2010, Acosta 2011). Second, the reallocation of household responsibility to the wife in case a male household head migrates may influence the allocation of resources in favor of educational expenditures, reflecting that females tend to invest more in human capital formation than male household heads (Gyimah-Brempong & Asiedu 2015).

Recognizing the importance of internal migration as a part of the development process in many developing countries, a number of studies have also dealt with the educational impact of internal remittances specifically (Mueller & Shariff 2011) or relative to international remittances (Adams 2005, Gyimah-Brempong & Asiedu 2015).²⁴ Adams' (2005) results support that remittance-recipient households invest considerably more in education at the margin than non-recipients in Guatemala. More specifically, the marginal increases in education expenditures especially benefit the secondary school level and are largest for recipients of international remittances, with 58.1 percent, whereas internal remittances raise marginal spending by 45.2 percent (pp. 13–14). As for school participation, Mueller and Shariff (2011) show that Indian teenaged children in rural households receiving internal remittances tend to attend school during more hours per week. The results of Gyimah-Brempong and Asiedu (2015) for Ghana lend further support to the positive impact of domestic remittances on enrollment in education. Nevertheless, the authors also find that the positive impact is much stronger for international remittances. Moreover, the marginal impact is more pronounced for secondary than primary school enrollment.²⁵

²³ In a study of the Dominican Republic, Amuedo-Dorantes and Pozo (2010) find that migration negatively influences children's school attendance since the positive impact of remittances vanishes as children in migrant households are included in the sample.

²⁴ Although quantitatively internal migration is more prevalent, most research is conducted on the association between development and international migration (King & Skeldon 2010 p. 1637). The relative prevalence of domestic migration is often related to the lower costs, in terms of travel fees and ease of entry into society.

²⁵ For instance, receiving international remittances increases the marginal probability of enrollment by 0.138 and 0.545 for primary and secondary school respectively (Gyimah-Brempong & Asiedu 2015 p. 188).

Effects of Foreign Aid on School Enrollment

In light of the importance of human capital accumulation for sustainable economic development, the enhancement of human capital has been one of the primary objectives of foreign aid. However, although a rich flora of research is devoted to the impact of aid on growth, the literature examining the effects on education specifically is still sparse. D'Aiglepiere and Wagner (2013) point out that the research on the effectiveness of aid for education is in its infancy and attribute the scarcity of empirical evidence to lack of adequate data (p. 98).

Michaelowa (2004) pioneered the analysis of the effectiveness of education sector aid using data for about 80 low-income countries. Although the results indicate that education aid increases gross primary enrollment, the effect is very modest. Furthermore, the findings suggest that under bad political and institutional conditions the effect is even negative, thus extending Burnside and Dollar's (2000) findings of the importance of good governance to the education sector specifically (Michaelowa 2004 p. 16).²⁶ Accordingly, Michaelowa and Weber (2008) note a positive albeit small effect of good political governance on education aid effectiveness. Furthermore, the authors add to this research by employing disaggregate primary, secondary, and tertiary education aid. However, the observed positive effects of aid on all educational levels remain weak, the strongest evidence indicating that an increase in aid by one percent of the country's GDP raises primary completion by 2.5 percentage points (Michaelowa & Weber 2008 p. 9).²⁷

In addition, the impact of education aid on primary enrollment has also been assessed relative to that of government spending on education for almost 100 countries (Dreher *et al.* 2008). Aid targeted to the education sector may be more productive in promoting enrollment rates than government spending on education as development assistance is often devoted to improve the supply and quality of education, thus influencing incentives, whereas government funds predominantly pay teachers' salaries. Moreover, donors' spending tends to target the poor and disadvantaged to a larger extent (p. 295). Finally, considerable local capture of public funds intended for primary schools has been revealed (Reinikka & Svensson 2004), an issue which aid donors may be better at circumventing. Indeed, the results of Dreher *et al.* (2008) indicate that aid is more effective than government spending in raising primary school enrollment. The association between enrollment and per capita aid is significant and weakly positive but not negligible, whereas that with government spending is insignificant.

These initial studies show that aid may serve to promote school enrollment over time, although the positive relationship between education aid and education is modest. However, limiting the study to aid for primary education, D'Aiglepiere and Wagner (2013) reveal strong robust positive impacts on primary education outcomes, e.g. enrollment, in recipient countries. By contrast, no significant effects are detected for more aggregated measures, such as total aid or total education aid, on primary education indicators. Further nuancing the picture of education aid effectiveness, Christensen *et al.*

²⁶ The results may also be interpreted as an indication of the fungibility of aid, freeing government resources for use in areas harmful to development (Michaelowa 2004 p. 18).

²⁷ While for secondary school enrollment the results indicate effects of similar magnitude (Michaelowa & Weber 2008 p. 10), increases in tertiary enrollment are restricted to the longer perspective (p. 11).

(2011) use data on primary aid project commitments to compare aid from multilateral and bilateral donors. The results provide tentative evidence for effectiveness of bilateral aid in encouraging primary school enrollment based on its greater aptitude to condition aid on governance quality.

In a recent contribution, De and Becker (2015) criticize the use of aggregate measures of foreign aid projects as well as evaluations of specific interventions through randomized control trials (RCTs) to assess the effectiveness of external assistance projects.²⁸ By contrast, the authors adopt a subnational approach relying on disaggregated estimates from geocoded data on aid projects related to education, health and water in Malawi to assess the impact on beneficiaries. Significant and positive impacts are detected for all categories. The results for education aid are economically significant, suggesting that it serves to increase school exposure.

Education in Iraq

Previous analyses of education in Iraq have either been of descriptive nature (Shafiq 2013) or focused on the effects of war and armed conflict on the level of education accumulation (Diwakar 2015).

Shafiq (2013) performs the alleged first statistical analysis of education in Iraq in this century using data from the IHSES 2006–2007. The probability of children's school enrollment given child, household, regional, school, and labor market characteristics is analyzed for children aged six to 17. As a descriptive analysis it cannot establish the causal impact of the characteristics on education, although all covariates show a statistically significant correlation with school enrollment. The results suggest among others that girls are 12.9 percent less likely to be enrolled in school than boys, consistent with the priority given to the sons' education in Iraqi families. Moreover, children in female-headed households are 5.4 percent less likely to be enrolled compared to children in households with a male head. Not surprisingly, poverty has a substantially negative impact on children's education prospects (p. 135). By contrast to most education research, rural children are found to have a 13.6 percent higher probability of school enrollment than children in urban areas, possibly due to the higher level of conflict and unrest in the cities. Major reasons for non-enrollment of school-aged children are lack of children's or parents' interest, as well as inability to enroll due to e.g. social reasons (8.1 percent), inability to afford the school expenses (4.4 percent), and working for the family (4.7 percent) (p. 136).

As a direction for future research, Shafiq (2013) calls for identification of the causal effect of war on schooling in Iraq. Diwakar (2015) adopts this approach in a study of the relationship between armed conflict and human capital accumulation in Iraq, likewise using the IHSES 2006–2007 as well as the Iraq Body Count database on civilian deaths. The results consistently indicate a negative association between conflict and education in terms of enrollment rates and years of schooling. This aligns with the general findings in the literature that conflict prevalence leads to a fall in educational attainment. Although the detected impact on education is negative for both genders, it is more pronounced for school-aged boys. As the investment in educating boys might go to waste in a highly conflict-affected

²⁸ Whereas focusing on aggregate measures of foreign aid projects and their overall effects might hide the impact of smaller successful projects, the use of RCTs to evaluate individual-level outcomes of targeted interventions raises issues with respect to the generalizability of the results due to heterogeneity in projects' returns (De & Becker 2015).

state, conflict may result in a shift in priority from boys' to girls' education, even under circumstances when this goes against the patriarchal tradition.

At present, both demand and supply factors might influence the education of children in Iraq. Demand for schooling may be influenced by e.g. the level of violence in the area of residence, unsafe conditions for transportation to school, and the displacements of families. Supply factors entail for instance budget cuts to education, reduction in the number of schools or teachers, availability of material, electricity and books, and reduction in the number of hours of schooling (Diwakar 2015 p. 14).

Contributions and Expected Relationships

As stated in the introduction, this thesis attempts to provide an answer to the research question: what is the impact of remittances and foreign aid on enrollment in intermediate education in Iraq?

In light of previously conducted research, this study makes three main contributions. First, the focus of the investigation is on the relative effects of remittances and foreign aid on educational outcomes of individual children. To the best of my knowledge, none of the comparative studies of the development impacts of remittances and aid has previously dealt with their relative importance for education on the micro-level. Second, the impacts of two different categories of external assistance, on the one hand, aid received directly by households from foreign organizations as self-reported in household survey interviews and, on the other hand, officially reported specific aid projects, are explored. The study of aid interventions augments the evidence presented by De and Becker (2015), whereas household-level assistance adds a new dimension. Third, this analysis extends the scope of the study of remittances' impact on human capital investment in developing countries from the previous primary domain of Latin America (e.g. Acosta 2011, Lopez *et al.* 2007), and to a lesser degree Asia and Africa (e.g. Yang 2008, Gyimah-Brempong & Asiedu 2015), to that of the Middle East and North Africa (MENA) region and in particular the Iraqi context.

Consequently, this thesis sheds light on three distinct forms of assistance with potential to influence the education of children in Iraq, albeit through different mechanisms. As pointed out by Cooray (forthcoming), whereas development assistance may serve to increase access to education such as schools and teachers, remittances may contribute by impacting household income and access to finance (p. 2). At this stage it is however worth emphasizing that foreign aid allocated directly to households may, in that sense, work through the same mechanism as remittances. Hence, in the Iraqi context, I believe that remittances as well as foreign aid to families will affect the demand for schooling through the income effect by addressing shortage of funds (Shafiq 2013), whereas aid projects will rather influence supply factors (Diwakar 2015).

Given the overall support for remittances promoting children's school participation, I deem this a reasonable relationship also in Iraq. Concerning aid interventions, the results presented by De and Becker (2015) certainly point to a positive association between education sector assistance projects and education at the subnational level. However, the scarcity of such evidence is to be considered rather

as a justification for the focus of this study than a base for predictions. Likewise, the lack of benchmark for the effectiveness of assistance targeted directly to households warrants its examination. To summarize, in this analysis I do not anticipate the comparative effects of remittances and foreign aid on Iraqi school enrollment but rather seek to present new evidence, thus laying the ground for subsequent research.

Data

This investigation relies on two main data sources. The household-level data have been obtained from the two waves of the Iraq Household Socio-Economic Survey, conducted for the first time in 2006–2007 and most recently in 2012–2013 (Central Organization for Statistics and Information Technology (COSIT) of Iraq & Kurdistan Regional Statistics Office (KRSO) 2015a, 2015b). This is the origin of data for receipt of remittances and aid from foreign organizations, as well as all control variables used in the analysis. The data on aid projects in Iraq have been acquired from the AidData initiative and contain all geocoded projects from the Development Assistance Database (DAD) managed for Iraq (AidData 2015a).

Iraq Household Socio-Economic Survey

The Iraq Household Socio-Economic Survey is part of the Poverty Reduction Strategy Project, implemented by the Republic of Iraq and the World Bank (COSIT *et al.* 2008 p. 13). The two waves of the IHSES conducted so far are not panel data. The surveys contain information on a broad set of areas, including among others household characteristics, education, health, consumption and expenditures, and income from various sources and activities. The IHSES 2006–2007, the first nationally representative household survey since 1988, was conducted by the Central Organization for Statistics and Information Technology and the Kurdistan Regional Statistics Office from November 2006 to October 2007. Fieldwork was carried out in all of Iraq's governorates, including those in the Kurdistan Region.²⁹ The total response rate, i.e. the share of households fully interviewed, was 98.62 percent (COSIT *et al.* 2008 p. 19) and the total sample amounted to 17,822 households and 127,189 individuals. Data for the second round of the IHSES were collected between January 2012 and February 2013. The survey aimed for a total sample of 25,488 households and the final sample consisted of 25,146 households and 176,042 individuals (COSIT *et al.* 2015 p. 3, COSIT & KRSO 2015b). For the analysis of the impact of remittances and foreign aid to households, both surveys are used in a pooled cross-section, thus increasing the sample size and the variation in the explanatory variables in order to achieve more precise estimators. However, in the examination of aid projects' impact on education, only data from the most recent survey round are employed.

The IHSES is a suitable data source for this kind of analysis. As argued by Adams (2011 p. 810), household surveys are the most appropriate sources for evaluation of the effect of remittances in

²⁹ The work was supported financially by the World Bank, also assisting with technical advice regarding e.g. objectives and design.

developing countries, as they contain data on a broad set of topics of relevance for evaluating the impacts on the surveyed country's population. Furthermore, the IHSES 2006–2007 has, as presented in the section on previous research, been employed in earlier analyses of education in Iraq (Shafiq 2013, Diwakar 2015).

AidData for Iraq

AidData is a partnership between the College of William & Mary, Development Gateway and Brigham Young University, created in 2009. The aim of the initiative is to increase the transparency of information on development assistance funds in order to enhance the understanding and impact of development finance.³⁰

AidData provides a database comprising close to one million past and ongoing aid activities (Tierney *et al.* 2011). Projects in AidData are assigned a single overall purpose code and the number of activity codes needed to capture the individual objectives and activities undertaken as part of the development intervention (Tierney *et al.* 2011 p. 1896). The aid projects are georeferenced, i.e. assigned latitude and longitude coordinates, at the subnational level based on the AidData coding scheme.³¹ The objective of the coding is to georeference all locations where development finance is committed or distributed, i.e. locations benefitting directly from aid flows. Thus, separate coordinates are included for every location where a specific assistance project is implemented, resulting in project-location observations. Eight precision codes reflect the varying exactitude of the geocoding, ranging from exact locations to broad areas and provinces. Concerning the time dimension, most georeferenced projects can only be associated with the year of the specific commitment decision. For further reference on the geocoding procedure, see Strandow *et al.* (2011).

In total, AidData for Iraq includes 1,338 aid projects over the time period 2002 to 2014, financed by 21 mainly bilateral but also multilateral donors and implemented at one or several locations across all governorates. Among the at least 56 project sectors, the largest are water supply and sanitation, multisector aid for social services, electrical transmission and distribution, primary education, and higher education.³² Total geocoded disbursements amount to USD 4,033,399,904.74 (constant 2011 USD) and geocoded commitments to USD 10,349,947,195.22 (constant 2011 USD). The commitments included in AidData thus correspond to approximately 12 percent of the total external assistance to Iraq over the same time period according to the records of the International Development Statistics (IDS) online database (IDS 2015).³³

³⁰ AidData defines development finance as “loans or grants from governments, official government aid agencies, and inter-governmental organizations (IGOs) intended mainly to promote the economic development and welfare (broadly defined) of developing countries.” However, projects funded by non-governmental organizations (NGOs) or by private investors, banks, or foundations are not included (Tierney *et al.* 2011 p. 1892).

³¹ Coordinates are based on Geonames and the map projection of the standard World Geodetic System 1984 (WGS 84).

³² The sector is unspecified for 127 projects.

³³ Based on the author's own calculations comparing the AidData dataset to the total assistance from all donors and for all sectors recorded in the International Development Statistics online databases in "Total net ODA disbursements from all donors to developing countries" (IDS 2015). Constant Prices (2013 USD).

Method

As stated in the introduction, this thesis evaluates the probability of continued education at the intermediate level. Analyzing enrollment in intermediate education is of interest as it allows to explore how school participation develops immediately after the mandatory primary education. Moreover, as introduced in the section on the current state of the Iraqi education system, only about a third of the pupils continue from primary to intermediate education. Increasing this share is a prerequisite for education to be able to fill its role in youth empowerment through further studies. Identifying means of assisting in promoting enrollment in intermediate education is thus of importance. The analysis is conducted in a difference-in-differences framework, the design of which will be further described in this section. Before that, a brief introduction to the concerns related to assessing the effects of remittances and foreign aid as well as potential solutions, will follow.

Methods for Impact Evaluation of Remittances and Aid

The central and inherent issue when attempting to estimate the causal effects of remittances and foreign aid on household-level outcomes is that neither remittances nor aid are randomly allocated among households, such that any observed association of receipt of assistance with the outcome of interest, here children's education, might simply reflect unobserved characteristics of households. In other words, the remittances or foreign aid variable is endogenous if it is correlated with the error term.

Endogeneity of remittances arises if, which is usually the case, there is simultaneity in decisions to migrate, send remittances, and for example enroll children in school. This may be a reflection of reverse causality, selection bias and omitted variables. Reverse causality emerges when the outcome of interest influences remittances or foreign aid and not vice versa, whereas selection bias occurs if beneficiaries of remittances and aid differ substantially from non-recipients. In other words, certain characteristics drive the selection into treatment. Biased estimates may also result if the selection is based on unobservable factors or from omission of fundamental factors from the estimation. Likewise, the allocation of aid across households is non-random (De & Becker 2015) and the methodological challenges arise in impact evaluations for assessing foreign aid effectiveness.

These circumstances call for methods to overcome potential endogeneity and correct for unobservable factors that may influence the outcome of interest. The ideal method for assessing the respective causal impacts of remittances and aid is a natural experiment (e.g. Yang 2008). However, RCTs combine the before/after and treatment/non-treatment dimensions, thus also isolating the causal effects by eliminating the influence of other factors and selection bias. In the case of remittances, this would for instance imply the creation of identical control and treatment groups by random assignment of migrant status in the population. With regard to foreign aid, this would entail the random allocation of interventions among beneficiaries (McKenzie & Sasin 2007 p. 7, Gauck 2011 p. 8).

Usually however, randomization is not feasible and researchers resort to quasi-experimental methods to account for non-randomization and create similar control and treatment groups. This is achieved

by reconstructing the counterfactual, i.e. creating a benchmark of what the outcome would have been in the absence of remittances or aid. Frequently used methods in impact evaluation of aid and estimation of remittances' impacts include differences-in-differences (e.g. Alcaraz *et al.* 2012), propensity score matching (e.g. De & Becker 2015, Mueller & Shariff 2011), and instrumental variable strategies (e.g. Michaelowa 2004, Adams & Page 2005, Amuedo-Dorantes & Pozo 2010, Alcaraz *et al.* 2012, D'Aiglepiepierre & Wagner 2013).

Difference-in-differences estimation is an influential technique in applied empirical works in order to isolate the causal effect of treatment. Utilizing data from two time periods as well as one treatment and one control group, the approach accounts for systematic differences between the groups as well as differences across time, thus addressing the biases of endogeneity. The next section presents how the difference-in-differences technique is implemented in the present study.

Difference-in-Differences Approach

Given the aim of this study's empirical investigation, to estimate the relative effects of remittances and foreign aid on the probability of continued schooling after primary education, i.e. enrollment in intermediate education, the treatment and control groups are constructed as follows. The treatment group consists of children living in households that received assistance in the form of remittances or aid from foreign organizations during the past twelve months or, alternatively, children in families living in proximity to relevant aid projects, whereas the control group comprises children in families to whom these forms of assistance did not accrue.³⁴ I will first introduce the setup with remittances and aid allocated directly to households, before presenting how aid presence in the form of georeferenced assistance projects are incorporated into the analysis.

To begin with, the treatment variables are remittance or aid receipt, depending on the specification. The time periods refer to before and after the receipt of remittances and aid respectively. More specifically, the two periods concern the timing of decisions regarding enrollment of children in intermediate education, i.e. whether the question of enrolling or not enrolling in further studies was settled before or after the household had received (or not received) assistance.

The fundamental identifying assumption for the difference-in-differences estimation is that of a common trend, i.e. that the control and treatment groups follow the same trend absent treatment, which induces a deviation from this course (Angrist & Pischke 2009 p. 230). For the present study, this implies that the development of children's enrollment in intermediate education should be similar for children in assistance-recipient and non-recipient households. The validity of this assumption is likely to rely on aspects such as equal access to education (e.g. school establishments and buildings) and vulnerability to shocks to the education system.

Given the cross-sectional nature of the household data and the fact that the data on remittance and foreign aid receipt only concern the past twelve months, my analysis is restricted to the marginal effect of the remittances or aid received over the course of the year preceding the respective survey. This

³⁴ These variables will be further described in the empirical analysis section as well as in the appendix.

requires utilizing children of different ages and adopting a narrow approach focused around the year of the receipt. Consequently, I utilize the year of birth, time of interview, and enrollment status of children, as well as the assistance-recipient characteristic of households, to allow for a comparison across time and treatment status.

This translates into an approach where allocation of remittances and aid during a specific year and the children's year of birth are used as the identification strategy to estimate the causal effects of remittances and foreign aid on schooling. The post-assistance period, i.e. the younger group, is represented by children who, at the time of the interview and according to their year of birth, should be enrolled in first intermediate grade. The pre-assistance period, i.e. the older group, is represented by children who should be in third intermediate grade. In this strategy, I allow for one repeat year as this is common in the total sample.³⁵ The precise construction of the older and younger group of children and the related assumptions are available in the appendix (see table 12). Over the short time period that elapsed between the enrollment decisions of the pre- and post-assistance periods, I deem the assumption of a common trend in education likely to hold.

The described setup for estimating the causal effect of remittances and aid from foreign organizations on the probability of pursuing studies after the sixth primary grade can be summarized in the difference-in-differences equation,

$$Y_{iht} = \alpha + \beta young_{it} + \gamma T_h + \delta(T_h \times young_{it}) + \varepsilon_{iht} \quad (1)$$

where Y_{iht} is the outcome of interest for child i in household h and time period t , i.e. either before or after potential assistance-receipt. The dummy variable takes the value one for children who are currently enrolled in the correct grade in intermediate education according to their age group and time of interview, and zero otherwise, i.e. if they are not enrolled at all or attend another grade. T_h and $young_{it}$ are dummy variables and the interaction term, $T_h \times young_{it}$, is their product. T_h takes the value one for children in treated households and zero otherwise, while $young_{it}$ equals one for the younger group of children whose future enrollment or non-enrollment was decided after or during assistance-receipt, and zero for the older group for whom it was settled before. The interaction term marks children in recipient households for whom the decision with regards to continued schooling was taken after or during the period of remittances or foreign aid. The parameter of interest is the difference-in-differences estimator, δ , sometimes also termed the average treatment effect. As will be further developed in the empirical analysis section, its role is to compare, within the treatment group, the outcome of the enrollment decision before and after assistance was received. As a consequence, δ represents the causal effect of treatment. The setup for the difference-in-differences approach applied in this study, without additional covariates, is summarized in table 2.

At this stage, it is worth noting the distinction between the probability of *continuing* in intermediate education, rather than the probability of *completing* primary education. Whereas focusing on the likelihood of enrollment in a specific grade allows to control for the year in which the pupil ought to have started intermediate education, including children who left school after completion of primary

³⁵ For the pooled dataset of both survey waves, the average number of repeat years for primary education is 0.43.

education would give the older cohorts longer time to attain the certificate, thus potentially biasing the results.³⁶ Consequently, the choice of outcome variable relies on priority of precision, enabling to isolate the marginal effect of the assistance received during the most recent year.

Table 2. Difference-in-differences setup

	Pre-treatment/Older	Post-treatment/Younger
Control	Children living in households that <i>did not receive</i> remittances or aid during the twelve months preceding the interview, and whose year of birth determines that the decision of enrolling or not enrolling in intermediate education was taken <i>before</i> the household received remittances or aid. Coefficient: α	Children living in households that <i>did not receive</i> remittances or aid during the twelve months preceding the interview, and whose year of birth determines that the decision of enrolling or not enrolling in intermediate education was taken <i>after</i> the household received remittances or aid. Coefficients: $\alpha + \beta$
Treatment	Children living in households that <i>received</i> remittances or aid during the twelve months preceding the interview, and whose year of birth determines that the decision of enrolling or not enrolling in intermediate education was taken <i>before</i> the household received remittances or aid. Coefficients: $\alpha + \gamma$	Children living in households that <i>received</i> remittances or aid during the twelve months preceding the interview, and whose year of birth determines that the decision of enrolling or not enrolling in intermediate education was taken <i>after</i> the household received remittances or aid. Coefficients: $\alpha + \beta + \gamma + \delta$

Source: Description by the author.

The two ways of differencing, either by first comparing the outcome of the treatment group with that of the control group for each time period and then differencing the results over time, or by first calculating the differences over time for each group and then differencing these changes, will lead to equivalent results for the difference-in-differences estimator. According to the second method and excluding other regression covariates, the difference-in-differences estimator may be expressed as,³⁷

$$\hat{\delta} = (\bar{y}_{T,post} - \bar{y}_{T,pre}) - (\bar{y}_{C,post} - \bar{y}_{C,pre}) \quad (2)$$

or, alternatively, in terms of the coefficient estimates in table 2,

$$\hat{\delta} = \{(\hat{\alpha} + \hat{\beta} + \hat{\gamma} + \hat{\delta}) - (\hat{\alpha} + \hat{\gamma})\} - \{(\hat{\alpha} + \hat{\beta}) - \hat{\alpha}\} = (\hat{\beta} + \hat{\delta}) - \hat{\beta} = \hat{\delta} \quad (3)$$

In the empirical analysis, a set of control variables will however be included in the regressions, a practice that is straightforward in a difference-in-differences framework and further reduces the risk for omitted variables bias (Angrist & Pischke 2009 p. 236).

Inclusion of Geocoded AidData

Recognizing the multifaceted concept of external assistance, analyzing both assistance received directly by households and geocoded aid projects serves to provide a more comprehensive picture of the impacts of foreign aid. The objective of the analysis with geocoded aid projects is thus to estimate the

³⁶ A larger share of primary education graduates among the older cohorts should cause a downward bias of the coefficients.

³⁷ Expression based on Wooldridge (2009 p. 453).

marginal effect of proximity to one or several aid activities on the probability of continued education at the intermediate level. For this purpose it is appropriate to use only the projects with exact point locations, i.e. precision code one, as this provides sufficient granularity for matching with families' places of residence and thus for assessing the impact of aid at the household level.³⁸ In total, 536 of the geocoded projects have exact coordinates, corresponding to 829 project-location observations. These exact project sites are matched with the households' geographic locations based on latitude and longitude coordinates.³⁹

The study's ambition to empirically estimate the a priori unclear education aid effectiveness at the micro-level by focusing on individual schooling outcomes corroborates employing a subnational and sectoral approach.⁴⁰ Hence, the crucial consideration concerns which projects may affect the probability of continuing in intermediate education. Access to schooling is likely to be a decisive factor for attendance. Shortage of schools has been a pressing issue in Iraq, both in terms of the quantity of school buildings, resulting in multiple-shift teaching, and the quality and condition of premises, calling for a massive rehabilitation programme (UNESCO 2004 p. 4, 37). Moreover, construction of new classrooms is an effective measure for increasing access to education (UNESCO 2011 p. 33). Against this background, projects of rehabilitation or reparation, construction of new classrooms, supply of equipment, and other projects related to specific schools are included. These activities are concerned with the educational stages kindergarten, primary education, intermediated education, and secondary education. Thus, I consider a subset of education projects rather than aggregate measures, in line with D'Aiglepiere and Wagner (2013). In total, the analysis covers 79 projects, each implemented in a specific school. The aggregate commitment amount is USD 18,057,594 (constant 2011 USD).⁴¹ The choice of investigating education aid in relation to progression through the educational stages is supported by De and Becker (2015 p. 26) who argue that aid for education might in fact be better suited for analyses of a more precise indicator of education, for instance related to quality or duration of schooling, than their focus on school exposure in specific areas.

In order to incorporate the selected projects into the difference-in-differences framework, a variable indicating proximity to education sector aid projects substitutes the variable for receiving assistance in the form of remittances and aid from foreign organizations as the treatment variable, and its product with the younger age group replaces the interaction term. The method for measuring distances between households and projects will be further described in connection to the aid projects specification in the empirical analysis section.

³⁸ Projects' coordinates thus indicate specific locations, e.g. towns, cities, hills, farms and different forms of installations.

³⁹ The distances between projects and households are calculated using the Stata package *geonear* that finds all pairwise combinations of households and projects within a specified distance. A more detailed description of the *geonear* transformation is included in the appendix. The geographic location of each family is noted based on the GPS coordinates recorded during the first survey visit to the household. Like AidData geocoding, GPS devices use WGS 1984.

⁴⁰ In addition to the arguments by De and Becker (2015) (see note 28), Michaelowa (2004 p. 1) proposes that sectoral analyses are suitable to expose the impact of governance quality on aid effectiveness.

⁴¹ As the OECD only has data on sector-level allocation of aid for all recipients and not for individual countries, it is not possible to calculate the share of the sector's total development assistance to Iraq covered by the data.

The time perspective is an important consideration when using geocoded aid project data to evaluate aid effectiveness. It is difficult to determine the time needed for measurable effects after project completion. Nevertheless, I expect projects related to rehabilitation and expansion of schools to have a fairly immediate impact on increasing the access to schooling, thus favoring increased enrollment with at most a short lag after completion. All but eight projects started over the period 2004 to 2006. Unfortunately, the end date is only available for 45 of the included activities. I attempt to circumvent this limitation by calculating the missing end dates based on the duration of similar projects. Although there is a degree of uncertainty in this assumption, the result indicates that the peak of project completion occurred in 2006 and that the vast majority of projects were completed before the start of the 2008–2009 academic year. Consequently, I assume that the projects are effective counting from school year 2008–2009 at the latest. Ideally, I would therefore have wanted to compare the enrollment outcomes between the first and second survey waves, i.e. between 2006–2007 and 2012–2013, to capture the potential impact of the education aid projects on access to schooling. Unfortunately, the lack of households' geographic coordinates in the first survey round restricts the analysis of aid presence to the 2012–2013 sample. This survey was conducted during the spring semester of the 2011–2012 and the fall semester of the 2012–2013 academic year, i.e. at least three school years after the projects were effective. Lamentably, the extended period over which the education aid projects are implemented and completed, coupled with the limited number of interventions, complicates the construction of pre- and post-treatment groups focused around the date of project completion. Recognizing the inherent limitations of such a long period of treatment, I choose to use the equivalent age groups, i.e. time periods, as in the specifications with remittances and self-reported foreign aid receipt.

As a consequence, the identification strategy in this case relies on the relative duration of exposure to improved access to education for children in the two age groups, i.e. children expected to be enrolled in the first and third intermediate grade respectively. Compared to the older group, the younger children did, because of their relatively lower age, benefit from the completed education projects during a larger part of their years in primary education. It is reasonable to expect that better access to primary education should influence the concerned children's probability of continued schooling in higher levels.

Empirical Analysis

The difference-in-differences approach is implemented empirically by estimating a set of Linear Probability Models (LPM) using Ordinary Least Squares (OLS) regression.

The dependent variable, i.e. the dummy marking children enrolled in the grade in intermediate education that is expected given their age, is common to all specifications. The main independent variable of interest, i.e. remittances, aid from foreign organizations, or proximity to aid projects, is specified separately for each estimation. Furthermore, a set of covariates are added in all specifications to reduce the influence of omitted variables and control for factors known to have an impact on the

probability of school enrollment. The main independent variables of interest and education outcome might both be determined by these characteristics and failing to include any one of them would therefore risk inducing a bias in the estimated coefficients. A description of all variables used in the analysis is provided in table 13 in the appendix.

Control Variables

The control variables are based mainly on the education literature. One of the most widely applied approaches to the determinants of student achievement is the so called education production function approach, relating educational outcomes to characteristics of the student, family and fellow students, as well as school factors (see e.g. Hanushek 1995).⁴² I include controls reflecting characteristics of the individual child, family, and area of residence.

Child characteristics include gender, disabilities, and chronic diseases. In developing countries, there is generally a negative bias for girls' education.⁴³ Traditional attitudes and values may further lower female school participation. Poor health is also an impediment to participation in education.⁴⁴ Lastly concerning child characteristics, the inability to control for children's innate ability due to lack of appropriate measurement is partly addressed by the difference-in-differences method.

Turning to family-specific factors, I control for household size in terms of the number of adults and children respectively, acknowledging their different capacities to contribute financially to the household. Furthermore, monthly per capita income and expenditures among the household members are added as measures of socio-economic status.⁴⁵ Family income determines the demand for education as financial constraints may prevent children from enrolling in school or force them to drop out.⁴⁶ Both income and expenditures are deflated by consumer price index (CPI) to 2010 values and included in log form.⁴⁷ Moreover, parents' education is controlled for in terms of the highest certificate attained by the child's mother and father respectively, recognizing the positive correlation between the level of education of parents and the probability of enrolling children in school. Parents with more schooling give higher priority to education and provide more resources and support. Especially important for

⁴² This model states that student performance is associated with a set of measurable inputs. See Hanushek (1995) for further reference and an overview of research on schooling in developing countries.

⁴³ See e.g. Björkman Nyqvist (2013) for a study of gender bias in education in Uganda, with girls receiving less schooling than boys. The results show that a negative income shock has a significant negative effect on girls' primary school enrollment.

⁴⁴ See e.g. Miguel and Kremer (2004) for an evaluation of a program of deworming mass treatment among school-aged children in Kenya. The authors find an increase in school participation and improved health, not only in treatment schools but also in neighboring schools.

⁴⁵ Controlling for the gender of the household's head of family is also important. However, in the final sample there was no household with a female head.

⁴⁶ The use of *per capita* monthly income and expenditures in the household of the individual child, and not e.g. the income of the child's parents only, relies on the definition of the family as usually consisting of relatives but also potentially other individuals that "share food of the family and living necessities." (COSIT & KRSO 2012 p. 14). The spending on e.g. food and other categories is reasonably associated with the money left for educational expenditures. What matters is thus the aggregate income corrected for the number of household members. For income and expenditures components, see table 13 in the appendix.

⁴⁷ The measure for average yearly CPI is from the International Monetary Fund, International Financial Statistics, and has 2010 as base year (World Bank 2015a).

this study, I also include a variable for parental absence to control for further effects of migration on the educational attainment of children.⁴⁸

Concerning the child's area of residence, environment is controlled for by a dummy variable for rural areas. Rural parts of Iraq are relatively more deprived of education compared to urban areas, concerning access to schools, teachers, and work environment (Ministry of Planning 2014 p. 90). However, the level of violence has been higher in Iraqi cities (Shafiq 2013). Moreover, governorate dummies are included to control for factors specific to each of the 18 governorates.⁴⁹ In addition, a dummy variable indicating the second survey round is added to control for time-specific trends, especially important given the radical events and violent conflict during the years that elapsed between the surveys. Finally, I add interaction terms for governorates and the second survey round to control for governorate-specific time trends.

Remittances Specification

The first specification investigates the relationship between remittances and the probability of enrollment in intermediate education. Thus, I estimate the following equation,

$$Y_{ihgt} = \alpha + \beta young_{it} + \gamma Rem_h + \delta(Rem_h \times young_{it}) + X_i + Z_{ih} + s_{ih} + \mu_g + \mu_g s_{ih} + \varepsilon_{ihgt} \quad (4)$$

where the dependent variable Y_{ihgt} represents the enrollment status of child i in household h and governorate g , in time period t , i.e. either before or after potential remittances were received. It takes the value one if the child attends the correct grade according to age and zero otherwise, i.e. if enrolled in a lower or higher grade, or not attending school at all. The first independent variable, $young_{it}$, marks children whose future school enrollment or non-enrollment was decided after remittances were sent and received by households. The second independent variable, Rem_h , indicates whether during the past twelve months household h received remittances or not. I analyze remittances from three different types of senders. Assistance received from relatives in Iraq corresponds to domestic remittances whereas assistance from relatives abroad represents international remittances. These are considered separately and in aggregate. In addition, remittances from others, i.e. individuals not related to the family by kinship, are grouped with remittances from all relatives. The main independent variable of interest is the interaction term $(Rem_h \times young_{it})$, marking children in households that received remittances from at least one of the mentioned sources during the past twelve months, and for whom the enrollment decision was taken after the receipt of remittances. The causal effect of interest, i.e. the effect of remittances on the probability of intermediate education enrollment, is thus represented by the coefficient δ .

⁴⁸ For the survey conducted in 2006–2007, the dummy indicates whether the child had at least one absent parent during the last year (minimum one month) or living in another household, whereas for the 2012–2013 survey it indicates whether the child had at least one absent parent during some period of the last one or two years, or living in another household.

⁴⁹ In particular, this controls for the varying level of conflict and violence across provinces and differential impact of war on education. The average educational attainment also shows geographic variation. To the extent that public spending per pupil varies across governorates, this would also be captured by the dummies.

The following set of control variables are common to all estimated equations unless any deviation is indicated. X_i represents the child-specific covariates (gender and health), whereas Z_{ih} contains household characteristics (household size, income and expenditures, parents' education, and parental absence), including rural area of residence. The variable s_{ih} denotes the second survey round, μ_g controls for the governorate-specific characteristics, and $\mu_g s_{ih}$ captures the governorate-specific time trends. Finally, ε_{ihgt} is the child-specific error term.

Aid from Foreign Organizations Specification

My next specification concerns the effect of aid targeted to households and the probability of continued schooling in intermediate education. Thus, I estimate the following equation,

$$Y_{ihgt} = \alpha + \beta young_{it} + \gamma Aid_h + \delta(Aid_h \times young_{it}) + X_i + Z_{ih} + s_{ih} + \mu_g + \mu_g s_{ih} + \varepsilon_{ihgt} \quad (5)$$

where the dependent variable Y_{ihgt} represents the enrollment status of child i , in household h and governorate g , in time period t , i.e. either before or after aid was allocated to households. It takes the value one if the child attends the correct grade according to age and zero otherwise.

In this specification, receipt of aid from foreign organizations, as reported by the recipient households, has substituted remittances in the treatment variable and the interaction term. Accordingly, the independent variable Aid_h indicates whether during the past twelve months household h received aid from foreign organizations or not. The main independent variable of interest, the interaction term ($Aid_h \times young_{it}$), marks children in households that reported receiving aid from foreign organizations, and for whom the enrollment decision was taken after being provided assistance. Its coefficient, δ , thus captures the causal effect of household-level foreign aid on the probability of continued education.

Remittances and Aid from Foreign Organizations Specification

Having performed separate regressions with remittances and aid received by households to evaluate their respective impact on children's education, I next attempt to assess the comparative effect of the two forms of assistance on the probability of enrolling in intermediate education. With this objective, I estimate the following equation,

$$Y_{ihgt} = \alpha + \beta young_{it} + \gamma_1 Rem_h + \delta_1(Rem_h \times young_{it}) + \gamma_2 Aid_h + \delta_2(Aid_h \times young_{it}) + X_i + Z_{ih} + s_{ih} + \mu_g + \mu_g s_{ih} + \varepsilon_{ihgt} \quad (6)$$

where the dependent variable Y_{ihgt} , like before, takes the value one if the child is enrolled in the correct grade in intermediate education and zero otherwise. Likewise, the first independent variable, $young_{it}$, marks children for whom the decision concerning continued education was taken after the period of treatment. However, this model contains two treatment variables, representing assistance in the form of remittances and aid from foreign organizations respectively, as well as two interaction terms with each of these assistance dummies and the younger age group. In line with previous specifications, the

twin independent variables of interest, Rem_h and Aid_h , indicate whether during the past twelve months household h received assistance in the form of remittances or foreign aid, respectively.

The specification is estimated for remittances from relatives in Iraq, relatives abroad, all relatives, and from all sources, respectively, in line with the specifications for remittances' impact only. The two interaction terms ($Rem_h \times young_{it}$) and ($Aid_h \times young_{it}$), mark children in households that reported having received assistance in the form of remittances and aid respectively over the preceding twelve months, and for whom the enrollment decision was taken after the allocation of remittances and aid. Consequently, the causal effects of remittances and aid are represented by the coefficients δ_1 and δ_2 , respectively.

Descriptive Statistics for Remittances and Aid from Foreign Organizations Regressions

The final sample of children from the older and younger age groups that are included in the regressions with remittances, aid from foreign organizations, and both measures of assistance amount to 17,396 individuals, in 11,460 households, from both survey waves.⁵⁰ The number of households receiving assistance from different sources, and thus the children affected, are displayed in table 3. As inferred from the table, the size of the treatment group varies between the specifications.

Table 3. Recipients of assistance by type: remittances and aid

Type of assistance	No. of households	No. of children
<i>Remittances</i>		
Relatives in Iraq	2,531	3,870
Relatives abroad	232	342
Other than relatives	515	804
Any source (one or several)	2,920	4,455
<i>Aid</i>		
Aid from foreign organizations	460	710
<i>Both</i>		
Remittances (any source) & aid	101	153

Notes: Households may receive assistance from several sources. A total of 17,396 children in 11,460 households are included in the analysis.

Source: Data from Iraq Household Socio-Economic Survey (IHSES) 2006–2007 and 2012–2013, processed by the author.

Summary statistics for the data and variables used in the regressions with remittances and aid from foreign organizations, as well as in the joint specifications, are presented in table 4. About 25.6 percent of the children live in households that reported having received remittances, from any source, whereas 4.1 percent of the children live in families to which aid was distributed by foreign organizations during

⁵⁰ The original total sample of children from these age groups consisted of 29,728 observations from both survey rounds. However, due to missing data on certain covariates, the sample was reduced. In particular, missing data on parents' education caused a substantial loss of 12,193 observations from the combined sample. Nevertheless, the importance of parental education for the schooling of children warrants this inclusion.

the past twelve months. Regarding the dependent variable, about 23.4 percent of the children in the sample are currently enrolled in the grade in intermediate education that is expected given their age and the time of interview. The sample is divided fairly equally between the younger and older age group and female and male children constitute half of the sample each. About 65.3 percent of the observations come from the second survey wave.

Table 4. Summary statistics for variables used in analysis of remittances and aid from foreign organizations

VARIABLES	Mean	Std. Dev.	Min	Max
<i>Dependent variable</i>				
Intermediate education (correct grade)	0.234	0.423	0	1
<i>Independent variables</i>				
Younger age group	0.533	0.499	0	1
Internal remittances (relatives in Iraq)	0.222	0.416	0	1
Internal remittances * younger	0.118	0.322	0	1
International remittances (relatives abroad)	0.020	0.139	0	1
International remittances * younger	0.010	0.098	0	1
Remittances from relatives (internal & international)	0.236	0.425	0	1
Remittances from relatives * younger	0.125	0.331	0	1
Remittances from relatives and non-relatives (internal & international)	0.256	0.436	0	1
Remittances from relatives and non-relatives * younger	0.136	0.343	0	1
Aid from foreign organizations	0.041	0.198	0	1
Aid from foreign organizations * younger	0.023	0.150	0	1
Second survey	0.653	0.476	0	1
Absent parent	0.075	0.263	0	1
Female	0.495	0.500	0	1
Rural	0.364	0.481	0	1
Number of adults	3.579	2.040	0	18
Number of children	5.160	2.423	1	32
Log monthly income per capita (1,000 ID)	4.701	0.791	-3.188	9.694
Log monthly expenditures per capita (1,000 ID)	4.917	0.480	2.830	7.626
<i>Parents' education (base: no certificate)</i>				
Primary certificate father	0.335	0.472	0	1
Primary certificate mother	0.380	0.486	0	1
Intermediate certificate father	0.130	0.336	0	1
Intermediate certificate mother	0.107	0.309	0	1
Secondary school certificate father	0.133	0.339	0	1
Secondary school certificate mother	0.051	0.221	0	1
Higher certificate father	0.201	0.400	0	1
Higher certificate mother	0.073	0.260	0	1
Other certificate father	0.002	0.041	0	1
Other certificate mother	0.001	0.030	0	1
Disability	0.022	0.146	0	1
Chronic illness	0.027	0.163	0	1

Notes: The regressions include 17,396 observations. Governorate dummies and interactions between governorates and the second survey are not included in the table.

Source: Data from Iraq Household Socio-Economic Survey (IHSES) 2006–2007 and 2012–2013, processed by the author.

Summary statistics for the treatment and control groups used in the regressions with remittances, from all relatives and non-relatives, are displayed in table 14 in the appendix. The statistics suggest that children in remittance-recipient and non-recipient households are similar on most individual and household characteristics. However, the treatment group is sampled slightly more from the second survey wave, 67.7 percent deriving from the 2012–2013 sample compared to 64.4 percent for the control group. It is further worth noting that parental absence is more common for children in remittance-receiving households than for children in households not receiving remittances. About 10.6 percent of the children in the treatment group had an absent parent, compared to 6.4 percent in the control group. Hence, it is not unreasonable to assume that the absent parent could, in some cases, be the source of remittance transfers. Finally, non-recipient families reside slightly more in rural areas (37 percent) than households receiving remittances (34.6 percent).

Aid Projects Specification

Lastly, I estimate the effect of proximity to education aid interventions and exposure to the completed assistance projects on the probability of continuing in intermediate education. Thus, the following equation is estimated,

$$Y_{ihgt} = \alpha + \beta young_{it} + \gamma Aidpres_h + \delta(Aidpres_h \times young_{it}) + X_i + Z_{ih} + \mu_g + \varepsilon_{ihgt} \quad (7)$$

As mentioned in the method section, this specification is estimated for the 2012–2013 survey sample exclusively, which is why the dummies for the second survey round and governorate time trends are omitted. Analogously to previous specifications, the dependent variable Y_{ihgt} represents the enrollment status of child i in household h and governorate g in time period t .⁵¹

The treatment variable, $Aidpres_h$ is a measure of foreign aid presence in the form of projects implemented nearby. In order to allow for different relationships between aid interventions and enrollment, the variable is included both in linear form, i.e. the number of projects in the household's proximity, and as a binary variable, taking the value one if there is at least one nearby project and zero otherwise. In other words, I estimate both a linear and binary specification of aid presence. Due to the difficulty in assessing the radius within which an education aid project is likely to influence schooling decisions, distances of 20, 15, 10, and 5 kilometer between projects and households are considered in separate regressions (see note 39 and the appendix regarding the method for calculating distances). Given the need for transportation between the home and the school, I expect the projects at larger distances from the home to have a weaker effect on the probability of enrollment in education than projects implemented in schools closer to the dwelling.

Analogously to previous specifications, the independent variable $young_{it}$ takes the value one for children who according to their age and time of interview should be enrolled in the first intermediate grade and zero for the older children who should be in third intermediate. As noted in the description

⁵¹ However, the interpretation of time periods is somewhat different. Whereas in the previous specifications the second time period included the younger children for whom the enrollment decision was taken before the year of remittances and foreign aid were distributed, this setup does not include assistance allocated during the most recent year but through aid activities in previous years. The second period thus simply refers to the younger age group.

of the method, these are not the ideal age groups for isolating the causal impact of the aid projects. Given the data at hand, implying an extended treatment period over the duration of the aid activities, I nevertheless opted for this solution.

The main variable of interest, the interaction term ($Aidpres_h \times young_{it}$), marks children in households living in proximity to at least one education aid project, and who belong to the younger group. The coefficient on the interaction variable, δ , thus represents the causal effect of proximity to education aid projects and duration of exposure to their achievements on the probability of continuing in intermediate education.

Descriptive Statistics for Aid Projects Regressions

A total of 11,354 children in the older and younger age groups, living in 7,414 households, are included in the sample used for the aid projects regressions. These observations are from the second survey wave only.⁵² The number of households residing within 20, 15, 10, and 5 kilometers from an education aid project are displayed in table 5, together with the corresponding number of children treated by aid presence.

Table 5. Proximity to at least one education aid project by distance

Distance	No. of households	No. of children
20 kilometers	1,722	2,611
15 kilometers	1,294	1,946
10 kilometers	862	1,287
5 kilometers	355	531

Sources: Data from AidData (2015a) and Iraq Household Socio-Economic Survey (IHSES) 2012–2013, processed by the author.

Summary statistics for the data and variables used in the regressions with the geocoded aid projects are displayed in table 6. About 23 percent of the children live in households that reside within 20 kilometers of at least one education aid project, 17.1 percent have one or more education aid activities within 15 kilometers, 11.3 percent have at least one such project within ten kilometers, and about 4.7 percent of the children live within five kilometers of at least one education aid project.

As for the dependent variable, the share of the children currently enrolled in the grade in intermediate education that is expected given their age and the time of interview is almost identical to that in the pooled cross-sectional sample, about 23.1 percent. Likewise, the division between the younger and older age groups is similar, with a close to equal split, and the sample is partitioned equally between female and male children.

⁵² The original total samples of children consisted of 17,569 individuals from the second survey wave. However, due to missing data on certain covariates, in particular for parents' education (6,117 missing observations) a substantial number of observations were lost.

**Table 6. Summary statistics for variables used in analysis of education aid projects.
Binary and linear specifications.**

VARIABLES	Mean	Std. Dev.	Min	Max
<i>Dependent variable</i>				
Intermediate education (correct grade)	0.231	0.421	0	1
<i>Independent variables</i>				
Younger age group	0.520	0.500	0	1
<i>Used in binary specifications</i>				
At least one education aid project within 20 km	0.230	0.421	0	1
At least one education aid project within 20 km * younger	0.119	0.324	0	1
At least one education aid project within 15 km	0.171	0.377	0	1
At least one education aid project within 15 km * younger	0.088	0.283	0	1
At least one education aid project within 10 km	0.113	0.317	0	1
At least one education aid project within 10 km * younger	0.058	0.233	0	1
At least one education aid project within 5 km	0.047	0.211	0	1
At least one education aid project within 5 km * younger	0.023	0.149	0	1
<i>Used in linear specifications</i>				
Number of education aid projects within 20 km	2.157	6.035	0	34
Number of education aid projects within 20 km * younger	1.100	4.421	0	34
Number of education aid projects within 15 km	1.228	3.922	0	32
Number of education aid projects within 15 km * younger	0.620	2.831	0	32
Number of education aid projects within 10 km	0.555	2.070	0	27
Number of education aid projects within 10 km * younger	0.279	1.490	0	27
Number of education aid projects within 5 km	0.128	0.767	0	11
Number of education aid projects within 5 km * younger	0.064	0.553	0	11
Absent parent	0.080	0.271	0	1
Female	0.497	0.500	0	1
Rural	0.409	0.492	0	1
Number of adults	3.594	2.008	0	15
Number of children	5.121	2.404	1	26
Log monthly income per capita (1,000 ID)	4.805	0.796	-3.073	86.009
Log monthly expenditures per capita (1,000 ID)	5.029	0.487	2.946	77.414
<i>Parents' education (base: no certificate)</i>				
Primary certificate father	0.344	0.475	0	1
Primary certificate mother	0.365	0.482	0	1
Intermediate certificate father	0.120	0.325	0	1
Intermediate certificate mother	0.092	0.289	0	1
Secondary school certificate father	0.115	0.319	0	1
Secondary school certificate mother	0.038	0.192	0	1
Higher certificate father	0.177	0.382	0	1
Higher certificate mother	0.059	0.236	0	1
Other certificate father	0.002	0.043	0	1
Other certificate mother	0.001	0.028	0	1
Disability	0.023	0.150	0	1
Chronic illness	0.026	0.159	0	1

Notes: The regressions include 11,354 observations from IHSES 2012–2013. Governorate dummies are not included in the table.

Sources: Data from Iraq Household Socio-Economic Survey (IHSES) 2012–2013 and AidData (2015a), processed by the author.

Results

In this section, the results from the empirical analysis will be introduced, i.e. from estimation of equations (4) through (7). Before turning our attention to the results obtained from the regressions, some general comments on the coefficients and variables will facilitate further analysis.

The coefficients on the dummy variables are measured as the marginal change in probability of continued schooling in intermediate education as the dummy takes the value one and holding all other factors fixed. The interpretation of the estimates for the main independent variables of interest, i.e. the dummies and interaction terms with remittances and foreign aid, will be further developed under their respective sections. Concerning the household-size variables, the coefficients represent the marginal change in probability of enrollment for one additional adult or child respectively as household member. Moreover, as per capita monthly income and expenditures are included in their log forms the marginal effect of a one-percent increase in income or expenditures respectively is a change in probability corresponding approximately to the size of the coefficient through 100. Regarding the variables for parents' education, the base is set to having no certificate. Therefore, the coefficient points to the marginal change in probability of enrolling in intermediate education if the parents have attained a given level of education compared to not having finished primary education.

Remittances

The results from estimating equation (4) for remittances from relatives in Iraq, relatives abroad, and all relatives, as well as from relatives and others, are presented in table 7.

First, I note the consistently negative coefficient on the remittances variable regardless of sender and origin of assistance, being significant with exception for remittances from relatives abroad. The effect is most pronounced in the specification with remittances from all relatives without differentiation between domestic and international transfers. The results suggest that the overall probability of continued school enrollment is 2.5 percentage points lower for children in households that receive remittances from any relative, 2.2 percentage points lower for remittances from relatives in Iraq, and 2.0 percentage points lower for assistance from any sender type. The consistency of these results points to the presence of selection into remittance-receipt and systematic differences between the households that receive remittances and those that do not.

Table 7. Effect of remittances on the probability to continue in intermediate education

SPECIFICATION: Origin of remittances	Relatives in Iraq	Relatives abroad	All relatives	All relatives & non-relatives
VARIABLES				
Younger age group	0.0349*** (0.00711)	0.0393*** (0.00632)	0.0336*** (0.00716)	0.0335*** (0.00725)
Remittances-recipient (dummy)	-0.0215** (0.0110)	-0.0255 (0.0323)	-0.0249** (0.0108)	-0.0197* (0.0106)
Remittances * younger age group (interaction)	0.0205 (0.0149)	0.00994 (0.0478)	0.0249* (0.0146)	0.0235* (0.0142)

Absent parent	-0.0484*** (0.0108)	-0.0493*** (0.0108)	-0.0483*** (0.0108)	-0.0486*** (0.0108)
Female	-0.0273*** (0.00627)	-0.0272*** (0.00627)	-0.0273*** (0.00627)	-0.0272*** (0.00627)
Rural	-0.0380*** (0.00683)	-0.0378*** (0.00683)	-0.0380*** (0.00683)	-0.0379*** (0.00683)
Number of adults	-0.00315** (0.00151)	-0.00300** (0.00151)	-0.00316** (0.00151)	-0.00311** (0.00151)
Number of children	-0.00718*** (0.00142)	-0.00715*** (0.00142)	-0.00718*** (0.00142)	-0.00715*** (0.00142)
Log monthly income per capita	0.000347 (0.00473)	0.000420 (0.00473)	0.000309 (0.00473)	0.000326 (0.00473)
Log monthly expenditures per capita	0.0414*** (0.00878)	0.0422*** (0.00879)	0.0416*** (0.00878)	0.0418*** (0.00878)
<i>Parents' education (base: no certificate)</i>				
Primary certificate father	0.0287*** (0.00830)	0.0290*** (0.00830)	0.0287*** (0.00830)	0.0287*** (0.00830)
Primary certificate mother	0.0306*** (0.00732)	0.0307*** (0.00732)	0.0305*** (0.00732)	0.0306*** (0.00732)
Intermediate certificate father	0.0651*** (0.0114)	0.0655*** (0.0114)	0.0651*** (0.0114)	0.0652*** (0.0114)
Intermediate certificate mother	0.0779*** (0.0123)	0.0784*** (0.0123)	0.0779*** (0.0123)	0.0780*** (0.0123)
Secondary school certificate father	0.0839*** (0.0118)	0.0842*** (0.0118)	0.0838*** (0.0118)	0.0839*** (0.0118)
Secondary school certificate mother	0.123*** (0.0178)	0.124*** (0.0179)	0.124*** (0.0178)	0.124*** (0.0178)
Higher certificate father	0.118*** (0.0115)	0.118*** (0.0115)	0.118*** (0.0115)	0.118*** (0.0115)
Higher certificate mother	0.0803*** (0.0164)	0.0805*** (0.0164)	0.0802*** (0.0164)	0.0804*** (0.0164)
Other certificate father	-0.0918 (0.0578)	-0.0912 (0.0573)	-0.0921 (0.0579)	-0.0925 (0.0578)
Other certificate mother	0.104 (0.120)	0.102 (0.119)	0.104 (0.120)	0.104 (0.120)
Disability	-0.144*** (0.0160)	-0.144*** (0.0160)	-0.144*** (0.0160)	-0.144*** (0.0160)
Chronic illness	0.000461 (0.0192)	0.000495 (0.0192)	0.000690 (0.0192)	0.000416 (0.0192)
Governorate dummies	YES	YES	YES	YES
Second survey	0.0777** (0.0373)	0.0768** (0.0372)	0.0778** (0.0373)	0.0773** (0.0373)
Governorate time trends	YES	YES	YES	YES
Constant	0.0521 (0.0595)	0.0443 (0.0594)	0.0530 (0.0595)	0.0510 (0.0595)
No. of obs.	17,396	17,396	17,396	17,396
R-squared	0.061	0.061	0.061	0.061

Notes: Robust standard errors are in parentheses. ***, **, and * denote significance at the 1, 5, and 10 percent level, respectively. The binary dependent variable indicates whether the child is enrolled in the expected grade in intermediate education, as explained in the appendix "Construction of Age Groups". Data from Iraq Household Socio-Economic Survey (IHSES) 2006–2007 and 2012–2013.

Second, turning to the variable for the younger age group the coefficient is positive and highly statistically significant in all specifications, indicating that the probability of continuing in intermediate education is generally higher for the younger children whose future enrollment status was settled after the period of sending and receiving remittances. The marginal increase in the probability is similar for all types of remittances, ranging from 3.4 to 3.9 percentage points.

Third and most importantly for this study, the coefficient on the interaction term between remittance-receipt and the younger group of children, i.e. the difference-in-differences estimator, is positive for all specifications and significant at the 10 percent level for the two more comprehensive definitions of remittances. More specifically, the result indicates that the probability to continue schooling in intermediate education is 2.5 percentage points higher for children in households that received domestic or international remittances from relatives during the preceding twelve months and for whom the decision regarding future schooling was taken after remittances were received. Analogously remittances in its broadest sense, i.e. including transfers from non-relatives, lead to a marginal increase of 2.4 percentage points in the probability of continued enrollment. The magnitude of this effect is not negligible considering that approximately 23.4 percent of the children in the sample are currently enrolled in the correct grade in intermediate education.

Turning to the control variables I note a positive and statistically significant coefficient on the dummy for the second survey wave, suggesting that the probability of continuing in intermediate education is higher for children interviewed in 2012 than in 2007 regardless of age group. As expected, female children are consistently less likely to be enrolled in the correct grade in intermediate education. More specifically, the probability is 2.7 percentage points lower for females throughout all four specifications. Furthermore, in line with theory of migration, parental absence exhibits a highly statistically significant and negative marginal reduction by almost five percentage points in the probability that the child enrolls in intermediate education on time. Concerning the influence of living environment, I observe a statistically significant lower probability of continued enrollment for children in rural areas. The impact of household size further conforms with expectations. Although every additional household member leads to a marginal reduction in the probability that children continue in intermediate education, the effect is most pronounced for additional children.⁵³

Regarding measures of socio-economic status, per capita expenditures show a statistically significant marginal effect on schooling. More specifically, a one-percent increase in expenditures is associated with a marginal rise by approximately 0.04 percentage points in the probability of continuing in intermediate education. By contrast, monthly per capita income turns out insignificant. There are reasons to suspect that this is due to correlation between income and expenditures.⁵⁴

⁵³ The coefficients on the number of adults and number of children are also jointly significant in the regressions, the F-test of joint significance indicating a p -value of 0.0000. This holds for all the equations estimated in the analysis.

⁵⁴ In fact, the correlation between the level forms of monthly per capita income and expenditures is only 0.1566, but the correlation is as high as 0.5522 when the variables are included in log form as in the regressions.

As predicted, parents' level of education demonstrates a highly statistically significant impact on the probability of continued schooling.⁵⁵ In particular, in comparison to the base of no completed level of education for mothers and fathers respectively, the probability of continuing in intermediate education increases the higher the parents' level of education. Interestingly, the certificate attained by mothers shows a stronger effect than that achieved by fathers, for all levels up to secondary education inclusively.

Concerning the health of the child, the results indicate that disabled children have a statistically significant lower probability of continuing their schooling in intermediate education than children who do not suffer from a disability. Furthermore, the effect is practically significant, corresponding to a 14 percentage points lower probability, whereas chronic illness is statistically insignificant.⁵⁶

As for regional characteristics, although not all governorate dummies are individually statistically significant they are jointly significant. This further holds for the interaction terms for governorate-specific time-trends, confirming the disparities in terms of human development across the Iraqi provinces. Lastly, I note the statistically significant and positive coefficient on the dummy variable for the second survey round, suggesting that the probability of children continuing their schooling in intermediate education is overall about 7.7 percentage points higher for those interviewed in 2012 than in 2007.

Aid from Foreign Organizations

Table 8 displays the results from estimating equation (5) for aid received by households from foreign organizations. The complete version of the table is provided in the appendix (table 15). Among the 17,396 children included in the regression, 710 children live in the 460 households that reported having received aid from foreign organizations during the twelve months preceding the interview. It is worth emphasizing that the majority of observations, 691 children, are issued from the 2006–2007 survey wave, whereas only 23 children represent the second survey round.

To begin with, the results from substituting remittances by aid from foreign organizations in the regression indicate the exact opposite effect on children's participation in intermediate education. The statistically significant coefficient on the variable for aid receipt suggests that children living in households who received assistance from foreign organizations overall have a 6.7 percentage points higher probability to continue in intermediate education than children in households that did not receive aid from foreign organizations during the twelve months preceding the survey. This suggests that the distributed assistance does not accrue to the families where children face the highest risk of dropping out of school. Furthermore, the coefficient on the interaction term between aid and the

⁵⁵ The dummy variables for the different certificates attained by fathers and mothers are jointly statistically significant, with a p -value from the F-test of 0.0000, which holds throughout the remaining estimations. The only certificate variables that do not display a significant effect on the probability of continuing education at the intermediate level are those for other certificates. These include e.g. degrees from religious schools and other institutions not affiliated to official educational authorities.

⁵⁶ The two measures of the child's health are however jointly significant with a p -value of the F-test of 0.0000. This holds for all equations estimated in the analysis.

younger age group, i.e. those for whom the decision to enroll or not enroll in intermediate education was taken after assistance had been allocated among households, demonstrates a highly statistically significant and negative marginal effect of receiving aid from foreign organizations. In addition, the impact is practically important, suggesting a 10.3 percentage points lower probability of continuing in intermediate education for children in aid-recipient households for whom the enrollment decision was taken after the allocation of aid. This implies that aid from foreign organizations induces a substantial reduction in the probability of continued education at the intermediate level considering that 23.4 percent of the children in the sample are currently enrolled in the correct grade in intermediate education. Nevertheless, the assistance received is not specifically earmarked for education purposes, and aid flows in the form of projects might therefore be a more appropriate indicator. Moreover, I note that children in the younger age group in general have a 4.4 percentage points higher probability of pursuing studies at the intermediate level, in congruence with the findings from the estimation with remittances.

With regard to the control variables their coefficients correspond very closely to the estimates from the remittances specifications. Significance levels, signs, and magnitudes are intact except for the coefficient on the binary time-trend variable that turns out statistically insignificant.

Table 8. Effect of aid from foreign organizations on the probability to continue in intermediate education

VARIABLES	
Younger age group	0.0437*** (0.00640)
Aid-recipient (dummy)	0.0665** (0.0319)
Aid * younger age group (interaction)	-0.103*** (0.0310)
Controls	YES
Governorate dummies	YES
Second survey	0.0178 (0.0375)
Governorate time trends	YES
Constant	0.0441 (0.0594)
No. of obs.	17,396
R-squared	0.061

Notes: The regression contains the full set of child and household covariates. Robust standard errors are in parentheses. ***, **, and * denote significance at the 1, 5, and 10 percent level, respectively. The binary dependent variable indicates whether the child is enrolled in the expected grade in intermediate education, as explained in the appendix "Construction of Age Groups". Data from Iraq Household Socio-Economic Survey (IHSES) 2006–2007 and 2012–2013.

Remittances and Aid from Foreign Organizations

The results from jointly analyzing aid and the four measures of remittances respectively, as in equation (6), are presented in table 9. The number of households and children benefiting from remittances and aid respectively are equivalent to that from the specifications with the two forms of assistance separated (see also table 3). Among those, 101 households with 153 children received both remittances and aid during the preceding twelve-month period, thus only a limited overlap.

Looking at the regression estimates from this combined analysis in light of the results from the separate regressions, I observe an overall consistent picture with regard to the sign and magnitude of the dummies for remittances, foreign aid and age group, as well as for the interaction terms. Nevertheless, it is noteworthy that the coefficients on the interaction terms between the younger age group and remittances from relatives and remittances from all sources are no longer significant at conventional levels in their respective specifications. Specifically, the p -values for the difference-in-differences estimators change from 0.088 to 0.112 and from 0.099 to 0.113 respectively when the effect of aid from foreign organizations is accounted for in the regressions. Hence, none of the specifications yield significant estimates for the remittances-interaction term. This indicates that the effect of aid dominates that of remittances in the sample.

Concerning the remittances dummies, estimates are significant for all specifications except for remittances from relatives abroad, albeit with a slight increase in p -values and reduction in absolute magnitudes compared to the regressions without foreign aid. However, the results still indicate that the probability to continue education at the intermediate level is about two percentage points lower for children in households who received remittances, regardless of whether they are expected to have enrolled in the intermediate level before or after the receipt of remittances.

As for the dummy for the younger age group, the coefficient remains highly statistically significant and positive at a magnitude in between the estimates from the separate regressions with remittances and foreign aid. This lends further support to the prior indications of a higher probability of being enrolled in the expected grade in intermediate education for children who should, according to their age, have started intermediate education after the allocation of foreign aid and remittances.

Turning to the foreign aid variables, results align closely to those from the regression without remittances, both in significance and magnitude. Hence, children living in households who were recipients of aid from foreign organizations during the past twelve months have a higher probability of pursuing studies at the intermediate level, whether belonging to the younger or older group. Of main interest however, I note a statistically significant and negative causal effect of aid receipt on continued schooling for children for whom the enrollment decision was taken after the allocation of aid compared to the older children. For instance, in the specification including recipients of remittances from all sources, the coefficient on the foreign aid dummy and the difference-in-differences estimator imply a 6.6 percentage points higher overall probability of pursuing intermediate education for children in households receiving aid from foreign organizations but a 10.2 percentage points lower probability for children in aid-recipient households for whom the enrollment decision was taken after the aid allocation.

Finally, the control variables exhibit coefficient estimates that are very similar to those for the separate remittances and aid regressions. In line with the regression for foreign aid only, the coefficient on the dummy marking households from the second survey is insignificant.

Table 9. Effect of remittances and aid from foreign organizations on the probability to continue in intermediate education

SPECIFICATION: Origin of remittances	Relatives in Iraq	Relatives abroad	All relatives	All relatives & non-relatives
VARIABLES				
Younger age group	0.0395*** (0.00724)	0.0434*** (0.00645)	0.0381*** (0.00729)	0.0379*** (0.00737)
Remittances-recipient (dummy)	-0.0202* (0.0110)	-0.0257 (0.0322)	-0.0237** (0.0108)	-0.0191* (0.0106)
Remittances * younger age group (interaction)	0.0187 (0.0149)	0.00969 (0.0477)	0.0232 (0.0146)	0.0226 (0.0142)
Aid-recipient (dummy)	0.0646** (0.0319)	0.0668** (0.0319)	0.0646** (0.0319)	0.0659** (0.0319)
Aid * younger age group (interaction)	-0.101*** (0.0310)	-0.103*** (0.0310)	-0.101*** (0.0310)	-0.102*** (0.0310)
Controls	YES	YES	YES	YES
Governorate dummies	YES	YES	YES	YES
Second survey	0.0173 (0.0375)	0.0181 (0.0374)	0.0175 (0.0374)	0.0177 (0.0375)
Governorate time trends	YES	YES	YES	YES
Constant	0.0518 (0.0595)	0.0445 (0.0594)	0.0528 (0.0594)	0.0509 (0.0594)
No. of obs.	17,396	17,396	17,396	17,396
R-squared	0.062	0.062	0.062	0.062

Notes: The regressions contain the full set of child and household covariates. Robust standard errors are in parentheses. ***, **, and * denote significance at the 1, 5, and 10 percent level, respectively. The binary dependent variable indicates whether the child is enrolled in the expected grade in intermediate education, as explained in the appendix "Construction of Age Groups".

Source: Data from Iraq Household Socio-Economic Survey (IHSES) 2006–2007 and 2012–2013, processed by the author.

Aid Projects

Table 10 and table 11 present the results from estimating equation (7) for the binary and linear specifications of aid projects respectively.

First, looking at the findings from the binary specification, I do not observe any statistically significant coefficients for the aid project variables. Although the dummy variables for proximity to at least one education aid activity is positive throughout the different distances tested for, in line with the result from including aid from foreign organizations as regressor, the coefficients are insignificant. Likewise, the difference-in-differences estimators are consistently negative but insignificant. However, I note a highly statistically significant and positive coefficient on the dummy for the younger age group. More

specifically, the younger children have a 5.5 to 6 percentage points higher probability of continuing in intermediate education.

Table 10. Effect of proximity to education aid projects on the probability to continue in intermediate education. Binary specification.

SPECIFICATION: Distance to projects (kilometers)	20	15	10	5
VARIABLES				
Younger age group	0.0599*** (0.00870)	0.0550*** (0.00840)	0.0549*** (0.00813)	0.0552*** (0.00789)
At least one education aid project in proximity (dummy)	0.0208 (0.0162)	0.0121 (0.0175)	0.0278 (0.0196)	0.00658 (0.0262)
Proximity to education aid project * younger (interaction)	-0.0242 (0.0186)	-0.00367 (0.0208)	-0.00500 (0.0251)	-0.0199 (0.0370)
Controls	YES	YES	YES	YES
Governorate dummies	YES	YES	YES	YES
Constant	-0.0926 (0.0576)	-0.0908 (0.0575)	-0.0895 (0.0575)	-0.0913 (0.0576)
No. of obs.	11,354	11,354	11,354	11,354
R-squared	0.062	0.062	0.062	0.062

Notes: The regressions contain the full set of child and household covariates. Robust standard errors are in parentheses. ***, **, and * denote significance at the 1, 5, and 10 percent level, respectively. The binary dependent variable indicates whether the child is enrolled in the expected grade in intermediate education, as explained in the appendix "Construction of Age Groups".

Source: Data from Iraq Household Socio-Economic Survey (IHSES) 2012–2013 and AidData (2015a), processed by the author.

Table 11. Effect of proximity to education aid projects on the probability to continue in intermediate education. Linear specification.

SPECIFICATION: Distance to projects (kilometers)	20	15	10	5
VARIABLES				
Younger age group	0.0576*** (0.00812)	0.0554*** (0.00803)	0.0545*** (0.00796)	0.0532*** (0.00782)
Number of education aid projects in proximity	0.00225** (0.00112)	0.00116 (0.00157)	0.00169 (0.00283)	-0.00561 (0.00623)
Proximity to education aid projects * younger (interaction)	-0.00151 (0.00132)	-0.000812 (0.00200)	-0.000197 (0.00379)	0.00841 (0.00968)
Controls	YES	YES	YES	YES
Governorate dummies	YES	YES	YES	YES
Constant	-0.0882 (0.0575)	-0.0912 (0.0575)	-0.0918 (0.0575)	-0.0912 (0.0576)
No. of obs.	11,354	11,354	11,354	11,354
R-squared	0.062	0.062	0.062	0.062

Notes: The regressions contain the full set of child and household covariates. Robust standard errors are in parentheses. ***, **, and * denote significance at the 1, 5, and 10 percent level, respectively. The binary dependent variable indicates whether the child is enrolled in the expected grade in intermediate education, as explained in the appendix "Construction of Age Groups".

Source: Data from Iraq Household Socio-Economic Survey (IHSES) 2012–2013 and AidData (2015a), processed by the author.

Second, the linear specifications exhibit patterns very similar to those from the binary specification. The difference-in-differences estimator on the interaction term between aid presence and the younger age group is statistically insignificant for all distances tested. By contrast to the binary specification, I discern a statistically significant coefficient on the aid presence dummy for a 20-kilometer radius. The finding indicates that one additional education aid project within 20 kilometers from the household's exact location leads to a marginal increase of 0.23 percentage points in the probability that the household's children continue in intermediate education, hence not a practically significant effect. Moreover, as for the binary specifications, the coefficient on the dummy for the younger age group is consistently highly statistically significant and positive.

Finally, turning to the control variables, the results from the aid projects regressions are similar to those from estimation with self-reported receipt of aid from foreign organizations. Among the few changes that occur, the covariate for number of adults is here insignificant.

Robustness Check

The results presented are obtained using heteroskedasticity-robust standard errors. As a robustness check I also run the regressions with standard errors clustered on the 18 governorates in order to allow for error correlation within provinces. The regressions with clustered standard errors generate more significant results for the positive causal effect of remittances on the probability of continued schooling in intermediate education. The difference-in-differences estimator is then significant at the five percent level as compared to the ten percent level. Moreover, with clustered standard errors the coefficient on the interaction term is significant, at the ten percent level, also in the specification with remittances from Iraq only. Likewise, the difference-in-differences estimator in the separate regression with aid from foreign organizations is even more significant than with robust standard errors. In the combined specification with both remittances and aid from foreign organizations, the coefficient on the interaction term with remittances from relatives in Iraq, from all relatives, and from all sources remain significant in the respective regressions, as opposed to the results using robust standard errors. Regarding the analysis of the influence of aid projects, clustered standard errors yield lower p -values for the difference-in-differences estimators in all binary and linear specifications. It comes out significant and negative, but very weak in magnitude, for the linear specification with 20-kilometer radius.

These stronger results, in terms of statistical significance for the parameter of interest, may nevertheless be an effect of the relatively small number of clusters, i.e. governorates, in the analysis.⁵⁷ Consequently, the findings from the regressions without clustering of standard errors are those that will be further interpreted in the following discussion.

⁵⁷ Less than 30 clusters are to be considered as a small number (Cameron *et al.* 2008 p. 414).

Discussion

Interpretation of Results

To begin with, the observation of statistically significant difference-in-differences estimators in the separate regressions for remittances and foreign aid provides support for a causal effect of assistance in the form of remittances and aid from foreign organizations received by households, on the probability to continue in intermediate education. The significant coefficients on the interaction terms confirm that the outcome of the decision to enroll or not enroll a child in intermediate education differs between the period before and after the distribution of the respective types of assistance.

Regarding remittances, the difference-in-differences estimator measures, within the group of households receiving remittances, the marginal difference in the outcome of the enrollment decision before and after the preceding twelve months' remittances. Thus, the statistically significant and positive coefficients on the interaction terms in the regressions with remittances from all relatives, as well as including transfers from non-relatives, are evidence of a positive causal effect of remittances on the probability of pursuing intermediate education. As for the magnitude, an increase by 2.5 and 2.4 percentage points respectively in the probability of continued schooling is to be considered a non-negligible impact. Whereas the difference-in-differences estimators are not significant when the remittances are separated by source, the magnitude on the coefficient for the internal remittances is comparable to that of the more comprehensive measures and the merging with remittances from abroad makes it significant. Aggregating all sources of remittances, the p -value changes from 0.167 in the internal remittances specification to 0.088 for that with all relatives and 0.099 in the regression with all origins of remittances.⁵⁸ Considering that the control and treatment groups contain equivalent shares of households from the survey rounds in 2006–2007 and 2012–2013 respectively (see table 14 in the appendix), the effect of the degree of violence during these years should not differ between remittance-recipient and non-recipient families in the sample. As a consequence, to the extent that the prevalence of armed conflict affects the propensity for educational investment in a given year, this impact should not interfere with the estimated causal effect of remittances on the probability of enrollment in intermediate education.

Turning to the results for the difference-in-differences estimator in the separate regression for foreign aid to households, I would, although the lack of previous evidence prevented me from hypothesizing about the impact, nonetheless like to stress that the finding of a both statistically and economically significant negative causal effect on school enrollment is counterintuitive. The aid-recipient households are concentrated in the three governorates Qadisiya, Wasit, and Muthanna. The idiosyncratic differences between the provinces should however be accounted for by the governorate dummies and time trends. Looking at the regression results reveals that all three coefficients are negative. The estimate for Muthanna is significant at the 1 percent level and large in magnitude with -0.13, the coefficient for Wasit amounts to -0.09 and is significant at the ten percent level, while that for Qadisiya is insignificant. Any governorate-specific factors negatively affecting education, such as differential

⁵⁸ The p -value of the coefficient on the interaction term in the specification with remittances from relatives abroad is 0.835.

degree of violence, should be captured by these coefficients and not interfere with the impact estimate of foreign aid. As a robustness check I nevertheless test for the incidence of violence by including a dummy for whether the household suffered from violence during the past year, as reported by the survey respondents. This did not change the estimates and is hence not reported.⁵⁹ The negative causal effect observed is indeed highly undesirable as an outcome of development assistance. Although the exact aid composition is not specified, whether the assistance is provided in cash or in-kind it is certainly not intended to repel continued schooling. Yet, the findings indicate that the probability of enrolling in intermediate education decreases by as much as ten percentage points as a consequence of receiving foreign aid during the past twelve months. However, as for remittances, given the data available the possibility that the households receiving aid from foreign organizations over the past twelve months had also been aid-recipients on previous occasions cannot be ruled out. The timing and use of any such aid allocations are of interest. In particular, to the extent that the use of previous aid to households disproportionately benefited the education of the older age group relative to the younger children, this would induce a negative bias in the coefficient estimate. As a consequence, if the hypothesis regarding previous aid receipt is correct, the magnitude of the identified negative effect of aid should, although probably still negative, be overstated. One of the few possible explanations for the unexpected negative result is a potential change in priorities induced from receiving aid, which affects the parents' preference for investing in children's continued education. It is reasonable to assume that such a change is more likely to occur the larger the value of assistance relative to the household's aggregate income. However, lack of data on the magnitude of funds prevents validation of this suggestion. Further plausible is that this effect is produced given the specific Iraqi context at the time of the survey. As emphasized in the results section, the vast majority of observations for aid recipients are from 2006–2007. The time of the survey coincided with the most violent period during the war in Iraq.⁶⁰ Thus, it is not implausible that the aid allocation was related to the effects of conflicts. It is further possible that the opportunities to participate in education were particularly restricted during this period due to destruction of school infrastructure and security concerns. However, the precise causal links between aid receipt and school enrollment of the younger children cannot be determined.

The joint analysis of remittances and aid reported by households augments the support for the negative causal impact of aid from foreign organizations on the probability of enrollment in intermediate education. The loss of significance of the difference-in-differences estimators on the interaction terms with remittances from relatives, with and without non-relatives, as external assistance is accounted for, strengthens the signal that the negative causal effect of receiving aid is more influential than the positive contribution of remittance receipt. This is consistent with the significance and magnitudes recorded from the separate analyses. As deduced from my introduction to remittances and foreign aid in the Iraqi context, inflows of ODA have far exceeded inward remittances over the concerned time period.

⁵⁹ The dummy variable included takes the value one for children in households reporting to have been adversely affected by violence during the past twelve months, and zero otherwise. Although the coefficient is significantly negative in all regressions (for foreign aid and remittances), with a coefficient around -0.047 and *p*-value approximately 0.05, all other estimates are in principle unaffected. Furthermore, among the aid-recipient households only two report having suffered from violence and among the remittance-recipients only 129.

⁶⁰ About 52,000 people were killed between March 2006 and March 2008 (Iraq Body Count (IBC) 2013).

The maximum ratio occurred in 2006, the year when the majority of the foreign aid to households reported in the IHSES was distributed, when net ODA inflows to the country of Iraq corresponded to 23 times the remittances received. Consequently, the positive impact identified in the separate analysis of remittances emerges in an environment where the underlying level of foreign assistance is substantial. This may be part of the explanation for the finding of a dominating impact of aid from foreign organizations. However, an uncontested explanation for its negative sign remains obscure and calls for further examination of foreign aid distributed directly to households in Iraq.

Concerning the investigation of the influence of aid presence in the form of education sector projects on the probability of continuing in intermediate education, no causal effect of proximity to these interventions is discerned. The statistical insignificance of the difference-in-differences estimators for all distances and binary as well as linear specifications implies that the marginal effect on education of the included projects does not differ between younger and older children living in their neighborhood. In other words, a longer period of exposure to completed education aid projects in primary school does not appear to have improved the younger children's chances of enrollment in intermediate education. As a consequence, my investigation fails to confirm that the positive effects detected by De and Becker (2015) of education aid on schooling are relevant also in the Iraqi context. Several potential explanations can be found for these insignificant results. First, it is possible that the aid projects did indeed not affect the access to education. Although this could be the case for projects implemented at distances of 20 or 15 kilometers from the dwelling, due to the need for transportation to school, it is not a likely explanation for the shorter distances analyzed. More plausible however, is that the sample contains too few projects compared to the overall number of aid activities affecting the same outcome, their contribution thus being clouded by confounding factors. In addition, the lack of identified causality could be due to the construction of the age groups, potentially inappropriate for this form of impact assessment. As all projects had been completed at the time of taking the decision regarding the children's enrollment in intermediate education, both for the younger and the older group, the distinction between treatment and control groups is slightly blurred.

The empirical analysis further results in some noteworthy observations regarding the overall probability of pursuing intermediate education for children in the treatment group compared to the control group. First, the negative and statistically significant coefficient on the remittances dummy variable signifies that children in remittances-recipient households in general had a lower probability of continuing their education than children in non-recipient households. In turn, this advocates that households receiving remittances differ systematically from families not receiving remittances in terms of children's enrollment in intermediate education. To the extent that school attendance is positively associated with income, this is in line with the finding of De and Ratha (2012) that remittances to a large extent accrue to the poorer sections of society. On the other hand, it runs contrary to the general relationship between the cost of migration and income of migrant families. This may however be explained by the large proportion of internal, rather than international, remittances received in the sample. With respect to the positive and throughout statistically significant coefficient on the dummy for aid from foreign organizations, it could be interpreted as an indication that Briggs' (2015) finding of pro-rich allocation of aid within partner countries extends to the context of Iraq. Although this

relationship could be due to the fact that most households receiving foreign aid in the sample live in urban areas, where the access to education is better, the control variable for rural area should mitigate this fact.⁶¹

The robust result for the coefficient on the variable for the younger age group, regardless of treatment variable, conforms with expectations given the fall in enrollment as dropout rates increases for the older children (see figures 1 through 3).

Finally, the statistically significant estimates observed for most control variables used in the analysis indicate that they capture important aspects vis-à-vis school enrollment. First, the positive coefficient associated with the second survey round is anticipated as the overall enrollment rates have improved over the elapsed period (figure 1), pointing to a favorable overall development of education in Iraq. Moreover, the lower probability of continued education noted for females relative to males is concordant with the findings of Shafiq (2013) for education in Iraq and the pronounced gender gap in education, partly due to the influence of social traditions. Furthermore, controlling for the adverse consequences of having a migrant parent was relevant as parental absence is found to negatively influence the probability of continued schooling. However, contrary to the observation by Shafiq (2013) of substantially higher school enrollment in rural areas, I find that children in rural environments are overall less likely to pursue education at the intermediate level, in line with the differential access to and participation in schooling (see note 61).

Concerning household size, the relatively more negative influence of the number of children than adults is expected given the extent of financial contribution to the family. As for the relevance of socio-economic status for education, it appears as if expenditures take precedence over income. Hence, credit constraints negatively influence the likelihood of investing in children's human capital. With regard to parents' education, the larger effects generally observed for mothers' educational attainment may be linked to the lower priority given to women's education in general. Against this background, it appears plausible that having a well-educated mother should influence the children's enrollment prospects more than the father's level of schooling. Further in line with theory, the practically important negative effect on enrollment probability of having a disability confirms the association between health and education.

To summarize, the results from the separate analysis of remittance receipt are in line with and augment the previous evidence of a positive causal effect of remittances on human capital investment (e.g. Yang 2008, Adams 2005), possibly by relaxing budget constraints. By contrast, my analysis provides new, puzzling, and counterintuitive evidence suggesting that foreign aid allocated directly to households has a negative causal effect on the probability of continued education at the intermediate level. Furthermore, in the sample at hand the adverse impact of household-level foreign assistance dominates the benefits of remittances in promoting schooling. Lastly, living in proximity to the sample of

⁶¹ Among the children living in families who received assistance from foreign organizations during the twelve months preceding the survey, 538 resided in urban areas whereas 176 lived in rural environments. Among urban children 81 percent are currently attending school, while the corresponding share for rural children is 65 percent.

education aid interventions at specific schools does not appear to have a marginal effect on the probability of continuing in intermediate education.

Limitations and Generalizability

Despite the effort made with regard to design and performance of the analysis, the results are not without concern. I will discuss the most relevant limitations with regard to data, method, and econometric analysis, as well as the generalizability of the findings.

Both sources of data employed have some shortcoming that restricted the study. As for the survey data from the IHSES, four main issues have been identified. First and foremost, the data on remittances are limited to the transfers that have occurred over the year preceding the interview. As remittances are typically recurrent payments by migrant workers to the origin households it is a reasonable assumption that the remittance-recipient households who received remittances during the most recent twelve months have also received remittances in the past. While this is unfortunate as it restricts the assessment to the marginal effect of the past year's remittances only, the potential confounding influence of previously received remittances should rather create a downward bias of the difference-in-differences estimator. Hence, my results should be a lower bound of the causal influence of remittances. Second, the survey lacks information on the specific sender of the remittances. In addition to the instructions on international versus internal remittances and relative or non-relative sender it would have been valuable to know the relationship between the sender and the household members. In particular, for the purpose of this investigation, the senders' relationship to the school-aged children could influence whether income from remittances is invested in education, in other areas, or used for consumption. Furthermore, although not a serious issue, the precision of the evaluation would have benefited from data on the amount of remittances from relatives. Third, data on households' potential previous receipt of foreign aid as well as information on the grounds for aid allocation would have enabled a more enlightened interpretation of the counterintuitive negative effect of aid from foreign organizations on continued school enrollment. Finally, the lack of latitude and longitude coordinates from IHSES 2006–2007 is unfortunate for the evaluation of the impact of the aid projects. Given the completion of most of the relevant education projects prior to the start of the school year 2008–2009 it would have been of interest to compare the outcome of schooling among children in the same areas of residence in 2007 and 2012 respectively. The children in primary or secondary school-age in 2007 would reasonably not yet have benefitted from the completion of the projects, or they would very recently have been completed, whereas school-aged children in 2012 would have been exposed to completed activities during several years. Limiting the analysis to the most recent survey fails to account for this heterogeneity in exposure.

The primary deficit of the geocoded data is the relatively small sample of precisely coded education sector aid projects included. This is problematic as there are most probably many other aid activities influencing education that I have not been able to control for, thus hiding any potential impact of the included activities. For instance, a number of projects similar to those used in the analysis were coded with too low precision to be useful for impact evaluation of individual-level outcomes. Moreover the aid projects considered, and thus the treated households and children, are highly concentrated in a few

governorates, as illustrated in table 16 in the appendix. The accumulation in Baghdad is considerable, followed by Nainawa and Duhok for the 20-kilometer radius. This is problematic as it restrains the generalizability of the results.

Regarding the method, the validity of the difference-in-differences estimation is sensitive to a common trend in education for treatment and control groups in the absence of treatment. This requirement could potentially be questioned for the evaluation of the effect of aid from foreign organizations if the reason for receiving aid is that the families had experienced an adverse shock, such as a surge in violence and destruction of school establishments. In addition, using the same age groups for the impact evaluation of the geocoded projects as in the specifications with remittances and aid from foreign organizations constitutes a serious drawback given the extended treatment period when the aid activities were completed, as discussed in the method section.

Third, an important consideration for the econometric analysis concerns the national representativeness of the estimation results. As selection probabilities are different for households, calculation of estimates for the population requires weighting according to the inverse of the selection probabilities to ensure representativeness and unbiasedness of estimators (Deaton 1997 p. 19). However, the use of two survey waves with different stratification bases and individual sample weights makes correct weighting infeasible. Appropriate weighting of the combined samples would require a sampling-weight variable for the combination of the two rounds, which is not available.⁶² Representativeness of the estimates may further be influenced by the fact that the IHSES does not take into account all internally displaced people in Iraq, a group that is relatively more deprived of access to education and stable conditions for schooling.

Turning to the external validity of my results for the impact of remittances and foreign aid targeted to households, they are likely to be constrained by the dramatic and violent events in Iraq during the period under consideration. As noted by Lopez *et al.* (2007 p. 24) the link between remittances and education is likely to differ between countries due to the large dependence on idiosyncratic features of for instance the structure of the labor market and returns to education. Although the difference-in-differences approach allows to isolate the causal effect of receiving assistance, the response to remittance and aid receipt should vary according to the broader context in which the household lives and the priorities and preferences for education that this implies. Hence, the generalizability of these findings could reasonably at most be extended to other conflict-affected nations. As for the detection of a negative effect of foreign aid received by households, this is both counterintuitive and stands in contrast to the general evidence of either a null or a positive impact of aid. Indeed, the substantial level of ODA inflows and violent conflict during the period considered make Iraq a special case. As a consequence, this finding should not be generalized to other contexts. Furthermore, the generalizability of the results from the aid project impact evaluation is primarily restricted by the non-

⁶² Whereas the first survey is stratified by the rural, urban and metropolitan sections of each of Iraq's 18 governorates with the exception of Baghdad, which has three metropolitan strata, the second survey wave is stratified by qadha. Both survey rounds are however sampled in two stages. See COSIT and KRSO (2015c) and COSIT *et al.* (2015) for further reference on the IHSES sampling strategy.

exhaustiveness of the project sample. If the results would still be valid, the sectoral approach and focus on education projects limits the generalizability to this sector.

Concluding Remarks

This thesis set out with the purpose to contribute to the understanding of the developmental aspects of remittances, foreign aid received directly by households, and external assistance projects in terms of their role in education. The main research question governing the analysis is: what is the impact of remittances and foreign aid on enrollment in intermediate education in Iraq? Thus, the study's purpose is addressed in a case study of Iraq, where I evaluate children's probability of continued education at the intermediate level. To this end, I employ a difference-in-differences approach where the treatment group comprises children in households reporting having received assistance in the form of remittances or aid from foreign organizations during the past twelve months or living in proximity to aid project sites, in the respective specifications. This thesis pioneers the examination of the comparative effects of remittances and foreign aid on individual education outcomes. Moreover, the contrasting of the influences of self-reported foreign aid receipts by households and education aid projects, such as construction and rehabilitation of school buildings, is a new feature. Furthermore, the Iraqi context extends the geographic domain for analyzing remittances' impact on investment in education. I conjecture that remittances as well as foreign aid received by households affect the demand for schooling through the income effect by relaxing budget constraints whereas education aid projects should rather promote continued enrollment from the supply side.

My investigation yields support for statistically significant separate causal effects of both remittances and foreign aid received by households on the probability of continued schooling in intermediate education. In particular, I detect a statistically significant and non-negligible positive effect of remittances from all relatives, with or without the inclusion of non-relatives' transactions, on the probability of continued schooling in intermediate education, thus augmenting the extensive existing evidence of a positive causal effect of remittances on human capital investment. Strikingly, I also find new and counterintuitive indications of a both statistically and economically significant negative effect of foreign aid received directly by households on the probability of pursuing intermediate education. Although the precise mechanisms behind this causation remain undetermined, the specific Iraqi context as well as the grounds for aid allocation are likely to be important.

Concerning the comparative impact of these two forms of household-level assistance, the negative effect of foreign aid is found to dominate, thus cancelling the statistical significance of remittances' positive contribution to the prospects of further schooling beyond primary education as both forms of assistance are analyzed jointly. This relative strength of their influences conforms with the significance and magnitudes produced in the separate analyses and is potentially related to the substantial level of foreign assistance inflows to Iraq. Of further relevance are the overall differences discerned between the assistance-recipient and non-recipient households. Specifically, it appears as if remittances largely accrue to households with a lower propensity of investing in intermediate education

for their children, providing tentative support for the proposition by De and Ratha (2012) of remittances benefitting mainly the poorer people in society. By contrast, my results indicate that the foreign aid distributed to households does not effectively target the families whose children face the highest risk of dropping out of school. Finally, I do not discern any statistically significant causal effect of residing in proximity to education aid projects and longer exposure to their achievements during primary school on the probability of continued enrollment past primary education. This result is robust to functional form of the treatment variable as well as varying distances between households and aid activities, thus failing to extend the findings by De and Becker (2015) of a positive impact of education aid on schooling to the Iraqi setting.

The findings of this thesis point to several viable paths for future research, of which the majority are however dependent on further data collection, both in terms of quantity and quality. First, further research into the comparative effect of remittances and foreign aid on various household-level outcomes is critical to deepen our understanding of their respective mechanisms. In this respect, additional studies of the Iraqi context would be of interest in order to enhance our knowledge of the relative importance of these types of foreign capital flows in conflict-affected states. Household surveys constitute a main vehicle for collecting data on remittances as it accounts for the economically important informal channels. Forthcoming survey rounds of e.g. the Iraq Household Socio-Economic Survey should aim to collect information on the amounts of assistance received through relatives' remittances and aid from foreign organizations in order to enable a more precise analysis of the effects. Second, further studies of the impact of remittances on education outcomes of individual children would benefit from the possibility to account for the relationship between the transaction sender and the school-aged children. Third, additional research into the effects of foreign aid targeted directly to households is required both for the Iraqi environment and other conflict-affected states in order to confirm, on the one hand, whether the results of this thesis are in fact representative for Iraq and, on the other hand, whether the negative effect is commensurate with the relationships in other fragile states. Finally, the potential for and credibility of future examinations of the impact of foreign aid projects on household- and individual-level indicators are highly reliant on continued expansion of georeferenced data on aid activities. In other words, geocoded aid data should ideally contain a larger share of both the total number of aid interventions and disbursement amounts. Provided increased exhaustiveness of the databases, continued research on geocoded aid projects may help us improve the design and targeting of foreign assistance to heterogeneous contexts and predict the lag with which different interventions impact individual outcomes.

My results further suggest that policies to stimulate the flow of remittances have the potential to be the most effective means of assisting in the enhancement of education outcomes in Iraq. Hence, given the modest share of international remittances relative to internal transfers, Iraqi policy-makers should attempt to encourage remittances from the overseas diaspora. Moreover, international efforts to reduce the transaction costs and increase competition among transfer operators are critical to leverage the full potential benefits of remittances and steer the flows to formal rather than informal channels. In addition, increased control on the part of the senders of the uses of remittance funds could

potentially encourage the channeling of remittances to education purposes and further boost the amounts transferred (Yang 2011).

Nevertheless, I side with Ratha (2013 p. 6) in emphasizing that remittances should not be considered as a substitute for official development assistance as the costs of migration generally exclude the poorest people from the benefits of remittances. However, as noted by Yang (2011 p. 146), remittances have the potential to remain one of the most important forms of international capital flows to developing countries. As for this study I can but conclude that remittances have a positive impact on the probability of continued education at the intermediate level in the Iraqi context, as opposed to the counterintuitive negative influence found for foreign aid targeted to households. Regarding education aid projects, better data are needed to establish their impact. Additional comparative studies of remittances and foreign aid are required in order to determine their importance for education in Iraq and other conflict-affected states alike.

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Appendix

Figures

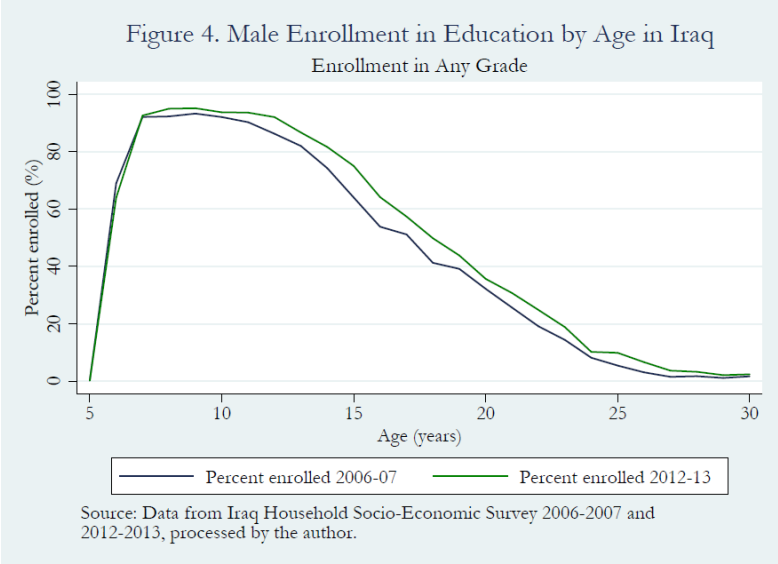


Figure 4. Male enrollment in education by age in Iraq

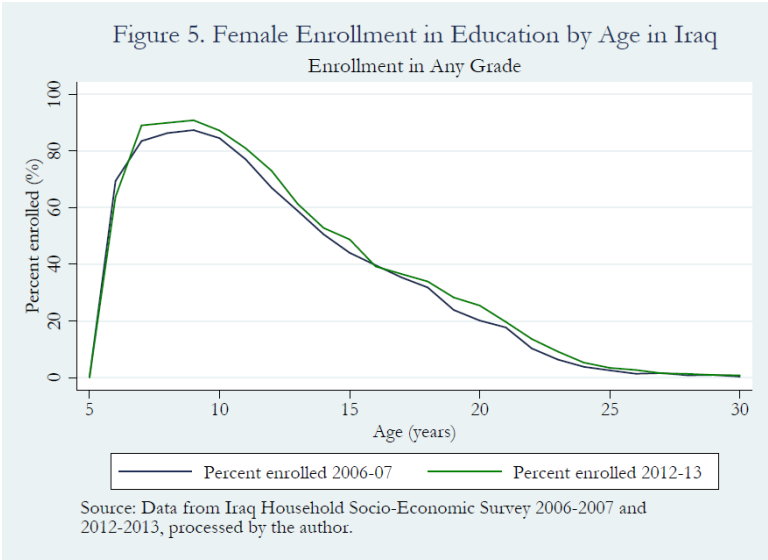


Figure 5. Female enrollment in education by age in Iraq

Construction of Age Groups for Analysis

In order to construct the pre- and post-treatment, i.e. groups of older and younger children, it is necessary to account both for the time of the interview and the children's year of birth. The two rounds of IHSES were conducted over the course of more than a full year each and the topics included in the survey were covered during repeated visits to the same households. Hence, the time of the visit when the section on education was covered (IHSES 2006–2007, visit 3, section 4: education, and IHSES 2012–2013, visit 2, section 5: education) is the date at which the household members' enrollment status is evaluated.

The children that I deem should be enrolled in a particular grade are those that according to the year of birth are expected to attend that grade if they have followed the normal pace of educational progression through the school system, as well as those who are one year older. Thus, I allow for one repeat year as this is prevalent in the sample and also mitigates the influence of factors during previous years affecting educational progress.

The younger children are those that should have finished primary school, and started intermediate education, during the course of the past twelve months. The older children should have finished primary education earlier, but with as small an age difference as possible in order to get a precise comparison around the year of remittance and foreign aid receipt. Ideally I would therefore have wanted the older age group to consist of children who should currently be enrolled in second intermediate grade. However, this is not possible when allowing for a repeat year in the age groups as it would create an overlap of children expected to be enrolled in first as well as second intermediate grade simultaneously, thus included both among the younger and the older children. As a consequence, I move the older age group one grade and include children expected to be enrolled in third intermediate grade, whether they kept the pace of education or had one repeat year.

Table 12. Construction of pre- and post-treatment groups

	Pre-treatment/Older	Post-treatment/Younger
On time	<i>IHSES 2006–2007</i>: children born in 1992 and interviewed October–December 2006, those born in 1992 and interviewed January–July 2007, and those born 1993 in and interviewed August–December 2007. <i>IHSES 2012–2013</i>: children born in 1997 and interviewed January–July 2012, and those born in 1998 and interviewed August 2012–January 2013.	<i>IHSES 2006–2007</i>: children born in 1994 and interviewed October–December 2006, those born in 1994 and interviewed January–July 2007, and those born in 1995 and interviewed August–December 2007. <i>IHSES 2012–2013</i>: children born in 1999 and interviewed January–July 2012, and those born in 2000 and interviewed August 2012–January 2013.
One repeat year	<i>IHSES 2006–2007</i>: children born in 1991 and interviewed October–December 2006, those born in 1991 and interviewed January–July 2007, and those born in 1992 and interviewed August–December 2007. <i>IHSES 2012–2013</i>: children born in 1996 and interviewed January–July 2012, and those born in 1997 and interviewed August 2012–January 2013.	<i>IHSES 2006–2007</i>: children born in 1993 and interviewed October–December 2006, those born in 1993 and interviewed January–July 2007, and those born in 1994 and interviewed August–December 2007. <i>IHSES 2012–2013</i>: children born in 1998 and interviewed January–July 2012, and those born in 1999 and interviewed August 2012–January 2013.

Source: Description by the author.

Following the formal structure of the education system and the intended pace of grade progression, children turn twelve years old the year when they start first intermediate and 14 years old the year when they start third intermediate grade. I assume that the children interviewed in July state the grade that they had completed in June and that those interviewed in August state the grade that they are to start in September. Table 12 illustrates how the time of interview and year of birth are accounted for in the creation of pre- and post-treatment groups.

Within the younger and older group, the outcome variable is coded as one for pupils enrolled in the correct grade, i.e. first intermediate for the younger and third intermediate for the older children, and zero otherwise.

Description of Variables

Table 13. Description of variables

VARIABLES	Type	Description	Source
<i>Dependent</i>			
Intermediate education (correct grade)	Dummy	Takes the value 1 if the child is enrolled in the correct grade in intermediate education (first or third intermediate) according to his/her age and time of interview (see “Construction of Age Groups for Analysis”). Takes the value 0 otherwise, i.e. if he/she is not enrolled at all or attends another grade.	Constructed based on IHSES
<i>Independent (different specifications)</i>			
Remittances	Dummy	Takes the value 1 for children in households that reported having received remittances during the preceding twelve months, and 0 if the household did not report remittance-receipt. Survey question: “If the household received assistance (cash or other than cash), last 12 months, who is the donating entity? (write up to three codes)” and the alternatives potentially including remittances: “relatives inside Iraq”, “relatives outside Iraq”, and “other than relatives inside Iraq” (including friends and others). ^a	IHSES
Aid from foreign organizations	Dummy	Takes the value 1 for children in households that reported having received foreign aid during the preceding twelve months, and 0 if the household did not report receipt of foreign aid. Survey question: “If the household received assistance (cash or other than cash), last 12 months, who is the donating entity? (write up to three codes)” and the alternative of interest is “foreign organizations”. ^a	IHSES
Aid presence	Dummy	Takes the value 1 for children residing in proximity to the location of at least one education sector aid project and 0 otherwise. The distance defining “in proximity” varies across specifications (20, 15, 10, or 5 kilometers).	Constructed based on AidData (2015a) & IHSES
Aid presence	Discrete	Takes the value of the number of education sector aid projects in proximity to the child's residence location. The distance defining “in proximity” varies across specifications (20, 15, 10, or 5 kilometers).	Constructed based on AidData (2015a) & IHSES

Younger	Dummy	Takes the value 1 for children belonging to the younger age group, and 0 for children in the older age group. See further "Construction for Age Groups for Analysis".	Constructed based on IHSES
Remittances × younger	Dummy / Interaction	Takes the value 1 for children in households that reported having received remittances from at least one source during the past twelve months, and who belong to the younger group for whom the enrollment decision was taken after the receipt of remittances.	Constructed based on IHSES
Aid from foreign organizations × younger	Dummy / Interaction	Takes the value 1 for children in households that reported having received aid from foreign organizations during the past twelve months, and who belong to the younger group for whom the enrollment decision was taken after the receipt of foreign aid.	Constructed based on IHSES
Aid presence × younger	Dummy / Interaction	Takes the value 1 for children in households living in proximity to at least one education sector aid project, and who belong to the younger group.	Constructed based on AidData (2015a) & IHSES
Aid presence × younger	Discrete / Interaction	For children living in proximity to at least one education sector aid project, and who belong to the younger group, it takes the value of the number of education aid projects in proximity to the child's residence location.	Constructed based on AidData (2015a) & IHSES

Controls

Parental absence	Dummy	<i>IHSES 2006–2007</i> : coded as 1 if at least one of the child's parents 1) does not live in the household (but is alive), or 2) lived elsewhere during a period of at least one month during the past twelve months. <i>IHSES 2012–2013</i> : coded as 1 if at least one of the child's parents 1) does not live in the household (but is alive), or 2) lived elsewhere during a period of at least six months in the past but returned in 2011 or 2012.	Constructed based on IHSES
Female	Dummy	Coded as 1 for female children and 0 for male children.	IHSES
Rural	Dummy	Coded as 1 for rural environment and 0 for urban area of residence.	IHSES
Number of adults	Discrete	Number of adults in the household.	Constructed based on IHSES
Number of children	Discrete	Number of children in the household. Children defined as younger than 18 years old.	Constructed based on IHSES
Monthly per capita income	Log	Total per capita income per month in log form. Includes income from categories wages and allowances, property and transfers, agriculture (crops, animals, fishing, forestry), and enterprises. Calculated by the author following the guidelines provided for IHSES 2006–2007. See COSIT and KRSO (2007a) for further reference. Corresponding calculations for IHSES 2012–2013 with adaptation to certain changes in the questionnaires. Deflated by CPI to 2010 values by the author.	Constructed based on IHSES
Monthly per capita expenditures	Log	Total per capita expenditures per month in log form. Includes all expenditure categories (food, liquid and tobacco, housing, utilities, clothing, health, education, transport, communications, recreation, durables, other). Deflated by Paasche index. Deflated by CPI to 2010 values by the author.	IHSES

Parents' education	Dummies	Dummies indicating the highest certificate attained by the child's mother and father respectively: no certificate (base category), primary, intermediate, secondary, higher, and other certificate. Constructed from several variables: - The certificate attained by parents living in the household, - The certificate attained by absent parents (only for 2012–2013), - For parents enrolled in education: the certificate preceding the current level of enrollment.	Constructed based on IHSES
Disability	Dummy	Coded as 1 if the child has a disability and 0 if the child does not have a disability.	IHSES
Chronic illness	Dummy	Coded as 1 if the child has a chronic disease and 0 if the child does not have a chronic disease.	IHSES
Governorates	Dummies	Each governorate dummy is coded as 1 if the family resides in that particular governorate and 0 otherwise.	IHSES
Second survey	Dummy	Coded as 1 for IHSES 2012–2013 and 0 for IHSES 2006–2007.	Constructed based on IHSES
Governorates × second survey	Dummy / Interaction	The governorate-specific time trend. Coded as 1 if the family resides in that particular governorate and was interviewed during IHSES 2012–2013, and 0 otherwise.	Constructed based on IHSES

^a “Assistance (cash and non-cash) represents any cash amounts or in-kind commodities that an individual receives against no certain job or service and in the form of assistance, such as the assistance a household receives from sons or relatives from inside or outside Iraq...” (COSIT & KRSO 2007b p. 40).

Descriptive Statistics

Table 14. Summary statistics for treatment and control groups for variables used in analysis of remittances from all sources (relatives in Iraq and outside Iraq, and non-relatives)

Group	Treatment group				Control group			
	Mean	Std. Dev.	Min	Max	Mean	Std. Dev.	Min	Max
VARIABLES								
<i>Dependent variable</i>								
Intermediate education (correct grade)	0.230	0.421	0	1	0.235	0.424	0	1
<i>Independent variables</i>								
Younger age group	0.530	0.499	0	1	0.533	0.499	0	1
Remittances from relatives and non-relatives * younger	0.530	0.499	0	1	0.000	0.000	0	0
Second survey	0.677	0.468	0	1	0.644	0.479	0	1
Absent parent	0.106	0.308	0	1	0.064	0.245	0	1
Female	0.492	0.500	0	1	0.496	0.500	0	1
Rural	0.346	0.476	0	1	0.370	0.483	0	1
Number of adults	3.460	1.959	1	18	3.619	2.066	0	16
Number of children	5.103	2.386	1	27	5.179	2.435	1	32
Log monthly income per capita (1,000 ID)	4.724	0.765	-1.760	8.249	4.694	0.799	-3.188	9.694
Log monthly expenditures per capita (1,000 ID)	4.928	0.485	3.395	7.626	4.914	0.478	2.830	7.607
<i>Parents' education (base: no certificate)</i>								
Primary certificate father	0.327	0.469	0	1	0.338	0.473	0	1
Primary certificate mother	0.367	0.482	0	1	0.385	0.487	0	1
Intermediate certificate father	0.123	0.328	0	1	0.132	0.339	0	1
Intermediate certificate mother	0.097	0.297	0	1	0.110	0.312	0	1
Secondary school certificate father	0.133	0.339	0	1	0.133	0.339	0	1
Secondary school certificate mother	0.053	0.225	0	1	0.051	0.220	0	1
Higher certificate father	0.181	0.385	0	1	0.207	0.405	0	1
Higher certificate mother	0.056	0.229	0	1	0.079	0.269	0	1
Other certificate father	0.002	0.047	0	1	0.001	0.038	0	1
Other certificate mother	0.001	0.037	0	1	0.001	0.028	0	1
Disability	0.024	0.155	0	1	0.021	0.143	0	1
Chronic illness	0.035	0.184	0	1	0.025	0.156	0	1

Notes: The regressions include 17,396 observations. The treatment group consists of 12,941 children and the control group comprises 4,455 children. Governorate dummies and interactions between governorates and the second survey are not included in the table.

Source: Data from Iraq Household Socio-Economic Survey (IHSES) 2006–2007 and 2012–2013, processed by the author.

Regression Tables

Table 15. Effect of aid from foreign organizations on the probability to continue in intermediate education

VARIABLES	
Younger age group	0.0437*** (0.00640)
Aid-recipient (dummy)	0.0665** (0.0319)
Aid * younger age group (interaction)	-0.103*** (0.0310)

Absent parent	-0.0490*** (0.0108)
Female	-0.0272*** (0.00627)
Rural	-0.0377*** (0.00682)
Number of adults	-0.00300** (0.00151)
Number of children	-0.00720*** (0.00142)
Log monthly income per capita	0.000390 (0.00473)
Log monthly expenditures per capita	0.0416*** (0.00878)
<i>Parents' education (base: no certificate)</i>	
Primary certificate father	0.0289*** (0.00830)
Primary certificate mother	0.0306*** (0.00732)
Intermediate certificate father	0.0652*** (0.0114)
Intermediate certificate mother	0.0788*** (0.0123)
Secondary school certificate father	0.0841*** (0.0118)
Secondary school certificate mother	0.124*** (0.0178)
Higher certificate father	0.118*** (0.0115)
Higher certificate mother	0.0806*** (0.0164)
Other certificate father	-0.0918 (0.0575)
Other certificate mother	0.103 (0.119)
Disability	-0.143*** (0.0160)
Chronic illness	0.000171 (0.0192)
Governorate dummies	YES
Second survey	0.0178 (0.0375)
Governorate time trends	YES
Constant	0.0441 (0.0594)
No. of obs.	17,396
R-squared	0.061

Notes: Robust standard errors are in parentheses. ***, **, and * denote significance at the 1, 5, and 10 percent level, respectively.

The binary dependent variable indicates whether the child is enrolled in the expected grade in intermediate education, as explained in the appendix "Construction of Age Groups".

Source: Data from Iraq Household Socio-Economic Survey (IHSES) 2006–2007 and 2012–2013, processed by the author.

Aid Presence in Governorates

Table 16. Children living in proximity of at least one education aid project (by maximum distance to project(s))

GOVERNORATE	20 kilometers		15 kilometers		10 kilometers		5 kilometers		Governorate total
	NO	YES	NO	YES	NO	YES	NO	YES	
Duhok	158	356	297	217	418	96	459	55	514
Nainawa	339	554	443	450	577	316	696	197	893
Sulaimaniya	750	55	802	3	805	0	805	0	805
Kirkuk	215	151	292	74	339	27	366	0	366
Erbil	384	80	395	69	443	21	462	2	464
Diyala	391	208	456	143	490	109	565	34	599
Anbar	1,078	0	1,078	0	1,078	0	1,078	0	1,078
Baghdad	84	1,020	157	947	400	704	862	242	1,104
Babylon	548	2	548	2	548	2	549	1	550
Kerbela	357	0	357	0	357	0	357	0	357
Wasit	633	21	654	0	654	0	654	0	654
Salah Al-Deen	783	87	854	16	868	2	870	0	870
Najaf	384	0	384	0	384	0	384	0	384
Qadisiya	347	72	396	23	411	8	419	0	419
Muthanna	395	2	395	2	395	2	397	0	397
Thi-Qar	514	0	514	0	514	0	514	0	514
Maysan	560	0	560	0	560	0	560	0	560
Basrah	823	3	826	0	826	0	826	0	826
Total	8,743	2,611	9,408	1,946	10,067	1,287	10,823	531	11,354

Sources: Data from AidData (2015a) and Iraq Household Socio-Economic Survey (IHSES) 2012–2013, processed by the author.

***Geonear* Transformation**

The Stata package *Geonear* finds nearest neighbors using geodetic distances. One file is taken as the base, here the household file (base ID, base latitude, base longitude) and one as the neighbor, here the project locations file (neighbor ID, latitude, longitude). For each base location, identified by its ID and coordinates, neighbors identified by their IDs and coordinates are found in the other data file.

Distances are in kilometers. The option *ellipsoid* is specified to generate ellipsoidal distances computed using the WGS 1984 reference ellipsoid rather than the default option of distances calculated on a sphere. The technique used to compute distances is a “divide and conquer strategy”, which serves to reduce the number of distances computed. Nearest neighbors are returned in long form, generating one observation for each neighbor identified. The *within* option returns neighbors within the specified distance from each base ID, here set to 100 kilometers at a first stage.

The approach results in a dataset of 2,629,335 observations with all pairwise combinations of the households and the precise locations, with a distance of 100 kilometers or less. This dataset is then used for further analysis. As regards the accuracy of *geonear*, the approach is argued to provide submillimeter accuracy for all distances, with the exception of within ten meters of antipodal locations.