

Impact Evaluation of the Free Primary Education Program in Nigeria and in Neighboring Beninese Communities.

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Abstract

The Western Region of Nigeria implemented a Free Primary Education (FPE) program from 1955 to 1965 that included building new schools, hiring teachers, and mandating that children attend primary school. We assess whether this program could have positively impacted educational and life outcomes in western Nigerian communities as well as in eastern Beninese communities with connections to Nigeria, even if children in those communities did not themselves attend Nigerian primary schools. To this end, we compare five places:

- Treatment 1 locations include places within the Western Region in Nigeria where the FPE program was implemented.
- Treatment 2 locations include “**Spillover Zones**”, which are places in Nigeria that border the Western Region.
- Treatment 3 group includes “**Spillover Zones**” in Benin, which are communities in Benin that border Nigeria’s Western Region. These spillover communities in Benin share cultural, economic, and geographic connections with communities in Western Nigeria.
- Control 1 refers to “**Control Zones**” in Nigeria. These are Nigerian communities located further away from the Western Region compared to Treatment 2. Thus, we would not expect spillover impacts of the FPE program in these communities.
- Control 2 group refers to “**Control Zones**” in Benin. These are Beninese communities located further from the Nigerian border than Treatment 3 communities that do not have relationships with the Western Region of Nigeria.

Within each location we identify 3 cohorts of individuals based on birth year and the age at which they would have been in school during the FPE Program. This enables us to examine the effects of the program and persistence over time. These cohorts are:

- Before FPE Cohort (Born before 1940)
- FPE Cohort (Born 1940-1960)
- Post-FPE Cohort (Born after 1965)

By comparing differences in outcomes across cohorts and locations, we are able to identify the effects of the FPE on three major outcomes:

1. School achievements in terms of the level of education and primary school completion;
2. Life achievements in terms of occupation choices, demographic settings and political participation; and
3. Parental involvement in children's education, indicating intergenerational impacts of the FPE.

Overall, 3,340 subjects were surveyed in Benin and Nigeria. We find evidence that Nigeria's FPE program led to increased school attendance and primary school completion for the cohort of individuals exposed to the FPE in the former Western Region. These effects are significantly larger for females. We also find evidence of spillovers to neighbouring communities in Nigeria that were not within the Western Region, particularly for the next generation. That said, we do not find evidence that the FPE program improved educational outcomes in indirectly treated Beninese communities for those who were of school age at the time of the FPE.

Keywords: Free education, impact evaluation, Historical microdata, FPE program, Treated, Spillover and control, Demand for Education, Persistence

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1- Introduction and Motivation

A large body of international research has shown that free education is a key input to boost the quality of education, increase student enrolment and keep children at school (Aoko Ndolo and al, 2016; Duflo and al, 2017; Koumassa and al, 2020). However, free education programs are difficult to initiate and many have failed to achieve their objectives. For example, Nigeria's federal government, and several regional governments within the country, have initiated a series of free education programs that have failed to meet set goals (Csapo, 1983; Obidi, 1988).

In this paper, we examine the effects of the Free Primary Education (FPE) program implemented by the government of Nigeria's Western Region in 1955. Six decades later, the program is still seen as the benchmark for education expansion in Nigeria and has been described as the "most unprecedented educational scheme in Africa South of the Sahara" (Fafunwa, 1974, p.168). Specifically, we want to understand if the program was successful, why the effects of the program have persisted, and how the program influenced the demand for education within the Western region of Nigeria and neighbouring areas that share historical and cultural ties. We do this by studying the effects of the FPE on schooling outcomes, life achievements, and community participation. We are interested in the FPE's impacts in directly impacted communities in Nigeria and in surrounding areas in Nigeria and Benin that did not directly participate in the program. We identify the effects of the program using a combination of the timing of the FPE, between 1955 to 1965 following a military coup, and the fact that the program was limited to the Western Region. Spillover effects are estimated using neighbouring communities in Nigeria and Benin that are close to the Western Region and also share historical ties. Even though these neighbouring communities did not benefit from the program, their proximity to, and interactions with, residents of the Western Region would have influenced their perception of the value of education.

The Free Primary Education program was introduced in 1955. The goal of the program was for every family in the Western Region of Nigeria to be able to send their kids to school for free, and the program mandated that at least one child of eligible age had to be sent to school. The program emphasised instruction in the local language, Yoruba, which further increased its popularity. The FPE scheme oversaw an expansion of primary schooling across all provinces of the region. The number of primary schools increased from 3550 in 1952 to 6450 by 1960. Secondary schools in the region also saw significant increases from about 68 in 1955 to 700 in

1960. Thus, the expansion of primary education also led to an expansion in secondary schooling because the government felt primary education could not be developed in isolation. Further, the schooling population increased from 429,542 in 1953 to 1.15 million students in 1960, and enrolment rates jumped from 35 to 63 percent over the same time period. Remarkably, female schooling enrolment increased faster than that of males. It was an expensive program for the government but was sustained as a result of its popularity and the political commitment of the governing party to free education (Ajayi, 2008). Education alone accounted for 41% of recurrent regional expenditures in 1955, and remained relatively high at 35.4% as at 1966, with about 80% of the education budget going to primary education.

An investigation from Ajayi (2008) showed an increase in enrolment and school facilities in the years following the intervention of the FPE in Nigeria, but little evidence exists on the long-term impacts of the program on direct beneficiaries, differences by gender, effects on life outcomes and future community participation, and spillover impacts on those living in bordering communities in Nigeria and in Benin. This paper fills this gap, and results can be applied to other contexts in order to understand how to promote and sustain the effects of the program.

Further, we might expect significant spillovers because communities in the Western Region are linked together by internal trade routes, geographical influence, and cultural factors with other communities outside the region and in eastern Benin (Isyaku and Shittu, 2017). Historical, cultural, and economic relations between the two countries predate colonialism – thus, there is a belief among the people in many border communities that they are one and belong to the same ancestor (Isyaku and Shittu, 2017). It is common for members of a single family to live on each side of the border. The same currencies and phone numbers are usually found on both sides and conducting business and going to markets on each side of the border is common¹. A robust information flow between communities directly impacted by the FPE and neighbouring communities could lead to increased demand for education in these neighbouring communities. This is the main mechanism by which we would expect the program to have had spillover impacts.

We find that the program was popular and knowledge of the FPE was widespread even outside Nigeria's Western Region. The cohort exposed to the FPE within the Western Region was more likely to attend school and complete primary education, adjusting for fixed cohort and location

¹ Field evidence, FPE data collection Benin, March to August 2021

characteristics. Furthermore, the effect of the program is significantly larger for females, implying that expanding access to females is perhaps the single greatest legacy of the FPE. The FPE is also found to have influenced education outcomes in neighbouring areas within Nigeria for the next generation, suggesting that demand for education increased in neighbouring areas in response to knowledge of the program.

The paper proceeds as follows. Section 2 discusses the theory of change. Section 3 describes the related literature. Section 4 outlines the research questions and the methodology. Section 5 presents the results, and Section 6 concludes.

2- Theory of Change

The Regional Premier Obafemi Awolowo made education a top priority when he began his rule in western Nigeria in 1952. Awolowo contended that the existing education system and its focus on missions' schooling were not adapted to the requirements of a modern economy. He thus set a new objective of producing educated people who could better participate in the global economy. In 1955, the government of Nigeria's western region implemented a Free Primary Education program funded by an increase in cocoa prices (the primary export of the region) with the aim of educating a greater number of children. The policy made education compulsory, mandating that each household should send at least one child. The large influx of pupils caused by the FPE program was accompanied by teacher recruitment and construction of new classrooms and other school facilities. These accompanying measures were intended to maintain the quality of education in order to produce educated people who could compete in a global job market.

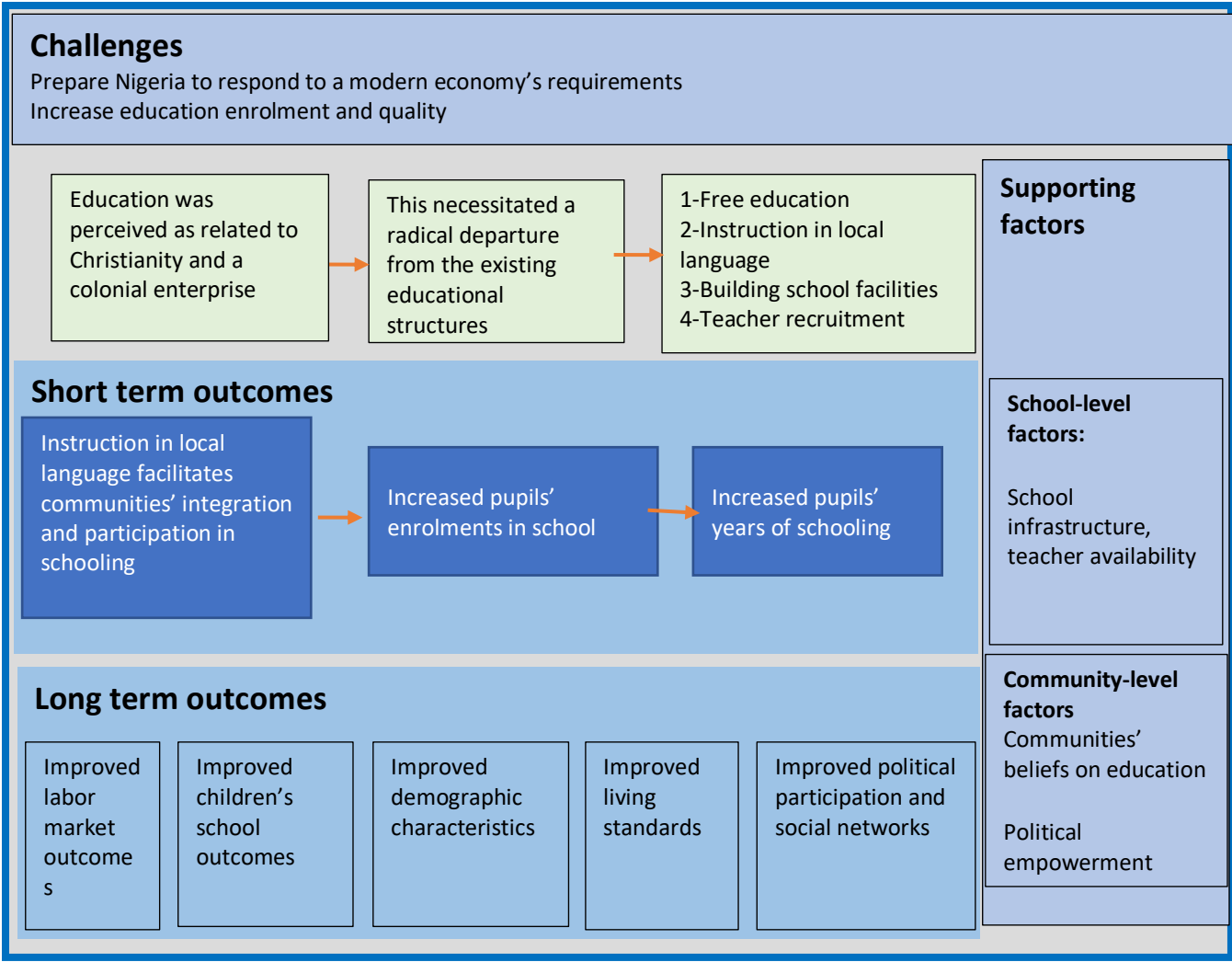
One concern that needed to be addressed at this time was the common belief that schooling was a colonial endeavour, intended for Christian purposes. Earlier in the 20th century, reports highlighted a high level of hostility toward the colonial presence, its education system, and cultural influence on the west coast of Africa (France, Government Report, 1906, p. 62; cited by Wantchekon, 2015). Designing a program in the local language was therefore a means of integrating community and cultural norms and increasing participation.

We expect that the FPE program increased school enrolments and number of schooling years in Nigeria. In the long run we expect that it improved subjects' life outcomes in terms of incomes, political participation, profession, and intergenerational effects on school enrolment of children of those who themselves participated in the FPE program. We expect that these outcomes would also lead to increased social mobility, community empowerment, and that they might also be

experienced by those who did not directly participate in the FPE program. This is because educational programs such as the FPE can increase community, parental, and/or students' educational aspirations and involvement, and this increase in "education demand" can lead to improved educational outcomes, as has been shown in other contexts (Wantchekon et al, 2015).

As previously mentioned, we also expect that this program may have had spillover impacts into neighboring areas in Benin and Nigeria through the mechanism of information flows. This is because these areas have deep economic and cultural ties to the western Nigerian communities in which the FPE was implemented. Increased school enrolments in the communities where the FPE was implemented could have led parents or others in neighboring communities to increase their aspirations for children's education.

Figure 1 below highlights the theory of change of this intervention emphasizing the challenges and motivation, the steps taken to address those challenges, expected short- and long-term outcomes, and supporting factors that led to the success of the program.



3- Literature Review

Evidence shows that access to education increases income and that the private and social returns to education are about 6-10% (Acemoglu, 2000, Card, 1999). A study of an Indonesian school-building program suggests that each primary school constructed per 1,000 children led to an average increase of 0.12 to 0.19 years of education, as well as a 1.5 to 2.7 percent increase in wages. This implies estimates of economic returns to education ranging from 6.8 to 10.6 percent (Duflo, 2001). The literature on economic and labor market effects of education (Duflo 2004) finds that wage and output premiums, as well as development, are likely caused by increased human capital. These and other studies confirm the general intuition that investments in education lead to positive economic outcomes.

Education can also improve social outcomes through its link with fertility, impact on political attitudes, and other positive externalities it generates. In an investigation of Nigeria's Universal Primary Education Program enacted from 1976-1981 (a separate program from the FPE), Una Okonkwo Osili (2007) suggested that increasing female education by one year reduces early fertility by 0.26 births. Education can also affect the political life of individuals (Wantchekon et al., 2015). Educational attainment appears to be the most important variable impacting political attitudes among demographic variables commonly analyzed such as sex, place of residence, occupation, income, age, etc. (Almond and Verba, 1989, 1963). Larreguy and Marshall (2014) exploit spatial variation in the intensity of Nigeria's 1976 education reform to show that educational attainment causes more political participation in the forms of voting, contacting politicians, attending community meetings, and devoting attention to political events. Demographic changes and political empowerment could be important for continued investments in education for future generations. The evidence from this article seeks to build on this research by showing effects of the FPE on profession, political activity, and investments in children.

While most of the literature emphasizes the importance and the effect of school reforms in the place where the reforms are implemented, little has been written on spillover effects on those who might have been familiar with the program but did not participate. Lalive and Cattaneo (2009) and Bobonis and Finan (2009) find that ineligible students benefited from the PROGRESA program in Mexico due to neighborhood peer effects. Wantchekon et al. (2015) found that high-achieving students from age cohorts that attended colonial schools in Benin helped boost learning outcomes in their communities and across generations by raising aspirations. We add to this literature by

measuring spillover effects of the FPE program across neighboring communities and on future generations.

We should note that evidence does exist of an increase in enrollment of 5-14 year-old pupils in the years following the introduction of the FPE program in directly-impacted communities in Western Nigeria (Ajayi, 1965). However, a lack of evidence exists on long-run life outcomes of these students and on spillover impacts outside of directly impacted communities.

4- Methods

4.1- Research Questions

The main research question is whether the FPE program implemented in Nigeria from 1955 to 1965 impacted school and life achievement outcomes in Nigeria and in bordering communities in Benin. More specifically, research questions include:

- 1- What was the impact of the FPE program on subjects' school achievement, as measured by level of education and primary school completion rates?
- 2- What was the impact of the FPE program on life achievements and other social factors, as measured by:
 - a. Demographic characteristics, i.e. family size
 - b. Occupational choices
 - c. Political participation
- 3- What is the impact of the FPE program on parental involvement in children's education?

The current paper focuses on answers to the first question, specifically on impacts on schooling outcomes and political participation.

4.2- Survey Design

The FPE program was implemented from 1955-1965 in the former Western Region of Nigeria. In addition to separating between control, spill-over and treated zones, our identification strategy used variation across birth cohorts to identify people who went to school at that time, people who were of school age at the time but who did not go to school, people who were too old to attend school during that time, and people who were too young to attend school during that time period. People born between 1940-1960 in treated zones would have benefited from the program, and

those of the same cohort age in spillover zones both in Nigeria and in Benin could have benefited indirectly from the program through contacts and interactions with people in the Western region.

People born before 1940 did not benefit from the program even if they were living in treated or spillover zones and of school age at the time of the program. This is because they would have been at least 15 years of age at the start of the program which is generally too late to enter primary school. School records in some areas (these were not available in all areas) were used to make a list of students who attended school during the period of study, and we can verify that no students were 15 or older. Focus group discussions in each location were used to identify peers of the same age who did not attend school.

About 76% of subjects in the sample (in Benin and in Nigeria) are still alive today and were able to provide data on their own lives and those of their descendants. In cases where subjects are deceased, informants provided survey answers on their behalf. Informants must have spent the majority of their life with the subject, know the subject intimately, and be capable of providing detailed information about the subject and his/her descendants' lives. All informants have close familial or personal ties to the original subjects. We control for whether the subject is alive in the regressions in order to adjust for quality of information.

Overall, the study was implemented in 6 states in Nigeria and in 7 Beninese municipalities that share a border with Nigeria and speak Yoruba (the predominant language spoken in the former Western region). Figure 2 shows the study locations, including Treatment categories, and Table 1 in the Appendix shows all communities and regions included in this study classified by treatment arm. The states in Nigeria include Edo, Ekiti, Kogi, Oyo, Kwara and Ogun states whereas the communes in Benin include Ketou, Pobe, Sakete, Ifangni, Adjara, Ouesse and Save. Within each commune in Benin, six villages that were determined to have a strong connection to Nigeria (connection criteria include having a road or river that connects to a Nigerian village, having nearby markets in Nigeria that are visited, the existence of Yoruba speaking people in the community, and a large share of people who frequently travel to Nigeria) and six others that do not have a strong connection to Nigeria were selected to represent the treatment 3 and control communities, respectively. On the Nigerian side, the states of Edo, Ekiti, Oyo and Ogun made up the treated areas, the local government areas of Asa in Kwara State and Ijumu in Kogi State made up the spillover zones, and the local government areas of Omala in Kogi State and Edu in Kwara State made up the control zones.

4.3- Data Collection

Our analysis utilizes primary data collected through surveys as well as secondary data from the DHS survey in Benin. Approval was sought and obtained by the research team to use the DHS data in both countries. For primary data collection, ethical and technical approval was obtained from the Benin institute of Statistics. Primary data were collected in the study area described in section 4.2 above, and this primary data is the focus of the current paper. A preliminary identification phase used school records (when available) and focus group discussions in communities within the study area to identify subjects for the study. The questionnaire was translated into local languages when necessary.

Enumerators were recruited based on the criteria of being a member of the community, having lived a long time in that community, having at least a bachelor's degree, and having experience in socio-economic and historical data collection. Enumerators were hired from communities within the study area to ensure familiarity with the location and with subjects. Enumerators used their pre-existing connections and trust to locate the correct subjects and informants.

Before data collection, enumerators became familiarized with the questionnaires through five days of training and survey simulation activities. Enumerators were evaluated at the end of each day to ensure understanding – poorly-performing enumerators were dropped from the study. Quality control was ensured using three main strategies: (i) The questionnaire, which was designed using the SurveyCTO software platform, included constraints that prevented enumerators from entering data that conflicts with the logic of the survey. The questionnaire was also tested rigorously and mistakes were corrected before the training began; (ii) Spot checks were performed by field “controllers” (supervisors), whose job it is to monitor enumerators’ work and ensure they respect the field protocol; and (iii) “High frequency checks,” or back-end data quality checks, were performed regularly using code prepared to match the survey design. Key variables for the study were also checked every 2-3 days to record inconsistencies and ensure these inconsistencies were corrected.

After the cleaning, 3340 subjects were included in the dataset in Benin and Nigeria. These included all who were of school age within the study area during the time of the FPE, including subjects who attended school as well as those who did not in control, spillover and treated areas.

Key information gathered in the questionnaire includes the subjects’ date and place of birth, school attended and schooling years, performance in school, profession/employment activities,

and date of death if no longer alive. One section of the questionnaire gathered information on subjects' descendants, their marital status, their profession, and the educational attainment and professions of their descendants. We also collected information on parental investments into education in order to understand how the FPE increased aspirations towards education. Political participation, community engagement, social networks, and sports practised were included in a second section. The data on community engagement can be used to understand how exposure to the program increased stakeholder engagement within the community and how this might have led to further investments in education. Information on housing quality and connections to Nigeria were included in the third and final section of the questionnaire. As already indicated, the present paper presents results on schooling attainment and political participation.

4.4 Econometric Framework

In order to estimate the impact of the FPE, we adopt a combination of a regression discontinuity together with a difference-in-differences approach. Specifically, we estimate the Equation (1) below:

$$y_{itc} = \beta_0 + \beta_1 T_t + \beta_2 C_c + \gamma T_t \times C_c + \rho_1 D_{it} + \rho_2 D_{it}^2 + X_{itc} \theta + \varepsilon_{itc} \quad (1)$$

We model each outcome, y , for individual i , belonging to treatment group, t , and cohort c , as a function of a dummy variable representing the community's treatment status, T , a set of indicator variables representing the individual's cohort, C (before, during, after, FPE), a quadratic of the community's distance to the former Western region of Nigeria, D_{it} and D_{it}^2 , and a matrix of individual level control variables, X_{itc} , including sex of the subject, an indicator for whether the subject is alive, and age of the subject. We include an indicator for being alive in order to account for the possibility that people who are alive might provide better information compared to informants for deceased subjects. We include a quadratic for distance to the Western region in order to account for any community characteristics or outcomes that differ as we move away from the borders of the Western region. The fixed effects account for any fixed differences across communities, for example differences in initial levels of education, and any

fixed differences across cohorts, for example the fact that educational attainment has increased over time. Other fixed community characteristics might be language, primary occupation, soil/land quality, and access to markets, which are all captured in the community-type fixed effects.

The main variable of interest is an interaction of the community's treatment status with individual cohort, $T_t \times C_c$. Therefore, the main parameter of interest is γ , the degree to which the given outcome, y_i , changed due to the FPE program. In particular, we are comparing individuals who were born and went to school within the former Western Region to individuals born outside the Western Region in Nigeria and Benin from the same cohort, while taking into account any time invariant differences across both communities and any differences across cohorts that are similar across communities.

The identification does not assume that there are no differences between communities and neither does it assume that there are no differences across cohorts. Instead, the effect of the FPE is identified from changes in the outcomes across cohorts that differ discontinuously across locations as we cross the border of the former Western Region. For example, when comparing locations within the Western Region to those outside of the region, we will find that the FPE improved education outcomes if education outcomes increased relatively faster for individuals born just within the Western Region during the FPE program, compared to individuals born just outside the Western Region during the FPE program. The same logic applies to any changes in education outcomes for future generations, and for any other outcomes. Put differently, the effect of the FPE program is identified if treated communities within the Western Region would have evolved similarly to similar communities just outside the Western Region without the FPE program. We investigate how similar these communities and cohorts are in the analyses that follow.

In order to understand how the effect of the FPE is identified, consider Figure 3, which shows probability of enrolment (attendance) across locations and cohorts. Focusing on areas within the Western Region (Treatment 1), and control locations within Nigeria (Control 1), we find that school enrolment was quite similar at these two locations for the cohort born prior to the FPE. With the introduction of the FPE, however, enrolment increased substantially in Treatment 1, but remained flat in the control locations. Therefore, the effect of the FPE on the FPE cohort in Treatment 1 locations is the change in enrolment in Treatment 1 ($.9 - .65 = .25$) less the general

change over time across these cohorts as represented by the change in control locations (.67-.65 =.02), hence an increase of about 23 percentage points.

4.4- Variables and Balance Checks

4.4.1. Variables Description

4.4.1.1. Main Outcomes or Dependent Variables

This paper focuses specifically on the effects of the FPE on schooling and political participation. For school achievement, we measure the level of education and categorise it as primary education, secondary education, and university level education. Primary school completion is used as a dummy dependent variable in statistical regressions, valued as “1” for those who finished primary school and 0 for those who did not. We assess intergenerational student enrolment using the percentage of subjects’ children enrolled. Political participation is measured by whether the subjects vote or participate in electoral meetings.

The data also contains other information on social outcomes, including subjects’ number of children and living standards as measured by the subjects’ assets. “Profession” is categorized into primary sector activities such as farming, animal husbandry and fishing, secondary sector activities such as creating craft goods from raw materials and hairdressing, and tertiary sector activities including services and high-level professional careers as accountants, administrators, lecturers, etc. An analysis of these outcome variables will be included in a subsequent working paper.

4.4.1.2. Covariates or Independent Variables

The “cohort variable” is constructed according to age of the subjects. Subjects who were born between 1940 and 1960 are classified as the FPE cohort. Subjects born before 1940 are classified as having been born before the FPE. The post-FPE cohort refers to subjects born after the FPE (1965). The FPE cohort includes people who were at most 15 years old at the time when the FPE started (they were still eligible for primary school at this age) and at least 5 years old when the FPE was finishing. 5 was the minimum age to attend school. Demographic variables such as sex and ethnicity were also collected.

The “treatment” variable includes 5 control and treatment arms. Treatment arms include the treated zone within the former Western Region (Treatment 1), spillover zones in Nigeria (Treatment 2), and spillover zones in Benin (Treatment 3). The spillover zones are outside the Western Region but are culturally and economically connected to the Western Region, hence there is a chance of interaction between both groups. Control arms include areas further away from FPE-

impacted areas in Nigeria (Control 1) and eastern Beninese communities without cultural or economic ties to Nigeria (Control 2).

4.4.2. Balance Check

Balance checks were conducted to show the comparability of treated communities, spillover communities, and control communities, using the childhood experience of those born before the FPE. The checks show (Table 1a) that the communities are comparable for some characteristics but have statistically significant differences across others. While there is gender balance across locations in our data, we find that treated and neighbouring locations are more likely to be Yoruba and Yoruba speakers (Yoruba is the predominant language in the former Western region). Locations in Benin were more likely to have straw roofs (Treatment 3 and Control 2), but there are no differences in roof type within Nigeria. We find no differences in the presence of a land phone, and minor differences in flooring type used in homes. Locations in Benin are more likely to be Catholic and less likely to be Muslim. Control locations in Nigeria are more likely to be Muslim. There are no differences in the presence of a radio in control and treated locations in both Nigeria and Benin. Overall, the picture here is mixed, but we may conclude that while communities are similar in terms of house assets, control locations in Nigeria are more likely to be Muslim and less likely to be from the Yoruba ethnic group. This motivates the use of a difference-in-differences approach that properly accounts for differences in community characteristics.

4.4.3. Education Outcome Comparison

The last row of Table 1a indicates that there are no differences in primary completion between treated and control locations in both countries, hence comparability, but spillover locations in Nigeria tend to have significantly lower levels of schooling. Based on this, we might conclude that for the primary treated and control locations, schooling attainment was not significantly different prior to the onset of the FPE. Therefore, since the treated, spill-over and control communities were found to be broadly similar in initial levels of education attainment, we believe that any subsequent differences are driven by the FPE program implemented in the Western region.

4.4.4 Limitations

The study relies on the memories of elderly people and sometimes on the memories of key informants speaking about subjects who are deceased. Respondents were not always able to remember the years the subjects went to school to identify the exact school cohort they belong to. It is possible that reliance on their memories could also lead to general measurement error. We believe that because of the similarities between communities, differences in outcome variables can be attributed to exposure to the FPE program. Another limitation is the small sample size of the cohort born before and after the FPE in the current survey data. We plan to expand data collection in order to obtain a larger sample of individuals in these cohorts.

5- Results

5.1- Descriptive statistics

Descriptive statistics are shown in Tables 1b and 1c. Table 1b shows differences in school attendance by cohort, treatment group, gender, awareness of the FPE, participation in the FPE, political participation, and community engagement (holding a traditional title). The data reveals that educational attainment increased for the FPE cohort, as might have been expected, but drops off for the next generation, partly due to the onset of the Nigerian civil war for the generation born after 1965 and partly due to early challenges with integrating early graduates into the job market (Ajayi, 2008). Individuals in the former Western Region (Treatment 1) are significantly more likely to have gone to school, and males also have higher levels of schooling attainment. People who participated in the FPE are more likely to have gone to school, as expected, but awareness of the program alone is not related to schooling enrolment. Those who were politically active were more likely to have gone to school, but this is not true for community heads and Chiefs.

Table 1c presents more descriptive data according to treatment location. The key thing here is that individuals in Treatment 1 locations, within the former Western region, are significantly more likely to have been aware of and participate in the FPE program. Interestingly, some individuals in control and adjoining areas (Treatment 2 and 3) also participated in the program, indicating that migration was an option. This is one reason why we expect to see spillovers (though is not the main reason). Furthermore, individuals outside the Western Region are also likely to have had some knowledge of the program, including individuals in Benin, even if they did not participate. Awareness is much higher, 58.4% in areas in Benin that border Nigeria

(Treatment 3), compared to areas further away (Control 2 at 39.8%). This awareness and the possibility that it might inspire further investments in children's education is a key reason why we expect spillovers outside the Western Region, especially for the future generation.

5.2- Results on subjects' school achievements

Results on School Attendance

Tables 2a to 2c shows results on school enrolment for the FPE and future cohorts in the Western Region, in spillover regions within Nigeria, and in spillover regions in Benin. The estimates are obtained from estimating Equation (1) assuming that attendance follows a logistic function. Results are disaggregated by sex, and we control for whether the subject is alive, age, and a quadratic of distance to the Western Region of Nigeria.

The results indicate that the FPE increased the probability that the FPE cohort within the Western region would have attended school, relative to the control areas, and relative to the earlier cohorts. This effect of the FPE is even higher for the cohort that came after the FPE. The results confirm that locations in the Western Region, Treatment 1, are more likely to have attended school, and the cohort after FPE is more likely to have attended school relative to the cohort before FPE. The outcome is not related to whether the subject is alive. When we examine results by sex, we find that the effects of the FPE are muted for males across generations. In fact, the bulk of the effect is driven by females in the Western Region who benefited substantially from the FPE relative to females in other regions. This is consistent with the findings in Ajayi (2008), who shows that enrolment increased significantly more for females compared to males following the implementations of the FPE.

Tables 2b and 2c examine spillover effects within Nigeria and across to Benin, respectively. The results indicate that while there are no spillovers for the FPE cohort, the FPE within the Western Region increased schooling attainment for the next cohort in neighbouring communities within Nigeria. As already indicated earlier, these places were very much aware of the FPE and it likely stimulated investments in the education of their children even if they themselves were not able to benefit from the program.

The results in Table 2c do not provide significant evidence of spillovers to neighbouring communities in Benin. The reasons for these different effects are still to be investigated, but might be related to the nature of education policy in both countries.

Results on Primary School Completion

Tables 3a to 3c provide results on primary school completion in addition to earlier results on attendance. Consistent with results from Table 2a, the results in Table 3a show that the FPE increases the probability of completing primary education, especially for the future generation. These results can also be seen in Figures 4 and 5. Once again, the results are larger for females relative to males, emphasizing the importance of the FPE program in promoting female education within the Western region. Tables 3b and 3c continues to show increased primary completion also increased in spillover areas within Nigeria, but not for locations in Benin. This is consistent with the results on increased enrolment due to the FPE.

Overall, we may conclude that the FPE program increased school enrolment and the probability of completing primary education for the FPE cohort within the Western region, compared to the same cohort in control locations, all else the same. The effects are larger for females, and there is strong evidence of spillover effects in neighbouring communities in Nigeria but no strong evidence of cross-country spillovers. Awareness of the program, given its size and popularity, likely inspired increased education for the subsequent generation in neighbouring areas especially for females. This is consistent with the results of early missionary education found in Benin (Wantchekon et al, 2015).

5.3- Results on Political Participation

In this section we examine the extent to which the FPE, an initial political endeavour and a foundation of the governing party's electoral platform in 1952, inspired further political and community participation, which could have spurred sustained investments and interest in the education sector. The results are in Tables 4a to 4b for individuals in the former Western region and spillover locations within Nigeria. There are no results for locations in Benin as no respondent indicated participating in politics.

The results show that the FPE program is associated with increased political participation, especially for females exposed to the program within the Western Region. There is no estimated effect for males, and there is no evidence that the program inspired political participation in neighbouring locations outside the Western region. While previous studies have found that exposure to education is associated with increased political participation, including in Nigeria (Larreguy and Marshall, 2017), we do not find this effect for the FPE, except for females. This is

probably a result of deliberate disengagement given that Nigeria was autocratic for the adult life of most of the FPE cohort (Croke et al, 2016).

5.4- Results on the Next Generation

This section investigates the effects of the FPE on the school attendance of the next generation. For each individual, we ask about the number of children they had and the number of these children who attended school. We then compute the percentage of children who went to school based on this information. Tables 5a to 5c provide estimates of the effects of the FPE on the likelihood that the subject's children will go to school for the treated cohort in the Western Region, for spillover across neighbouring areas in Nigeria, and spillover into neighbouring areas in Benin.

Table 5a provides evidence that children of the FPE cohort within the former Western Region are also more likely to have gone to school, compared to children of the same cohort in control locations, accounting for location and cohort fixed effects. This indicates that the FPE continued to have an effect even on the generation that was not directly exposed. This is true for males exposed to the program and also for females, although the estimates for females are slightly noisier. Tables 5b and 5c provide even further evidence of spillover in Nigeria and into neighbouring communities in Benin on the next generation. This set of findings provides evidence that the children of those exposed to the FPE directly, or indirectly through spillovers, are significantly more likely to have attended school. This indicates increased demand for education given that these spillover locations were not exposed to the supply increases driven by the FPE.

6- Conclusions and Implications

Broadly speaking, the results of our analysis of the direct impacts of the FPE program on educational attainment in western Nigeria echo the results of past studies, both international and local. As expected, investment in school infrastructure led to improved enrolment and primary school completion rates in Nigeria's Western Region. These impacts were especially strong for women, and persisted into the next generation, as children of those directly impacted by the FPE program are more likely to have gone to school compared to those in control areas. This aligns with not only the general intuition that school building improves educational outcomes, but also the broad understanding within Nigeria that the FPE policy was successful in expanding

educational access and improving outcomes. Furthermore, we find evidence that the program increased political participation for those directly exposed, especially girls living in the Western Region at the time of the FPE.

Our results also suggest that government education programs such as the FPE can produce positive, intergenerational externalities through the mechanism of information flows. Though we did not find statistically significant spillover effects of the program on children of school age in Nigerian communities that bordered the Western Region at the time of the FPE, we did find effects on members of these communities in our “post-FPE” birth cohort (those born after the FPE was implemented). This cohort exhibited relatively higher enrolment and educational attainment levels compared to the same age cohort in control communities within Nigeria. Some evidence of intergenerational spillover impacts can also be found in Benin, as members of the post-FPE birth cohort in Beninese communities with geographic and cultural ties to Nigeria’s Western Region were more likely to have their children attend school compared to other Beninese communities that do not have these ties.

Taken together, these results provide support for the proposition that “supply side” governmental education policies such as building schools may also interact with “demand side” factors such as parental aspirations for their children’s education. This interaction has policy implications. If impact on education demand is one potential mechanism through which a government program could positively impact educational outcomes, then policymakers may consider whether they should explicitly encourage this mechanism in their program design. In regions with strong information flows, we may also expect that educational policies enacted in one geographical area would have spillover impacts in neighbouring areas.

Tables and Graphs

Table 1a: Balance Check for pre-FPE cohorts

| | | N | Mean | sd | Difference with treatment 1 |
|---|--------------------|----|-------|---------|-----------------------------|
| What is the gender of the subject? | Treatment 1 | 40 | 0.275 | [0.071] | |
| | Treatment 2 | 37 | 0.351 | [0.080] | 0.076 |
| | Treatment 3 | 55 | 0.164 | [0.050] | -0.111 |
| | Control 1 | 45 | 0.244 | [0.065] | -0.031 |
| | Control 2 | 51 | 0.176 | [0.054] | -0.099 |
| Yoruba | Treatment 1 | 40 | 0.750 | [0.069] | |
| | Treatment 2 | 37 | 1.000 | [0.000] | 0.250*** |
| | Treatment 3 | 55 | 0.800 | [0.054] | 0.050 |
| | Control 1 | 45 | 0.000 | [0.000] | -0.750*** |
| | Control 2 | 51 | 0.510 | [0.071] | -0.240** |
| As a child, was there a landline phone in the subject's home? | Treatment 1 | 40 | 0.000 | [0.000] | |
| | Treatment 2 | 37 | 0.000 | [0.000] | N/A |
| | Treatment 3 | 55 | 0.018 | [0.018] | 0.018 |
| | Control 1 | 45 | 0.000 | [0.000] | N/A |
| | Control 2 | 51 | 0.000 | [0.000] | N/A |
| Nature of the roof : straw | Treatment 1 | 40 | 0.000 | [0.000] | |
| | Treatment 2 | 37 | 0.000 | [0.000] | N/A |
| | Treatment 3 | 55 | 0.836 | [0.050] | 0.836*** |
| | Control 1 | 45 | 0.000 | [0.000] | N/A |
| | Control 2 | 51 | 0.863 | [0.049] | 0.863*** |
| Nature of the Floor: soil | Treatment 1 | 40 | 0.625 | [0.078] | |
| | Treatment 2 | 37 | 0.946 | [0.038] | 0.321*** |
| | Treatment 3 | 55 | 0.545 | [0.068] | -0.080 |
| | Control 1 | 45 | 0.511 | [0.075] | -0.114 |
| | Control 2 | 51 | 0.451 | [0.070] | -0.174 |
| Catholic | Treatment 1 | 40 | 0.050 | [0.035] | |
| | Treatment 2 | 37 | 0.000 | [0.000] | -0.050 |
| | Treatment 3 | 55 | 0.255 | [0.059] | 0.205*** |
| | Control 1 | 45 | 0.000 | [0.000] | -0.050 |
| | Control 2 | 51 | 0.373 | [0.068] | 0.323*** |
| Muslim | Treatment 1 | 40 | 0.275 | [0.071] | |
| | Treatment 2 | 37 | 0.432 | [0.083] | 0.157 |
| | Treatment 3 | 55 | 0.091 | [0.039] | -0.184** |
| | Control 1 | 45 | 0.867 | [0.051] | 0.592*** |
| | Control 2 | 51 | 0.059 | [0.033] | -0.216*** |
| As a child, was there a radio in the subject's home? | Treatment 1 | 40 | 0.200 | [0.064] | |
| | Treatment 2 | 37 | 0.000 | [0.000] | -0.200*** |
| | Treatment 3 | 55 | 0.291 | [0.062] | 0.091 |
| | Control 1 | 45 | 0.244 | [0.065] | 0.044 |
| | Control 2 | 51 | 0.235 | [0.060] | 0.035 |

| | | | | | |
|----------------------------|--------------------|----|-------|---------|-----------|
| Did subject go to school ? | Treatment 1 | 40 | 0.650 | [0.076] | |
| | Treatment 2 | 37 | 0.189 | [0.065] | -0.461*** |
| | Treatment 3 | 55 | 0.418 | [0.067] | -0.232** |
| | Control 1 | 45 | 0.667 | [0.071] | 0.017 |
| | Control 2 | 51 | 0.373 | [0.068] | -0.277*** |
| Primary achieved | Treatment 1 | 40 | 0.325 | [0.075] | |
| | Treatment 2 | 37 | 0.054 | [0.038] | -0.271*** |
| | Treatment 3 | 55 | 0.291 | [0.062] | -0.034 |
| | Control 1 | 45 | 0.289 | [0.068] | -0.036 |
| | Control 2 | 51 | 0.294 | [0.064] | -0.031 |
| Regular at School ? | Treatment 1 | 40 | 0.375 | [0.078] | |
| | Treatment 2 | 37 | 0.027 | [0.027] | -0.348*** |
| | Treatment 3 | 55 | 0.273 | [0.061] | -0.102 |
| | Control 1 | 45 | 0.133 | [0.051] | -0.242*** |
| | Control 2 | 51 | 0.314 | [0.066] | -0.061 |
| Good Result at School ? | Treatment 1 | 40 | 0.325 | [0.075] | |
| | Treatment 2 | 37 | 0.108 | [0.052] | -0.217** |
| | Treatment 3 | 55 | 0.127 | [0.045] | -0.198** |
| | Control 1 | 45 | 0.422 | [0.074] | 0.097 |
| | Control 2 | 51 | 0.118 | [0.046] | -0.207** |

Notes: Table shows differences across survey locations on individual level characteristics. Differences are relative to Treatment 1 locations.

Table 1.b: Descriptive Statistics by "School Attendance Status"

| Covariate | Did subject go to school? | |
|---|---------------------------|-------------|
| | No | Yes |
| Overall | 1368 (41.0) | 1972 (59.0) |
| Cohort | | |
| Before FPE | 123 (53.9) | 105 (46.1) |
| FPE cohort | 988 (38.6) | 1573 (61.4) |
| After FPE | 257 (46.6) | 294 (53.4) |
| Treatment status | | |
| Treatment 1 | 118 (13.5) | 755 (86.5) |
| Treatment 2 | 297 (64.0) | 167 (36.0) |
| Treatment 3 | 381 (51.0) | 366 (49.0) |
| Control 1 | 197 (38.2) | 319 (61.8) |
| Control 2 | 375 (50.7) | 365 (49.3) |
| What is the gender of the subject? | | |
| Male | 778 (35.2) | 1431 (64.8) |
| Female | 590 (52.2) | 541 (47.8) |
| Was Aware of FPE? | | |
| Yes and participated in | 3 (0.3) | 910 (99.7) |
| Yes, did not participated in | 715 (56.7) | 547 (43.3) |
| No, not aware | 650 (55.8) | 515 (44.2) |
| Were You Political Active? | | |
| No | 1106 (42.3) | 1511 (57.7) |
| Yes | 262 (36.2) | 461 (63.8) |
| Traditional Title | | |
| None | 1145 (40.9) | 1654 (59.1) |
| King/ Chief | 120 (42.4) | 163 (57.6) |
| Council Member | 11 (15.9) | 58 (84.1) |
| Community Head | 55 (49.1) | 57 (50.9) |
| Other | 37 (48.1) | 40 (51.9) |

Note: Freq (%), row percentage. Before FPE refers to people born from 1935 to 1939; FPE cohort are people born from 1940 to 1960 and After FPE deals with those born from 1960 to 1970. Treatment 1 is related to places within the former western region; Treatment 2 refers to places in Nigeria near to the former western region; Treatment 3 takes into account places in Benin near to the former western region; Control 1 are Villages in Nigeria far away to the former western region; Control 2 is about Beninese villages relatively far from the Nigerian former western region.

Table 1.c: Descriptive Statistics by "Treatment Status"

| Covariate | Treatment Status | | | | |
|-------------------------------------|------------------|-------------|-------------|------------|-------------|
| | Treatment 1 | Treatment 2 | Treatment 3 | Control 1 | Control 2 |
| Overall | 873 (26.1) | 464 (13.9) | 747 (22.4) | 516 (15.4) | 740 (22.2) |
| Cohort | | | | | |
| Before FPE | 40 (4.6) | 37 (8.0) | 55 (7.4) | 45 (8.7) | 51 (6.9) |
| FPE cohort | 726 (83.2) | 356 (76.7) | 547 (73.2) | 427 (82.8) | 505 (68.2) |
| After FPE | 107 (12.3) | 71 (15.3) | 145 (19.4) | 44 (8.5) | 184 (24.9) |
| Did subject go to school ? | | | | | |
| No | 118 (13.5) | 297 (64.0) | 381 (51.0) | 197 (38.2) | 375 (50.7) |
| Yes | 755 (86.5) | 167 (36.0) | 366 (49.0) | 319 (61.8) | 365 (49.3) |
| Gender | | | | | |
| Male | 476 (54.5) | 278 (59.9) | 552 (73.9) | 340 (65.9) | 563 (76.1) |
| Female | 397 (45.5) | 186 (40.1) | 195 (26.1) | 176 (34.1) | 177 (23.9) |
| Was Aware of FPE | | | | | |
| Yes and participated in | 731 (83.7) | 13 (2.8) | 24 (3.2) | 140 (27.1) | 5 (0.7) |
| Yes, did not participated in | 132 (15.1) | 280 (60.3) | 412 (55.2) | 149 (28.9) | 289 (39.1) |
| No, not aware | 10 (1.1) | 171 (36.9) | 311 (41.6) | 227 (44.0) | 446 (60.3) |
| Were You Politically Active? | | | | | |
| No | 594 (68.0) | 138 (29.7) | 747 (100.0) | 398 (77.1) | 740 (100.0) |
| Yes | 279 (32.0) | 326 (70.3) | 0 (0.0) | 118 (22.9) | 0 (0.0) |
| Traditional Title | | | | | |
| None | 752 (86.1) | 417 (89.9) | 609 (81.5) | 419 (81.2) | 602 (81.4) |
| King/ Chief | 62 (7.1) | 32 (6.9) | 76 (10.2) | 38 (7.4) | 75 (10.1) |
| Council Member | 33 (3.8) | 2 (0.4) | 0 (0.0) | 34 (6.6) | 0 (0.0) |
| Community Head | 14 (1.6) | 12 (2.6) | 37 (5.0) | 11 (2.1) | 38 (5.1) |
| Other | 12 (1.4) | 1 (0.2) | 25 (3.3) | 14 (2.7) | 25 (3.4) |

Note: Freq (%), row percentage. Before FPE refers to people born from 1935 to 1939; FPE cohort are people born from 1940 to 1960 and After FPE deals with those born from 1960 to 1970.

Table 2a: Logistic Estimation: Treatment 1 vs. Control1 (FPE and School Enrollment)

| Dependent variable : School Attendance | | | |
|--|-----------------------|----------------------|-----------------------|
| | All Sex | Males | Females |
| Treatment-Cohort Interaction | | | |
| Treatment 1 # FPE cohort | 3.010** (1.511) | 1,634 (1.146) | 10.48** (11.12) |
| Treatment 1 # After FPE | 576.8*** (539.2) | 1 | 1392.8*** (2230.1) |
| Treatment | | | |
| Treatment 1 | 54.49** (99.69) | 150.1** (318.0) | 10.10 (35.44) |
| Cohort | | | |
| FPE cohort | 0.568 (0.232) | 0.694 (0.343) | 0.470 (0.359) |
| After FPE | 0.007*** (0.00564) | 0.010*** (0.0109) | 0.005*** (0.00715) |
| Sex | | | |
| Female | 0.288*** (0.0450) | | |
| Alive | | | |
| Yes | 0.800 (0.164) | 0.846 (0.233) | 0.801 (0.256) |
| Age | | | |
| | 0.534*** (0.0668) | 0.619*** (0.110) | 0.475*** (0.0859) |
| Distance to West Region | | | |
| | 15.64*** (16.29) | 23.99*** (28.52) | 9.626 (18.92) |
| Squared Distance to West Region | | | |
| | 0.432*** (0.116) | 0.368*** (0.114) | 0.526 (0.260) |
| Wald Statistic | | | |
| | 195.0*** | 94.32*** | 86.42*** |
| Log-Likelihood | | | |
| | -594.7 | -302.3 | -288.0 |
| AIC | | | |
| | 1211.5 | 622.6 | 596.0 |
| BIC | | | |
| | 1269.1 | 664.4 | 639.5 |
| Observations | | | |
| | 1389 | 764 | 573 |

Note: Robust standard errors in parenthesis. * p<0.1, ** p<0.05, *** p<0.001. Before FPE refers to people born from 1935 to 1939; FPE cohort are people born from 1940 to 1960 and After FPE deals with those born from 1960 to 1970. Treatment 1 is related to places within the former western region; Control 1 are Villages in Nigeria far away to the former western region. Distance to the western region is in meters.

Table 2b: Logistic Estimation. Treatment 2 vs. Control 1 (Spillovers within Nigeria)

| Dependent variable: School Attendance | | | |
|--|----------------------|----------------------|----------------------|
| | All Sex | Males | Females |
| Treatment-Cohort Interaction | | | |
| Treatment 2 # FPE cohort | 2.132 (1.183) | 1.656 (1.084) | 5.838 (7.888) |
| Treatment 2 # After FPE | 69.76*** (58.42) | 91.21*** (97.62) | 103.1*** (183.1) |
| Treatment | | | |
| Treatment 2 | 0.045*** (0.0329) | 0.016*** (0.0169) | 0.195 (0.256) |
| Cohort | | | |
| FPE cohort | 0.760 (0.287) | 0.805 (0.376) | 0.760 (0.541) |
| After FPE | 0.017*** (0.0139) | 0.013*** (0.0148) | 0.019*** (0.0280) |
| Sex | | | |
| Female | 0.389*** (0.0594) | | |
| Alive | | | |
| Yes | 1.388* (0.263) | 1.334 (0.302) | 1.523 (0.593) |
| Age | | | |
| | 0.761** (0.0912) | 0.767* (0.119) | 0.767 (0.150) |
| Distance to West Region | | | |
| | 0.804 (0.294) | 0.476 (0.227) | 3.198* (2.007) |
| Squared Distance to West Region | | | |
| | 0.917 (0.103) | 0.961 (0.143) | 0.688** (0.126) |
| Wald Statistic | 129.1*** | 75.63*** | 31.83*** |
| Log-Likelihood | -592.1 | -369.4 | -216.1 |
| AIC | 1206.2 | 758.8 | 452.2 |
| BIC | 980 | 618 | 362 |
| Observations | 1389 | 764 | 573 |

Note: Robust standard errors in parenthesis. * p<0.1, ** p<0.05, *** p<0.01. Before FPE refers to people born from 1935 to 1939; FPE cohort are people born from 1940 to 1960 and After FPE deals with those born from 1960 to 1970. Treatment 2 refers to places in Nigeria near to the former western region; Treatment 3 takes into account places in Benin near to the former western region; Control 1 are Villages in Nigeria far away to the former western region. Distance to the western region is in meters.

Table 2c: Treatment 3 vs. Control 2 (Cross-Border Spillovers)

| Dependent variable : School Attendance | | | |
|--|----------------------|----------------------|------------------|
| | All Sex | Males | Females |
| Treatment-Cohort Interaction | | | |
| Treatment 3 # FPE cohort | 0.847 (0.373) | 0.977 (0.450) | 0.444 (0.485) |
| Treatment 3 # After FPE | 0.600 (0.288) | 0.652 (0.333) | 0.378 (0.447) |
| Treatment | | | |
| Treatment 3 | 1.276 (0.548) | 1.176 (0.526) | 1.920 (2.101) |
| Cohort | | | |
| FPE cohort | 1.310 (0.468) | 1.342 (0.505) | 0.867 (0.802) |
| After FPE | 0.996 (0.442) | 1.083 (0.523) | 0.513 (0.552) |
| Sex | | | |
| Female | 0.255*** (0.0352) | | |
| Alive | | | |
| Yes | 0.651*** (0.0797) | 0.648*** (0.0865) | 0.656 (0.202) |
| Standardized Age | | | |
| | 0.759*** (0.0677) | 0.759*** (0.0762) | 0.743 (0.142) |
| Distance to West Region | | | |
| | 1.112 (0.213) | 1.037 (0.221) | 1.381 (0.559) |
| Squared Distance to West Region | | | |
| | 1.220 (0.462) | 1.265 (0.534) | 0.970 (0.764) |
| Wald Statistic | 127.8*** | 26.13*** | 6.339 |
| Log-Likelihood | -955.8 | -747.3 | -206.2 |
| AIC | 1933.6 | 1514.6 | 432.3 |
| BIC | 1992.0 | 1564.7 | 471.5 |
| Observations | 1487 | 1115 | 372 |

Note: Robust standard errors in parenthesis * p<0.1, ** p<0.05, *** p<0. Before FPE refers to people born from 1935 to 1939; FPE cohort are people born from 1940 to 1960 and After FPE deals with those born from 1960 to 1970. Treatment 3 takes into account places in Benin near to the former western region; Control 2 is about Beninese villages relatively far from the Nigerian former western region. Distance to the western region is in meters.

Table 3a: Logistic Estimation: Treatment 1 vs. Control1 (FPE and Primary Completion)

| Dependent variable: Primary Completion | | | |
|--|-----------------------|-----------------------|-------------------------|
| | All Sex | Males | Females |
| Treatment-Cohort Interaction | | | |
| Treatment 1 # FPE cohort | 1.026 (0.496) | 0.576 (0.358) | 10.20* (12.72) |
| Treatment 1 # After FPE | 66.26*** (53.94) | 22.73*** (23.58) | 752.7*** (1245.1) |
| Treatment | | | |
| Treatment 1 | 44.60* (91.18) | 134.5** (327.7) | 3.035 (10.35) |
| Cohort | | | |
| FPE cohort | 1.082 (0.426) | 1.513 (0.671) | 0.480 (0.363) |
| After FPE | 0.0131*** (0.0105) | 0.0228*** (0.0231) | 0.00551*** (0.00763) |
| Sex | | | |
| Female | 0.308*** (0.0414) | | |
| Alive | | | |
| Yes | 0.818 (0.147) | 0.984 (0.230) | 0.659 (0.193) |
| Standardized Age | | | |
| | 0.537*** (0.0565) | 0.622*** (0.0924) | 0.474*** (0.0732) |
| Distance to West Region | | | |
| | 9.453** (10.82) | 13.02* (17.64) | 6.881 (12.87) |
| Squared Distance to West | | | |
| | 0.512** (0.147) | 0.460** (0.156) | 0.583 (0.275) |
| Wald Statistic | | | |
| Log-Likelihood | 161.3*** | 81.41*** | 62.11*** |
| AIC | -737.7 | -385.9 | -345.9 |
| BIC | 1497.5 | 791.8 | 711.7 |
| | 1555.1 | 838.8 | 755.2 |

Note: Robust standard errors in parenthesis * p<0.1, ** p<0.05, *** p<0.01. Before FPE refers to people born from 1935 to 1939; FPE cohort are people born from 1940 to 1960 and After FPE deals with those born from 1960 to 1970. Treatment 1 is related to places within the former western region; Control 1 are Villages in Nigeria far away to the former western region. Distance to the western region is in meters.

Table 3b: Treatment 2 vs. Control 1 (FPE and Primary Completion, Spillovers within Nigeria)

| Dependent variable: Primary Completion | | | |
|--|-----------------------|-----------------------|-----------------------|
| | All Sex | Males | Females |
| Treatment-Cohort Interaction | | | |
| Treatment 2 # FPE cohort | 1.364 (0.809) | 0.784 (0.513) | 0.0489** (0.0606) |
| Treatment 2 # After FPE | 56.57*** (50.12) | 48.29*** (51.36) | 1 (.) |
| Treatment | | | |
| Treatment 2 | 0.0797*** (0.0595) | 0.0667*** (0.0641) | 16.77** (23.55) |
| Cohort | | | |
| FPE cohort | 1.318 (0.496) | 1.800 (0.786) | 0.603 (0.437) |
| After FPE | 0.0276*** (0.0232) | 0.0362*** (0.0382) | 0.0130*** (0.0191) |
| Sex | | | |
| Female | 0.393*** (0.0611) | | |
| Alive | | | |
| Yes | 1.586** (0.302) | 1.624** (0.358) | 1.471 (0.601) |
| Standardized Age | | | |
| | 0.757** (0.0912) | 0.811 (0.122) | 0.680* (0.140) |
| Distance to West Region | | | |
| | 0.925 (0.338) | 0.651 (0.305) | 3.126* (1.970) |
| Squared Distance to West Region | | | |
| | 0.912 (0.102) | 0.961 (0.139) | 0.697** (0.127) |
| Wald Statistic | 143.6*** | 84.98*** | 38.75*** |
| Log-Likelihood | -580.3 | -373.7 | -201.1 |
| AIC | 1182.6 | 767.5 | 420.2 |
| BIC | 1236.3 | 811.8 | 454.9 |
| Observations | 980 | 618 | 349 |

Note: Robust standard errors in parenthesis * p<0.1, ** p<0.05, *** p<0. Before FPE refers to people born from 1935 to 1939; FPE cohort are people born from 1940 to 1960 and After FPE deals with those born from 1960 to 1970. Treatment 2 refers to places in Nigeria near to the former western region; Control 1 are Villages in Nigeria far away to the former western region. Distance to the western region is in meters.

Table 3c: Treatment 3 vs. Control 2 (FPE and Primary Completion, Cross-Border Spillovers)

| Dependent variable: Primary Completion | | | |
|--|----------|---------|---------|
| | All Sex | Males | Females |
| Treatment-Cohort Interaction | | | |
| Treatment 3 # FPE cohort | 0.655 | 0.886 | 0.472 |
| | (0.450) | (0.632) | (0.497) |
| Treatment 3 # After FPE | 0.375 | 0.432 | 1 |
| | (0.278) | (0.334) | (.) |
| Treatment | | | |
| Treatment 3 | 2.224 | 1.913 | 0.919 |
| | (1.502) | (1.341) | (0.993) |
| Cohort | | | |
| FPE cohort | 2.959* | 2.610* | 0.806 |
| | (1.665) | (1.513) | (1.228) |
| After FPE | 3.781** | 3.617* | 0.567 |
| | (2.466) | (2.464) | (0.936) |
| Sex | | | |
| Female | 0.296*** | | |
| | (0.0673) | | |
| Alive | | | |
| Yes | 0.740** | 0.774 | 0.484 |
| | (0.111) | (0.122) | (0.215) |
| Standardized Age | | | |
| | 1.036 | 1.038 | 1.017 |
| | (0.109) | (0.119) | (0.293) |
| Distance to West Region | | | |
| | 1.596* | 1.676** | 0.800 |
| | (0.394) | (0.439) | (0.665) |
| Squared Distance to West Region | | | |
| | 1.021 | 1.263 | 0.0737 |
| | (0.434) | (0.574) | (0.124) |
| Wald Statistic | 43.85*** | 17.23** | 11.57 |
| Log-Likelihood | -955.8 | -747.3 | -206.2 |
| AIC | 1290.9 | 1103.9 | 190.7 |
| BIC | 1349.2 | 1154.1 | 225.7 |
| Observations | 1487 | 1115 | 363 |

Note: Robust standard errors in parenthesis * p<0.1, ** p<0.05, *** p<0. Before FPE refers to people born from 1935 to 1939; FPE cohort are people born from 1940 to 1960 and After FPE deals with those born from 1960 to 1970. Treatment 3 takes into account places in Benin near to the former western region; Control 2 is about Beninese villages relatively far from the Nigerian former western region. Distance to the western region is in meters.

Table 4a: FPE and Community Engagement: Treatment 1 vs. Control1

| Dependent variable: Being Active in Politics | | | |
|--|----------|----------|----------------|
| | All Sex | Males | Females |
| Treatment-Cohort Interaction | | | |
| Treatment 1#FPE cohort | 0.745 | 1.522 | 0.124* |
| | (0.400) | (0.935) | (0.152) |
| Treatment | | | |
| Treatment 1 | 6.827 | 0.221 | 2.51719e+30*** |
| | (16.28) | (0.518) | (4.11760e+31) |
| Cohort | | | |
| FPE cohort | 3.136*** | 3.088** | 4.074 |
| | (1.365) | (1.474) | (4.393) |
| After FPE | 4.626*** | 14.22*** | 0.497 |
| | (2.328) | (9.065) | (0.429) |
| Sex | | | |
| Female | 0.720** | | |
| | (0.0932) | | |
| Alive | | | |
| Yes | 1.054 | 1.029 | 1.072 |
| | (0.171) | (0.201) | (0.330) |
| Standardized Age | | | |
| | 1.702*** | 1.937*** | 1.303* |
| | (0.161) | (0.241) | (0.199) |
| Distance to West Region | | | |
| | 1.506 | 0.228 | 1.07354e+16*** |
| | (1.999) | (0.305) | (9.75946e+16) |
| Squared Distance to West Region | | | |
| | 0.985 | 1.662 | 0.000284*** |
| | (0.326) | (0.580) | (0.000587) |
| Wald Statistic | 53.57*** | 47.16*** | 33.21*** |
| Log-Likelihood | -790.9 | -473.9 | -302.0 |
| AIC | 1601.8 | 965.9 | 622.0 |
| BIC | 1653.8 | 1007.9 | 660.9 |
| Observations | 1345 | 792 | 553 |

Note: Robust standard errors in parenthesis. * p<0.1, ** p<0.05, *** p<0.001. Before FPE refers to people born from 1935 to 1939; FPE cohort are people born from 1940 to 1960 and After FPE deals with those born from 1960 to 1970. Treatment 1 is related to places within the former western region; Control 1 are Villages in Nigeria far away to the former western region. Distance to the western region is in meters.

Table 4b: FPE and Community Engagement: Treatment 2 vs. Control 1

| Dependent variable: Being Active in Politics | | | |
|--|---------------------|----------------------|---------------------|
| | All Sex | Males | Females |
| Treatment-Cohort Interaction | | | |
| Treatment 2 # FPE cohort | 0.536 (0.316) | 0.939 (0.628) | 0.0967 (0.152) |
| Treatment | | | |
| Treatment 2 | 3.963** (2.775) | 1.271 (1.139) | 73.75*** (118.6) |
| Cohort | | | |
| FPE cohort | 3.575*** (1.674) | 2.974** (1.528) | 7.428 (9.168) |
| After FPE | 24.00*** (17.38) | 21.85*** (19.27) | 15.09* (22.04) |
| Sex | | | |
| Female | 1.138 (0.186) | | |
| Alive | | | |
| Yes | 1.970*** (0.450) | 1.846** (0.451) | 2.264 (1.337) |
| Standardized Age | | | |
| | 2.217*** (0.303) | 2.146*** (0.369) | 2.303*** (0.514) |
| Distance to West Region | | | |
| | 0.273*** (0.101) | 0.157*** (0.0772) | 0.808 (0.533) |
| Squared Distance to West Region | | | |
| | 1.499*** (0.169) | 1.771*** (0.259) | 1.052 (0.207) |
| Wald Statistic | | | |
| | 199.6*** | 114.0*** | 90.45*** |
| Log-Likelihood | | | |
| | -508.4 | -332.2 | -170.8 |
| AIC | | | |
| | 1036.7 | 682.5 | 359.5 |
| BIC | | | |
| | 1085.2 | 722.0 | 394.1 |
| Observations | | | |
| | 936 | 594 | 342 |

Note: Robust standard errors in parenthesis. * p<0.1, ** p<0.05, *** p<0.001. Before FPE refers to people born from 1935 to 1939; FPE cohort are people born from 1940 to 1960 and After FPE deals with those born from 1960 to 1970. Treatment 2 refers to places in Nigeria near to the former western region; Control 1 are Villages in Nigeria far away to the former western region. Distance to the western region is in meters.

Table 5a: FPE and Percentage of Children who Attended School (Treatment 1 vs Control 1)
Dependent Variable: Percentage of Children who Attended School

| | All Sex | Males | Females |
|---|----------|----------|----------|
| Treatment-Cohort Interaction | | | |
| Treatment 1 # FPE cohort | 0.460* | 0.389* | 0.749 |
| | (0.216) | (0.219) | (2.14) |
| Treatment 1 # After FPE | 1.237 | 0.973 | 2.225 |
| | (3.748) | (24.325) | (2.618) |
| Treatment | | | |
| Control 1 | 1 | 1 | 1 |
| Treatment 1 | 25.94** | 2.269 | 26.71** |
| | (11.229) | (4.828) | (13.49) |
| Cohort | | | |
| Before FPE | 1 | 1 | 1 |
| FPE cohort | 1.661 | 2.230 | 0.834 |
| | (1.221) | (1.477) | (3.971) |
| After FPE | 0.601 | 0.882 | 0.245 |
| | (0.771) | (5.513) | (0.176) |
| Sex | | | |
| Female | 0.913 | | |
| | (0.550) | | |
| Alive | | | |
| Yes | 1.317** | 1.013 | 2.216*** |
| | (0.538) | (6.753) | (0.739) |
| Standardized Age | | | |
| | 0.935 | 0.946 | 0.877 |
| | (0.649) | (0.802) | (0.522) |
| Distance to West Region Standardized | | | |
| | 2.019 | 0.450 | 2.874 |
| | (2.219) | (0.556) | (2.790) |
| Squared Distance to West Region Standardized | | | |
| | 2.019 | 0.450 | 2.874 |
| | (4.543) | (0.916) | (3.740) |
| Wald Statistic | 104.6*** | 43.90*** | 98.21*** |
| Log-Likelihood | 4735.2 | 2705.7 | 2044.2 |
| AIC | -9446.4 | -5389.4 | -4066.3 |
| BIC | -9383.9 | -5337.9 | -4018.9 |
| Observations | 1348 | 795 | 553 |

Note: Robust standard errors in parenthesis. * p<0.1, ** p<0.05, *** p<0.001. Before FPE refers to people born from 1935 to 1939; FPE cohort are people born from 1940 to 1960 and After FPE deals with those born from 1960 to 1970. Treatment 2 refers to places in Nigeria near to the former western region; Control 1 are Villages in Nigeria far away to the former western region. Distance to the western region is in meters.

Table 5b: FPE and Percentage of Children who Attended School (Spillover within Nigeria)
Dependent Variable: Percentage of Children who Attended School

| | All Sex | Males | Females |
|---|---------------------|---------------------|---------------------|
| Treatment-Cohort Interaction | | | |
| Treatment 2 # FPE cohort | 0.874 (2.819) | 0.549 (0.395) | 2.205 (1.934) |
| Treatment 2 # After FPE | 1.506 (1.673) | 0.765 (1.962) | 4.226* (2.429) |
| Treatment | | | |
| Control 1 | 1 | 1 | 1 |
| Treatment 2 | 4.415*** (1.538) | 4.481*** (1.572) | 2.538 (2.44) |
| Cohort | | | |
| Before FPE | 1 | 1 | 1 |
| FPE cohort | 1.380 (1.394) | 1.838 (0.967) | 0.740 (1.51) |
| After FPE | 0.660 (0.617) | 1.038 (17.3) | 0.305 (0.193) |
| Sex | | | |
| Female | 0.891 (0.614) | | |
| Alive | | | |
| Yes | 1.641*** (0.486) | 1.243 (0.787) | 3.330*** (0.988) |
| Standardized Age | | | |
| | 0.989 (6.181) | 1.014 (5.965) | 0.953 (2.269) |
| Distance to West Region Standardized | | | |
| | 1.659** (0.882) | 1.210 (1.658) | 2.433** (1.187) |
| Squared Distance to West Region Standardized | | | |
| | 1.033 (2.246) | 1.111 (0.761) | 0.912 (1.126) |
| Wald Statistic | 94.13*** | 47.27*** | 61.62*** |
| Log-Likelihood | 4735.2 | 2705.7 | 2044.2 |
| AIC | -6757.2 | -4089.4 | -2671.2 |
| BIC | -6698.8 | -4041.0 | -2628.5 |
| Observations | 960 | 602 | 358 |

Note: Robust standard errors in parenthesis. * p<0.1, ** p<0.05, *** p<0.001. Before FPE refers to people born from 1935 to 1939; FPE cohort are people born from 1940 to 1960 and After FPE deals with those born from 1960 to 1970. Treatment 2 refers to places in Nigeria near to the former western region; Control 1 are Villages in Nigeria far away to the former western region. Distance to the western region is in meters.

Table 5c: FPE and Percentage of Children who Attended School (Spillover within Benin)
Dependent Variable: Percentage of Children who Attended School

| | All Sex | Males | Females |
|---|----------|----------|----------|
| Treatment-Cohort Interaction | | | |
| Treatment 3 # FPE cohort | 0.785 | 0.587 | 2.322 |
| | 1.308 | 0.397 | 1.935 |
| Treatment 3 # After FPE | 0.544 | 0.453* | 1.227 |
| | 0.365 | 0.246 | 4.719 |
| Treatment | | | |
| Control 2 | 1 | 1 | 1 |
| Treatment 3 | 1.701 | 1.860* | 0.954 |
| | 1.329 | 1.120 | 13.629 |
| Cohort | | | |
| Before FPE | 1 | 1 | 1 |
| FPE cohort | 1.448 | 1.736** | 0.557 |
| | 1.114 | 0.839 | 0.33 |
| After FPE | 1.710* | 1.714* | 1.046 |
| | 0.919 | 1.270 | 11.622 |
| Sex | | | |
| Female | 0.628*** | | |
| | 0.15 | | |
| Alive | | | |
| Yes | 1.898*** | 2.028*** | 1.565** |
| | 0.363 | 0.361 | 0.894 |
| Standardized Age | | | |
| | 1.015 | 0.977 | 1.128 |
| | 5.075 | 2.791 | 1.327 |
| Distance to West Region Standardized | | | |
| | 1.518*** | 1.314** | 2.211*** |
| | 0.398 | 0.801 | 0.792 |
| Squared Distance to West Region Standardized | | | |
| | 1.106 | 1.999*** | 0.317** |
| | 2.257 | 0.784 | 0.133 |
| Wald Statistic | 95.63*** | 57.23*** | 42.00*** |
| Log-Likelihood | 3608.9 | 2493.1 | 1130.6 |
| AIC | -7193.9 | -4964.3 | -2239.2 |
| BIC | -7130.8 | -4909.6 | -2196.4 |
| Observations | 960 | 602 | 358 |
| Observations | 1422 | 1061 | 361 |

Note: Robust standard errors in parenthesis. * p<0.1, ** p<0.05, *** p<0.001. Before FPE refers to people born from 1935 to 1939; FPE cohort are people born from 1940 to 1960 and After FPE deals with those born from 1960 to 1970. Treatment 2 refers to places in Nigeria near to the former western region; Control 1 are Villages in Nigeria far away to the former western region. Distance to the western region is in meters.

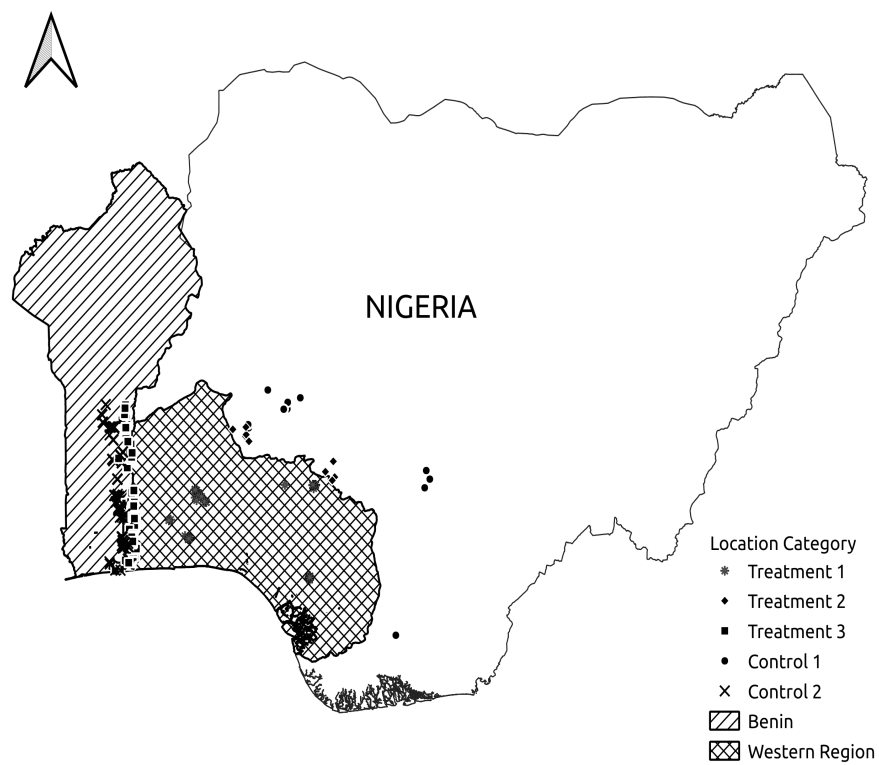


Figure 2: Survey Locations in Nigeria and Benin

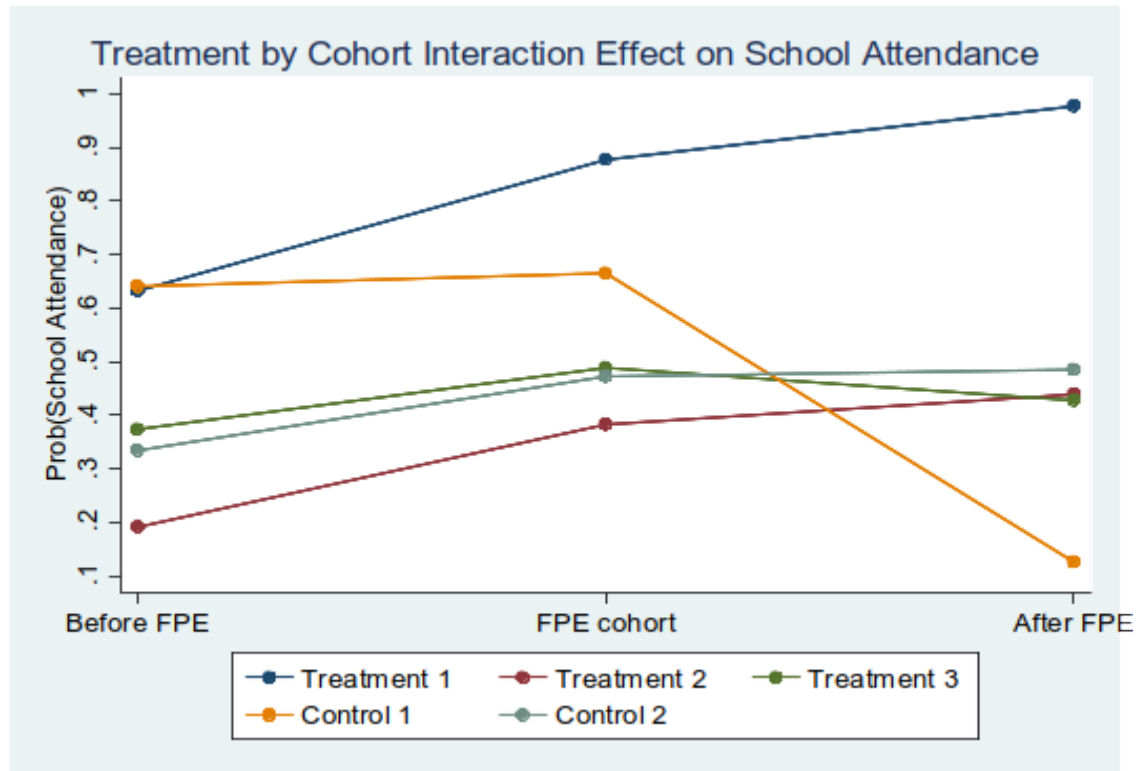


Figure 3: FPE and School Attendance by Treatment Location and Cohort

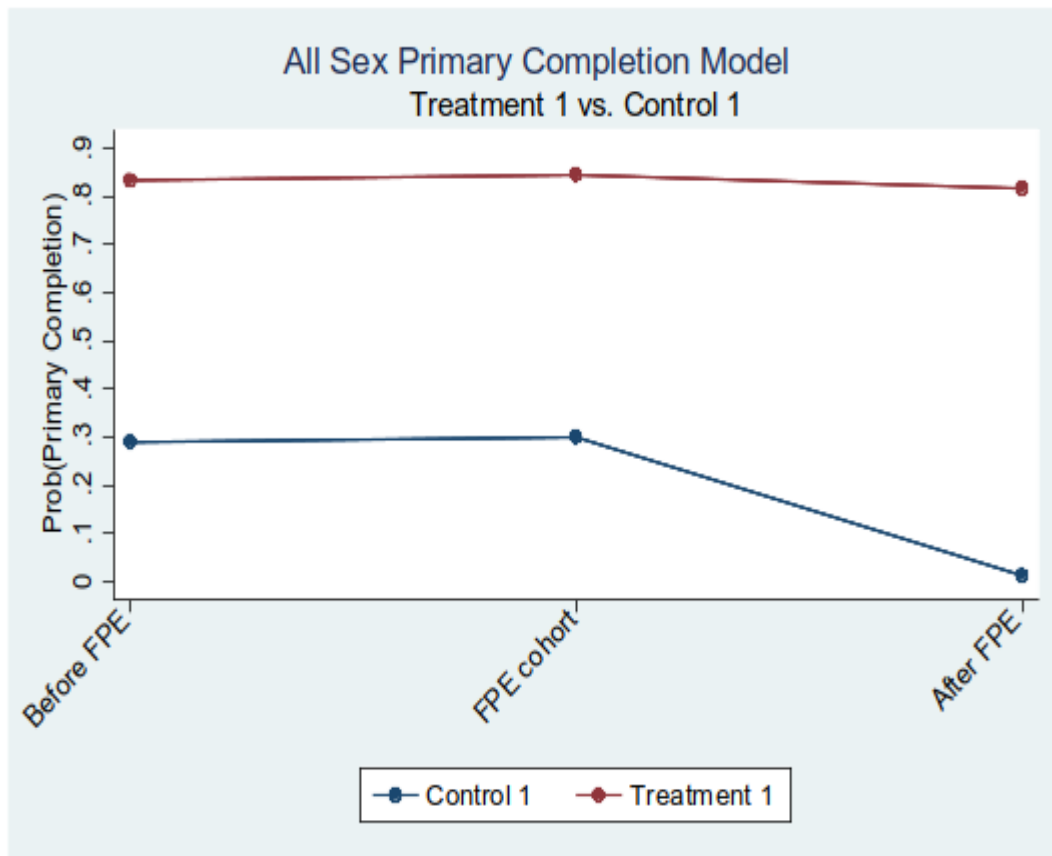


Figure 4: Effect of FPE on School Completion

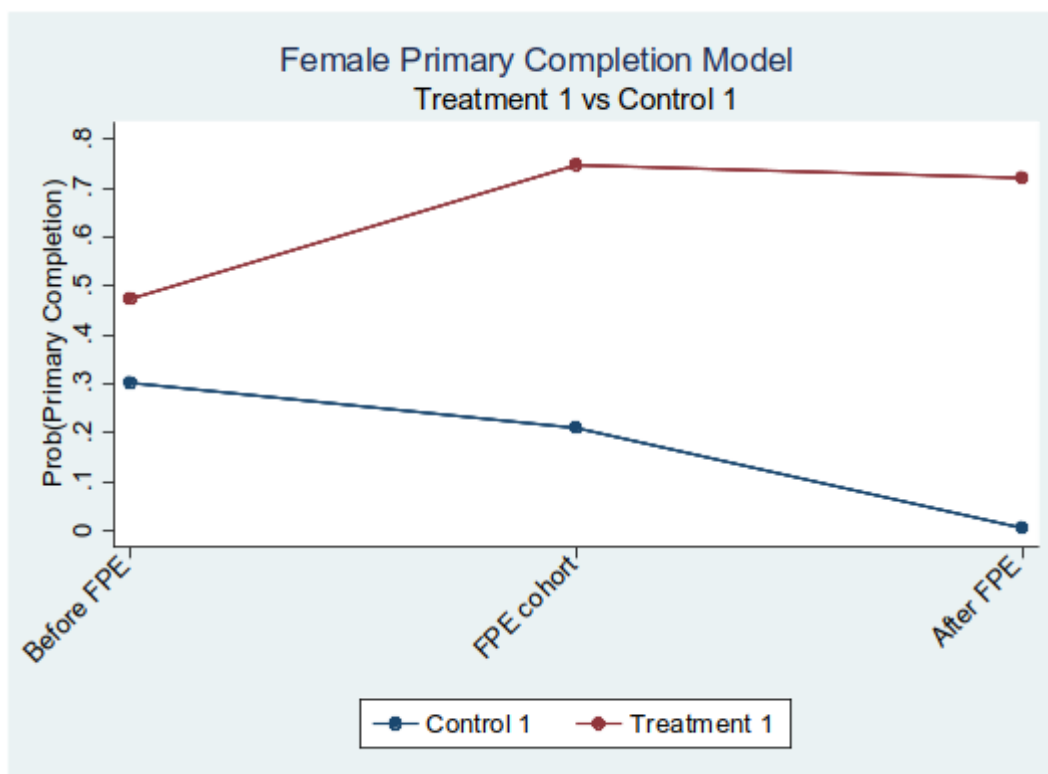
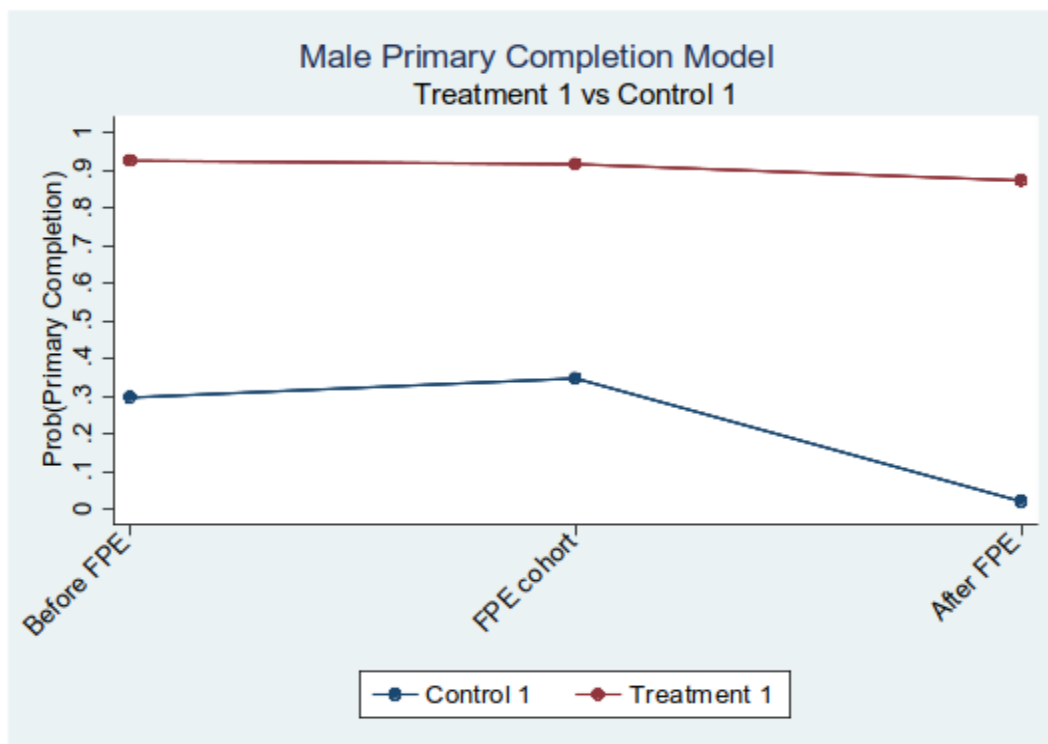


Figure 5: Effect of FPE on School Completion by Sex

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APPENDIX

In Nigeria, the states of Edo, Ekiti, Oyo and Ogun made up the treated areas. The local government areas of Asa in Kwara State and Ijumu in Kogi State made up the spillover zones in Nigeria whereas the the local government areas of Omala in Kogi state and Edu in Kwara states made the control zones in Nigeria.

Table 1: Study areas in Benin

| | | | |
|-----------------------------------|-------------------------------|--|--|
| TREATED ZONES | Edo | Oredo | |
| | Ogun | Shagamu | |
| | Oyo | Ido | |
| | Ekiti | Aiyekire | |
| SPILLOVER ZONES IN NIGERIA | Kwara | Edu | |
| | Kogi | Omala | |
| CONTROL ZONES IN NIGERIA | Kétou | | |
| | Pobè | Agbele, Akouho, Akpate, Igbekofin-Iguelou, Igbidi, Issale-Ibéré, Ita-Adeleye, Itchakpo, Ogouba | |
| | Sakété | Akpechi, Assa-idioche; Bqrigbo Owode, Kobedjo, Makpa, Madogan | |
| | Ifangni | Akadja Centre, Alobatin, Djegou Nagot, Doke, Igolo, Ita Soumba | |
| | Adjarra | Agbomey_Takplikpo, Bokovi Tchaka, Djavi, Dohongla, Lindja Dangbo, Mededjonou | |
| | Savè | Bako, Djabata, Gogoro, Monka, Oke Owo, Sandehou | |
| | Ouèssè | Agboro-Kombon, Kokoro Awoyo, yaoui | |
| | CONTROL ZONES IN BENIN | Kétou | |
| | | Pobè | Gbanago, Gbanigbe, Oke Atta |
| | | Sakété | Igba, Igbo-Assan, Illasso-Nagot, Saharo_Nagot, Tota, Yogou-Tohou |
| Ifangni | | Ko-Akonkessa, Ko Anago, Ko Gbegodo, Okedjere, Sokou, Tchaada | |
| Adjarra | | Adovie, Agata, Hahame, Hevie, Kpadovie, Vidjinan | |
| Savè | | Akon, Atchakpali, Diho, Gobe, Okpa, Ouoghi | |
| Ouèssè | | Azraou. Dokoundoho, Idadjo, Odo-Akaba, Tosso, Toui Gare, Vodje, Wodji | |

