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THE EFFECTS OF THE GREAT GREEN WALL ON WOMEN EMPOWERMENT AND CHILDREN'S SCHOOL ATTENDANCE

The study case of Senegal

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Abstract

This analysis is interested in answering the question *"what is the causal effect of the introduction of the Great Green Wall on women empowerment and school attendance in Senegal between 2005 and 2019"*. For this purpose, after presenting the project, the Senegalese demography, the social, economic, and political context, an empirical study was conducted following a multiple hypothesis testing analysis. It aims at (1) suggesting interesting variables reviewed from DHS - surveys, (2) measuring those potential effects by proposing a modus operandi that takes into account several issues encountered in a causality study; (3) displaying robust results including demographic and social considerations.

Contents

Acronyms and abbreviations

AFR100	African Forest Landscape Restoration Initiative
AU	African Union
BH procedure	Benjamini-Hochberg Procedure
CEDAW	Convention on the Elimination of All Forms of Discrimination Against Women
CEN-SAD	Communauté des États sahélo-sahariens translated in English as the Leaders and Heads of State of the Community of Sahel-Saharan States
DiD	Difference in Difference
ECOWAS	Economic Community of West African States
EU	European Union
FAO	Food and Agriculture Organization
FDR	False Discovery Rate
FGM	female genital mutilations
FWER	Familywise Error Rate
GDI	Gender development Index
GDP	Gross Domestic Product
GER	Gross Enrolment Ratio
GER	Gross Enrolment Ratio
GGW	Great Green Wall
GII	Gender inequality index
HCR	Head Count Ratio
HDI	Human Development Index
IDI	Inclusive Development Index
IFIs	International Financial Institutions
ILO	the International Labour Organization
NER	Net Enrolment ratio
NGO	Non-Governmental organization
OCDE	Organisation de coopération et de développement économiques
OECD	Organisation for Economic Cooperation and Development
PAGWW	Panafrican Agency of the Great Green Wall
PIQET-EF	program for improving the quality, ethics and transparency of the Education and Training sector
PSE	Plan Sénégal Emergent
SWPER	Survey-Based Women's Empowerment
TDFP	Ten-year Education and Training Plan
UN	United Nations
UEMOA	Union Economique et Monétaire Ouest Africaine

UNDP	United Nations Development Programme
UNICEF	United Nations International Children's Emergency Fund
VAW	violence against women
WEAI	Women’s Empowerment in Agriculture Index
yo	year old

1 Introduction

These last decades, women empowerment and children's education in developing countries have been largely discussed in the literature. By allowing humans to reach their full potential they are often advocated as development tools. Through the years many factors impacting these two matters have been highlighted. This work aims at participating to this framework.

The case studied in this endeavour is the implementation of the Great Green Wall (GGW) project in Senegal. The initiative addresses the issue of the desertification through sustainable practices and the protection of resources. It promotes local initiatives, production gains, transition to a green economy and ensures access to basic needs such as water, shelters, and good nutrition. Hence, the livelihoods and the socio-economic development of the local communities are affected (Diop et al., 2018).

Up until now, very few empirical analyses on the GGW have been published for the economic and social dimensions. This work is a first attempt at statistically studying the changes induced by the GGW on women empowerment and school attendance. Both being well known elements that measure a country's development. One way of defining development economics is given by Bird (2019) where she states that it is a branch of economics that focuses on improving fiscal, economic, and social conditions in developing countries. The aspects of this definition at heart in this work are the analysis of potential improvements in the social and economic conditions. The field of development economics is also concerned with examining both macroeconomic and microeconomic factors linked to the structure of developing economies, domestic and international economic growth. While microeconomic factors will largely be discussed, macroeconomic concerns will be mentioned to a smaller extent.

Through the literature review (cf. 2 Background), the author aims at setting the scene to understand the various aspects of the study by reviewing the GGW initiative, the Senegalese context, women empowerment, and children's education. The empirical framework supporting the results of this work is then presented. Next, the author attempted at displaying her results in a clear and structured way. She concluded by presenting the discussion, the limitations to her work, and the conclusion.

2 Background

This chapter presents the background of the Great Green Wall (GGW) and the project itself. It aims at examining all its tenants by reviewing its stakeholders, its challenges, and opportunities. One must also analyse the context of Senegal and understand what is at stake when it comes to women empowerment and school attendance. Therefore, those two topics will be examined with regards to the current situation in the country and how the literature addresses these issues.

2.1 The Motives Behind the Project

The Sahel is a vast semi-arid region marked by flat plains, sand dunes, riparian forests along rivers and outcrops of rocks. The plains are mainly used for grazing, wood extraction and the production of sorghum, beans, and millet. This region is blessed by abundant human capital, rich and ancestral culture and offers an enormous potential for rapid growth (UN, 2018).

For decades, the Sahel has been overshadowed by highly complex and multi-dimensional challenges. This region, already endowed with a complicated biophysical environment, has mutually reinforcing factors that increase its vulnerability and its insecurity, i.e., climate change; endemic poverty; inequalities; political and governance crises; limited access to basic services; high rate of youth unemployment; human rights abuses; migrations; population increase; etc. But desertification – associated with short rainfalls range, vulnerable ecosystems, competition for accessing the resources, bush fire, droughts, water management and climate change – is one of the biggest challenges of the Sahel region (UN, 2018).

A common misconception about desertification is seeing its cause in the advancement of the Sahara – a change in its boundaries. Geographically the Sahara fluctuated slightly but it is still considered as a stable ecosystem and contributes to the Earth's diversity and wealth. Desertification is a form of land degradation which only occurs in some specific regions and mainly triggered by the population concentration and the development of agro-silvo-pastoral[1] activities. It is defined by the United Nations Convention to Combat Desertification as *"land degradation in arid, semiarid and dry subhumid areas resulting from various factors, including climatic variations and human activities"*. Due to those reasons, fighting against desertification is a complex process that demands a good understanding of the environmental and developmental issues in the area. The soil top layers' loss makes it even more vulnerable to water and/or wind erosion, water runoff, sun exposure, and thus soil becomes even less fertile. The climate regime, and thus the rainfalls and wind sensitivity, is complex and unstable. Therefore, models to push back desertification are difficult to build (R. Bellefontaine et al, 2011).

2.2 The Great Green Wall Initiative

No country by itself has the sufficient resources in terms of human capital, financial wealth, or knowledge to deal with these issues. Indeed, many community-based forestry programs supported by donors' aid failed because of financial shortfalls, or technical deficiency – in water

[1] Agro-sylvo-pastoralism is a production activity that combines pastoralism (extensive livestock rearing practised on pastures) and agriculture with a forest/tree environment. This activity closely combines these three modes of land use. Agro-sylvo-pastoralism is a production activity that integrates different types of areas through grazing: cultivated areas and wooded or non-wooded rangelands (moorland, coppice, grassland, forests, etc.). Agro-sylvo-pastoralism can, in some cases, be included in the definition of agroforestry. In these systems, several plant strata are present: trees, shrubs and grass. This diversity of environments buffers climatic hazards (wind, precipitation, etc.) by offering a diversity of fodder resources and protection from wind and precipitation while reducing sunshine. (Dictionaire d'agroécologie, Laport-Riou et al. 2018, « Agro-sylvo-pastoralisme : définition » https://dicoagroecologie.fr/encyclopedie/agro-sylvo-pastoralisme/)

management; plant domestication; trees nurseries; genetic conservation; monitoring the greening activities, etc. Hence, a coordinated and united approach is necessary. The Great Green Wall (GGW) is a program including a vast country-led reforestation effort to stop land degradation. Initially, it was meant to span a 15km width of trees from Dakar to Djibouti (cf. original path figure 1), but it turned into an integrated set up to take into account the countries specificities and to make the project valuable socially and economically (cf. updated path figure 1). It involves many natural formations; long-standing artificial plantations; agro-silvo-pastoral production units; rangeland sectors; protected areas; retention ponds; and infrastructure constructions. Way beyond a natural belt, it is a set of multisectoral initiatives and local interventions based on scientific information to ensure natural resource preservation hand in hand with the objectives of fighting poverty and improving living standards. The GGW aims at providing tools, methods, and frameworks for managing and allocating land to achieve social, economic, and environmental objectives (Mbow, 2017). Environmental and human wellbeing are at the centre of the initiative. Thus, the project evolves to implement diverse efforts to provide long-term solution for environmental and socioeconomic issues. Previous programs for fighting desertification have been studied in both China and Algeria, allowing the project to learn from past mistakes (Veste et al., 2006; R. Bellefontaine et al, 2011).

2.2.1 Stakeholders

Even though afforestation is a major attentiveness since the 70's, the origins of the project date back to the 80's with Thomas Sankara, then president of Burkina Faso's, who was, at the time president of Burkina Faso. He theorised the initiatives for fighting against desertification. It is only in 2005, during the 7th summit of the Leaders and Heads of State of the Community of Sahel-Saharan States (CEN-SAD), that Olusegun Obasanjo, president of Nigeria back then, supported by Abdoulaye Wade, president of Senegal, brought back the work of President Thomas Sankara. In 2007 the GGW was adopted by the 11 founding members at the conference of the Heads of State and Government of the African Union, namely Burkina Faso, Djibouti, Eritrea, Ethiopia, Mali, Mauritania, Niger, Nigeria, Senegal, Sudan and Chad. Then they created the Panafrican Agency of the Great Green Wall (PAGWW) (Goffner et al., 2019).

The GGW is a multibillion-dollar initiative involving many actors (national government, international organisations, business sector, civil society). By design the initiative allows every actor to collectively manage natural resources (Goffner et al., 2019). One of the major actors engaged in this project is the African Union (AU) that initiated the program side by side with the 11 project partner countries (cf. *figure 1*, the original founding countries in light grey and the expended ones in darker grey). Of course, there are field organizations like the Agency of the Great Green Wall in Senegal, the National Agency of the Great Green Wall, Pan-African agencies, etc. Several other actors are also involved: universities; joint programs such as the African Forest Landscape Restoration Initiative (AFR100) and; regional initiatives. International Financial Institutions (IFIs) – like the World Bank or the African Development Bank – and the European Union are also major actors and donors. Nonetheless, the implementation of the process is deeply decentralised, meaning that each country is acting on its own to set its specificities, the population's needs and claims or its priorities. Therefore, agencies coordinating the program are important. In the end it is a complex and fully participatory exercise: local inhabitants; farmers; pastoralists; governmental agencies; small producers; and the local authorities will be responsible to manage and execute the project at the field-level. Those actors intend at mobilising private and public resources and investments. The UN Support Plan, for instance, aims at improving coordination and collaboration between the different partners to realise the 2030 Agenda for Sustainable Development and the African Union Agenda 2063's goals (UN, 2018). A major actor like the Food and Agriculture Organization (FAO) helps in supporting, supervising, and evaluating the GGW (Berrahmouni & Sacande, 2018).

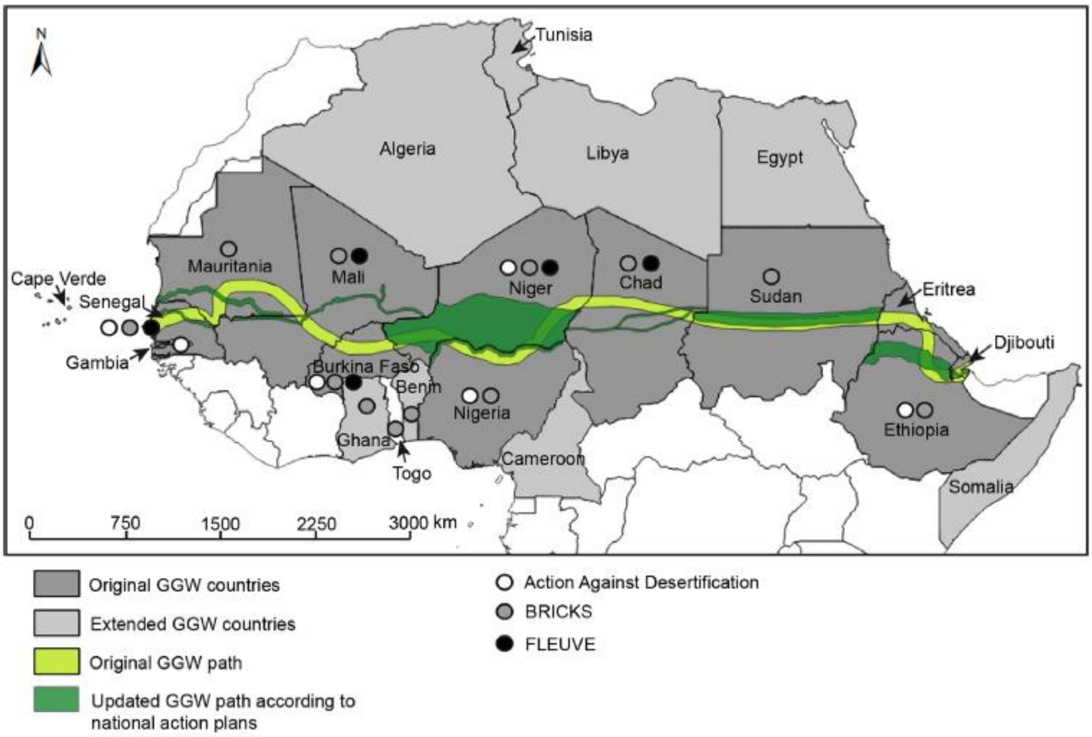

Figure 1: GWW path (Goffner et al., 2019)

2.2.2 Challenges

This program bears many challenges, a major one is to set up successful land- and water-management policies. In the past, central-government policies often led to failure because they did not meet the community expectations. For instance, bringing foreign investment capital had brought serious problems, even in some well-watered or green areas. Privatisation (for bioenergy production or agrobusiness) had often led to failure in most places of the Sahel due to the multifunctionality of the landscape and a poor water-management, pushing local communities off their ancestral lands and leaving them with less resources. Nowadays, policies are more community oriented and incorporate inhabitants' voices into the process. The GGW intends at tailoring different actions given the local communities' needs and region specificities. Nonetheless, the GGW faces some important trade-offs between competing use in terms of water and land; investment needs; and the poverty reduction. But it also offers the possibility of reducing the conflicts which have increased due to the intensified drought and resources' scarcity in the past decades (Mbow, 2017; Diop et al., 2018).

The GGW established different fields of action to achieve its goals. As discussed above, water management is one of the main components of the GGW's strategy, i.e., supplying water during the dry season; building micro irrigation mechanisms; planting wood near water bodies; protecting water quality; harvesting water for the cattle; promoting more sustainable and efficient customs than the Zaï technique or mulching[2].

The overuse of bushfire, the overgrazing practices and the excessive wood extraction are also concerning since it affects the biodiversity and the ecological systems and services. Thus, the goal is to decrease the use of those activities by offering other methods that balance the farming requirements, the wood demand, and the need of maintaining the tree cover. Those methods include raising awareness about important species, natural decay, the use of dead wood or branches and planting exploitable fast-growing trees.

2.2.3 Opportunities

Vegetation is closely linked to rainfall in especially in this environment limited in water supply. Diverse valuable species of trees and plants are developed to engender various benefits for the local population, but they also let some plots regenerate naturally (Ramde-tiendrebeogo et al., 2019). Agroforestry is a locally adapted approach designed to deliver water, basic nutrition needs for food, health, and shelter. Trees help in saving energy; reducing pollution through nitrogen-fixing mechanisms; increasing economic stability, increasing soil fertility; reducing the runoffs; and thus building resilience for those areas (Khoudia et al., 2014; Mbow, 2017; Diop et al., 2018). Agroforestry practices are well-spread instruments that can be great success in mitigating poverty. Plus, in terms of consistency through the years, they fit well in the traditional farming systems: from agro-sylvo-pastoral activities to home gardens it provides soil organic matter; fuel wood; hay for livestock; and food such as fruits.

The challenges and the stakes are often closely related in this kind of project. A project of this size can offer great economic opportunities. For instance, it can bring Foreign Direct Investment (FDI) and may lead economic growth and even poverty reduction in these countries (Dollar & Kraay, 2004; Blalock & Gertler, 2008). Even though there is no consensus on how globalisation affects poverty, some authors pointed out that trade (Dollar and Kraay, 2004) and Foreign Direct investment (FDI) can positively affect poverty reduction (Magombeyi et al., 2017;

[2] The Zai technique is mainly used in Burkina Faso, Mali and Niger, it involves drilling large holes in the soil to capture nutrients to allow the plants to grow even during severe dry periods or wet seasons. Mulching consists in covering the soil between plants with a layer of material to keep the roots warm or cold depending on the season. The use of Zaï and mulching is limited by the availability of farm residues that are mainly used to feed the cattle. Both of these techniques are very exhausting and time-consuming and are therefore the least favoured options for many communities that are so poor that they opt for easier and less expensive alternatives.

Magombeyi & Odhiambo, 2017) while other disproved this statement (Ravallion, 2001). Regardless of these findings, by the time the project grows and generates economic opportunities it is crucial to make sure that the local communities are not crushed by bigger investors. This concern has been highlighted in a study carried out by Meartens et al. (2011) about foreign investment in the tomato sector in Senegal River Delta. Even though in this case their study showed important benefits for poor rural households from FDI, it also pointed out the risk for small farmers of being excluded from the market since they cannot compete on an international level or have lost their bargaining power.

The GGW is internationally known. It hosts thousands of visitors (NGO workers, governments, reaserchers,…) that come to study, promote or record its effects. Some travellers are also hooked by the project and come to observe it, or to participate through NGO's. Tourism injects revenue into the local economy. Besides expanding the demand for local production, it allows cultural and intellectual exchange from all around the world (Alsobrook, 2015).

A reasonable assumption is that the land exploitation may allow the inhabitants to generate more agricultural production – even surplus – and to provide jobs in countries where a huge part of the young population is unemployed (UN, 2018) both by commercialisation and production (Chistiaensen, 2017). Recalling the well-known macroeconomic mechanism of supply and demand, it is rational to think that a rise in the supply – due to surplus production –, or in the demand – due to more or higher earnings – can lead to economic growth. The economic development of these regions may allow the expansion of regional or even international trade, giving the country more importance on the international stage. Hence, one other challenge is to develop commercial activities that might increase the consumption or trade opportunities.

Most people depend on agriculture and/or livestock farming. By restoring the soil fertility, improving water access, the GGW leaves scope for improving food security and sovereignty, and even for the satisfaction of domestic needs – in terms of food but also in terms of wood and non-wood products. Being healthier; decreasing the pressure on lands; and making them more fertile can lead to other dynamics; like a decrease in conflicts created by land scarcity (UN, 2018), a rise in school attendance; concentrated rural activities; the creation of more urbanized zones; or even trigger innovation. Since the local implementation of the project accounts for population preferences and needs, good use of resources, and sustainable growth, they are likely to raise positive consequences.

It is these consequences that this study will address, are there any positive consequences?

2.3 Research Area

Because a research study at the Sahel-level is not feasible for a Master thesis. This study will focus on the case of Senegal. This choice bears two explanations. Both are linked to the data needs. The first explanation is that the author has been able to reach important people that are currently working on the project. It allowed her to have reliable geographic data concerning the

GGW (cf. 3.1 Data). The second explanation is that Senegal was the first country implementing the GGW, hence, it is probably the country with the most data at hand both in terms of data sets and already-conducted studies.

More precisely, this work aims at measuring the effects of the GGW on women empowerment and the school attendance of children. Beyond the ethical considerations, education and women empowerment are important contributing factors in a country's growth. The goal is to determine to what extent the GGW influences those variables. The underlying hypothesis will be explained further in the methodology section. But before that, one needs to be more familiar with the Senegal context and the research topics in order to understand all the underlying takes of this study.

2.4 Context of Senegal

With a surface area of 196,722 km², Senegal is mostly flat, and it is bordered to the North by Mauritania, to the east by Mali, to the South by Guinea and Guinea Bissau, to the West by Gambia – almost landlocked in Senegal –, and by the Atlantic Ocean over a 500 km frontage. The capital, Dakar, is a peninsula located in the extreme west. Administratively, Senegal is organised into 14 regions, with the main cities as their capitals: Dakar, Diourbel, Fatick, Kaffrine, Kédougou, Kaolack, Kolda, Louga, Matam, Saint Louis, Sédhiou, Tambacounda, Thiès and Ziguinchor (Gouvernement Republique du Sénégale, n.d). The GGW path overlaps the Louga, Saint Louis, Matam and Tambacounda regions. It is important for the further analysis to notice that the regions of Sedhiou, Kaffrine and Kédougou have been administratively detached in 2008 from Kolda, Kaolack and Tabacounda respectively. Thus, later on, the work will be based on the 11 ante-2008 regions to allow for comparison between the years.

The climate is described as semi-desert with an annual rainfall of 1200mm in the North and tropical with an annual rainfall of 300mm in the South. The country is irrigated by 4 main rivers on its land and has a direct access to the sea.

According to the WorldBank, Senegal is one of the most politically stable countries in the continent. The political model of Senegal is inspired from the French model and is thus a democratic republic, with different parties and a semi-presidential system with a parliament and a president (Jakubiak, 2016), currently President Macky Sall. The official language is French, but there are also other national languages such as Diola, Malinké, Pular, le Sérère, Soninké, Wolof, etc. (Gouvernement Republique du Sénégale, n.d).

Senegal's economic development can be discussed in two different phases. From its independence in 1960 to the mid-80's its growth was very volatile; with strong growths and recessions. This economic development was mainly driven by the agricultural production and varied largely with rainfalls. Contrariwise, after the mid-80's, the sources of growth were more diversified allowing a steady 6% growth for the past couple of years – excluding the year 2020 and 2021 due the health crisis[3]. This steadiness makes Senegal a good environment for business and investment (OCDE, 2017). Its participation in economic and monetary zones (Economic Community of West African States ECOWAS; Union Economique et Monétaire Ouest Africaine UEMOA) and its geographical position help to access the large regional market. Senegal also benefits from several preferential trade agreements with the European Union, China and the United States (République du Sénégal, Ministère de l'économie du Plan et de la coopération, n.d.). Senegal's future growth will be based on an agricultural revitalisation and increased public investment in infrastructure and education – as already initiated in 2015 – in the framework of the *Plan Sénégal Emergent*[4] (PSE) (OCDE, 2017).

Even though the agricultural sector was one important growth-leading sector it only represents around 15% of the gross domestic product (GDP). The secondary sector – mines of gold, petrol or zircon, and the chemical and food industry – represents 23% of the GDP, boosted by an improvement in the energetic situation. The tertiary sector – services – speaks for 60% of the GDP mainly driven by the telecommunication, tourism, and financial sectors (OCDE, 2017; Gassama & Houeninvo, 2018; ANSD, 2020)

In 2021, the population amounts to about 17,212 million inhabitants with a demographic growth of 3% and, a fertility rate of 36% – on average a bit less than 5 children per woman (ANSD; PopulationData.net). Senegal is characterised by a young population. In 2018, most of the population was under the age of 18 which is represented by a cone-shaped age pyramid. Out of five people, three live in a rural area and one in three people living in these rural areas is under 10 years – the under 15 represents 42% of the rural population – (ANSD, 2020), nonetheless it is worth noting that the urbanisation phenomenon underwent an expansion these last year.

Notwithstanding these growth-encouraging characteristics, Senegal faces several challenges regarding its population: the workforce is characterised by a low level of efficiency (OCDE, 2017), there are major deficiencies in the educational system, it has a high unemployment rate – especially in rural zones and for women and young people – and the informal sector is important, its population is precarious and vulnerable, and the consumption level still low.

Senegal showed in 2019 a Human Development Index (HDI) of 0.514[5] classifying it 166th out of 189 (IDH, 2019) and in 2018 an Inclusive Development Index[6] (IDI) of 3.09, scoring a rank of

[3] COVID-19 pandemic

[4] It is a ten-year strategy for the period 2014-2023 that aims at realising the vision of Senegal as an emergent country by 2035 through tree strategic axes: structural transformation of the economy and growth; human capital, social protection and sustainable development; and governance, institutions, peace and security. (Ministère de l'Économie, des Finance et de la Relance, direction générale du Trésor, n.d.)

[5] with a life expectancy at birth of 67.7 years, an average length of schooling of 9 years and a Gross National Income (GNI) per capita of $3256 (2011 in Purchasing Power Parity (PPP) dollars)

[6] World Economic Forum: The Inclusive Development Index (IDI) is an annual assessment of 103 countries' economic performance that measures how countries perform on eleven dimensions of economic progress in addition to GDP. It has 3 pillars; growth and development; inclusion and intergenerational equity – sustainable stewardship of natural and financial resources.

61st out of 103 (IDI, 2018). According to The Harmonized Survey of Household Living Conditions[7] in 2018/19 (ANSD, 2020), the poverty headcount ration (HCR) is estimated at 32.6%[8] or 37.8%[9] depending on the threshold used for measuring the poverty. The Gini Index[10] was estimated at 40.3 in 2011 (WorldBank).

Although major improvements have been made this last decade, the country still encounters considerable issues. Among others, there are concerns about health, governance, and security. There are still efforts to be provided for education and gender equality. Those last two ones will be the focus of this work.

Senegal is thus one of the first countries to engage the project in 2008. The project is shouldered by the governmental division '*Eaux et Forets*'. With it the landscape and the society have deeply changed over the years. Extended economic activities and gardening labour brought different positive changes among the communities: better access to nutrient-rich foods or the opportunity to engage in entrepreneurial activities. But interviews held in 2013 in the areas also pointed out negative impacts such as a decreased water access around nurseries or a feeling of marginalisation among the inhabitants (Alsobrook, 2015).

Indeed, getting water is one of the main concerns of the inhabitants, especially during the hot season when the boreholes become the only source of water available, and the need for water rises for both livestock and inhabitants. *Eaux et Forets* nurseries add an additional pressure on the water supply. This water competition has compelling effects on the villagers' daily life. The interviews conducted by Alsobrook in 2005 highlighted the resentment from the villagers towards the GGW, accusing it to take their resources with no transparency about their use and the purpose of the GGW. In addition, they blame it for creating disequilibrium in the power relations already established. The GGW also limits the quantity of land available, increasing the pressure on land when it comes to finding a place for the cattle to graze. The parcels of young trees are fenced to avoid any destruction. Even though villagers can collect grass from parcels, the space available is still reduced. The Alsobrook's study pointed out that it is the cornerstone of the dissatisfaction of farmers. Indeed, parcels can be quite large – from hundred to thousand hectares – depending on the money allocated. According to Papa Sarr, the technical director of the

[7] Translated from L'Enquête Harmonisée sur les Conditions de Vie des Ménages (EHCVM). The survey aims at producing indicators for monitoring poverty and household living conditions but also provide data for the evaluation of public policies among the West Africa Economic Monetary Union (WAEMU)
[8] Approach based on the WorldBank lower middle-income International Poverty Line, set at \$3.20/day. The Poverty headcount ratio at \$3.20 a day is the percentage of the population living on less than \$3.20 a day at 2011 international prices.
[9] Approach based on a national poverty line's elaboration to allow the evaluation of the country's public policies.
[10] OECD glossary of statistical terms' definition: "The Gini index measures the extent to which the distribution of income (or, in some cases, consumption expenditure) among individuals or households within an economy deviates from a perfectly equal distribution." A Gini index of zero represents perfect equality and 100, perfect inequality.

National Agency of the GGW[11], the GGW tree cover will span around 817,000 hectares. The water access and the land pressure are likely to be short term issues. Fences' parcels are meant to be withdrawn once trees are mature enough and thus allowing free grazing or moving around parcels. Grown trees need less water to survive and also bring water to the zones. Plus, the water issues are likely to be more mitigated during the rainy season.

A criticism that emerged from the interviews concerns the acquisition of the jobs. People getting jobs in the nurseries, as gardeners or guardians are often relatives of the GGW executives working for *Eaux et Forets*. They are considered as privileged since they have a preferred access to water, an ensured provision of food – both from the harvest but also from the meals provided by *Eaux et Forets* – and a steady job (Alsobrook, 2015).

This work will aim at empirically testing if any positive or negative differences can be observed among the research interests. Before immersing in the empirical analysis, one should review the situation of women and children at the Senegal-level.

2.5 Gender Inequalities and Women Empowerment

Women empowerment and economic development are closely linked. Indeed, empowering women triggers changes in the decision-making process and in the workforce composition which have an impact on social and economic growth. Gender equality affects both the current women generation and the future generations. It increases the present wellbeing and the workforce's participation of women. The future generations will also benefit from more educated mothers and an access to more resources (Donald et al., 2017). Note that development itself works towards empowering women (Duflo, 2012). Several indices have been set up to help conceptualizing women's empowerment like the Gender development Index (GDI), Gender inequality index (GII), in which Senegal is always part of the countries with low development (UNDP, Human Development Reports 2020), and Women's Empowerment in Agriculture Index (WEAI). Another interesting index is the Relative Autonomy Index, which estimates if actions are motivated by individual goals or by social pressure (Donald et al., 2017). It has been recently incorporated in the WEAI.

Senegal progressed largely in gender equality. Its 2019 Social Institution and Gender Index[12] was 37%, meaning that there still exists some customary laws and practices discriminating against women or that legislations and/or legal frameworks are not well implemented (OECD, n.d).

[11] Directeur technique de l'Agence nationale de la Grande Muraille Verte au Sénégal

[12] Index set up by the OECD Development Centre. It is a cross country measure of discrimination against women in social institutions (taking into accounts laws, social norms, and practices). It ranges from 0 for low discrimination to 1 for very high discrimination.

2.5.1 Discrimination Among the Family

According to the Family Code (art. 108) and the Constitution, forced marriages are prohibited and punished by the Criminal Code (art. 173). Nonetheless, cultural practices sometimes win out over laws and regulations, which can be detrimental to women (CEDAW, 2013). Men are allowed to have several spouses while women are not. It should be noted that there exist rules that frame the marital practices such as: the prohibition of marriages for girls under 16 and boys under 18 (Family Code, art. 111), even if child marriages are only civilly penalized, i.e., cancellation of the marriage; legal divorces can be initiated by both parties but, in practice, divorces and marriages are often informal and thus regulated by cultural and religious customs that give more rights to men – especially concerning the custody of the children. In addition, the stigma sticked to divorce is still strong and shameful for women (OECD, 2019). The husband has parental authority on children since he is usually identified as the household's head. Thus, the place of residence and the expenses also depend largely on the husband.

The legal framework for violence against women (VAW) foresees imprisonment penalties in case of physical violence or rape (Criminal Code, art. 297 bis and art. 320). That being said, marital rape is not covered by the current laws and domestic violence is often socially accepted. Women themselves are sometimes unaware of the prohibition of such violence. Currently there is no specific law targeting VAW, domestic violence or sexual harassment. Various forms of violence are accounted for in the Penal Code but there is no such thing as legal gender-based violence protection. Female genital mutilations are criminalized since 1999 and the law, now, is well-known from the inhabitants. Many actions to fight against female genital mutilations (FGM) were led by the government – together with NGO's – in the context of achieving the Millennium Development Goals.

Having an abortion or performing an abortion is considered as a crime (Criminal Code, art. 305) and is punished by imprisonment. Yet, an estimated 51 500 abortions were performed in 2012 in Senegal. They are mostly done in clandestine and unsafe environments which may lead to increased maternal mortality (Guttmacher Institute, 2016). Jail sentences for pregnancy-related crime (abortion, miscarriages, and infanticide) are common among jail sentences for women. Those represent heavy social consequences and disrepute.

To fight against all forms of violence towards women and girls, many shelters or actions are set up for the victims. The Ginddi Center, ran by the government, has a free phone number available to provide help in case of emergencies. Other accommodations can also provide legal advice and counselling.

2.5.2 Women Financial Independence and Work

Legally, women have equal rights to men to open a bank account, they, sometimes, even have facilitated access to credit (Senegal, 2004). By the law, women are granted the same access to land and non-land assets than men. In practice socio-cultural impediments and insufficiently enforced laws do not allow to consider women as major actors of the economic and political framework (Coffee & Bolzendahl, 2010). Customarily, women are not allowed to inherit land, and their husband can decide whether his wife is allowed to acquire land or not. Informal financial arrangements are part of a vicious circle. As the society changes women are more progressively likely to become the head of the household or assume its role. Still, they often do not have access to paid jobs. Self-employment is also a challenging option since the land and credit access are limited (Guerin, 2006). Beyond the daily expenses in food or common services, women and her household are also held by community obligations that can be seen as formal as a tax or a redistribution principle (tontine[13]), or less formal such as donations, sheltering nieces and nephews, ceremonials occasions (marriages, baptisms, funerals). Women usually manage multiple debts by using the 'drawers' financial practice which consists in settling a debt by creating another with someone else. This practice leads to development of communities embedded in large debt networks.

Regarding work rights, Senegal has ratified 42 conventions and 1 protocol from the International Labour Organization (ILO). Among them, the convention 100 and 111 respectively cover equal remuneration and discrimination at work (ILO, n.d.). Women benefit from a paid maternity of 14 weeks and cannot be laid off during that period of time. Nonetheless, as expressed earlier, the access to paid employment is still restricted.

The GGW project uses a workforce for both men and women. In the society women are usually cooks and cleaners, but with the GGW they also have the opportunity to work in the nurseries – seeds' caring and planting –, to cook and clean for the *Eaux et Forets* centers, they can manage or guard the parcels and garden, they can even be drivers or animals' caretakers. One important aspect of the project affecting women activity is the creation of community gardens in each village of the GGW where women are often in charge of the maintenance – managing, watering, planting, weeding, harvesting – and the sale of the products. Furthermore, these gardens guarantee access to water to the people employed, granting the production of food through the years. Several fruits and vegetables, such as mango, eggplant and tomatoes are cultivated, and women are allowed to take some at home in exchange of work. Thus, a share of it is directly consumed by the women and their households, while another share is sold at the market. Beyond these considerations, it also allows women to gain managerial and leading experience with other women outside the household (Alsobrook, 2015).

2.5.3 Civil Liberties of Women

Compared to other African countries, the women participation in the voting process is quite high in Senegal, but only few of them occupy strategic positions in the political institutions. Regarding the access to the legal services, they have equal right as men to sue. But, in practice, the number of women accessing these services is still low. This lack of access to legal framework

[13] "*Tontines are multi-functional institutions that offer the benefit of security or insurance, economic support in the form of a safekeeping facility, loans, collective investments, and community development works, and social interaction*" (Bouman, 1994; Lelart, 1990)

complexifies even more the women entrepreneurship and investment (Coffee & Bolzendahl, 2010; OECD 2019).

2.5.4 Measuring Women Empowerment

Through the academic literature, plentiful definitions of women empowerment have been suggested. Despite different views, many tend to define it by the capacity to control all aspects of their life and the choices that they are being offered (UNDP, 2018). Donald et al. (2017) added to this definition, the ability to act on their goals, the perception the women have on their achievements and the concordance with their values.

The study of Phan (2015) offers to measure women empowerment in Southeast Asian Countries using three factors: *"women's labor force participation, women's education and women's household decision-making"*. Jennings et al. (2014) focus on antenatal care and male involvement in supporting women empowerment in eight African countries (including Senegal) while Asaolu et al. (2017) and Alaofè et al. (2017) are respectively interested in the use modern contraceptives and in maternal and child nutrition. Ewerling et al. (2017) suggest that one can use the attitude towards violence, the social independence, and the decision-making to measure women empowerment. By using DHS data from 38 African countries, they set up the Survey-Based Women's Empowerment (SWPER) Index which allows cross-African countries comparisons.

2.6 Education

In the last decade, financial resources granted to the education sector considerably increased, allowing, for instance, the Gross Enrolment Ratio (GER), in primary schooling, to evolve from 68% in 2000 to 84% in 2014. Education represents 40% of the national operating budget. The government wants to reform the educational system by implementing a Ten-year Education and Training Plan (TDFP) as well as a program for improving the quality, ethics and transparency of the Education and Training sector (PIQET-EF, 2013-2025) (Gouvernement Republique du Sénégale, n.d). Despite the financial efforts operated in the sector, the educational system does not help in raising the level of human capital and the unemployment rates are still high: 6.6% in 2019 and 8.21% for the youth (15-24) (Cabral & Thiaw, 2019; Macrotrends, n.d.).

The average number of years of schooling is 2.8 and, it is even lower for the girls although their access to education has been improved. According to the last Population Census (2013) the illiteracy rate was 54.6%, out of which 62% are women (OCDE, 2017).

Beyond the intrinsic value of the educational et ethical consideration, the current system does not provide a long-term quality learning, thus, the compagnies are limited by an insufficient human capital (OCDE, 2017).

An increase in the level of education raises the odds of having a skilled job. Furthermore, urban households are more likely to have access to skilled jobs than rural households. These results impact the educational policy-making process, namely the supply and demand for skilled jobs and promoting the access to skilled jobs must be considered (Cabral & Thiaw, 2019).

2.6.1 School enrolment

In terms of headcount, from the children who are enrolled in schools, most of them are enrolled in primary schools – 7 to 12 years old children – which is consistent with the age pyramid's composition displaying a large amount of young children. The education intensity is measured by the Gross Enrolment Ratio (GER)[14] and by the Net Enrolment ratio (NER)[15]. Disparities are observed among the sexes and the place of residence – rural/urban –. The GER is high for primary school – 80% –, but the NER is much lower – 58,1% – which indicates a weakness in the educational system. Indeed, the gap between the GER and the NER reveals high numbers of pupils admitted in primary school that would not be the target population for the primary cycle, for instance pupils aged of 13. The same trend is observed for the other cycles.

For each cycle, the proportion of boys enrolled is always higher as is the enrolment in urban areas. For both measurements, the enrolment is the highest in primary school and then falls in upper cycles (cf. Appendix 1). The four regions crossed by the GGW project – Saint-Louis, Matam, Louga, Tambacounda – are not well-ranked compared to other ones. Indeed, except Saint-Louis that shows better performance for middle school – 13-16year – and secondary school – 17-18years –, they are all below the median, meaning that their GER and NER are not displaying good results (cf. Appendix 2). Tambacounda and Matam are the regions with the highest proportion of individuals who never went to school (about 60%), closely followed by Louga. Saint-Louis exhibits better results. The regions that are performing better in education are Dakar and Ziguinchor, and, to a lower extend, Fatick. The most affected children are in the 10-14 age group and the children from rural areas.

2.6.2 Child Labour

It is a misleading view of child labour to assume that children either work or attend school. In Africa 40% of the children that are working also attend school. Whether a child should work or not is an ethical consideration that is not going to be questioned in this work. Nonetheless, ignoring their activities would not make much sense either. Indeed, children sometimes contribute greatly among the household in terms of both financial and human resources. A more engaging debate is to examine to what extent child labour as an effect on the human capital

[14] The gross enrolment rate (GER) is the total enrolment in a specific level of education, regardless of age, expressed as a percentage of the population in the official age group corresponding to this level of education. The GER can exceed 100% because of early or late entry and/or grade repetition. (INEE, n.d.)

[15] The net enrolment ratio is the number of boys and girls of the age of a particular level of education that are enrolled in that level of education, expressed as a percentage of the total population in that age group. (Eurostat, n.d.)

accumulation or school enrolment. Beegle et al. (2009) found short term economic benefits but in the long-term investment in education translated into higher wages. Chant and Jones (2005) found that the decision of leaving school to work is often taken by the child himself because the perceived gains were not sufficient or because their work is part of the household's dynamic and livelihood strategy.

The range used to assess child labour is 6-14 years. Important steps have been taken by international organisations (ILO, UNICEF, etc.) to fight against it. Nevertheless, the proportion of children participating in the economic activity is 6.9% and boys are more involved in child labour – 8.3% of boys and 5.3% of girls. The Tambacounda, Kaffrine, Sédhiou, Kolda and Louga regions display higher percentage – higher than 10% – unlike Thiès, Dakar and Ziguinchor where occupancy rates in child labour are between 4.3% and 2.3%. The highest number of working children are in the 10-14 age group and the child labour practice is more widespread in the rural areas (RGPHAE, 2013).

3 Empirical Framework

In this part the author will speak about the framework used to conduct the data analysis. First, the data sets will be presented. Second, the focus will be set on the adopted methodology adopted. The procedure that is going to be followed in the computations comes in third. Fourth, the results are going to be exhibited and interpreted. For all subsections, the author will first speak about women empowerment and then about children's school attendance.

3.1 Data

For this work reliable and precise geographic data concerning the GGW path was unavailable online. To access the necessary data the author contacted several people involved in the GGW project: Colonel Gora Diop (director of the GGW, Dakar), Mr. Octavio Fleury (scientific director of Oceanium) and Mr. Djibril Diagne (head of the environmental commission of *Coeur Vert* foundation), they all helped in providing the data.

The data sets concerning the households were downloaded from the DHS Program. The used ones are the files about Senegal from the years 2005, 2012[16] and 2019. From those files, the data sets about the women and the households – respectively named by DHS IR and PR files – were kept. The women files contain the information about women aged from 15-49 years old. They will be used for the women empowerment analysis. The household files report information about every member of the household, even the hosted children. It is used for the analysis of children's

[16] Notice that the survey for this year has been conducted for two years, 2012 and 2013. The time taken to conduct the study does not impact the analysis. It will be referred to the 2012 observations.

school attendance. The table below describes the headcounts of each year for both files. Most details about the headcount are displayed when describing the variables.

	2005	2012	2019
IR file	14,272	8,636	8,649
PR file	67,227	41,593	41,050
-18 yo children in PR	35,014	21,667	21,431

3.2 Methodology

3.2.1 The General Approach

The approach is a Difference in Difference (DiD) with a continuous treatment. One observes the exposure to the GGW, both before and after the intervention. The goal is to know if the GGW caused a decrease or a rise in both women empowerment and school attendance. The effect is measured as a function of the distance from the GGW. Different variables are going to be discussed to evaluate to the effects (cf. 3.2.4.1 Variables & 3.2.5.1 Variables).

3.2.2 Hypotheses

The idea is that the closer one is from the GGW the more it affects women empowerment and the school attendance. It is assumed that the further one lives from the GGW, the lesser he is affected. The channels behind those effects are multiple. For women empowerment, a change in occupation or earnings for women can modify the equilibriums among the household and vouch for emancipation. Although, earning more can also cause more violence (A. Donald et al., 2017). For the school attendance, a rise in the household's earnings may allow to send more children to school or allow them to attend more. On the contrary, more women at work might constrain teen girls to stay at home to take over the household-related tasks.

The analysis rests on the DiD principles. Thus, its parallel trend assumption must hold, it is explained below.

Between 2005 and 2012, and between 2005 and 2019 many events might have happened. Therefore, if the researcher focuses only on the outcomes' difference between 2005 and 2012 or between 2012 and 2019, the measurements will be biased by other side effects which will also be measured.

In the orthodox DiD method, two groups are formed: treated and untreated. The particularity here is that the analysis examines to what extent the treated are affected by the introduction of the distance from the GGW – the explicative variable –, which blurs and erases this classical and sharp boundary between treated and untreated. Here a variation in treatment intensity is studied, to some extent all the observations are treated. It leaves the model with lower-treated and higher-treated, i.e., being far from the GGW and being close to the GGW. The idea of the same trend hypothesis is more or less the same as in a classical DiD method. It states that the lower-treated and the higher-treated have the same evolution of potential outcomes when they are both untreated. It means that the lower-treated and the higher-treated would have followed the same trend if they were not treated – in the absence of the GGW. Differences between the two groups are allowed, there are obviously geographical differences across the country. Nonetheless those geographical differences between 2005 and 2019 will approximately be the same, allowing the comparison between the years. This same trend hypothesis allows the author to get rid of the 'side effects' problem. Surely, some control variables will be introduced in order to consider observable characteristics that may introduce a bias. Unfortunately, unobservable characteristics are likely to exist between people living far from the GGW and people living close to the GGW. The DiD method diminishes largely this endogeneity issue with this consistency assumption (Callaway et al., 2021).

It is also assumed that the GGW intervention did not affect past-outcomes, meaning that during the pre-intervention period, nobody changed their behaviour in anticipation of the GGW.

3.2.3 Procedure

First, the geographic data from the GGW in Senegal needs to be matched with the geographic data of the clustered households provided by DHS. The author worked with QGIS version 3.16 Hannover. After applying the same geographic projection[17] to the data, the Nearest Neighbour Join (NNJoin) plugin[18] has been used. It computes a vector of the orthogonal distances between clustered households and the GGW path. The calculated vector is the distance as the crow flies between the household dots and the green path of the GGW specified in the figure below.

[17] WGS 84 / UTM zone 28 N (corresponding to Senegal), coded ESPG:32628

[18] The NNPlugin joins two vector layers (the input and the join layer) based on nearest neighbour relationships. All geometry type combinations are supported. A feature from the input layer is joined to the nearest feature in the join layer. The result of the join is a new vector layer with the same geometry type and coordinate reference system as the input layer. (QGIS plugins)

The distance vector has been merged with the DHS data sets and thus enables the computations with respect to the distance from the GGW.

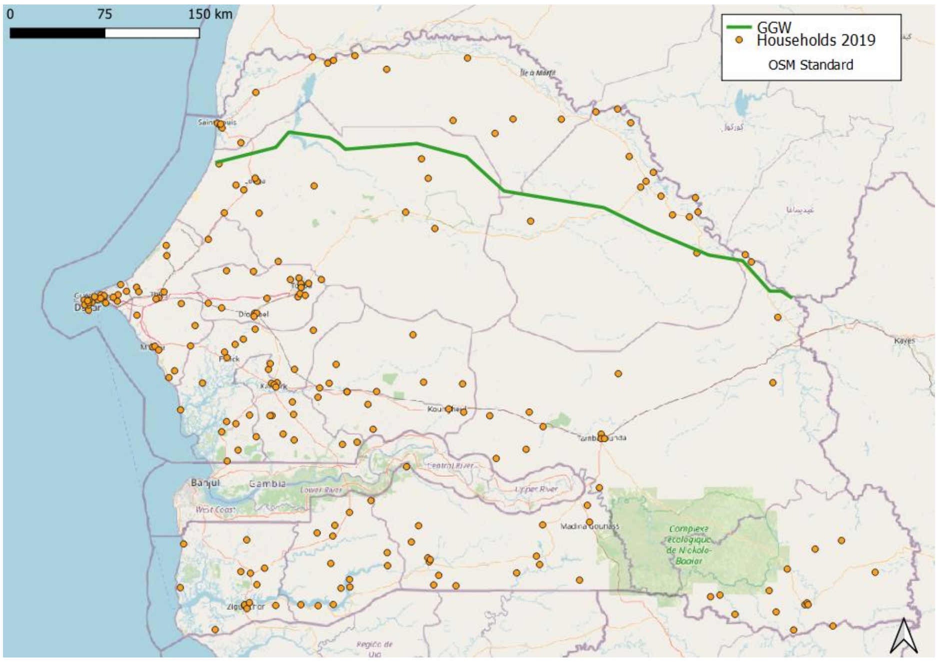

Figure 2 GGW and households' location for 2019

Second, a multiple hypothesis testing analysis is performed. Several regressions are executed with diverse variables of interest. The goal is to explain the relationship between multiple dependent variables and the independent term, i.e., the distance from the GGW. The analysis will first focus on the effect of the GGW on women empowerment, and then on school attendance. For this analysis, the Stata software version 15.1[19] is used.

For testing the different hypothesis, the null-hypothesis (H_0) will always be the statement of "no effect", meaning that the independent variable has no effect on the dependent variable studied (its coefficient equals 0). The alternative hypothesis is two-sided and stands for "different from". The p-values will be examined at the alpha, α, significance level depicted below. When the p-value is below α, the null-hypothesis is rejected, meaning that there exists a significant difference in the sample (H_a).

It is important to notice that the population is unevenly distributed across the regions. Dakar for instance accounts for 23% of the population, while Thiès and Diourbel regions weigh 13% and 11% respectively[20]. The DHS program does not sample with proportional allocation based on the actual regional distribution of the country. For example, they did not take a sample constructed as 23% of the observations are from Dakar, 13% from Thiès, 11% from Diourbel and on and so for. The reason is that for under-populated regions they would have very few respondents, and thus would not have precise data. Thus, they over-sample to get data sets representative enough and under-sample some regions to stay cost-effective. Therefore, to depict

[19] The newest accessibl version for the author

[20] Agence National de la statistique et de la démographie (ANSD), 2020, Situation économique et sociale du Sénégal 2017-2018 (http://www.ansd.sn/ressources/ses/SES_2017-2018.pdf) pg 51

the actual distribution, all the computations and regressions from this work will be executed with weighted data with respect to weights provided by DHS.

Third, regressions are tested for homoscedasticity with Breusch-Pagan tests. Since most regressions have been detected with heteroscedasticity, the author opted for a robust regression method by including the cluster option in the regressions. It indicates that the observations are clustered, and they might be correlated within the cluster. In other words, the standard errors reckon with non-independent observations within clusters. Notice that the DiD method also allows to avoid a large amount of endogeneity issues. For the variables considered as time-invariant or changing at a constant rate over time, like sex, age, cluster, the marital status, the region of residence, fixed effects are introduced in the regressions.

Fourth, the p-values are adjusted. This study works with the conventional 5% significance level. When performing multiple hypothesis tests, the likelihood of making a type I error rises. Said simply, the more experiments are performed, the more one is likely to find significant results – detecting an effect where there is none, i.e., type I error. Indeed, each test can result in a false positive with a chance of 5%, therefore, the more tests are performed, the more the odds of having at least one false positive rise. There are two ways of controlling for multiple hypothesis testing. The first one is to control for Familywise Error Rate (FWER) which evokes the commonly used Bonferroni correction. Shortly, the p-values are multiplied by the number of statistical tests runs. It is equivalent to adapting the significance level by dividing it by the number of regressions that are ran, it thus assures that the number of false discoveries is less than 5%. But it loses much statistical power and is considered as too conservative. The second way of controlling for multiple hypothesis tests is by considering False Discovery Rate (FDR)[21]. It is a way to increase power while maintaining some principle bound on error. To control the FDR, the Benjamini-Hochberg Procedure (BH procedure) gives a hint. It also adjusts the p-value to limit the number of false positives that are reported as significant. The idea is that, after ordering p-value from smallest to largest and ranking them, one must calculate the corrected p-values $p_{FDR} = p_i \times \frac{k}{i}$ (where i is the previously attributed rank of the p-value p, and k is the number of tests), on can eventually restore the original order (Shaffer, 1995).

3.2.4 Women Empowerment

As suggested by Asaolu et al. (2018) and Ewerling et al (2017) the author chose different dimensions to assess women empowerment. The first one is the economic dimension measured by the participation in the labour force. But considering work and labour market in the analysis can be tricky. Because of the informal market, but also for the associated definition to work or social norms. Thus, the variable used will only look if the women were working or not during the last year before the interview.

[21] FRD is the total of the false discovery (reject H0 when H0 is true) over the total of discoveries (all rejected H0)

The second one is the socio-cultural dimension described by the decision-making capacity, the presence of polygamy, the use of contraceptive and the attitude towards violence.

The following section describes the different variables at work for measuring women empowerment.

3.2.4.1 Variables

The table represents all the studied variables for women empowerment. The variable *distggw* has been computed with QGIS as explained above. Out of the nominal variables, binary variables are created. The decision-making capacity variables (12-15) have been constructed as following: *"Who usually makes decisions about making major household purchases: you, your (husband/partner), or you and your (husband/partner) jointly?"*, the possible responses to the question are thus *"respondent"*, *"husband/partner"*, *"respondent and husband/partner jointly"*, *"someone else"* or *"other"* standing for *"decision not made/not applicable"*, coded as 1,2,3,4,6 respectively. The same question is asked to the same respondents about who takes the decisions concerning her money earned, her health care, the visits to the family, the daily needs, or the food to be cooked. The two latest are missing for 2012 and 2019 they will therefore not be studied. The variables concerning the attitude towards violence (16-20) follow the same method. The question *"In your opinion, is a husband justified in hitting or beating his wife in the following situations: if she goes out without telling him, neglects the children, argues with him, refuses to have sex with him and burns the food"* has been asked, for each situations the responses either "yes", "non" or "don't know" (coded as 1, 2 and 8) were thus available. The responses such as *"I don't know"*, *"does not apply to this situation"* or inconsistent ones are excluded from the analysis. It is too hard to get something out of them, and they mostly represent less than 1% of the observations and in the worst cases 2,5%.

	variables	Observations			Mean (std) or modal category[22]			Label	Data	Type
		2005	2012	2019	2005	2012	2019			
1	distggw	14,272	8,636	8,649	147372.8 (94138.24)	158193.3 (93309.86)	160528.4 (96495.59)	distance from the GGW in kilometres	continuous	dependant
2	age[23]	14,272	8,636	8,649	28.34 (9.55)	28.03 (9.25)	28.31 (9.34)	age of the respondent	continuous	control
3	educ_year	14,272	8,636	8,649	6.65 (7.98)	2.96 (3.99)	7.85 (8.44)	education in single years	coutinuous	control
4	resi_region	14,272	8,636	8,649	kaolack	kaolack	kaolack	de facto region of residence	nominal	control
5	rural_urban	14,272	8,636	8,649	rural	rural	rural	de facto type of place of residence	dichotomous	control

[22] Regroups the highest number of observations

[23] Age when the interview were held

6	time2water	7,487	8,636	8,649	30.15 (50.78)	25.37 (39.45)	25.37 (34.07)	time taken to get to the water source for drinking water in minutes	continuous	independent
7	tot_livingchild	14,272	8,636	8,649	2.3 (2.48)	2.32 (2.47)	2.29 (2.4)	number of living children	discrete	control
8	contraceptive	14,272	8,636	8,649	never used	never used	never used	ever use of a modern, traditional, or folkloric method	nominal	independent
9	marital_status	14,272	8,636	8,649	married	married	married	current marital status	nominal	independent
10	polygamy	9,810	5,795	5,932	no other wives	no other wives	no other wifes	number of other wives base: married women	discrete	control & independent
11	worked	14,262	8,026	8,372	no work	no work	working	worked in last 12 months	nominal	control & independent
12	money_decision	4,691	2,407	2,445	respondent	respondent	respondent	who decides how to spend money earn by the respondent base: working women with a salary	nominal	independent
13	healthcare_decision	14,248	5,770	5,839	husband	husband	husband	final say on the respondent's health care	nominal	independent
14	large_decision	14,206	5,698	5,745	someone else	husband	husband	final say on making large household purchases	nominal	independent
15	visits_decision	14,116	5,676	5,769	someone else	husband	husband	final say on visits to family or relatives	nominal	independent
16	goout_beating	13,996	8,616	8,598	yes	yes	no	husband beating considered as justified if the wife goes out without telling him	dichotomous	independent
17	childnegl_beating	14,028	8,617	8,609	yes	no	no	husband beating considered as justified if the wife neglects the children	dichotomous	independent
18	argue_beating	13,978	8,616	8,612	yes	yes	no	husband beating considered as justified if the wife argues with him	dichotomous	independent
19	sexrefusal_beating	13,830	8,551	8,590	no	yes	no	husband beating considered as justified if the wife refuses sex with him	dichotomous	independent
20	food_burned_beating	13,983	8,626	8,612	no	no	no	husband beating considered as justified if the wife burns the food	dichotomous	independent
21	weight	14,272	8,636	8,649				sample weights	discrete	

3.2.4.2 Descriptive Findings from the Data Sets

Before measuring the causal effect of the GGW one will firstly review the tendency observed for the variables of interest. Interesting trends are described in Appendix 3, x is the number of observations concerned by the first column statement, y is the total number of observations. Through the years the number of married women rises a bit, but the number of polygamous households decreases by 8 percentage points.

The use of modern contraceptives dropped from 2005 to 2012 while it rose back to its 2005-level in 2019. For 2005 and 2019, about 18% of the observations had already used modern contraceptives.

Regarding the decision-authority it is mostly the husband or someone else that is taking the decisions. Nonetheless, in more than 80% of the cases women are taking the decisions concerning the spending of their money. A striking finding is that in 2005 another person had an overwhelming power in the decision-making process. For the respondent's health care decisions, the large purchases decisions, and the visits decisions someone else has the final say in respectively 35%, 44.5% and 38% of the cases. While for the next years those percentages are below 5% for the final say on respondent's health care decision and visits to relatives and family, and below 19% for final say on large purchases decisions. For those decisions it seems that the husband takes over these other parties when they get eliminated from the process. In 2005 for the respondent's health care decisions, the large purchases decisions, and the visits decisions the husband had the final say in respectively 47.50%, 42.30% and 35.50% of the cases, but in 2012 it was in respectively 80%, 69% and 69.50% of the cases and in 2019 in respectively 80%, 65% and 80% of the cases. Hence the husband, except for the decisions concerning the money earned by the respondent, has a major role in the household dynamics.

All kinds of domestic violence are progressively seen as unjustified, dropping by 20 percentage points between 2005 and 2019 (the major drops happening between 2012 and 2020). The understanding of being beaten in case of food burned does not follow this trend and decreases only by 2 percentage points. Nonetheless, it was already one of the least "accepted" domestic violence. For the domestic violence concerning going out without telling the husband, the children negligence, the argument with the husband or the sex refusal, in 2005 they all revolved around a half of women finding this kind of beating justified and then in 2019 it dropped to a third of them only. For the food burned violence it has been revolving around 21% of them for the 3 years.

3.2.4.3 Specification

The different independent variables listed from 10 to 20 in subsection *3.2.4.1 variables* are decomposed in dichotomous variables. The variable *money_decision* can take different values: 1 stands for *'respondent'*, 2 for *'respondent and husband'*, 3 for *'respondent and other'*, 4 for *'respondent'* and 5 for *'other'*. In essence this nominal variable is disassembled into 5 dichotomous variables: *resp_moneydecision*, *resp_husb_moneydecision*, *resp_other_moneydecision*, *husb_moneydecision*, and *other_moneydecision* corresponding to the 5 possible responses to the question *"Who usually decides how the money you earn will be used: you, your (husband/partner), or you and your (husband/partner) jointly?"*. The variable takes the value 1 when it is the person/people that is/are designated in the variable name that is the decision-maker – according to the respondent. For instance, if the variable *resp_husb_moneydecision* takes the value 1, then the decisions are taken by the respondent and the husband/partner jointly. The same logic goes for all the decision-making variables, rising the independent variable for decision-making from 4 to 16. All those variables use the same kind of terminology: resp_y when the respondent is designated as the person having the final say on the matter, resp_husb_y when the respondent and the husband jointly take the decision, resp_other_y when it is the respondent and someone else that take it, husb_y when it is the husband, and other_y when it is someone else.

Four variables related to the attitude towards violence are selected: *goout_beating*, *childnegl_beating*, *sexrefusal_beating* and, *food_burned_beating*. Each of them standing for whether the beating by the husband is considered as justified by the respondent if she goes out without asking him, neglects the children, argues with, refuses to have sex with him or burns the food. The analysis will focus on the affirmative responses, namely when the variable equals 1.

The variables *contraceptive* et *polygamy* are also recoded in dummy variables to ease the analysis. The first one is whether the respondent was using a modern contraception by the time of the interview (1) or not (0). The second one is whether polygamy is present in the household (1) or not (0), regardless of the number of other wives or live-in partners. Since most of the polygamous households represent one added wife this choice does not have a big impact on the results.

The last two variables are *worked* and *time2water*. *Worked* engages the question of the working condition of the respondent, whether she worked during the last 12 months (1) or not (0). The second one aimed at measuring an effect on the GWW on the water access.

All those variables are studied in the light of different factors that might affect the results. Especially, the analysis investigates different angles. Along with the study of the dependent variable, one should study if there are differences for the married and unmarried women, for the rural and urban zones, and for the +18yo women and -18yo women.

The analysis can easily be discussed in two different levels.

The first one is a two-way interaction model. It tests for a general effect for all observations and can be described as follows:

$$y \ = \beta_0 + \ \beta_1 \, x + \beta_2 \, z_1 + \beta_3 \, xz_1 + controls + u \qquad (A)$$

Where, y is the dependent variable studied, x is the distance from the GGW, z_1 is the *before_after* variable, separating the observations from the interview held in 2005, and the ones from 2012 or 2019.

The second model, a three-way interaction model, includes an additional specificity. It tests for the effect of the distance from the GGW for one specific group of observation, whether the observations are +18yo, from a rural area or married.

$$y = \beta_0 + \beta_1 x + \beta_2 z_1 + \beta_3 xz_1 + \beta_4 z_2 + b_5 xz_2 + \beta_6 z_1 z_2 + \beta_7 xz_1 z_2 + u \qquad (B)$$

Where, z_2 stands for the *rural*, *married* or *aduage*[24] variables.

A natural logarithm model has been considered for the analysis, but the ln-model provided less significant results and with bigger standard errors. To allow a more interesting analysis and discussion the author opted for a linear model.

In total 25 dependent variables are tested and a total of 116 regressions are studied for each year difference (2005 – 2012; 2005 – 2019). Since presenting the results of all these regressions would be highly redundant and ineffective, the results' analysis will focus on the interesting ones, assuming that no effect is detected for the other ones.

3.2.5 School Attendance

Measuring education outputs can be achieved in several ways. For instance, one can think of testing any improvements in the grade or in the literacy abilities, the enrolment rate. This research will measure it with the attendance. It goes further than enrolment and attests the actual participation to the class. The number of years of education will also be considered.

This work suggested several variables to account for intra- and inter- household dynamics. The goal is to consider issues like discrimination between sexes or 'natural' and fostered children among the household, or even parental delegation.

Isiugo-Abanihe (1985) described the social and demographic phenomenon of child fosterage in West Africa. The anthropological literature displayed the widely used practice of child transfer or exchange among West-African families. This practice has been observed in other regions of the globe, but its prevalence and the early age of fostered children make it a local uniqueness. The motivations of this phenomenon are plural, among them one can cite: kinship obligations[25]; freeing time for young mothers to work or to study; divorce or death of a parent (or both); an economic, social, or political alliance in which the child receives adequate care and training by an influential religious or political leader; the need of additional headcount to the domestic labour force; the supply of a proper education. The variable *foster* is meant to consider this phenomenon. R. Serra (2009) and A.Case et al (2004) suggested the discrimination in foster children may arise when it comes to education or labour motives.

Sex discrimination is also at stake in the matter of measuring school enrolment or any educational ability. Girls' education is often described as a development tool and a key factor in

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[24] Variable designates if the observation are +18yo

[25] For instance, boys are sent to the home of their mothers' brothers to be raised, while girls can be sent to fathers' siters.

reducing poverty. Nonetheless many countries fail in achieving gender parity in the educational system, but it remains most important in developing countries. Even if progress has been observed during the past decades, the problem of gender discrimination remains concerning and large differences persist (Tuwor & Sossou, 2008; Wiseman, 2008). Thus, this work investigates any differences between male and female children in school attendance.

Many control variables have been considered according to the number of people within a household, their age, sex, and level of education. Since many dynamics among a household can be at play the author tried to take many of them into account.

The variable *school_attendance* aimed at giving a general idea of the children's state of education. It basically states whether the child attended school during the last year or not. Nonetheless the variable *attendance_status* will be more interesting for the analysis. It is more complete, and it records the last two years of education against one for the *school_attendance*. Indeed *attendance_status* entails different cases of school attendance:

- Never attended – the child has no education
- Entered school – the child currently attends school but did not the previous year
- Advanced – the child's current level of education is higher than the previous year
- Repeating – the child's current level of education is the same than the previous year
- Dropout – the child does not currently attend school but did the previous year
- Leftschool 2+years ago - the child does not currently attend school and did not the previous year

Hence this last variable is handled with dummies, one for each category supported by *attendance_status*, the following dichotomous variable resulted: *chnever_attsch*, *chenteredsch*, *chadvanced_sch*, *chrepeat_sch*, *chrepeat_sch*, *chdrop_sch*, and *chleft2ya_sch*.

The last variable the analysis is interested in is the number of education year, *year_educ*.

The variable *time2water* has been considered only for the information at a household level. A quick analysis from the DHS data shows that for 2012 and 2019[26] children are the fetching person in less than 5% of the cases. Consequently, *time2water* has been excluded from the statistical analysis.

[26] Data not available in the 2005 survey

3.2.5.1 Variables

	variables	nb of observations			Mean (std) or modal category			Label	Data	Type
		2005	2012	2019	2005	2012	2019			
1	distggw	67,227	41,593	41,050	150.47 (95.84)	161.75 (94.98)	165.56 (97.86)	distance from the GGW (km)	continuous	dependant
2	age[27]	67,198	41,583	41,047	22.29 (19.37)	22.09 (19.54)	22.94 (20.03)	age of the household member	continuous	control
3	child_age	35,014	21,667	21,431	7.83 (5.15)	7.52 (5.07)	7.91 (4.99)	age variable for children only	continuous	-
4	teenage	11,703	6,519	7,123	-	-	-	whether the child is considered as a teen or not	dichotomous	independent
5	mean_adhhdeduc	32,192	19,923	19,616	2.17 (2.79)	2.63 (2.99)	3.16 (3.28)	mean education of the adults of the household in single years	continuous	control
6	childeduc_year	25,574	15,615	16,168	1.47 (2.22)	1.87 (2.62)	1.88 (2.58)	child's education in single year	continuous	independent
7	resi_region	67,227	41,593	41,050	saint-louis	kaolack	kaolack	region of residence	nominal	control
8	rural_urban	67,227	41,593	41,050	rural	rural	rural	type of place of residence	dichotomous	control
9	time2water	35,705	19,133	15,379	30.59 (51.33)	26.88 (45.00)	26.66 (35.38)	time taken to get to the water source for drinking water (min)[28]	continuous	independent
10	nb_hhdmembers	67,227	41,593	41,050	13.38 (8.40)	14.44 (8.44)	13.21 (8.42)	nb of members in a hhd	discrete	control
11	nb_adhhd	30,168	18,702	18,331	12.81 (8.17)	13.90 (8.42)	12.71 (8.42)	nb of adults[29] in the hhd	discrete	control
12	rel2head	67,187	41,593	41,050	son/daughter	son/daughter	son/daughter	relationship to head	nominal	independent
13	foster	9,175	6,317	5,326	-	-	-	whether the chid is foster or not	dichotomous	
14	female	35,433 (17,421)	21,979 (10,826)	22,111 (10,538)	-	-	-	sex = female	dichotomous	independent

[27] Age when the interviews were held

[28] base: all respondents except those with drinking water either piped to, or available from a well in, the residence, yard or plot or piped to a neighbour

[29] Age between 18- and 69-year-old (included)

15	male	31,789 (17,589)	19,614 (10,841)	18,939 (10,893)	-	-	-	sex = male	dichotomous	independent
16	father_alive	28,117 (94.36%)	20,483 (94.58%)	20,446 (95.44%)	-	-	-	father of the child alive	dichotomous	control
17	mother_alive	29,176 (97.56%)	21,173 (97.72%)	21,001 (97.99%)	-	-	-	mother of the child alive	dichotomous	control
18	parents_alive	27,568	20,102	20,085	-	-	-	both parents are alive	dichotomous	control
19	parents_dead	5,289	113	69	-	-	-	both parents are dead	dichotomous	control
20	school_attendance	34,905	21,667	21,431	not attended	not attended	not attended	child attended school during current school year	nominal	independent
21	attendance_status	23,369	14,207	14,904	never attended	never attended	advanced	school attendance status: never attended, entered school, advanced, repeating, dropout, left 2+ years ago	nominal	independent
22	weight	67,227	41,593	41,050				sample weights	discrete	

3.2.5.2 Descriptive Findings from the Data Sets

The number of pupils that never attended school decreases with time (from about 70% in 2005 to 60% in 2019), thus more of them attend. The ratio of children that advanced class also rises every year, from 38% in 2005 to 40% in 2019 and finally 46% in 2019. Children that are repeating a year in school are low, from about 4% in 2005 to 1% in 2019, the rest of them never entered school, are entering school the year of the study, or left more than two years ago. School dropouts do not affect many children, for each year children that are dropping school are less than 1%.

The average number of years of education rises a little through the years but remains very low (from 1.08 year of education on average in 2005 to 1.42 year in 2019). Teens seem to perform better at school since more of them are advancing in class compared to non-teens. With a high number of pupils that never entered school, one of the first issues the educational system must address is to get children at school in the first place.

3.2.5.3 Specification

The analysis can easily be discussed in three different systematic models, each of them including an additional specificity.

The first one, a two-way interaction model, tests for a general effect for all the observations and can be described as follows:

$$y = \beta_0 + \beta_1 x + \beta_2 z_1 + \beta_3 xz_1 + controls + u \qquad (C)$$

Where, y is the dependent variable studied, x is the natural logarithm of the distance from the GGW (*lndistggw*), z_1 is the *before_after* variable, separating the children born before 2008 (0) and after 2008 (1).

The second model (three-way interaction) tests for the effect of the distance from the GGW for one specific group of observation, whether the children are fostered, from a rural area, female, or male, or of teen age (11 to 17 years).

$$y = \beta_0 + \beta_1 x + \beta_2 z_1 + \beta_3 xz_1 + \beta_4 z_2 + \beta_5 xz_2 + \beta_6 z_1 z_2 + \beta_7 xz_1 z_2 + controls + u \qquad (D)$$

Where, z_2 stands for the *female, male, teenage, rural,* or *foster* variables.

The third model is a four-way interaction model. It focuses on a very specific group, such as the foster girls or boys or the teenage girls or boys to examine for above-mentioned considerations.

$$\begin{aligned} y = \beta_0 + \beta_1 x + \beta_2 z_1 + \beta_3 xz_1 + \beta_4 z_2 + \beta_5 xz_2 + \beta_6 z_1 z_2 + \beta_7 xz_1 z_2 + \beta_8 z_3 \\ + \beta_9 xz_3 + \beta_{10} z_1 z_3 + \beta_{11} x z_1 z_3 + \beta_{12} z_2 z_3 + \beta_{13} x z_2 z_3 + \beta_{13} xz_2 z_3 + \beta_{14} z_1 z_2 z_3 \\ + \beta_{15} xz_1 z_2 z_3 + controls + u \end{aligned} \qquad (E)$$

This model added the variable z_3, which can take the value *male*, *female* or *teenage* when z_2 represents the variable *foster* or *rural*.

male and *female* are the same variable, *male* is obviously only the opposite of *female*. The difference has been made to ease the reading in the statistical analysis in STATA, because when testing for female and male children the regressions did not disclose the same control variables. For instance, when testing for female foster children *mother_alive* for control variable has been preferred.

A natural logarithm model is used for this analysis because it allowed more significant results than the linear model.

In total 8 dependent variables are tested and a total of 77 regressions are performed. Again, only the interesting results are going to be studied.

4 Basic Results and Analysis

The tables presented below depict the most significant results. After considering many options in terms of specification, interaction, and control variables, the most adequate models (detailed in the above section) have been kept to perform the study. In the light of these results many control variables appeared to be ineffective. Thus, they have been dropped from the final regressions executed for the analysis and, by extension, from the summary tables below.

As explained in the methodology section (cf. 3.2.3 Procedure), the p-values have been subject to the BH correction (cf. Appendix 26, 46, 53). To confront the results before and after the correction, they have both been exhibited in the below tables. The bolded ones are the results after applying the correction. The description and the analysis will focus on the values after correction. However, the correction did not allow to reject any hypothesis for the school attendance at the 5% level of significance, thus the author decided to apply a less stringent threshold, 10%, to have at least one result to analyse. Despite this adjustment, none of the four-way interaction appear to be significant. For the sake of the exercise, and not the reliability of the results, the author will also have a look at the regression 22 of the children's school attendance (Appendix 48). It is significant at 20% which leaves too much room for type I error and will not be considered further.

More precise estimates can be found in the Appendixes about the regressions. For the purpose of clear reading, the foregoing calculations are rounded to 4 digits of precision.

Acknowledge that the term husband will be used regardless of the marital status of the respondent, it stands for companion, partner, or husband indifferently. Whether the women of interest are married or not will always be mentioned.

The tables follow the standard conventions, i.e., standard errors are reported in parentheses and *, **, *** indicates significance at the 90%, 95%, and 99% level, respectively. The total effects are computed from the unrounded numbers displayed in the Appendixes. The theoretical coefficients used for these computations will be described in parentheses.

4.1 Results

4.1.1 Women Empowerment

4.1.1.1 Evolution Between 2005 and 2012

a) Money decisions: final say on the money earned by the respondent

In the regressions below, the researcher is interested in the respondent's characteristics and her place of residence, for this variable only the distinction between rural and urban areas happens to be interesting for the analysis.

The regression (1) tests for the dependent variable *resp_moneydecision*, i.e., when it is the respondent that takes the decision for her wage allocation. The regression (2) tests for the variable *resp_husb_moneydec*, i.e., when the respondent and the husband take decision about money earned by the respondent jointly. (3) tests for *resp_other_moneydec*, when the decision is made by the respondent and someone else and (4) tests for only the husband (cf. Appendix 4-7).

(1) The total effect of the distance from the GGW on the probability that the respondent takes money decisions for women living in rural areas interviewed in 2012 is 0.0019777 (b_1+b_7). The effect of the rural women interviewed in 2005 compared to the ones interviewed in 2012 is 0.001824 (b_7). Notice that the total effect for the urban-located women is slightly negative (-0.0007308) (b_1+b_3).

This result can be interpreted as: for women living in a rural area, a rise of one kilometre in the GGW distance increases the probability that the respondent takes money decisions herself by 0.0019777 (b_1+b_7) percentage point.

The coefficients for regressions (2) and (3) are not significant anymore after the BH-correction.

(4) The effect of the GGW distance for a woman interviewed in 2012 living in rural areas on the probability that it is the husband who takes the decision for the money she earned is negative. Indeed, one unit increase in the distance from the GGW is associated with a 0.0011938 (b_1+b_7) percentage point decrease in the probability that the husband takes the decision for the respondent's earned money. The same effect for the ones living in the urban area would be a rise of 0.0758036 (b_1+b_3) percentage point. Thus, depending on where the women are situated, the proximity of the GGW has a positive impact on the involvement of the husband in the decision process, i.e., in rural areas, or a negative impact, i.e., in urban areas.

Table 1 : effects of the distance from the GGW on the probability the someone in particular takes the decisions concerning the money earned by the respondent

y: resp_moneydecision; resp_husb_moneydec; resp_other_moneydec; husb_moneydec						
model		variables	(1)	(2)	(3)	(4)
b_0		constant	**0.9082 (0.0475)*** **	0.0184 (0.0351)	0.0199 (0.0087)**	**0.0302 (0.0347)**
b_1	x	distggw	**0.0001 (0.0003)**	0.0000 (0.0002)	-0.0001 (0.0001)	**-0.0001 (0.0002)**

b_2	z_1	before_after	**-0.0097 (0.0791)**	0.0474 (0.042)	-0.0298 (0.0160)	**-0.0271 (0.0516)**
b_3	$x.z_1$	distggw.before_after	**-0.0009 (0.0004)****	0.0001 (0.0002)	0.0002 (0.0001)**	**0.0006 (0.0003)****
b_4	z_2	rural	**0.0581 (0.0595)**	0.0011 (0.0413)	-0.0208 (0.0118)*	**-0.0346 (0.0400)**
		married	-	-	-	
		aduage	-	-	-	
b_5	$x.z_2$	distggw.z2	**-0.0014 (0.0004)*****	0.0005 (0.0002)**	0.0001 (0.0001)*	**0.0006 (0.0002)*****
b_6	$z_1.z_2$	before_after.z2	**-0.1000 (0.0941)**	0.0025 (0.0488)	0.0335 (0.0202)	**0.1040 (0.0657)**
b_7	$x.z_1.z_2$	distggw.before_after.z2	**0.0018 (0.0005)*****	-0.0005 (0.0003)**	-0.0002 (0.0001)**	**-0.0011 (0.0004)*****
controls		tot_livingchild	**0.0042 (0.0027)**	0.0002 (0.0026)	-0.0007 (0.0004)	**-0.0016 (0.0015)**
		educ_year	**0.0016 (0.0020)**	0.0018 (0.0016)	-0.0007 (0.0007)	**-0.0029 (0.0013)**
		polygamy_presence	**0.0033 (0.0120)**	-.0096 (0.0086)	0.0068 (0.0040)	**0.0027 (0.0080)**
		worked	-	-	-	
		R-squared	**0.1452**	0.1471	0.1772	**0.1471**
		adjusted R-squared	**0.0775**	0.0794	0.1119	**0.0794**
		No. observations	**5,772**	5,772	5,772	**5,772**
		Appendix	**4**	5	6	**7**

b) Health care decisions: final say on the respondent's health care

Regressions (1) and (2) test for *resp_healthdec*. The first one follows the two way-interaction model (A), and the second one the three-way interactions model (B). (3) and (4) test for *other_healthdec,* with first the simplest model and second the more complete one (cf. Appendix 8-11).

(2) The total effect of the distance from the GGW on the probability that it is the respondent who takes the decisions concerning her own health care is -0.0005603 (b_1+b_7) for women of adult age interviewed in 2012, meaning that a rise of one kilometre affects the probability by -0.0005603 percentage point. If the coefficient of b_3 would have been significant, the effect for non-adult women would be –0.0000282 (b_1+b_3).

(3) The total effect of *distggw* on the probability that someone else takes the decision concerning the heath care of the respondent is 0.0001731 (b_1+b_3) for women interviewed in 2012. Indeed, one unit increase in the distance from the GGW is associated with a 0.0001731 (b_1+b_3) percentage point decrease in the probability that someone else takes the decision concerning the heath care of the respondent. A specificity has been brought by regression (4) to see if any difference is observed between rural and urban areas. An effect has been detected for rural-located women, while the coefficient for the urban ones is not significant. In 2012, if the distance from the GGW rises by one kilometre, the probability that someone else takes the decisions on behalf of the respondent concerning heath care rises by 0.0004481 (b_1+b_7) percentage point.

Table 2: effects of the distance from the GGW on the probability the someone in particular takes the decisions concerning the respondent healthcare

y: resp_healthdec; resp_healthdec; other_healthdec; other_healthdec						
model		variable	(1)	(2)	(3)	(4)
b_0		constant	0.0536 (0.0208)**	**0.0214 (0.0273)**	**0.2177 (0.0197)***	**0.2022 (0.0218)***
b_1	x	distggw	0.0003 (0.0001)**	**-0.0001 (0.0002)**	**-0.0003 (0.0001)***	**-0.0001 (0.0001)**
b_2	z_1	before_after	-0.0057 (0.0236)	**0.0001 (0.0290)**	**-0.1609 (0.0283)***	**-0.1095 (0.0304)***
b_3	$x.z_1$	distggw.before_after	-0.0004 (0.0001)**	**-0.0100 (0.0002)**	**0.0005 (0.0001)***	**0.0001 (0.0002)**
b_4	z_2	rural	-		-	**0.0214 (0.0270)**
		married	-		-	
		aduage	-	**-0.0100 (0.0227)**	-	
b_5	$x.z_2$	distggw.z2	-	**0.0004 (0.0001)***	-	**-0.0003 (0.0001)***
b_6	$z_1.z_2$	before_after.z2	-	**0.0058 (0.0249)**	-	**-0.0752 (0.0434)***
b_7	$x.z_1.z_2$	distggw.before_after.z2	-	**-0.0004 (0.0001)***	-	**0.0006 (0.0002)***
controls		tot_livingchild	-0.0046 (0.0021)**	**0.0064 (0.0015)***	**-0.0105 (0.0017)***	**-0.0105 (0.0017)***
		educ_year	0.0063 (0.0015)***	**0.0067 (0.0015)***	**-0.0022 (0.0009)**	**-0.0022 (0.0009)**
		polygamy_presence	0.0201 (0.0086)**	**0.0362 (0.0084)***	**-0.0096 (0.0070)**	**-0.0096 (0.0070)**
		worked	0.0593 (0.0086)***	**0.0701 (0.0086)***	**-0.0164 (0.0068)**	**-0.0166 (0.0068)**
		R-squared	0.1576	**0.1428**	**0.1651**	**0.1656**
		adjusted R-squared	0.1329	**0.1196**	**0.1407**	**0.1411**
		No. observations	15,115	**15,115**	**15,115**	**15,115**
		Appendix	8	**9**	**10**	**11**

c) Large purchases decisions: final say on major household purchases

The regression (1) displays results for the variable *resp_husb_largedec* with a focus on the +18yo women, thus with a three-way interaction model (B). The (2) for the variable *husb_largedec* according to the two-way interaction model (A). The (3) has *other_largedec* as dependent variable and follows the model of regression A (cf. Appendix 12-14).

The jointly process of decision is left apart since after the BH correction it is not significant anymore at a level of 5%.

Nonetheless the tests on the dependent variables concerning the husband or another person taking the decision about major household purchases are still of interest. (2) The total effect of the distance from the GGW on the probability that it is the husband who takes the decisions concerning large purchases decisions is -0.000237 (b_1+b_3) for women interviewed after 2012, meaning that a rise of one kilometre affects the probability by -0.000237 percentage point. (3) For another person taking the decision the effect on the probability is 0.000323 (b_1+b_3).

Table 3: effects of the distance from the GGW on the probability the someone in particular takes the decisions concerning the major household purchases

y: resp_husb_largedec; husb_largedec; other_largedec					
model			(1)	**(2)**	**(3)**
b_0		constant	-0.0052 (0.0280)	**0.4956 (0.0279)***	**0.4333 (0.0234)***
b_1	x	distggw	0.0002 (0.0002)	**0.0005 (0.0002)***	**-0.0008 (0.0001)***
b_2	z_1	before_after	0.1242 (0.0448)***	**0.1830 (0.0419)***	**-0.2915 (0.0356)***
b_3	$x.z_1$	distggw.before_after	-0.0009 (0.0003)***	**-0.0007 (0.0003)***	**0.0011 (0.0002)***
b_4	z_2	rural	-	-	-
		married	-	-	-
		aduage	0.0044 (0.0178)	-	-
b_5	$x.z_2$	distggw.z2	-0.0001 (0.0001)	-	-
b_6	$z_1.z_2$	before_after.z2	-0.0036 (0.0314)	-	-
b_7	$x.\ z_1.z_2$	distggw.before_after.z2	0.0005 (0.0002)**	-	-
controls		tot_livingchild	0.0072 (0.0014)***	**0.0228 (0.0029)***	**-0.0214 (0.0021)***
		educ_year	0.0055 (0.0014)***	**-0.0096 (0.0019)***	**0.00028 (0.0013)**
		polygamy_presence	-0.0257 (0.0063)***	**0.0446 (0.0106)***	**-0.0325 (0.0080)***
		worked	0.0787 (0.0075)***	**-0.0826 (0.0123)***	**-0.0183 (0.0078)**
		R-squared	0.1338	**0.1456**	**0.1942**
		adjusted R-squared	0.1104	**0.1206**	**0.1706**
		No. observations	15,115	**15,115**	**15,115**
		Appendix	12	**13**	**14**

d) Visits' decisions: final say on visits to the respondent's family or relatives

The regression (1) concerns the variable *resp_husb_visitsdec*, the first one is a two-way interaction regression, and the second one, a three-way. The regression (2) has the dependent variable *husb_visitsdec* with an added interaction term and the (3) has the dependent variable *other_visitsdec* (cf. Appendix 15-17).

(2) A general effect of the GGW distance on the probability that the decisions concerning the visits are taken by the husband and the respondent jointly is observed. Indeed, when the distance from the GGW rises by one kilometre, the probability that this decision is taken jointly drops by 0.0004781 (b_1+b_3) percentage point for the women interrogated in 2012. Meaning that the proximity of the GGW has eventually a positive impact on this probability.

For the effect on the probability that the decisions concerning the visits are taken by the husband, one must look at the rural observations and the urban observations separately. For the observations located in a rural area and interrogated in 2012, when the distance from the GGW rises by one kilometre, the probability that the decisions concerning the visits are taken by the husband falls by 0.0021326 (b_1+b_7) percentage point, for the urban observations this effect is positive and amounts to an increase of 0.0005573 (b_1+b_3) percentage point. The closer rural observations are from the GGW, the more likely the husband will take the decisions concerning the visits to the family and relatives. For the urban observations it is the opposite detected.

(3) The last regression observes a general effect on the dependent variable, when the distance from the GGW rises by one kilometre the probability that these decisions are taken by someone else drops by 0.00028126 (b_1+b_3) percentage point.

Table 4: effects of the distance from the GGW on the probability the someone in particular takes the decisions concerning the visits to family or relatives

y: resp_husb_visitsdec; husb_visitsdec; other_visitsdec					
model			**(1)**	**(2)**	**(3)**
b_0		constant	0.0490 (0.0308)	0.5410 (0.0483)***	0.3310 (0.0207)***
b_1	x	distggw	0.0004 (0.0002)**	-0.0004 (0.0003)	-0.0007 (0.0001)***
b_2	z_1	before_after	0.1503 (0.0419)***	0.0221 (0.0656)**	-0.2730 (0.0309)***
b_3	$x.z_1$	distggw.before_after	-0.0009 (0.0002)***	0.0009 (0.0004)**	0.0010 (0.0002)***
b_4	z_2	rural	-	-0.1382 (0.0559)**	-
		married	-	-	-
		aduage	-	-	-
b_5	$x.z_2$	distggw.z2	-	0.0010 (0.0003)***	-
b_6	$z_1.z_2$	before_after.z2	-	0.2885 (0.0773)***	-
b_7	$x.z_1.z_2$	distggw.before_after.z2	-	-0.0017 (0.0004)***	-
controls		tot_livingchild	-0.0006 (0.0020)	0.0210 (0.0026)***	-0.0145 (0.0017)***
		educ_year	0.0064 (0.0013)***	-0.0114 (0.0018)***	-0.0003 (0.0012)
		polygamy_presence	-0.0192 (0.0079)**	0.0217 (0.0111)**	-0.0187 (0.0066)***
		worked	0.0748 (0.0089)***	-0.0957 (0.0116)***	-0.0081 (0.0069)
		R-squared	0.1414	0.1723	0.1994
		adjusted R-squared	0.1164	0.1479	0.1760
		No. observations	15,108	15,108	15,108
		Appendix	15	16	17

e) Attitude towards violence

The regressions (1), (2), (3), (4), (5) tackle the understanding of being beaten as a wife by her husband when she goes out without telling him; neglects the children; argues with him; refuses sex; and burns food respectively. They focus on no specific group, none of them appeared to be significant in the previous test, the analysis will thus focus on a basic two-way model (A) for those dependent variables (cf. Appendix 18-22).

When the distance from the GGW grows by one kilometre the probability of being beaten by her husband because she went out without telling him; neglected the children; argued with him; refused sex or burned the food is seen as justified all rises respectively by 0.0004806; 0.0004159; 0.0002488; 0.0004121; and 0.0003657 (b_1+b_3) percentage point for the women participating in the DHS survey in 2012. The proximity of the GGW seems to play a positive role in the probability of finding domestic violence unjustified for the women participating in the 2012 survey.

Table 5: effect of the distance from the GGW on the probability that a certain situation of domestic violence is seen as justified

y: yes_gooutbeating; yes_childneglbeating; yes_arguebeating; yes_sexrefusalbeating; yes_foodbbeating							
model			(1)	(2)	(3)	(4)	(5)
b_0		constant	0.5872 (0.0356)***	0.5990 (0.0409)***	0.6431 (0.0412)***	0.6686 (0.0340)***	0.3063 (0.0384)***
b_1	x	distggw	-0.0004 (0.0002)*	-0.0006 (0.0003)**	-0.0008 (0.0003)***	-0.0012 (0.0002)***	-0.0005 (0.0002)**
b_2	z_1	before_after	-0.1757 (0.0468)***	-0.1964 (0.0552)***	-0.1683 (0.0536)***	-0.1962 (0.0454)***	-0.1592 (0.0554)***
b_3	$x.z_1$	distggw.before_after	0.0009 (0.0003)***	0.0010 (0.0003)***	0.0011 (0.0003)***	0.0015 (0.0003)***	0.0008 (0.0003)**
controls		tot_livingchild	0.0109 (0.0028)***	0.0075 (0.0028)***	0.0065 (0.0031)**	0.0089 (0.0026)***	0.0071 (0.0027)**
		educ_year	-0.0177 (0.0019)***	-0.0148 (0.0017)***	-0.0161 (0.0017)***	-0.0170 (0.0017)***	-0.0072 (0.0012)***
		polygamy_presence	0.0173 (0.0118)	0.0116 (0.0119)	0.0149 (0.0115)	0.0094 (0.0108)	0.0006 (0.0090)
		worked	0.0121 (0.0112)	0.0161 (0.0114)	0.0003 (0.0113)	0.0095 (0.0108)	-0.0062 (0.0095)
		R-squared	0.2015	0.1862	0.1905	0.2086	0.1438
		adjusted R-squared	0.1782	0.1625	0.1669	0.1855	0.1188
		No. observations	15,114	15,115	15,111	15,114	15,113
		Appendix	18	19	20	21	22

f) The use of modern contraceptive and the presence of polygamous household

Regression (1) tests for the dependent variable *neverused_contraceptive*, (2) looks at the use of modern contraceptive and (3) the presence of polygamous household

Only the use of modern contraceptive stays of interest after the BH correction. By reading the effect, one can assert that if the distance from the GGW goes up by one kilometre, the probability that the respondent used a modern method decreases by 0.0003043 (b_1+b_3) percentage point for the women interviewed after the GGW introduction (cf. Appendix 23-25).

Table 6: effects of the distance from the GGW on the probability the respondent has never taken a modern contraceptive, ever taken a contraceptive or that she is in a polygamous union

y: *neverused_contraceptive; used_moderncontraceptive; polygamy_presence*					
model			(1)	**(2)**	(3)
b_0		constant	0.9909 (0.0192)***	**0.0384 (0.0253)**	0.0767 (0.0483)
b_1	x	distggw	-0.0004 (0.0001)***	**0.0004 (0.0001)*** **	0.0003 (0.0003)
b_2	z_1	before_after	0.0169 (0.0285)	**0.0214 (0.0372)**	-0.0244 (0.0701)
b_3	$x.z_1$	distggw.before_after	0.0003 (0.0002)**	**-0.0007 (0.0002)*** **	-0.0005 (0.0004)
b_4	z_2	rural	-	**-**	-
		married	-	**-**	-
		aduage	-	**-**	0.2358 (0.0431)***
b_5	$x.z_2$	distggw.z2	-	**-**	-0.0006 (0.0002)***
b_6	$z_1.z_2$	before_after.z2	-	**-**	-0.1438 (0.0564)**
b_7	$x.z_1.z_2$	distggw.before_after.z2	-	**-**	0.0010 (0.0004)***
controls		tot_livingchild	-0.0340 (0.0023)***	**0.0331 (0.0028)*** **	0.0371 (0.0021)***
		educ_year	-0.0153 (0.0011)***	**0.0221 (0.0017)*** **	-0.0074 (0.0018)***
		polygamy_presence	-0.0347 (0.0068)***	**-0.0199 (0.0095)** **	-
		worked	-0.0340 (0.0023)***	**0.0372 (0.0094)*** **	0.0722 (0.0101)***
		R-squared	0.2561	**0.2605**	0.1469
		adjusted R-squared	0.2414	**0.2389**	0.1239
		No. observations	22,288	**15,119**	15,119
		Appendix	23	**24**	25

g) The access to water and worked within the last 12 months

With those two variables: *time2water* and *worked*, no statistically significant effect has been detected at 5%, they have thus been dropped from the analysis.

4.1.1.2 Evolution Between 2005 and 2019

a) Money decisions: final say on the money earned by the respondent

Both (1) and (2) test for *resp_moneydec* with firstly a two-way interaction regression and secondly a three-way interaction regression with a focus on the married respondent interviewed in 2019, while (3) is concerned by *other_moneydec* with no further specifications (cf. Appendix 27-29).

When the distance from the GGW increases by one kilometre, the probability that the respondent interviewed in 2019 takes the decisions about the money she earned decreases by 0.000246 percentage point. Thus, it suggests that the proximity of the GGW has a positive effect on this probability.

Table 7: effects of the distance from the GGW on the probability the someone in particular takes the decisions concerning the money earned by the respondent

y: resp_moneydec; resp_moneydec; other_moneydec					
model			**(1)**	(2)	(3)
b_0		constant	**1.011 (0.0458)**	0.8320 (0.1354)***	-0.0018 (0.0163)
b_1	x	distggw	**-0.0010 (0.0003)*** **	-0.0003 (0.0005)	0.0002 (0.0001)**
b_2	z_1	before_after	**-0.1599 (0.0635)** **	0.3268 (0.1598)**	0.0318 (0.0187)*
b_3	$x.z_1$	distggw.before_after	**0.0008 (0.0004)** **	-0.0013 (0.0007)*	-0.0003 (0.0001)**
b_4	z_2	rural	**-**		-
		married	**-**	0.1832 (0.1280)	-
		aduage	**-**		-
b_5	$x.z_2$	distggw.z2	**-**	-0.0007 (0.0004)	-
b_6	$z_1.z_2$	before_after.z2	**-**	-0.4907 (0.1529)***	-
b_7	$x.z_1.z_2$	distggw.before_after.z2	**-**	0.0021 (0.0007)***	-
controls		tot_livingchild	**0.0016 (0.0031)**	0.0016 (0.0031)	-0.0028 (0.0008)***
		educ_year	**-0.0005 (0.0009)**	-0.0006 (0.0009)	-0.0002 (0.0004)
		polygamy_presence	**0.0383 (0.0128)*** **	(0.0385 (0.0127)***	-0.0028 (0.0033)
		worked	**-**	-	-
		R-squared	**0.1757**	0.1764	0.1524
		adjusted R-squared	**0.1112**	0.1114	0.0860
		No. observations	**5,814**	5,814	5,814
		Appendix	**27**	28	29

b) Health care decisions: final say on the respondent's health care

Those regressions test whether it is the respondent who takes the decisions concerning her own health care, (1), or her husband, (2) and (3) (cf. Appendix 30-32).

Both (1) and (3) are based on the model B, with the involvement of the married women group, (2) is based on model A. After the p-value adjustment operation, none of them is still worthy of attention.

Table 8 : effects of the distance from the GGW on the probability the someone in particular takes the decisions concerning the respondent healthcare

y: resp_healthdec; husb_healthdec; husb_healthdec					
model			(1)	(2)	(3)
b_0		constant	0.0525 (0.0865)	0.6188 (0.0312)***	0.2602 (0.0916)***
b_1	x	distggw	0.0007 (0.0004)**	0.0004 (0.0002)**	0.0000 (0.0003)
b_2	z_1	before_after	0.0171 (0.1026)	0.1678 (0.0418)***	0.6717 (0.1286)***
b_3	$x.z_1$	distggw.before_after	-0.0011 (0.0005)**	-0.0006 (0.0002)**	0.0004 (0.0005)
b_4	z_2	rural	-	-	-
		married	0.0475 (0.0868)	-	0.3646 (0.0898)***
		aduage	-	-	-
b_5	$x.z_2$	distggw.z2	-0.0006 (0.0003)*	-	0.0004 (0.0003)
b_6	$z_1.z_2$	before_after.z2	-0.0865 (0.1016)	-	-0.5037 (0.1254)***
b_7	$x.z_1.z_2$	distggw.before_after.z2	0.0010 (0.0005)**	-	-0.0010 (0.0005)**
controls		tot_livingchild	-0.0057 (0.0021)***	0.0132 (0.0026)***	0.0132 (0.0026)***
		educ_year	0.0007 (0.0005)	0.0003 (0.0007)	0.0003 (0.0007)
		polygamy_presence	0.0136 (0.0082)*	0.0133 (0.0108)	0.0133 (0.0108)
		worked	0.0510 (0.0078)***	-0.0857 (0.0114)***	-0.0858 (0.0114)***
		R-squared	0.1519	0.1464	0.1470
		adjusted R-squared	0.1278	0.1224	0.1228
		No. observations	15,717	15,717	15,717
		Appendix	30	31	32

c) Large purchases decisions: final say on major household purchases

The regressions (1), (2), (3) display results for the variable *resp_husb_largedec, husb_largedec* and *other_largedec* respectively, with a focus on the rural-located women for (1) and (2), and on married women for (3). Thus, each of them is based on a three-way interaction model (B).

Only the regression (2) passed the adjustment of the p-values (HB correction). Hence, one can describe the result as following: when the distance from the GGW goes up by one kilometre, the probability that it is the husband who takes the decisions for the large purchases for the household drops by 0.0013037 (b_1+b_7) percentage point for women living in a rural area interviewed in 2019. The effect for the urban-located observations is 0.0008285 (b_1+b_3). The differential effect between these two groups is 0.0004752 (cf. Appendix 33-35).

Table 9: effects of the distance from the GGW on the probability the someone in particular takes the decisions concerning the major household purchases

y: resp_husb_largedec; husb_largedec; other_largedec					
model			(1)	**(2)**	(3)
b_0		constant	0.0456 (0.0315)	**0.5279 (0.0466)*****	0.6968 (0.1109)***
b_1	x	distggw	0.0000 (0.0001)	**0.0000 (0.0003)**	-0.0001 (0.0004)
b_2	z_1	before_after	0.1791 (0.0461)***	**-0.1019 (0.0639)**	0.0636 (0.3205)
b_3	$x.z_1$	distggw.before_after	-0.0006 (0.0003)**	**0.0009 (0.0007)****	-0.0034 (0.0016)**
b_4	z_2	rural	0.0327 (0.0381)	**-0.0589 (0.0586)**	
		married			-0.3403 (0.1044)***
		aduage			
b_5	$x.z_2$	distggw.z2	-0.0002 (0.0002)	**0.0007 (0.0003)****	-0.0003 (0.0003)
b_6	$z_1.z_2$	before_after.z2	-0.1639 (0.0622)***	**0.1963 (0.0852)****	-0.1531 (0.3164)
b_7	$x.z_1.z_2$	distggw.before_after.z2	0.0007 (0.0003)**	**-0.0013 (0.0004)*****	0.0037 (0.0016)**
controls		tot_livingchild	0.0005 (0.0020)	**0.0268 (0.0029)*****	-0.0230 (0.0021)***
		educ_year	0.0001 (0.0004)	**-0.0024 (0.0007)*****	0.0012 (0.0005)**
		polygamy_presence	-0.0372 (0.0070)***	**0.0491 (0.0118)*****	-0.0282 (0.0089)***
		worked	0.0785 (0.0075)***	**-0.0820 (0.0113)*****	-0.0225 (0.0075)***
		R-squared	0.1464	**0.1355**	0.1960
		adjusted R-squared	0.1224	**0.1110**	0.1733
		No. observations	15,717	**15,717**	15,717
		Appendix	33	**34**	35

d) Visits decisions: final say on visits to the respondent's family or relatives

The regressions (1), (2), (3) and (4) exhibit results for the variable *visits_decision,* either if it is (1) the respondent and the husband jointly who take the decision; (2) and (3) the husband by himself; or (4) another person (cf. Appendix 36-39).

Only the third one is examined because it is the only one that outdid the p-value adjustment. The effect of the distance from the GGW on the probability that the husband takes the decision for married women is -0.0044891. It means that when the distance from the GGW grows by one kilometre, the probability that the husband takes the decision related to visits drops by 0.0044891 (b_1+b_7) for married women interviewed in 2019 but raises by 0.0043898 (b_1+b_3) percentage point in the case of unmarried women.

Table 10: effects of the distance from the GGW on the probability the someone in particular takes the decisions concerning the visits to family or relatives

y: resp_husb_visitsdec; husb_visitsdec; husb_visitsdec; other_largedec						
model			(1)	(2)	(3)	(4)
b_0		constant	0.0345 (0.0392)	-0.0003 (0.0003)***	0.1651 (0.0615)***	0.6968 (0.1109)***
b_1	x	distggw	0.0005 (0.0002)**	0.1030 (0.0653)	-0.0001 (0.0003)	-0.0001 (0.0004)
b_2	z_1	before_after	0.1525 (0.0554)***	0.0009 (0.0004)**	-0.2374 (0.2844)	0.0636 (0.3205)
b_3	$x.z_1$	distggw.before_after	-0.0009 (0.0003)***	-0.0905 (0.0598)	0.0045 (0.0013)***	-0.0034 (0.0016)**
b_4	z_2	rural	0.0644 (0.0438)	-0.0003 (0.0006)	-	-
		married	-	-	0.3045 (0.0568)***	-0.3403 (0.1044)***
		aduage	-	-	-	-
b_5	$x.z_2$	distggw.z2	-0.0003 (0.0002)	0.0007 (0.0003)**	0.0003 (0.0003)	-0.0003 (0.0004)
b_6	$z_1.z_2$	before_after.z2	-0.1782 (0.0702)**	0.1779 (0.0933)*	0.4612 (0.284)	-0.1531 (0.3164)
b_7	$x.z_1.z_2$	distggw.before_after.z2	0.0008 (0.0004)**	-0.0011 (0.0005)**	-0.0044 (0.0013)***	0.0037 (0.0016)**
controls		tot_livingchild	0.0006 (0.0024)	0.0182 (0.0026)***	0.0182 (0.0026)***	-0.0230 (0.0021)***
		educ_year	0.0006 (0.0005)	-0.0017 (0.0007)**	-0.0017 (0.0007)**	0.0012 (0.0005)**
		polygamy_presence	-0.0135 (0.0077)	0.0093 (0.0106)	0.0097 (0.0106)	-0.0282 (0.0089)***
		worked	0.0592 (0.0080)***	-0.0809 (0.0115)***	-0.0811 (0.0115)***	-0.0225 (0.0075)***
		R-squared	0.1305	0.1938	0.1935	0.1960
		adjusted R-squared	0.1058	0.1710	0.1706	0.1733
		No. observations	15,710	15,710	15,710	15,717
		Appendix	36	37	38	39

e) Attitude towards violence

The regressions (1), (2), (3), (4), (5), (6) respectively concern the understanding of being beaten as a wife by her husband when she goes out without telling him, neglects the children (model A), neglects the children as a wife (model B), she argues with him, refuses sex, and burns food. They focus on no specific group, none of them appeared to be significant in the previous test, the analysis will thus focus on simple two-way regression for those dependent variables (cf. Appendix 40-45).

When the distance from the GGW grows by one kilometre the probability that the fact of being beaten by her husband because she (1) went out without telling him; (2) neglected the children;

(4) argued with him; (5) or refused sex is seen as justified rises by 0.0006848; 0.0006453; 0.0004954; 0.0005913 (b_1+b_3) percentage point respectively for the women interviewed in 2019.

For the married women participating in the 2019 survey, when the distance from the GGW grows by one kilometre the probability of to see wife beating by her husband because she neglected the children (3) or burned the food (6) as justified is dropping respectively by 0.0054839 and 0.0036462 (b_1+b_7) percentage point. While for non-married women it rises by 0.004328 percentage point for the variable *yes_chilneglbeating*, and by 0.004317 percentage point for the variable *yes_foodbeating* (b_1+b_3).

Table 11: effect of the distance from the GGW on the probability that a certain situation of domestic violence is seen as justified

y: yes_gooutbeating; yes_childneglbeating; yes_childneglbeating; yes_arguebeating; yes_sexrefusalbeating; yes_foodbbeating

model			(1)	(2)	(3)	(4)	(5)	(6)
b_0		constant	0.6010 (0.0414)***	0.6072 (0.0406)***	0.7554 (0.1267)***	0.6458 (0.0466)***	0.6867 (0.0401)***	0.2448 (0.0912)***
b_1	x	distggw	-0.0006 (0.0003)**	-0.0007 (0.0003)***	-0.0013 (0.0005)***	-0.0010 (0.0003)***	-0.0013 (0.0003)***	-0.0001 (0.0004)
b_2	z_1	before_after	-0.3896 (0.0569)***	-0.3762 (0.0551)***	-0.8737 (0.1576)***	-0.3663 (0.0697)***	-0.3965 (0.0591)***	-0.3764 (0.0993)***
b_3	$x.z_1$	distggw.before_after	0.0012 (0.0004)***	0.0013 (0.0003)***	0.0055 (0.0007)***	0.0014 (0.0004)***	0.0018 (0.0008)***	0.0044 (0.0005)***
b_4	z_2	rural	-	-	-	-	-	
		married	-	-	-0.1513 (0.1212)	-	-	0.0368 (0.0866)
		aduage	-	-	-	-	-	
b_5	$x.z_2$	distggw.z2	-	-	0.0006 (0.0004)	-	-	-0.0003 0.0003
b_6	$z_1.z_2$	before_after.z2	-	-	0.4996 (0.1496)***	-	-	0.2688 (0.0937)***
b_7	$x.z_1.z_2$	distggw.before_after.z2	-	-	-0.0042 (0.0006)***	-	-	-0.0037 (0.0004)***
controls		tot_livingchild	0.0134 (0.0026)***	0.0098 (0.0029)***	0.0098 (0.0029)***	0.0097 (0.0030)***	0.0114 (0.0027)***	0.0100 (0.0027)***
		educ_year	-0.0041 (0.0008)***	-0.0033 (0.0008)***	-0.0033 (0.0008)***	-0.0030 (0.0007)***	-0.0047 (0.0007)***	-0.0030 (0.0006)***
		polygamy_presence	0.0235 (0.0109)**	0.0202 (0.0113)*	0.0202 (0.0113)*	0.0232 (0.0114)**	0.0173 (0.0112)	0.0072 (0.0089)
		worked	-0.0158 (0.0107)	-0.0112 (0.0112)	-0.0114 (0.0111)	-0.0179 (0.0116)	-0.0175 (0.0102)*	-0.0101 (0.0100)
		R-squared	0.2323	0.2243	0.2246	0.2172	0.2239	0.1632

adjusted R-squared	**0.2107**	**0.2025**	**0.2026**	**0.1952**	**0.2020**	**0.1395**
No. observations	**15,716**	**15,717**	**15,717**	**15,713**	**15,716**	**15,715**
Appendix	**40**	**41**	**42**	**43**	**44**	**45**

f) The use of modern contraceptive, the presence polygamous household, worked and access to water

No regression concerning these four variables gave any useful results for the analysis, no effect will thus be assumed for those.

4.1.2 Children's School Attendance

The variable *school_attendance* did not provide any interesting results and it is thus left out. This lack of result is not to deplore since the variable *attendance_status* gives a hint of it. The regression (1) concerns the variable *chnever_attsch* following the model E of regression, (2) involves the dependent variable *chenteredsch* with a model D arrangement, (3) and (4) are both related to *chrepeated_sch* and follow the model C but with different z_2. (5) has as dependent variable *chdrop_sch* and (6) *cheduc_year* with the C model (cf. Appendix 47-52).

As explained above regression (5) is subject to 10% level of significance and not 5% as the other and regression (2) will be looked at as an exercise.

When the distance from the GGW rises by one percent the probability to drop school as a teenager born after 2008 drops by 0.0074299 (b_1+b_3) percentage point. For non-teenager it would be a raise of 0.0002056 (b_1+b_3) percentage point if the coefficient was significant.

The total effect of the distance from the GGW for the female children living in a rural area and born after 2008 on the probability of entering school during the last year would be 0.0146687 ($b_1+b_{11}+ b_{15}$) if the coefficient were significant. Meaning that if the GGW rises by one percent, the probability of entering school within the last year as a rural-located girl rises by 0.0146687 percentage point. For the male children of the same group, it would be 0.0252357 ($b_1+b_3+ b_7$). The effect of the independent variable on the rural-located female children born after 2008 compared to the ones born before 2008 would be -0.0273 (b_{15}) and for the male children 0.0236 (b_7). One might be interested in checking out the difference for urban situations. This regression allows for this comparison. The total effect of the distance from the GGW on the female children living in an urban area and born after 2008 on the probability of entering school during the last year would be 0.04199619 (b_1+b_{11}) and for the male children 0.0016009 (b_1+b_3). The effect of y on the urban-located female children born after 2008 compared to the ones born after 2008 would be 0.0237 (b_{11}) and for the male children -0.0166243 (b_3).

Table 12: the effects of the GGW on the probability that one of the status of school attendance = 1 and on the number of years of education

y: chnever_attsch; chenteredsch; chrepeat_sch; chrepeat_sch; chdrop_sch; cheduc_year								
model			(1)	(2)	(3)	(4)	**(5)**	(6)
b_0		constant	0.8949 (0.1273)***	0.0328 (0.0350)	-0.0271 (0.0117)**	-0.0070 (0.0191)	**0.0073 (0.0064)**	-1.264 (0.3026)***
b_1	x	lndistggw	-0.0633 (0.0259)**	0.0182 (0.0077)***	0.0114 (0.0025)***	0.0059 (0.0040)	**-0.0006 (0.0013)**	0.1657 (0.0651)**
b_2	z_1	before_after	-0.2625 (0.1857)	-0.0273 (0.0577)	0.0226 (0.0186)	-0.0113 (0.0266)	**-0.0010 0.0083**	3.692 (0.6156)***
b_3	$x.z_1$	lndistggw.before_after	0.0030 (0.0384)	-0.0166 (0.0122)	-0.0075 (0.0039)*	(0.0066) (0.0057)	**0.0008 (0.0017)**	-0.0870 (0.1267)
b_4	z_2	rural	0.0964 (0.1582)	0.0258 (0.0437)	-	-0.0418 (0.0222)*	**-**	
		foster	-	-	-	-	**-**	0.3078 (0.1559)**
		teenage	-	-	0.0272 (0.0110)**	-	**0.0101 (0.0090)**	
b_5	$x.z_2$	lndistggw.z_2	0.0013 (0.0323)	-0.0046 (0.0094)	-0.0024 (0.0025)	0.0068 (0.0047)	**-0.0005 (0.0018)**	-0.1033 (0.0330)***
b_6	$z_1.z_2$	before_after.z_2	0.2482 (0.2211)	-0.1261 (0.0699)*	-0.0596 (0.0159)***	0.0700 (0.0329)**	**0.0328 (0.0129)****	-0.5647 (0.3029)*
b_7	$x.z_1.z_2$	lndistggw.before_after.z	-0.0344 (0.0459)	0.0236 (0.01449)	0.0117 (0.0036)***	-0.0139 (0.0068)**	**-0.0068 (0.0026)**	0.1540 (0.0636)**
b_8	z_3	female	-0.2038 (0.0604)***	0.0610 (0.0256)	-	-	**-**	-
		teenage			-	-	**-**	-
b_9	$x.z_3$	lndistggw.z_3	0.0461 (0.0123)	-0.0127 (0.0053)**	-	-	**-**	-
b_{10}	$z_1.z_3$	before_after.z_3	0.1098 (0.1076)	-0.1211 (0.0353)***	-	-	**-**	-
b_{11}	$x.z_1.z_3$	lndistggw. before_after.z_3	-0.0285 (0.0221)	0.0237 (0.0076)***	-	-	**-**	-
b_{12}	$z_2.z_3$	$z_2.z_3$	0.0920 (0.0820)	-0.0412 (0.0325)	-	-	**-**	-
b_{13}	$x.z_2.z_3$	lndistggw. $z_2.z_3$	-0.0164 (0.0166)	0.0095 (0.0068)	-	-	**-**	-
b_{14}	$z_1.z_2.z_3$	before_after.$z_2.z_3$	-0.3047 (0.1341)**	0.1367 (0.0437)***	-	-	**-**	-
b_{15}	$x.z_1.z_2.z_3$	lndistggw. before_after.$z_2.z_3$	0.0558 (0.0276)**	-0.0273 (0.0094)***	-	-	**-**	-
	controls	mean_educyear	-0.0416 (0.0021)***	0.0013 (0.0008)*	0.0034 (0.0008)***	0.0033 (0.0008)***	**-0.0003 (0.0003)**	0.2178 (0.0103)***
		nb_adhhd	0.0022 (0.0010)**	-	-0.0004 (0.0003)	-(0.0004) (0.0003)	**-0.0002 (0.0001)****	-0.0178 (0.0043)***
		nb_oldhhd	-0.0287 (0.0095)***	-	-	-	**-0.0009 (0.0004)****	0.0839 (0.0204)***
		parents_alive	0.8949 (0.1273)***	-	-	-	**-0.0013 (0.0015)**	-
		R-squared	0.3019	0.0908	0.0360	0.0438	**0.0168**	0.4147
		adjusted R-squared	0.2962	0.0834	0.0287	0.0361	**0.0093**	0.4103
		No. observations	52,929	52,929	52,929	52,929	**52,929**	57,334
		Appendix	47	48	49	50	**51**	52

4.2 Analysis

The above outcomes are the result of many attempts at finding reliable, robust but also as relevant as possible specifications for the regressions. Nonetheless for many reasons the perfect regression does not exist. Several flaws will be reviewed in the next section. First, one needs to summarise the results and examine if any trends can be disclosed.

The first striking outcome is that if the distance of the GGW affects to a very limited extent women empowerment or children's school attendance at the national level. Effects are only observed after two digits of precision or more. Nonetheless, the detected effects might suggest the direction of the effects.

Several results disprove the hypothesis stating that the proximity of the GGW has a positive impact on women empowerment and children's school attendance, while some are not.

The seven-year evolution studied between 2005 and 2012 reports that the further the rural-located respondent is from the GGW the more likely she will take the decisions about the allocation of the money she earned by herself. In contrast, the closer to the GGW the woman is, the more likely her husband will make that choice on her behalf. Nonetheless this trend may reverse in a longer term. Indeed, results on women interviewed in 2019 showed that the further they are from the GGW the lesser they are likely to take decisions about their money. Thus, the closer they are the higher the chances they are the initiator of this choice. This effect is even a bit stronger than the one measured from the previous period. This respondent's implication in the money decision process concurs with what is observed at the global extent. In general, women are taking the decision for her money earned – more than 80% of them are. But in 2012 this ratio dropped a bit before rising in 2019 (cf. 3.2.4.2 Descriptive Findings from the Data Sets).

For both periods at study, the husband also seems to benefit from the proximity of the GGW. Indeed, for the rural observations of 2012, the closer the husband is to the GGW the more likely he takes decisions about visiting the family or relatives. This trend is also observable at a stronger extent among the married observations interviewed in 2019. Notice that for the 2005-2012 analysis the closer the observations are from the GGW the more likely the visits decision will also be taken by the husband and the respondent jointly, or by someone else. Even though the effects of the distance from the GGW on the visits decisions for the 2005-2012 study may seem a bit blurry, one must keep in mind that the probability is the highest for the decisions taken by the husband for the rural observations as they get closer to the GGW. When the distance from the GGW decreases, the husband is also more likely to decide on the household's large purchases for the 2012 and 2019 – regardless of their localisation or marital status. But the intensity of this effect decreases for the 2019 interrogated women.

Sometimes, empowering someone means firstly weakening the decision power of someone else. The descriptive findings highlighted a neat withdrawal of another person in the decision process. Those findings are supported by the causal analysis. In this case the analysis suggested that the closer the respondent interrogated in 2012 is from the GGW the smaller the chances it is someone else that is taking the decisions for the respondent's health care – especially for she is in rural area. The same trend applies to large purchases for the household. However, some specificities have been found for urban observations. The further they are from the GGW the higher the probability that the husband will make visits decision is. This trend concerning the probability of the husband taking the decisions about visits is confirmed for the unmarried observations of the 2005-2019 study.

The 2005-2012 analysis provided interesting results that advocate for a positive effect of the GGW on women empowerment. For all the situations that have been studied, the closer women are to the GGW, the less likely they consider being beaten as justified. Furthermore, the more likely they ever have used modern contraceptive. For the period 2005-2019, the effects are less straightforward for married women solely. As the distance from the GGW rises, the probability of understanding wife beating increases in the case of going out without telling the husband, children negligence, arguing with the husband, and refusing sex, for the women interrogated in 2019. Meaning the proximity of the GGW has a positive impact on the probability of finding these kinds of VAW unjustified. It supports the 2005-2012 findings. However, one needs to distinguish married women from unmarried women. Indeed, for the variable concerning seeing the beating justified as she neglects the children or burns food, the effects are different. The closer the married respondent interviewed in 2019 is to the GGW the more likely violence in the case of children negligence or food burning is going to be seen as justified. For the unmarried women, the opposite trend is observed.

For school attendance, the GGW appears to have no effect. Or if it has some, they are ambivalent. Indeed, for teenagers born after 2008 and living in a rural area, the further they are from the project, the less likely they will drop out of school. The opposite effect is observed for non-teenagers. Nevertheless, one needs to recall that dropping out of school does not concern a lot of observations (cf. 3.2.5.2 Descriptive findings from the data set). Since it concerns less than 1% of the observation it is not important or can even be biased because of too little observations.

The GGW appears to have more short-term effects on women empowerment as it is more likely to exclude other people from the process. Sometimes it even includes the respondent, but also her husband. The respondent did not gain any power decision for the visits and large household purchases matters, but she did for her money allocation and her health care. In this study, the location in rural area and being married both seem to be aggravating factors for women empowerment in this study. To a very small degree and for rural observations, the GGW affects positively younger children born after 2008, while it negatively affects teens born after 2008.

Broadly speaking, what is worth remembering from this analysis is the smallness of the results, as they are all very close to zero. Indeed, the biggest effects start at two digits of precision. And for the effects themselves, the proximity of the GGW is mostly positive for the attitude towards violence, i.e., women close to the GGW are less likely to see domestic violence as justified after its introduction. It also seems more likely that the core household members – i.e., the husband and/or the wife – engage in the decision-making process after the GGW introduction.

4.3 Limitations

The next section aims at reviewing the methodological choices made throughout this work. The author has identified 6 technical limitations: the model; the dataset; the variables; the author's knowledge; the measure of the GGW effect; side effects.

The author decided to adopt a linear probability model, which is much easier to interpret. However, it has a considerable weakness. Indeed, the conditional probability function is considered as linear, it either takes the value 1 or the value 0. With bounded data the slope should not be constant because, at some point, the linear prediction can outrange the data. Meaning that eventually one will predict that the probability to have a one is below zero or above one. The author could have used a logit or probit model that flats out as the prediction approaches zero or one. In other words, the slopes are not constant. The shape of the predicted function curves away and does not hit zero or one.

The second limitation is inherent to the dataset used, as shown on *the figure 2* (cf. 3.2.3 Procedure) not many of the clustered observations are in the zone of the GGW. Eventually, for those households, the effects measured would be much higher. One solution could have been narrowing the research on the closest ones. But since there are not so many observations the analysis could have been biased. Aside from this issue, the study is bounded by the available information in the data set itself. Meaning that sometimes some variables could have been interesting but were not consistent across time or were missing for too many observations. Although DHS data performs very well on many levels and provides an extremely large amount of information, few additional variables would have been interesting for this research, especially for work conditions, land ownership or child labour.

The variables used for this study fail at measuring all the components of women empowerment or even school attendance. Especially the motivational and psychological dimension. By using decision-making variables as elements of women empowerment, this work disregards the fact that women may not engage in the decision process because they do not care, delegated the task or the internalised cultural norms, and not because they face restriction in participating. This work does not account for the beliefs in the decision-making process. Even more the study is led at the household-level, but issues may also rise at the community-level. For instance, to what extent are they allowed to voice their opinion or attend political group meetings. Additionally, this work measures the perception of the violence and not the amount of violence itself (A. Donald et al., 2017). The same kind of intrinsic flaws can be upraised for school attendance. The effect of the GGW on education has been studied through school attendance. The variable has been studied as it is. But it says nothing on the quality of the education, the grades obtained or hours a day they attend.

This study is not the result of a fieldwork. Even though the project is highly documented it limits greatly the comprehension. The authors may not have thought of enough interdependencies, external effects, or dynamics among the households and the communities. Even more, the author is a European citizen and that undoubtedly shapes her culture, education, and mentality. Even though efforts have been made to get acquainted as best as possible with the Senegal context it cannot be compared to someone with ground experience of Senegal. As she is an external person to the project she might bring some neutrality to the study, but it more likely brings knowledge lacks and preconceived ideas from occidental societies.

The distance from the GGW is considered as the crow flies. Nonetheless, those might not be the best approximation for measuring the effect of the GGW, especially for a non-landlock country. The observations located by the sea might not be affected in the same way as the ones located intra-land as the sea might block the diffusion of the effects.

The last limitation is about the measured effects. Another ongoing project to address land degradation and desertification in Africa is the African Forest Landscape Restoration Initiative (AFR100) which aims at managing and restoring 100 million hectares of degraded lands and forests across the continent by 2030. Building synergies between those kinds of restoring activities is essential to consolidate their actions. Senegal stepped in the process in 2016 (FAO 2020). Thus, the effect measured in 2019 might also absorb effects from the AFR100 project. Nonetheless by the time it was still at a very early stage and if any, effects blended with the GGW ones and those are extremely limited.

5 Discussion

The purpose of this research was to evaluate the effects of the GGW on women empowerment and school attendance. The social dimension found engaging effects while the economic dimension did not provide any. The subsection on the children's attendance (cf. 4.1.2 Children's school attendance) barely displayed any effects from the GGW and cannot be considered as significant or reliable.

The proximity of the households to the GGW has mitigated effects on women empowerment. While it has positive effects on the probability that money decisions are taken by women in the long term, the husband still plays a major role in the decision process. Nevertheless, the decision-power seems to progressively revolve around the central core of the household (either the respondent or the husband) and exclude more and more other people from the process. A positive evolution in the attitude towards violence related to the GGW proximity is suggested. Indeed, the closer the women are to the GGW the less likely they are going to consider that beatings from their husbands are justified, especially in the early stage of the project. The effects are less clear-cut for the long-term analysis, but mostly follow the same trend.

For the school attendance the only effect detected lies in the probability of dropping out of school as a rural teen or child. As the distance from the GGW decreases, the probability that the teenager drops out if school increases, the opposite is observed for the non-teenagers. It might be a sign of parental role delegation among the household. Indeed, a change in the mothers' occupation might force the oldest children to leave school and replace the missing parent in the household. But this discussion does not have much sense in the frame of this analysis. Indeed, as advocated earlier, the detected effects are considered as insignificant given the very low number of children they concern. To address any effects in the children's education one interesting analysis that could have been led is suggested by the gap between GER and NER. As pointed out in the earlier section, studying the gap between GER and NER in primary school exposes the pupils that are admitted in primary school but that are not the target population as they are too old. One could evaluate if the children enrolled in primary school are of age of being in primary school. At the end one could check out if there are any improvements due to the GGW proximity. The same test can be conducted for the other level of education.

Beyond the conceptual limitations above mentioned, the study conducted failed at including any water considerations in its computations. As explained in the literature review, water understanding gives major insight of the dynamics at the community level. The water supply is still a major challenge for the country. In 2012 and 2019, the fetching person is in more than 85% of the cases the adult women. For this reason, a positive change in community's water management obviously has a role to play in women emancipation. By freeing time for women, they might be able to work in the economy. Decreasing the pressure on water and land might open the labour market to newcomers. These kinds of mechanisms are worth to be studied and included in further research on women empowerment. Studies have shown that even though their workload is decreased with a better water management program, the women do not automatically undertake activities that empower them. Nonetheless for the project that takes into account gender equality women are likely to benefit from it (S. Ivens, 2008). It is thus, in light of those forethoughts, worth further investigating the effects of the GGW on women empowerment.

The study was carried out at a household level. But this kind of project goes way beyond this unit of analysis. Before evaluating the scope of the GGW effects on the individuals, one needs to figure out to what extent the community is. Two reasons can be evoked. The first one in the deduction, if the community is not very involved in the process, then households are less likely to be affected. The second reason at play is the meaningfulness of the study. The GGW's approach alleges advancing sustainable and wide-scaled water management while supporting regreening activities (C.Mbow, 2017). These kinds of centralized programs require great investment and complex equipment controlled by the forest department such as *Eaux et Forêt* which, in practice, often left the local communities out of the process. When the program is removed from the zones, one of the main goals is to build an independent management of the plantation and exploitation with the local communities and, to stabilize the erosion-prone areas. But the involvement of the communities is inevitable for a successful program. Plus, landowners are the keeper of knowledge and experience concerning degraded land's recovering activities. Up-coming decisions make then little sense to them and are less likely to be implemented properly or kept on the long-term. Nonetheless, experiences where the incentives and the policies are perceived as favourable, farmers and landowners encourage the regreening activities and the trees' plantation (J.Boffa, 1999). Hence, a program that includes communities at the local level

– as the GGW claims to do – would be more interesting to study many years after as it has more chances to survive after the departure of the initiator. If it does not, the effects would fade over the years and would be pointless to study.

One last thing to discuss is whether the ground hypotheses of the DiD are plausible or not. An important feature to add to this work is pre-testing the parallel trends assumptions. It would give an idea to whether the assumption is likely to hold or not. And if not, how it is violated and what differences in the trend one might actually account for. Nonetheless, it does not actually tell if it holds in the studied period of time. It does not substitute to formally reasoning about the assumption. The external factors affecting the two groups can be discussed as affecting them at the same rate. For instance, since Senegal is a stable political country, there is no reason why newly introduced policies would affect the two groups at a different rate. The same can be addressed for global warming. The levels in the global warming advancement do not need to be the same across the two groups as long as the rate of change is the same. The effects studied are mostly vertical given the country's topography. Indeed, the GGW crosses the country horizontally and, to measure the effects, the orthogonal distance has been used. In addition, it bordered to the West the Atlantic Ocean, so vertical effects comply with this topography. North and South are likely facing global warming in the same way, but the rate of increase of global warming should be more or less the same, especially for a country that is not very big. Furthermore, macroeconomics chocs are likely to affect the country the same way. Also, remind that to reflect the effects of the GGW as best as possible, the author introduced control variables for the observable differences and for the unobservable ones, fixed effects. This choice advocates for the common trend assumption.

Future research might thus be interested in both addressing the methodological limits of this study by introducing the use of a logit or probit function and engaging the above considerations.

6 Conclusions

The introduction of the GGW brings several changes among the community and the households. The changes are mostly due to the activities in the community garden, economic opportunities for trade, job creations, a modification in the grazing activity, and a change in the access to water. The social ramifications of the local communities are always difficult to grasp. The presence of the garden improves the nutrition and raises economic opportunities for women. Furthermore, improved nutrition among the households and increased earnings may thus have consequences on the children. In the light of these changes, the present work attempted at measuring the effects of the GGW on women empowerment and school attendance for children.

The review of the project and Senegalese context set light on the essential elements to understand the background of the empirical analysis. It rested on multiple hypothesis testing of linear probability models. The detected effects are very low if not insignificant. They are mostly about the social dimensions of women emancipation, i.e., the decision-making power and the attitude towards violence. Sometimes, because of the GGW proximity women gained in decision-authority, but so did their husbands. Nonetheless, the probability of understanding domestic violence decreases with the closeness of the GGW. The school attendance analysis, the only weak trend highlighted suggests that the rural teenagers must replace the potential missing mother among the household. But this hypothesis is not supported by the data about women at work. Indeed, no differential effect has been detected for the probability of having worked within the last 12 months in function of the GGW proximity.

Limits have pointed out that empowering women bears many other factors than the studied ones, and so does education. Further research may want to consider water issues and new community mechanisms created by the GGW in their analysis, as they can change the equilibrium among the household and the social network.

As a first attempt, this work achieved at suggesting trends, but the question surely deserves more attention. First the conceptual flaws need to be addressed, and then, the GGW project involves many other countries that are also highly interesting to study.

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8 Appendixes

Appendix 1. **GER and NER per year**

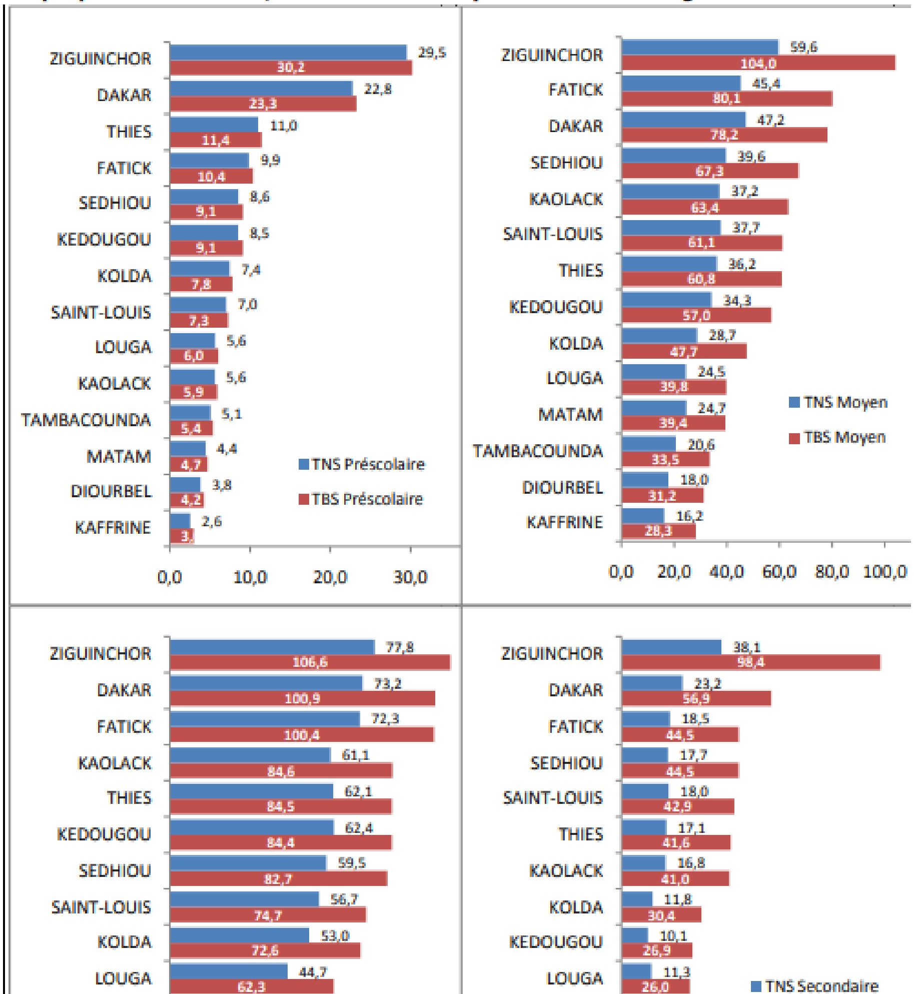
Tableau 3.10. : Taux brut/net de scolarisation par niveau selon le milieu de résidence et le sexe

Niveau d'instruction	Urbain			Rural			National		
	Masculin	Féminin	Ensemble	Masculin	Féminin	Ensemble	Masculin	Féminin	Ensemble
					TBS				
Préscolaire	18,8	19,8	19,3	5,6	6,1	5,8	10,2	11,0	10,6
Primaire	96,1	96,6	96,3	67,3	69,8	68,6	79,1	80,9	80,0
Moyen	77,2	76,6	76,9	47,4	43,6	45,5	60,5	58,3	59,4
Secondaire	67,5	58,6	62,9	26,0	15,4	20,5	46,7	36,6	41,5
					TNS				
Préscolaire	18,3	19,4	18,8	5,2	5,7	5,4	9,8	10,6	10,2
Primaire	70,4	71,2	70,8	48,0	50,4	49,2	57,2	59,0	58,1
Moyen	46,0	46,7	46,4	27,1	26,0	26,6	35,5	35,3	35,4
Secondaire	27,5	24,5	25,9	9,9	6,3	8,0	18,7	15,2	16,9

Source : ANSD. RGPHAE-2013

Appendix 2. **GER and NER per administrative region**

Graphique 3.8. : Taux brut/net de scolarisation par niveau selon la région en 2013



Appendix 3. **Descriptive statistics** [30]

<table>
<tr><th></th><th colspan="5">2005</th><th colspan="5">2012</th><th colspan="5">2019</th></tr>
<tr><th></th><th colspan="2">x</th><th>y</th><th colspan="2">%</th><th colspan="2">x</th><th>y</th><th colspan="2">%</th><th colspan="2">x</th><th>y</th><th colspan="2">%</th></tr>
<tr><td>the husband has at least one other wife than the respondent</td><td colspan="2">3,888</td><td>9,810</td><td colspan="2">39.63</td><td colspan="2">2,002</td><td>5,795</td><td colspan="2">34.55</td><td colspan="2">1,852</td><td>5,932</td><td colspan="2">31.22</td></tr>
<tr><td>married women</td><td colspan="2">9,489</td><td>14,272</td><td colspan="2">66.49</td><td colspan="2">5,762</td><td>8,636</td><td colspan="2">66.72</td><td colspan="2">5,925</td><td>8,649</td><td colspan="2">68.51</td></tr>
<tr><td>never married women</td><td colspan="2">3,581</td><td>14,272</td><td colspan="2">25,09</td><td colspan="2">2,473</td><td>8,636</td><td colspan="2">28.64</td><td colspan="2">2,360</td><td>8,649</td><td colspan="2">27.29</td></tr>
<tr><td>the use of a modern contraceptive method</td><td colspan="2">2,585</td><td>14,272</td><td colspan="2">18.11</td><td colspan="2">907</td><td>8,636</td><td colspan="2">10.50</td><td colspan="2">1,527</td><td>8,649</td><td colspan="2">17.66</td></tr>
<tr><td>currently working or worked in the past year</td><td colspan="2">6,124</td><td>14,262</td><td colspan="2">42.94</td><td colspan="2">4,012</td><td>8,026</td><td colspan="2">49,99</td><td colspan="2">4,362</td><td>8,372</td><td colspan="2">52.10</td></tr>
<tr><td>the respondent decides herself who to spend her money</td><td colspan="2">3,949</td><td>4,691</td><td colspan="2">84.18</td><td colspan="2">1,957</td><td>2,407</td><td colspan="2">81.30</td><td colspan="2">2,050</td><td>2,445</td><td colspan="2">83.84</td></tr>
<tr><td rowspan="3">the husband (husb) or someone else (se) has the final say on respondent's health care decisions</td><td>husb</td><td>se</td><td rowspan="2"></td><td>husb</td><td>se</td><td>husb</td><td>se</td><td rowspan="2"></td><td>husb</td><td>se</td><td>husb</td><td>se</td><td rowspan="2"></td><td>husb</td><td>se</td></tr>
<tr><td>6,766</td><td>4,986</td><td>47.49</td><td>34.99</td><td>4,606</td><td>187</td><td>79.82</td><td>3.24</td><td>4,653</td><td>150</td><td>79.68</td><td>2.57</td></tr>
<tr><td colspan="2">11,752</td><td>14,248</td><td colspan="2">82,48</td><td colspan="2">4,793</td><td>5,770</td><td colspan="2">83.06</td><td colspan="2">4,803</td><td>5,839</td><td colspan="2">82,25</td></tr>
<tr><td rowspan="3">the husband (husb) or someone else (se) has the final say on large purchase decisions</td><td>husb</td><td>se</td><td rowspan="2"></td><td>husb</td><td>se</td><td>husb</td><td>se</td><td rowspan="2"></td><td>husb</td><td>se</td><td>husb</td><td>se</td><td rowspan="2"></td><td>husb</td><td>se</td></tr>
<tr><td>6,010</td><td>6,322</td><td>42.30</td><td>44.50</td><td>3,938</td><td>634</td><td>69.11</td><td>11.12</td><td>3,737</td><td>1,049</td><td>65.04</td><td>18.26</td></tr>
<tr><td colspan="2">12,332</td><td>14,206</td><td colspan="2">86.80</td><td colspan="2">4,572</td><td>5,698</td><td colspan="2">80.23</td><td colspan="2">4,786</td><td>5,745</td><td colspan="2">83.30</td></tr>
<tr><td rowspan="3">the husband (husb) or someone else (se) has the final say on visits to family and relatives</td><td>husb</td><td>se</td><td rowspan="2"></td><td>husb</td><td>se</td><td>husb</td><td>se</td><td rowspan="2"></td><td>husb</td><td>se</td><td>husb</td><td>se</td><td rowspan="2"></td><td>husb</td><td>se</td></tr>
<tr><td>5,009</td><td>5,374</td><td>35.48</td><td>38.07</td><td>3,942</td><td>270</td><td>69,45</td><td>4.75</td><td>4,637</td><td>260</td><td>80.00</td><td>4.48</td></tr>
<tr><td colspan="2">10,383</td><td>14,116</td><td colspan="2">73.55</td><td colspan="2">4,212</td><td>5,676</td><td colspan="2">74.20</td><td colspan="2">4,897</td><td>5,769</td><td colspan="2">84.49</td></tr>
<tr><td>wife beating justified if she goes out without telling him</td><td colspan="2">7,534</td><td>13,996</td><td colspan="2">53.83</td><td colspan="2">4,415</td><td>8,616</td><td colspan="2">51.24</td><td colspan="2">2,936</td><td>8,598</td><td colspan="2">34.14</td></tr>
<tr><td>wife beating justified if she neglects the children</td><td colspan="2">7,256</td><td>14,028</td><td colspan="2">51.73</td><td colspan="2">4,280</td><td>8,617</td><td colspan="2">49.66</td><td colspan="2">3,006</td><td>8,609</td><td colspan="2">34.91</td></tr>
<tr><td>wife beating justified if she argues with him</td><td colspan="2">7,401</td><td>13,978</td><td colspan="2">52.94</td><td colspan="2">4,508</td><td>8,616</td><td colspan="2">52.32</td><td colspan="2">3,204</td><td>8,612</td><td colspan="2">37.20</td></tr>
<tr><td>wife beating is justified if she refuses sex</td><td colspan="2">6,879</td><td>13,830</td><td colspan="2">49.73</td><td colspan="2">4,434</td><td>8,551</td><td colspan="2">51.85</td><td colspan="2">3,179</td><td>8,590</td><td colspan="2">37.00</td></tr>
<tr><td>wife beating is justified if she burns food</td><td colspan="2">3,446</td><td>13,983</td><td colspan="2">24.64</td><td colspan="2">1,885</td><td>8,626</td><td colspan="2">21.85</td><td colspan="2">1,974</td><td>8,612</td><td colspan="2">22.92</td></tr>
</table>

[30] The responses alike 'I don't know' or 'not applicable', or even the missing values are excluded from this table

8.1 Women empowerment 2005-2019

Appendix 4. **Reg n002**

```
global ylist resp_moneydec
global xlist c.distggw##i.before_after##i.rural tot_livingchild educ_year polygamy_presence
reghdfe $ylist $xlist  [pw=weight], absorb (cluster_nb age resi_region marital_status)
cluster(cluster_nb)
(dropped 5 singleton observations)
(MWFE estimator converged in 17 iterations)

HDFE Linear regression                            Number of obs   =      5,772
Absorbing 4 HDFE groups                           F(  10,    367) =       7.12
Statistics robust to heteroskedasticity           Prob > F        =     0.0000
                                                  R-squared       =     0.1452
                                                  Adj R-squared   =     0.0775
                                                  Within R-sq.    =     0.0146
Number of clusters (cluster_nb) =        368      Root MSE        =     0.3368

                                           (Std. Err. adjusted for 368 clusters in cluster_nb)
----------------------------------------------------------------------------------------------
                             |               Robust
               resp_moneydec |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-----------------------------+----------------------------------------------------------------
                     distggw |   .0001537   .0002866     0.54   0.592    -.0004099    .0007174
              1.before_after |  -.0096978   .0791447    -0.12   0.903    -.1653319    .1459363
                             |
      before_after#c.distggw |
                          1  |  -.0008845   .0004321    -2.05   0.041    -.0017343   -.0000348
                             |
                     1.rural |   .0580881   .0595171     0.98   0.330    -.0589492    .1751255
                             |
             rural#c.distggw |
                          1  |  -.0013579   .0003515    -3.86   0.000    -.0020491   -.0006666
                             |
          before_after#rural |
                        1 1  |  -.0999794   .0941342    -1.06   0.289    -.2850895    .0851308
                             |
before_after#rural#c.distggw |
                        1 1  |    .001824   .0005196     3.51   0.001     .0008022    .0028458
                             |
             tot_livingchild |   .0041613   .0026941     1.54   0.123    -.0011364     .009459
                   educ_year |   .0015815   .0019903     0.79   0.427    -.0023323    .0054953
           polygamy_presence |   .0032745   .0120092     0.27   0.785     -.020341    .0268899
                       _cons |   .9082051   .0475018    19.12   0.000     .8147952    1.001615
----------------------------------------------------------------------------------------------
```

Appendix 5. **Reg n006**

```
global ylist resp_husb_moneydec
global xlist c.distggw##i.before_after##i.rural tot_livingchild educ_year polygamy_presence
reghdfe $ylist $xlist  [pw=weight], absorb (cluster_nb age resi_region marital_status)
cluster(cluster_nb)
(dropped 5 singleton observations)
(MWFE estimator converged in 17 iterations)

HDFE Linear regression                            Number of obs   =      5,772
Absorbing 4 HDFE groups                           F(  10,    367) =       4.87
Statistics robust to heteroskedasticity           Prob > F        =     0.0000
                                                  R-squared       =     0.1005
                                                  Adj R-squared   =     0.0291
                                                  Within R-sq.    =     0.0062
Number of clusters (cluster_nb) =        368      Root MSE        =     0.2479

                                           (Std. Err. adjusted for 368 clusters in cluster_nb)
----------------------------------------------------------------------------------------------
                             |               Robust
          resp_husb_moneydec |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-----------------------------+----------------------------------------------------------------
                     distggw |  -.0000108    .000189    -0.06   0.955    -.0003825     .000361
              1.before_after |   .0473931   .0421871     1.12   0.262    -.0355656    .1303519
                             |
      before_after#c.distggw |
                          1  |   .0001488   .0002314     0.64   0.521    -.0003062    .0006037
                             |
                     1.rural |   .0010674   .0413312     0.03   0.979    -.0802082    .0823431
                             |
             rural#c.distggw |
                          1  |   .0004878   .0002222     2.20   0.029     .0000508    .0009248
                             |
          before_after#rural |
                        1 1  |   .0024533   .0487673     0.05   0.960    -.0934452    .0983517
                             |
```

```
before_after#rural#c.distggw |
                         1 1  |   -.000505    .000253    -2.00   0.047    -.0010026   -7.38e-06
                              |
              tot_livingchild |   .0001978   .0025532     0.08   0.938    -.0048229    .0052186
                    educ_year |   .0017952   .0016091     1.12   0.265    -.0013689    .0049594
            polygamy_presence |  -.0095644   .0085968    -1.11   0.267    -.0264695    .0073406
                        _cons |   .0183565   .0350531     0.52   0.601    -.0505735    .0872866
----------------------------------------------------------------------------------------------
```

Appendix 6. **Reg n010**

```
global ylist resp_other_moneydec
global xlist c.distggw##i.before_after##i.rural tot_livingchild educ_year polygamy_presence
reghdfe $ylist $xlist  [pw=weight], absorb (cluster_nb age resi_region marital_status)
cluster(cluster_nb)
(dropped 5 singleton observations)
(MWFE estimator converged in 17 iterations)

HDFE Linear regression                            Number of obs   =      5,772
Absorbing 4 HDFE groups                           F(  10,    367) =       0.94
Statistics robust to heteroskedasticity           Prob > F        =     0.4967
                                                  R-squared       =     0.1772
                                                  Adj R-squared   =     0.1119
                                                  Within R-sq.    =     0.0052
Number of clusters (cluster_nb) =        368      Root MSE        =     0.0682

                                           (Std. Err. adjusted for 368 clusters in cluster_nb)
----------------------------------------------------------------------------------------------
                              |               Robust
          resp_other_moneydec |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
------------------------------+---------------------------------------------------------------
                      distggw |  -.0000684   .0000536    -1.28   0.203    -.0001739    .0000371
               1.before_after |   -.029828   .0159826    -1.87   0.063     -.061257     .001601
                              |
       before_after#c.distggw |
                            1 |   .0001647   .0000802     2.05   0.041     7.03e-06    .0003223
                              |
                      1.rural |  -.0208313     .01175    -1.77   0.077    -.0439372    .0022746
                              |
              rural#c.distggw |
                            1 |   .0001213   .0000663     1.83   0.068    -9.04e-06    .0002516
                              |
           before_after#rural |
                          1 1 |   .0334646   .0201678     1.66   0.098    -.0061944    .0731235
                              |
 before_after#rural#c.distggw |
                          1 1 |   -.000217   .0001052    -2.06   0.040     -.000424   -.0000101
                              |
              tot_livingchild |  -.0007136   .0004473    -1.60   0.111    -.0015931    .0001659
                    educ_year |  -.0006559   .0006644    -0.99   0.324    -.0019625    .0006506
            polygamy_presence |   .0067813   .0040394     1.68   0.094     -.001162    .0147246
                        _cons |    .019922     .00871     2.29   0.023     .0027942    .0370497
----------------------------------------------------------------------------------------------
```

Appendix 7. **Reg 14**

```
global ylist husb_moneydec
global xlist c.distggw##i.before_after##i.rural tot_livingchild educ_year polygamy_presence
reghdfe $ylist $xlist  [pw=weight], absorb (cluster_nb age resi_region marital_status)
cluster(cluster_nb)
(dropped 5 singleton observations)
(MWFE estimator converged in 17 iterations)

HDFE Linear regression                            Number of obs   =      5,772
Absorbing 4 HDFE groups                           F(  10,    367) =       4.19
Statistics robust to heteroskedasticity           Prob > F        =     0.0000
                                                  R-squared       =     0.1471
                                                  Adj R-squared   =     0.0794
                                                  Within R-sq.    =     0.0123
Number of clusters (cluster_nb) =        368      Root MSE        =     0.2092

                                           (Std. Err. adjusted for 368 clusters in cluster_nb)
----------------------------------------------------------------------------------------------
                              |               Robust
                husb_moneydec |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
------------------------------+---------------------------------------------------------------
                      distggw |  -.0000949   .0002162    -0.44   0.661      -.00052    .0003302
               1.before_after |  -.0270739   .0516994    -0.52   0.601    -.1287381    .0745902
                              |
       before_after#c.distggw |
                            1 |   .0006253   .0002991     2.09   0.037     .0000372    .0012134
                              |
```

```
                  1.rural |  -.0346036   .0399704    -0.87   0.387    -.1132034    .0439963
                          |
        rural#c.distggw |
                      1  |   .0006388   .0002318     2.76   0.006      .000183    .0010945
                          |
       before_after#rural |
                    1 1  |   .1040326   .0657184     1.58   0.114    -.0251993    .2332645
                          |
before_after#rural#c.distggw |
                    1 1  |  -.0010989   .0003608    -3.05   0.002    -.0018084   -.0003894
                          |
         tot_livingchild |  -.0016197    .001527    -1.06   0.290    -.0046225    .0013832
               educ_year |  -.0028832    .001342    -2.15   0.032    -.0055223   -.0002442
       polygamy_presence |   .0026898   .0080398     0.33   0.738      -.01312    .0184996
                   _cons |    .030156   .0346906     0.87   0.385    -.0380612    .0983733
------------------------------------------------------------------------------------------------
```

Appendix 8. **Reg n021**

```
global ylist resp_healthdec
global xlist c.distggw##i.before_after tot_livingchild educ_year polygamy_presence worked
reghdfe $ylist $xlist  [pw=weight], absorb (cluster_nb age resi_region marital_status rural_urban)
cluster(cluster_nb)
(MWFE estimator converged in 18 iterations)

HDFE Linear regression                            Number of obs   =     15,115
Absorbing 5 HDFE groups                           F(   7,    374) =      17.95
Statistics robust to heteroskedasticity           Prob > F        =     0.0000
                                                  R-squared       =     0.1576
                                                  Adj R-squared   =     0.1329
                                                  Within R-sq.    =     0.0205
Number of clusters (cluster_nb) =        375      Root MSE        =     0.2937

                                     (Std. Err. adjusted for 375 clusters in cluster_nb)
---------------------------------------------------------------------------------------
                       |               Robust
        resp_healthdec |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-----------------------+---------------------------------------------------------------
               distggw |   .0003011    .000128     2.35   0.019     .0000494    .0005529
        1.before_after |  -.0057119   .0236107    -0.24   0.809    -.0521383    .0407145
                       |
before_after#c.distggw |
                    1  |  -.0003757   .0001488    -2.53   0.012    -.0006683   -.0000832
                       |
       tot_livingchild |  -.0045606   .0021193    -2.15   0.032    -.0087278   -.0003934
             educ_year |    .006319   .0014713     4.29   0.000      .003426     .009212
     polygamy_presence |   .0200827   .0086437     2.32   0.021     .0030863     .037079
                worked |   .0593308   .0085915     6.91   0.000     .0424372    .0762245
                 _cons |   .0536273   .0207844     2.58   0.010     .0127584    .0944963
---------------------------------------------------------------------------------------
```

Appendix 9. **Reg 023**

```
global ylist resp_healthdec global xlist c.distggw##i.before_after##i.aduage tot_livingchild educ_year
polygamy_presence workedreghdfe $ylist $xlist  [pw=weight], absorb (cluster_nb resi_region
marital_status rural_urban) cluster(cluster_nb)
(MWFE estimator converged in 13 iterations)

HDFE Linear regression                            Number of obs   =     15,115
Absorbing 4 HDFE groups                           F(  11,    374) =      23.13
Statistics robust to heteroskedasticity           Prob > F        =     0.0000
                                                  R-squared       =     0.1428
                                                  Adj R-squared   =     0.1196
                                                  Within R-sq.    =     0.0339
Number of clusters (cluster_nb) =        375      Root MSE        =     0.2960

                                            (Std. Err. adjusted for 375 clusters in cluster_nb)
----------------------------------------------------------------------------------------------
                              |               Robust
               resp_healthdec |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
------------------------------+---------------------------------------------------------------
                      distggw |  -.0001173   .0001688    -0.69   0.488    -.0004493    .0002147
               1.before_after |   -.018639    .029005    -0.64   0.521    -.0756724    .0383944
                              |
       before_after#c.distggw |
                           1  |   .0000891   .0001914     0.47   0.642    -.0002873    .0004656
                              |
                     1.aduage |  -.0100287   .0226574    -0.44   0.658    -.0545805     .034523
                              |
             aduage#c.distggw |
                           1  |   .0004038   .0001277     3.16   0.002     .0001526     .000655
                              |
          before_after#aduage |
                          1 1  |   .0057708   .0248965     0.23   0.817    -.0431839    .0547254
```

```
                            |
before_after#aduage#c.distggw |
                        1 1  |  -.0004443   .0001586    -2.80   0.005    -.0007561   -.0001324
                            |
            tot_livingchild |   .0064275   .0014958     4.30   0.000     .0034863    .0093687
                  educ_year |   .0067715   .0014982     4.52   0.000     .0038255    .0097176
          polygamy_presence |    .036244   .0083599     4.34   0.000     .0198057    .0526824
                     worked |   .0700764   .0086267     8.12   0.000     .0531135    .0870393
                      _cons |   .0213822    .027348     0.78   0.435     -.032393    .0751573
-----------------------------------------------------------------------------------------------
```

Appendix 10. **Reg 037**

```
global ylist other_healthdec
global xlist c.distggw##i.before_after tot_livingchild educ_year polygamy_presence worked reghdfe $ylist
$xlist  [pw=weight], absorb (cluster_nb age resi_region marital_status rural_urban) cluster(cluster_nb)
(MWFE estimator converged in 18 iterations)

HDFE Linear regression                            Number of obs   =     15,115
Absorbing 5 HDFE groups                           F(   7,    374) =      19.22
Statistics robust to heteroskedasticity           Prob > F        =     0.0000
                                                  R-squared       =     0.1651
                                                  Adj R-squared   =     0.1407
                                                  Within R-sq.    =     0.0204
Number of clusters (cluster_nb) =        375      Root MSE        =     0.2660

                                     (Std. Err. adjusted for 375 clusters in cluster_nb)
----------------------------------------------------------------------------------------
                       |               Robust
       other_healthdec |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-----------------------+----------------------------------------------------------------
               distggw |  -.0003083    .000113    -2.73   0.007    -.0005305   -.0000862
        1.before_after |  -.1609013   .0283006    -5.69   0.000    -.2165496   -.1052531
                       |
before_after#c.distggw |
                     1 |   .0004814   .0001441     3.34   0.001     .0001981    .0007647
                       |
       tot_livingchild |  -.0105345   .0017194    -6.13   0.000    -.0139155   -.0071536
             educ_year |  -.0021852   .0009415    -2.32   0.021    -.0040364     -.000334
     polygamy_presence |  -.0096442   .0070473    -1.37   0.172    -.0235016    .0042132
                worked |  -.0163877   .0067667    -2.42   0.016    -.0296933   -.0030822
                 _cons |   .2176863    .019746    11.02   0.000     .1788592    .2565135
----------------------------------------------------------------------------------------
```

Appendix 11. **Reg 038**

```
global ylist other_healthdec
global xlist c.distggw##i.before_after##i.rural tot_livingchild educ_year polygamy_presence worked
reghdfe $ylist $xlist  [pw=weight], absorb (cluster_nb age resi_region marital_status)
cluster(cluster_nb)
(MWFE estimator converged in 16 iterations)

HDFE Linear regression                            Number of obs   =     15,115
Absorbing 4 HDFE groups                           F(  11,    374) =      13.43
Statistics robust to heteroskedasticity           Prob > F        =     0.0000
                                                  R-squared       =     0.1656
                                                  Adj R-squared   =     0.1411
                                                  Within R-sq.    =     0.0212
Number of clusters (cluster_nb) =        375      Root MSE        =     0.2659

                                           (Std. Err. adjusted for 375 clusters in cluster_nb)
----------------------------------------------------------------------------------------------
                             |               Robust
             other_healthdec |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-----------------------------+----------------------------------------------------------------
                     distggw |  -.0001286   .0001163    -1.11   0.269    -.0003573        .0001
              1.before_after |   -.109476   .0303625    -3.61   0.000    -.1691786   -.0497734
                             |
      before_after#c.distggw |
                           1 |   .0000871   .0001671     0.52   0.602    -.0002414    .0004157
                             |
                     1.rural |   .0213724     .02701     0.79   0.429     -.031738    .0744828
                             |
             rural#c.distggw |
                           1 |  -.0002663   .0001513    -1.76   0.079    -.0005637    .0000312
                             |
          before_after#rural |
                         1 1 |  -.0752293   .0434064    -1.73   0.084    -.1605806    .0101219
                             |
before_after#rural#c.distggw |
                         1 1 |   .0005767   .0002012     2.87   0.004     .0001811    .0009722
                             |
             tot_livingchild |  -.0105224   .0017201    -6.12   0.000    -.0139047   -.0071401
```

```
             educ_year |  -.0021748   .0009329    -2.33   0.020    -.0040092   -.0003405
      polygamy_presence |  -.0096432     .00703    -1.37   0.171    -.0234665    .0041801
                 worked |  -.0165632   .0067704    -2.45   0.015     -.029876   -.0032503
                  _cons |   .2021946   .0218471     9.25   0.000      .159236    .2451532
----------------------------------------------------------------------------------------------
```

Appendix 12. **Reg 047**

```
global ylist resp_husb_largedec
global xlist c.distggw##i.before_after##i.aduage tot_livingchild educ_year polygamy_presence worked
reghdfe $ylist $xlist  [pw=weight], absorb (cluster_nb resi_region marital_status rural_urban)
cluster(cluster_nb)
(MWFE estimator converged in 13 iterations)

HDFE Linear regression                            Number of obs   =     15,115
Absorbing 4 HDFE groups                           F(  11,    374) =      21.25
Statistics robust to heteroskedasticity           Prob > F        =     0.0000
                                                  R-squared       =     0.1338
                                                  Adj R-squared   =     0.1104
                                                  Within R-sq.    =     0.0326
Number of clusters (cluster_nb) =        375      Root MSE        =     0.2926

                                            (Std. Err. adjusted for 375 clusters in cluster_nb)
-----------------------------------------------------------------------------------------------
                              |               Robust
           resp_husb_largedec |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
------------------------------+----------------------------------------------------------------
                      distggw |   .0002114   .0001865     1.13   0.258    -.0001552    .0005781
               1.before_after |   .1242373   .0447281     2.78   0.006     .0362872    .2121873
                              |
       before_after#c.distggw |
                            1 |  -.0008567   .0002762    -3.10   0.002    -.0013999   -.0003135
                              |
                     1.aduage |   .0044473   .0178467     0.25   0.803    -.0306452    .0395397
                              |
             aduage#c.distggw |
                            1 |  -.0000654   .0001113    -0.59   0.557    -.0002843    .0001535
                              |
          before_after#aduage |
                          1 1 |  -.0035972   .0314401    -0.11   0.909    -.0654187    .0582244
                              |
before_after#aduage#c.distggw |
                          1 1 |   .0004929    .000192     2.57   0.011     .0001153    .0008705
                              |
              tot_livingchild |   .0071552   .0014028     5.10   0.000     .0043969    .0099135
                    educ_year |   .0055176   .0014328     3.85   0.000     .0027002     .008335
            polygamy_presence |  -.0257445   .0062694    -4.11   0.000    -.0380722   -.0134168
                       worked |   .0787009   .0075231    10.46   0.000     .0639081    .0934938
                        _cons |  -.0052371   .0279918    -0.19   0.852    -.0602781    .0498038
-----------------------------------------------------------------------------------------------
```

Appendix 13. **Reg 053**

```
global ylist husb_largedec
global xlist c.distggw##i.before_after tot_livingchild educ_year polygamy_presence worked
reghdfe $ylist $xlist  [pw=weight], absorb (cluster_nb age resi_region marital_status rural_urban)
cluster(cluster_nb)
(MWFE estimator converged in 18 iterations)

HDFE Linear regression                            Number of obs   =     15,115
Absorbing 5 HDFE groups                           F(   7,    374) =      28.18
Statistics robust to heteroskedasticity           Prob > F        =     0.0000
                                                  R-squared       =     0.1456
                                                  Adj R-squared   =     0.1206
                                                  Within R-sq.    =     0.0238
Number of clusters (cluster_nb) =        375      Root MSE        =     0.4537

                                     (Std. Err. adjusted for 375 clusters in cluster_nb)
----------------------------------------------------------------------------------------
                       |               Robust
         husb_largedec |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-----------------------+----------------------------------------------------------------
               distggw |   .0005041   .0001596     3.16   0.002     .0001903     .000818
        1.before_after |   .1830057   .0419286     4.36   0.000     .1005603     .265451
                       |
before_after#c.distggw |
                     1 |  -.0007411   .0002563    -2.89   0.004    -.0012451   -.0002371
                       |
       tot_livingchild |     .02284   .0028592     7.99   0.000      .017218    .0284621
             educ_year |  -.0096218   .0018836    -5.11   0.000    -.0133255   -.0059181
     polygamy_presence |   .0446399   .0106456     4.19   0.000     .0237071    .0655727
                worked |   -.082623   .0123307    -6.70   0.000    -.1068691   -.0583768
```

```
                 _cons |    .495621   .0279383    17.74   0.000     .4406851    .5505569
------------------------------------------------------------------------------------------
```

Appendix 14. **Reg 057**

```
global ylist other_largedec
global xlist c.distggw##i.before_after tot_livingchild educ_year polygamy_presence worked
reghdfe $ylist $xlist  [pw=weight], absorb (cluster_nb age resi_region marital_status rural_urban)
cluster(cluster_nb)
(MWFE estimator converged in 18 iterations)

HDFE Linear regression                              Number of obs   =     15,115
Absorbing 5 HDFE groups                             F(   7,     374) =      38.18
Statistics robust to heteroskedasticity             Prob > F        =     0.0000
                                                    R-squared       =     0.1942
                                                    Adj R-squared   =     0.1706
                                                    Within R-sq.    =     0.0303
Number of clusters (cluster_nb) =        375        Root MSE        =     0.3482

                                     (Std. Err. adjusted for 375 clusters in cluster_nb)
------------------------------------------------------------------------------------------
                       |               Robust
        other_largedec |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-----------------------+------------------------------------------------------------------
               distggw |  -.0008297   .0001401    -5.92   0.000    -.0011051   -.0005543
        1.before_after |  -.2914899   .0356114    -8.19   0.000    -.3615135   -.2214663
                       |
before_after#c.distggw |
                     1 |   .0011527   .0002013     5.73   0.000     .0007568    .0015485
                       |
       tot_livingchild |  -.0214509   .0021147   -10.14   0.000     -.025609   -.0172927
             educ_year |   .0002781   .0013503     0.21   0.837    -.0023772    .0029333
     polygamy_presence |  -.0324782   .0080529    -4.03   0.000    -.0483127   -.0166436
                worked |  -.0182991   .0077793    -2.35   0.019    -.0335957   -.0030025
                 _cons |   .4333102    .023404    18.51   0.000     .3872903    .4793302
------------------------------------------------------------------------------------------
```

Appendix 15. **Reg 015**

```
global ylist resp_husb_visitsdec
global xlist c.distggw##i.before_after tot_livingchild educ_year polygamy_presence worked
reghdfe $ylist $xlist  [pw=weight], absorb (cluster_nb age resi_region marital_status rural_urban)
cluster(cluster_nb)
(MWFE estimator converged in 18 iterations)

HDFE Linear regression                              Number of obs   =     15,108
Absorbing 5 HDFE groups                             F(   7,     374) =      17.32
Statistics robust to heteroskedasticity             Prob > F        =     0.0000
                                                    R-squared       =     0.1414
                                                    Adj R-squared   =     0.1164
                                                    Within R-sq.    =     0.0162
Number of clusters (cluster_nb) =        375        Root MSE        =     0.3449

                                     (Std. Err. adjusted for 375 clusters in cluster_nb)
------------------------------------------------------------------------------------------
                       |               Robust
   resp_husb_visitsdec |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-----------------------+------------------------------------------------------------------
               distggw |   .0004209   .0001952     2.16   0.032      .000037    .0008048
        1.before_after |   .1503211   .0418744     3.59   0.000     .0679824    .2326598
                       |
before_after#c.distggw |
                     1 |   -.000899   .0002507    -3.59   0.000    -.0013919   -.0004061
                       |
       tot_livingchild |  -.0006014   .0020496    -0.29   0.769    -.0046315    .0034288
             educ_year |   .0064826   .0013648     4.75   0.000      .003799    .0091663
     polygamy_presence |  -.0192042   .0078576    -2.44   0.015    -.0346548   -.0037537
                worked |   .0748188   .0089301     8.38   0.000     .0572594    .0923783
                 _cons |   .0490423   .0307952     1.59   0.112    -.0115111    .1095957
------------------------------------------------------------------------------------------
```

Appendix 16. **Reg 074**

```
global ylist husb_visitsdec
global xlist c.distggw##i.before_after##i.rural tot_livingchild educ_year polygamy_presence worked
reghdfe $ylist $xlist  [pw=weight], absorb (cluster_nb age resi_region marital_status)
cluster(cluster_nb)
(MWFE estimator converged in 16 iterations)

HDFE Linear regression                              Number of obs   =     15,108
```

```
Absorbing 4 HDFE groups                           F(  11,    374) =      33.20
Statistics robust to heteroskedasticity           Prob > F        =     0.0000
                                                  R-squared       =     0.1723
                                                  Adj R-squared   =     0.1479
                                                  Within R-sq.    =     0.0408
Number of clusters (cluster_nb) =        375      Root MSE        =     0.4585

                                           (Std. Err. adjusted for 375 clusters in cluster_nb)
----------------------------------------------------------------------------------------------
                             |               Robust
              husb_visitsdec |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-----------------------------+----------------------------------------------------------------
                     distggw |  -.0003825   .0002824    -1.35   0.176    -.0009377    .0001728
              1.before_after |   .0221739   .0655979     0.34   0.736    -.1068131    .1511609
                             |
       before_after#c.distggw |
                           1 |   .0009398   .0004026     2.33   0.020     .0001482    .0017314
                             |
                     1.rural |  -.1382281   .0559158    -2.47   0.014    -.2481768   -.0282795
                             |
             rural#c.distggw |
                           1 |   .0009804   .0003212     3.05   0.002     .0003488    .0016119
                             |
          before_after#rural |
                         1 1 |   .2884659   .0772671     3.73   0.000     .1365335    .4403983
                             |
before_after#rural#c.distggw |
                         1 1 |  -.0017501    .000451    -3.88   0.000     -.002637   -.0008632
                             |
             tot_livingchild |   .0210539    .002645     7.96   0.000      .015853    .0262548
                   educ_year |  -.0113709   .0018201    -6.25   0.000    -.0149499   -.0077919
           polygamy_presence |   .0217222   .0110654     1.96   0.050     -.000036    .0434805
                      worked |   -.095714   .0116363    -8.23   0.000    -.1185947   -.0728333
                       _cons |   .5410438   .0483119    11.20   0.000     .4460469    .6360407
----------------------------------------------------------------------------------------------
```

Appendix 17. **Reg 077**

```
global ylist other_visitsdec
global xlist c.distggw##i.before_after tot_livingchild educ_year polygamy_presence worked
reghdfe $ylist $xlist  [pw=weight], absorb (cluster_nb age resi_region marital_status rural_urban)
cluster(cluster_nb)
(MWFE estimator converged in 18 iterations)

HDFE Linear regression                            Number of obs   =     15,108
Absorbing 5 HDFE groups                           F(   7,    374) =      32.92
Statistics robust to heteroskedasticity           Prob > F        =     0.0000
                                                  R-squared       =     0.1994
                                                  Adj R-squared   =     0.1760
                                                  Within R-sq.    =     0.0313
Number of clusters (cluster_nb) =        375      Root MSE        =     0.2962

                                     (Std. Err. adjusted for 375 clusters in cluster_nb)
----------------------------------------------------------------------------------------
                       |               Robust
       other_visitsdec |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-----------------------+----------------------------------------------------------------
               distggw |   -.000724   .0001235    -5.86   0.000    -.0009668   -.0004813
        1.before_after |  -.2729567   .0309341    -8.82   0.000    -.3337833     -.21213
                       |
before_after#c.distggw |
                     1 |   .0010056   .0001615     6.23   0.000      .000688    .0013231
                       |
       tot_livingchild |  -.0145087   .0017063    -8.50   0.000    -.0178639   -.0111534
             educ_year |  -.0003443   .0011778    -0.29   0.770    -.0026603    .0019716
     polygamy_presence |  -.0186817   .0066251    -2.82   0.005    -.0317088   -.0056546
                worked |  -.0080941   .0069379    -1.17   0.244    -.0217362     .005548
                 _cons |   .3310533   .0207127    15.98   0.000     .2903254    .3717812
----------------------------------------------------------------------------------------
```

Appendix 18. **Reg 081**

```
global ylist yes_gooutbeating
global xlist c.distggw##i.before_after tot_livingchild educ_year polygamy_presence worked
reghdfe $ylist $xlist  [pw=weight], absorb (cluster_nb age resi_region marital_status rural_urban)
cluster
> (cluster_nb)
(MWFE estimator converged in 18 iterations)

HDFE Linear regression                            Number of obs   =     15,114
Absorbing 5 HDFE groups                           F(   7,    374) =      21.00
Statistics robust to heteroskedasticity           Prob > F        =     0.0000
                                                  R-squared       =     0.2015
```

```
                                                  Adj R-squared   =     0.1782
                                                  Within R-sq.    =     0.0191
Number of clusters (cluster_nb) =        375      Root MSE        =     0.4527

                                     (Std. Err. adjusted for 375 clusters in cluster_nb)
----------------------------------------------------------------------------------------
                       |               Robust
     yes_gooutbeating |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-----------------------+----------------------------------------------------------------
              distggw |  -.0003846   .0002265    -1.70   0.090      -.00083    .0000608
       1.before_after |  -.1757109   .0468462    -3.75   0.000    -.2678257    -.083596
                       |
before_after#c.distggw |
                    1  |   .0008652   .0002966     2.92   0.004      .000282    .0014484
                       |
      tot_livingchild |   .0108984   .0027736     3.93   0.000     .0054447    .0163522
            educ_year |  -.0176638   .0018901    -9.35   0.000    -.0213804   -.0139471
     polygamy_presence |    .017349   .0117989     1.47   0.142    -.0058515    .0405496
               worked |   .0120972   .0112293     1.08   0.282    -.0099832    .0341776
                _cons |    .587214   .0356485    16.47   0.000     .5171174    .6573106
----------------------------------------------------------------------------------------
```

Appendix 19. **Reg 085**

```
global ylist yes_childneglbeating
global xlist c.distggw##i.before_after tot_livingchild educ_year polygamy_presence worked
reghdfe $ylist $xlist  [pw=weight], absorb (cluster_nb age resi_region marital_status rural_urban)
cluster (cluster_nb)
(MWFE estimator converged in 18 iterations)

HDFE Linear regression                            Number of obs   =     15,115
Absorbing 5 HDFE groups                           F(   7,    374) =      16.58
Statistics robust to heteroskedasticity           Prob > F        =     0.0000
                                                  R-squared       =     0.1862
                                                  Adj R-squared   =     0.1625
                                                  Within R-sq.    =     0.0138
Number of clusters (cluster_nb) =        375      Root MSE        =     0.4576

                                     (Std. Err. adjusted for 375 clusters in cluster_nb)
----------------------------------------------------------------------------------------
                       |               Robust
  yes_childneglbeating |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-----------------------+----------------------------------------------------------------
              distggw |  -.0005716   .0002588    -2.21   0.028    -.0010805   -.0000626
       1.before_after |  -.1963681   .0552358    -3.56   0.000    -.3049797   -.0877564
                       |
before_after#c.distggw |
                    1  |   .0009875   .0003399     2.90   0.004     .0003191    .0016559
                       |
      tot_livingchild |   .0075301   .0028306     2.66   0.008     .0019641     .013096
            educ_year |  -.0148245   .0016747    -8.85   0.000    -.0181176   -.0115314
     polygamy_presence |   .0115592    .011876     0.97   0.331    -.0117929    .0349112
               worked |   .0160708   .0114214     1.41   0.160    -.0063874     .038529
                _cons |   .5989769   .0409134    14.64   0.000     .5185277     .679426
----------------------------------------------------------------------------------------
```

Appendix 20. **Reg 089**

```
global ylist yes_arguebeating
global xlist c.distggw##i.before_after tot_livingchild educ_year polygamy_presence worked
reghdfe $ylist $xlist  [pw=weight], absorb (cluster_nb age resi_region marital_status rural_urban)
cluster(cluster_nb)
(MWFE estimator converged in 18 iterations)

HDFE Linear regression                            Number of obs   =     15,111
Absorbing 5 HDFE groups                           F(   7,    374) =      16.60
Statistics robust to heteroskedasticity           Prob > F        =     0.0000
                                                  R-squared       =     0.1905
                                                  Adj R-squared   =     0.1669
                                                  Within R-sq.    =     0.0148
Number of clusters (cluster_nb) =        375      Root MSE        =     0.4562

                                     (Std. Err. adjusted for 375 clusters in cluster_nb)
----------------------------------------------------------------------------------------
                       |               Robust
     yes_arguebeating |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-----------------------+----------------------------------------------------------------
              distggw |  -.0008123   .0002632    -3.09   0.002    -.0013299   -.0002947
       1.before_after |  -.1683393   .0535961    -3.14   0.002    -.2737268   -.0629518
                       |
before_after#c.distggw |
                    1  |   .0010611   .0003334     3.18   0.002     .0004055    .0017167
                       |
```

```
       tot_livingchild |   .0064645   .0030712     2.10   0.036     .0004256    .0125034
             educ_year |  -.0160908   .0016822    -9.57   0.000    -.0193985   -.0127831
     polygamy_presence |   .0148609   .0114962     1.29   0.197    -.0077444    .0374662
                worked |   .0002946   .0113407     0.03   0.979     -.022005    .0225941
                 _cons |   .6431509   .0412435    15.59   0.000     .5620528    .7242491
--------------------------------------------------------------------------------------
```

Appendix 21. **Reg 093**

```
global ylist yes_sexrefusalbeating
global xlist c.distggw##i.before_after tot_livingchild educ_year polygamy_presence worked
reghdfe $ylist $xlist  [pw=weight], absorb (cluster_nb age resi_region marital_status rural_urban)
cluster(cluster_nb)
(MWFE estimator converged in 18 iterations)

HDFE Linear regression                            Number of obs   =     15,114
Absorbing 5 HDFE groups                           F(   7,    374) =      26.47
Statistics robust to heteroskedasticity           Prob > F        =     0.0000
                                                  R-squared       =     0.2086
                                                  Adj R-squared   =     0.1855
                                                  Within R-sq.    =     0.0206
Number of clusters (cluster_nb) =        375      Root MSE        =     0.4512

                                 (Std. Err. adjusted for 375 clusters in cluster_nb)
--------------------------------------------------------------------------------------
                       |               Robust
 yes_sexrefusalbeating |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-----------------------+--------------------------------------------------------------
               distggw |  -.0011601   .0002174    -5.34   0.000    -.0015875   -.0007327
        1.before_after |  -.1962466   .0454358    -4.32   0.000    -.2855883   -.1069049
                       |
before_after#c.distggw |
                     1 |   .0015722   .0002854     5.51   0.000     .0010111    .0021333
                       |
       tot_livingchild |   .0088822   .0026015     3.41   0.001     .0037669    .0139975
             educ_year |  -.0169859   .0017226    -9.86   0.000    -.0203731   -.0135987
     polygamy_presence |   .0093616   .0108378     0.86   0.388    -.0119492    .0306723
                worked |   .0094807   .0107819     0.88   0.380      -.01172    .0306815
                 _cons |   .6686436   .0339889    19.67   0.000     .6018104    .7354769
--------------------------------------------------------------------------------------
```

Appendix 22. **Reg 097**

```
global ylist yes_foodbbeating
global xlist c.distggw##i.before_after tot_livingchild educ_year polygamy_presence worked
reghdfe $ylist $xlist  [pw=weight], absorb (cluster_nb age resi_region marital_status rural_urban)
cluster(cluster_nb)
(MWFE estimator converged in 18 iterations)

HDFE Linear regression                            Number of obs   =     15,113
Absorbing 5 HDFE groups                           F(   7,    374) =       7.63
Statistics robust to heteroskedasticity           Prob > F        =     0.0000
                                                  R-squared       =     0.1438
                                                  Adj R-squared   =     0.1188
                                                  Within R-sq.    =     0.0066
Number of clusters (cluster_nb) =        375      Root MSE        =     0.3934

                                 (Std. Err. adjusted for 375 clusters in cluster_nb)
--------------------------------------------------------------------------------------
                       |               Robust
      yes_foodbbeating |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-----------------------+--------------------------------------------------------------
               distggw |  -.0004833   .0002363    -2.05   0.042    -.0009479   -.0000187
        1.before_after |  -.1592512   .0553607    -2.88   0.004    -.2681084   -.0503941
                       |
before_after#c.distggw |
                     1 |    .000849   .0003374     2.52   0.012     .0001856    .0015123
                       |
       tot_livingchild |   .0071192    .002772     2.57   0.011     .0016684    .0125699
             educ_year |  -.0071842    .001194    -6.02   0.000    -.0095321   -.0048364
     polygamy_presence |   .0006117   .0089806     0.07   0.946     -.017047    .0182705
                worked |  -.0061968   .0094849    -0.65   0.514    -.0248472    .0124535
                 _cons |   .3062914   .0384161     7.97   0.000     .2307527      .38183
--------------------------------------------------------------------------------------
```

Appendix 23. **Reg 108**

```
global ylist neverused_contraceptive
global xlist c.distggw##i.before_after tot_livingchild educ_year worked
```

```
reghdfe $ylist $xlist  [pw=weight], absorb (cluster_nb age resi_region marital_status rural_urban)
cluster(cluster_nb)
(MWFE estimator converged in 18 iterations)

HDFE Linear regression                            Number of obs   =     22,288
Absorbing 5 HDFE groups                           F(   6,    374) =      78.47
Statistics robust to heteroskedasticity           Prob > F        =     0.0000
                                                  R-squared       =     0.2561
                                                  Adj R-squared   =     0.2414
                                                  Within R-sq.    =     0.0452
Number of clusters (cluster_nb) =        375      Root MSE        =     0.3400

                                     (Std. Err. adjusted for 375 clusters in cluster_nb)
----------------------------------------------------------------------------------------
                       |               Robust
neverused_contracept~e |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-----------------------+----------------------------------------------------------------
               distggw |  -.0004475   .0001178    -3.80   0.000    -.0006791    -.000216
        1.before_after |   .0169292    .028561     0.59   0.554    -.0392311    .0730895
                       |
before_after#c.distggw |
                     1 |   .0003333   .0001655     2.01   0.045     7.86e-06    .0006587
                       |
       tot_livingchild |  -.0339701   .0023503   -14.45   0.000    -.0385917   -.0293486
             educ_year |  -.0153235   .0011168   -13.72   0.000    -.0175194   -.0131276
                worked |  -.0346946   .0068495    -5.07   0.000    -.0481629   -.0212262
                 _cons |   .9909146   .0192131    51.58   0.000     .9531355    1.028694
----------------------------------------------------------------------------------------
```

Appendix 24. **Reg 112**

```
global ylist used_moderncontraceptive
global xlist c.distggw##i.before_after tot_livingchild educ_year polygamy_presence worked
reghdfe $ylist $xlist  [pw=weight], absorb (cluster_nb age resi_region marital_status rural_urban)
cluster(cluster_nb)
(MWFE estimator converged in 18 iterations)

HDFE Linear regression                            Number of obs   =     15,119
Absorbing 5 HDFE groups                           F(   7,    374) =      65.50
Statistics robust to heteroskedasticity           Prob > F        =     0.0000
                                                  R-squared       =     0.2605
                                                  Adj R-squared   =     0.2389
                                                  Within R-sq.    =     0.0552
Number of clusters (cluster_nb) =        375      Root MSE        =     0.3659

                                     (Std. Err. adjusted for 375 clusters in cluster_nb)
----------------------------------------------------------------------------------------
                       |               Robust
used_moderncontracep~e |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-----------------------+----------------------------------------------------------------
               distggw |   .0003939   .0001393     2.83   0.005     .0001199    .0006679
        1.before_after |   .0214392   .0372034     0.58   0.565    -.0517148    .0945933
                       |
before_after#c.distggw |
                     1 |  -.0006982   .0002129    -3.28   0.001    -.0011168   -.0002796
                       |
       tot_livingchild |   .0331061   .0027704    11.95   0.000     .0276585    .0385536
             educ_year |   .0221246   .0017345    12.76   0.000     .0187141    .0255351
     polygamy_presence |  -.0199212   .0095211    -2.09   0.037    -.0386427   -.0011997
                worked |   .0372525   .0093885     3.97   0.000     .0187917    .0557134
                 _cons |   .0384297   .0253314     1.52   0.130    -.0113801    .0882395
----------------------------------------------------------------------------------------
```

Appendix 25. **Reg 108**

```
global ylist polygamy_presence
global xlist c.distggw##i.before_after##i.aduage tot_livingchild educ_year worked
reghdfe $ylist $xlist  [pw=weight], absorb (cluster_nb resi_region marital_status rural_urban)
cluster(cluster_nb)
(MWFE estimator converged in 13 iterations)

HDFE Linear regression                            Number of obs   =     15,119
Absorbing 4 HDFE groups                           F(  10,    374) =      90.30
Statistics robust to heteroskedasticity           Prob > F        =     0.0000
                                                  R-squared       =     0.1469
                                                  Adj R-squared   =     0.1239
                                                  Within R-sq.    =     0.0643
Number of clusters (cluster_nb) =        375      Root MSE        =     0.4506

                                             (Std. Err. adjusted for 375 clusters in cluster_nb)
------------------------------------------------------------------------------------------------
                               |               Robust
             polygamy_presence |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------------------------+----------------------------------------------------------------
```

```
                      distggw |   .0002645    .000257     1.03   0.304    -.0002409    .0007699
               1.before_after |  -.0243843   .0701209    -0.35   0.728     -.162265    .1134964
                              |
         before_after#c.distggw |
                            1 |  -.0005014   .0004422    -1.13   0.258     -.001371    .0003682
                              |
                     1.aduage |   .2358338   .0430742     5.48   0.000     .1511359    .3205317
                              |
               aduage#c.distggw |
                            1 |  -.0005997    .000215    -2.79   0.006    -.0010225   -.0001769
                              |
           before_after#aduage |
                          1 1 |  -.1438412   .0563878    -2.55   0.011     -.254718   -.0329644
                              |
before_after#aduage#c.distggw |
                          1 1 |   .0010035   .0003777     2.66   0.008     .0002607    .0017462
                              |
              tot_livingchild |   .0371274   .0020947    17.72   0.000     .0330086    .0412462
                    educ_year |  -.0074468   .0017616    -4.23   0.000    -.0109106    -.003983
                       worked |   .0722166   .0101327     7.13   0.000     .0522925    .0921408
                        _cons |   .0766954   .0483435     1.59   0.113    -.0183638    .1717546
-----------------------------------------------------------------------------------------------
```

Appendix 26. **BH correction 2005-2012**

No regression	p-value	rank	p-adj	No Appendix	No regression	p-value	rank	p-adj
57	0	1	0	14	49	0.404	60	0.781067
65	0	2	0	15	58	0.408	61	0.775869
74	0	3	0	16	78	0.408	62	0.763355
77	0	4	0	17	9	0.414	63	0.762286
93	0	5	0	21	86	0.414	64	0.750375
2	0.001	6	0.019333	4	90	0.418	65	0.745969
37	0.001	7	0.016571	10	82	0.423	66	0.743455
112	0.001	8	0.0145	24	62	0.432	67	0.74794
14	0.002	9	0.025778	7	8	0.44	68	0.750588
89	0.002	10	0.0232	20	95	0.445	69	0.748116
38	0.004	11	0.042182	11	11	0.449	70	0.744057
53	0.004	12	0.038667	13	75	0.461	71	0.753183
81	0.004	13	0.035692	18	28	0.497	72	0.800722
85	0.004	14	0.033143	19	67	0.5	73	0.794521
23	0.005	15	0.038667	9	84	0.522	74	0.81827
107	0.008	16	0.058		17	0.533	75	0.824373
21	0.012	17	0.081882		33	0.542	76	0.827263
97	0.012	18	0.077333		102	0.549	77	0.827065
47	0.023	19	0.140421		116	0.556	78	0.826872
10	0.04	20	0.232		41	0.566	79	0.831089
108	0.045	21	0.248571		31	0.572	80	0.8294
6	0.047	22	0.247818		16	0.591	81	0.84637
46	0.055	23	0.277391		13	0.623	82	0.881317
110	0.059	24	0.285167		104	0.625	83	0.873494
99	0.064	25	0.29696		63	0.633	84	0.874143
114	0.071	26	0.316769		100	0.652	85	0.889788
70	0.074	27	0.317926		30	0.669	86	0.902372
66	0.09	28	0.372857		42	0.677	87	0.902667
91	0.113	29	0.452		51	0.682	88	0.899
39	0.115	30	0.444667		111	0.69	89	0.899326
103	0.128	31	0.478968		87	0.717	90	0.924133
50	0.129	32	0.467625		96	0.721	91	0.919077
35	0.13	33	0.45697		43	0.746	92	0.940609
45	0.135	34	0.460588		64	0.753	93	0.939226
94	0.135	35	0.447429		68	0.775	94	0.956383
54	0.136	36	0.438222		7	0.784	95	0.957305
105	0.138	37	0.432649		24	0.797	96	0.963042
34	0.146	38	0.445684		113	0.821	97	0.981814

52	0.18	39	0.535385		26	0.832	98	0.984816
27	0.185	40	0.5365		36	0.84	99	0.984242
32	0.192	41	0.54322		88	0.848	100	0.98368
83	0.198	42	0.546857		61	0.855	101	0.98198
60	0.21	43	0.566512		19	0.86	102	0.978039
80	0.21	44	0.553636		109	0.887	103	0.998951
69	0.212	45	0.546489		25	0.889	104	0.991577
56	0.216	46	0.544696		59	0.894	105	0.987657
55	0.23	47	0.56766		79	0.894	106	0.97834
29	0.239	48	0.577583		15	0.895	107	0.97028
72	0.246	49	0.582367		92	0.92	108	0.988148
20	0.254	50	0.58928		98	0.939	109	0.999303
48	0.263	51	0.598196		18	0.94	110	0.991273
1	0.272	52	0.606769		3	0.943	111	0.985477
101	0.275	53	0.601887		44	0.96	112	0.994286
12	0.336	54	0.721778		4	0.97	113	0.995752
71	0.336	55	0.708655		22	0.994	114	1.011439
76	0.365	56	0.756071		106	0.995	115	1.003652
5	0.383	57	0.779439		115	0.998	116	0.998
40	0.4	58	0.8					
73	0.4	59	0.786441					

8.2 Women empowerment 2005-2019

Appendix 27. **Reg 001**

```
global ylist resp_moneydec
global xlist c.distggw##i.before_after tot_livingchild educ_year polygamy_presence
reghdfe $ylist $xlist  [pw=weight], absorb (cluster_nb age resi_region marital_status rural_urban)
cluster(cluster_nb)
(dropped 5 singleton observations)
(MWFE estimator converged in 18 iterations)

HDFE Linear regression                            Number of obs   =      5,814
Absorbing 5 HDFE groups                           F(   6,     368) =       4.61
Statistics robust to heteroskedasticity           Prob > F        =     0.0002
                                                  R-squared       =     0.1757
                                                  Adj R-squared   =     0.1112
                                                  Within R-sq.    =     0.0106
Number of clusters (cluster_nb) =        369      Root MSE        =     0.3317

                                     (Std. Err. adjusted for 369 clusters in cluster_nb)
----------------------------------------------------------------------------------------
                       |               Robust
         resp_moneydec |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-----------------------+----------------------------------------------------------------
               distggw |  -.0010286   .0002704    -3.80   0.000    -.0015604   -.0004969
        1.before_after |  -.1599525    .063466    -2.52   0.012     -.284754   -.0351509
                       |
before_after#c.distggw |
                     1 |   .0007826   .0003718     2.10   0.036     .0000514    .0015138
                       |
       tot_livingchild |   .0015703   .0031484     0.50   0.618    -.0046208    .0077614
             educ_year |  -.0005515   .0009043    -0.61   0.542    -.0023297    .0012268
     polygamy_presence |    .038301   .0127815     3.00   0.003     .0131671     .063435
                 _cons |   1.010651   .0457899    22.07   0.000     .9206083    1.100694
----------------------------------------------------------------------------------------
```

Appendix 28. **Reg 004**

```
global ylist resp_moneydec
global xlist c.distggw##i.before_after##i.married tot_livingchild educ_year polygamy_presence educ_year
reghdfe $ylist $xlist  [pw=weight], absorb (cluster_nb age resi_region rural_urban) cluster(cluster_nb)
(dropped 5 singleton observations)
(MWFE estimator converged in 17 iterations)
note: educ_year omitted because of collinearity

HDFE Linear regression                            Number of obs   =      5,814
Absorbing 4 HDFE groups                           F(  10,     368) =       5.09
Statistics robust to heteroskedasticity           Prob > F        =     0.0000
                                                  R-squared       =     0.1764
                                                  Adj R-squared   =     0.1114
```

```
                                                   Within R-sq.     =     0.0116
Number of clusters (cluster_nb) =        369      Root MSE         =     0.3316

                                             (Std. Err. adjusted for 369 clusters in cluster_nb)
------------------------------------------------------------------------------------------------
                               |               Robust
                 resp_moneydec |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------------------------+----------------------------------------------------------------
                       distggw |   -.000322    .000526    -0.61   0.541    -.0013564    .0007123
                1.before_after |   .3268135   .1598005     2.05   0.042     .0125768    .6410503
                               |
        before_after#c.distggw |
                            1  |  -.0012822   .0007411    -1.73   0.084    -.0027395    .0001751
                               |
                     1.married |   .1832106   .1280507     1.43   0.153    -.0685924    .4350136
                               |
             married#c.distggw |
                            1  |  -.0007334   .0004478    -1.64   0.102     -.001614    .0001472
                               |
          before_after#married |
                          1 1  |  -.4906911   .1528594    -3.21   0.001    -.7912786   -.1901036
                               |
before_after#married#c.distggw |
                          1 1  |   .0020884   .0007024     2.97   0.003     .0007072    .0034696
                               |
               tot_livingchild |   .0016038   .0031456     0.51   0.610    -.0045818    .0077894
                     educ_year |  -.0005556   .0009041    -0.61   0.539    -.0023335    .0012222
              polygamy_presence |    .038529   .0127532     3.02   0.003     .0134506    .0636073
                     educ_year |          0  (omitted)
                         _cons |   .8320109   .1353653     6.15   0.000     .5658244    1.098197
------------------------------------------------------------------------------------------------
```

Appendix 29. **Reg 017**

```
global ylist other_moneydec
global xlist c.distggw##i.before_after tot_livingchild educ_year polygamy_presence
reghdfe $ylist $xlist  [pw=weight], absorb (cluster_nb age resi_region marital_status rural_urban)
cluster(cluster_nb)
(dropped 5 singleton observations)
(MWFE estimator converged in 18 iterations)

HDFE Linear regression                             Number of obs    =      5,814
Absorbing 5 HDFE groups                            F(   6,    368) =       5.59
Statistics robust to heteroskedasticity            Prob > F         =     0.0000
                                                   R-squared        =     0.1524
                                                   Adj R-squared    =     0.0860
                                                   Within R-sq.     =     0.0052
Number of clusters (cluster_nb) =        369      Root MSE         =     0.1179

                                     (Std. Err. adjusted for 369 clusters in cluster_nb)
----------------------------------------------------------------------------------------
                       |               Robust
        other_moneydec |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-----------------------+----------------------------------------------------------------
               distggw |   .0002234   .0000959     2.33   0.020     .0000349    .0004119
        1.before_after |   .0317751   .0186977     1.70   0.090    -.0049928    .0685429
                       |
before_after#c.distggw |
                    1  |  -.0002839   .0001183    -2.40   0.017    -.0005166   -.0000513
                       |
       tot_livingchild |  -.0027768   .0007549    -3.68   0.000    -.0042613   -.0012923
             educ_year |  -.0001706    .000366    -0.47   0.641    -.0008903     .000549
     polygamy_presence |  -.0027739   .0033459    -0.83   0.408    -.0093533    .0038056
                 _cons |  -.0017877   .0162854    -0.11   0.913    -.0338118    .0302364
----------------------------------------------------------------------------------------
```

Appendix 30. **Reg 024**

```
global ylist resp_healthdec
global xlist c.distggw##i.before_after##i.married tot_livingchild educ_year polygamy_presence worked
reghdfe $ylist $xlist  [pw=weight], absorb (cluster_nb age resi_region rural_urban) cluster(cluster_nb)
(MWFE estimator converged in 16 iterations)

HDFE Linear regression                             Number of obs    =     15,717
Absorbing 4 HDFE groups                            F(  11,    375) =      15.47
Statistics robust to heteroskedasticity            Prob > F         =     0.0000
                                                   R-squared        =     0.1519
                                                   Adj R-squared    =     0.1278
                                                   Within R-sq.     =     0.0222
Number of clusters (cluster_nb) =        376      Root MSE         =     0.2883

                                             (Std. Err. adjusted for 376 clusters in cluster_nb)
------------------------------------------------------------------------------------------------
                               |               Robust
```

```
                resp_healthdec |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------------------------+----------------------------------------------------------------
                       distggw |   .0007408   .0003718     1.99   0.047     9.66e-06    .0014719
                1.before_after |   .0170562   .1026078     0.17   0.868    -.1847025    .2188149
                               |
        before_after#c.distggw |
                             1 |  -.0011151   .0004942    -2.26   0.025    -.0020868   -.0001435
                               |
                     1.married |   .0475007   .0868456     0.55   0.585    -.1232646     .218266
                               |
             married#c.distggw |
                             1 |  -.0006062   .0003551    -1.71   0.089    -.0013045    .0000921
                               |
          before_after#married |
                           1 1 |  -.0865523   .1016545    -0.85   0.395    -.2864366    .1133321
                               |
before_after#married#c.distggw |
                           1 1 |   .0010062   .0004741     2.12   0.034      .000074    .0019384
                               |
               tot_livingchild |  -.0056702   .0021181    -2.68   0.008    -.0098351   -.0015053
                     educ_year |   .0007305   .0004949     1.48   0.141    -.0002427    .0017037
             polygamy_presence |   .0136007   .0081598     1.67   0.096     -.002444    .0296455
                        worked |   .0509579   .0077591     6.57   0.000     .0357011    .0662146
                         _cons |   .0525153   .0865443     0.61   0.544    -.1176577    .2226883
------------------------------------------------------------------------------------------------
```

Appendix 31. **Reg 033**

```
global ylist husb_healthdec
global xlist c.distggw##i.before_after tot_livingchild educ_year polygamy_presence worked
reghdfe $ylist $xlist  [pw=weight], absorb (cluster_nb age resi_region marital_status rural_urban)
cluster(cluster_nb)
(MWFE estimator converged in 16 iterations)

HDFE Linear regression                            Number of obs   =     15,717
Absorbing 5 HDFE groups                           F(   7,    375) =      18.23
Statistics robust to heteroskedasticity           Prob > F        =     0.0000
                                                  R-squared       =     0.1464
                                                  Adj R-squared   =     0.1224
                                                  Within R-sq.    =     0.0153
Number of clusters (cluster_nb) =        376      Root MSE        =     0.4240

                                     (Std. Err. adjusted for 376 clusters in cluster_nb)
----------------------------------------------------------------------------------------
                       |               Robust
        husb_healthdec |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-----------------------+----------------------------------------------------------------
               distggw |   .0003911   .0001871     2.09   0.037     .0000233    .0007589
        1.before_after |   .1678242   .0418313     4.01   0.000     .0855709    .2500776
                       |
before_after#c.distggw |
                     1 |  -.0005837    .000253    -2.31   0.022    -.0010813   -.0000862
                       |
       tot_livingchild |   .0132547   .0026491     5.00   0.000     .0080457    .0184637
             educ_year |   .0002799   .0006627     0.42   0.673    -.0010231    .0015829
     polygamy_presence |   .0132959   .0108486     1.23   0.221    -.0080359    .0346277
                worked |  -.0856736   .0113953    -7.52   0.000    -.1080803   -.0632669
                 _cons |   .6187891   .0311722    19.85   0.000     .5574948    .6800834
----------------------------------------------------------------------------------------
```

Appendix 32. **Reg 036**

```
global ylist husb_healthdec
global xlist c.distggw##i.before_after##i.married tot_livingchild educ_year polygamy_presence worked
reghdfe $ylist $xlist  [pw=weight], absorb (cluster_nb age resi_region rural_urban) cluster(cluster_nb)
(MWFE estimator converged in 16 iterations)

HDFE Linear regression                            Number of obs   =     15,717
Absorbing 4 HDFE groups                           F(  11,    375) =      52.31
Statistics robust to heteroskedasticity           Prob > F        =     0.0000
                                                  R-squared       =     0.1470
                                                  Adj R-squared   =     0.1228
                                                  Within R-sq.    =     0.0332
Number of clusters (cluster_nb) =        376      Root MSE        =     0.4239

                                             (Std. Err. adjusted for 376 clusters in cluster_nb)
------------------------------------------------------------------------------------------------
                               |               Robust
                husb_healthdec |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------------------------+----------------------------------------------------------------
                       distggw |   .0000395   .0003469     0.11   0.909    -.0006427    .0007217
                1.before_after |   .6717135   .1285856     5.22   0.000     .4188744    .9245526
                               |
        before_after#c.distggw |
```

```
                         1  |   .0004457   .0005464     0.82   0.415    -.0006287    .0015201
                            |
                 1.married  |   .3646548   .0898087     4.06   0.000      .188063    .5412465
                            |
         married#c.distggw  |
                         1  |   .0003644   .0003154     1.16   0.249    -.0002557    .0009845
                            |
      before_after#married  |
                       1 1  |  -.5037103   .1254102    -4.02   0.000    -.7503057   -.2571149
                            |
before_after#married#c.distggw |
                       1 1  |  -.0010366   .0005154    -2.01   0.045    -.0020499   -.0000232
                            |
           tot_livingchild  |   .0132222   .0026487     4.99   0.000      .008014    .0184303
                 educ_year  |    .000308   .0006643     0.46   0.643    -.0009981    .0016141
         polygamy_presence  |   .0133253   .0108481     1.23   0.220    -.0080054    .0346559
                    worked  |  -.0857633   .0113799    -7.54   0.000    -.1081396   -.0633869
                     _cons  |   .2601576   .0916436     2.84   0.005     .0799578    .4403575
-----------------------------------------------------------------------------------------------
```

Appendix 33. **Reg 046**

```
global ylist resp_husb_largedec
global xlist c.distggw##i.before_after##i.rural tot_livingchild educ_year polygamy_presence worked
reghdfe $ylist $xlist  [pw=weight], absorb (cluster_nb age resi_region marital_status)
cluster(cluster_nb)
(MWFE estimator converged in 15 iterations)

HDFE Linear regression                            Number of obs   =     15,717
Absorbing 4 HDFE groups                           F(  11,    375) =      15.30
Statistics robust to heteroskedasticity           Prob > F        =     0.0000
                                                  R-squared       =     0.1364
                                                  Adj R-squared   =     0.1119
                                                  Within R-sq.    =     0.0258
Number of clusters (cluster_nb) =        376      Root MSE        =     0.2918

                                          (Std. Err. adjusted for 376 clusters in cluster_nb)
---------------------------------------------------------------------------------------------
                            |               Robust
         resp_husb_largedec |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
----------------------------+----------------------------------------------------------------
                    distggw |   .0000441   .0001714     0.26   0.797     -.000293    .0003812
             1.before_after |   .1790746   .0460723     3.89   0.000     .0884821    .2696671
                            |
       before_after#c.distggw |
                          1 |  -.0005733   .0002586    -2.22   0.027    -.0010817   -.0000649
                            |
                    1.rural |    .032674   .0381465     0.86   0.392     -.042334    .1076819
                            |
            rural#c.distggw |
                          1 |  -.0001707   .0001935    -0.88   0.378    -.0005512    .0002097
                            |
         before_after#rural |
                        1 1 |  -.1639301   .0622166    -2.63   0.009    -.2862673    -.041593
                            |
before_after#rural#c.distggw |
                        1 1 |   .0006995   .0003256     2.15   0.032     .0000593    .0013397
                            |
            tot_livingchild |   .0005022   .0020491     0.25   0.807     -.003527    .0045314
                  educ_year |    .000142   .0004286     0.33   0.741    -.0007008    .0009847
          polygamy_presence |   -.037238   .0070006    -5.32   0.000    -.0510034   -.0234727
                     worked |     .07853   .0074708    10.51   0.000       .06384      .09322
                      _cons |   .0456548   .0314621     1.45   0.148    -.0162094     .107519
---------------------------------------------------------------------------------------------
```

Appendix 34. **Reg 054**

```
global ylist husb_largedec
global xlist c.distggw##i.before_after##i.rural tot_livingchild educ_year polygamy_presence worked
reghdfe $ylist $xlist  [pw=weight], absorb (cluster_nb age resi_region marital_status)
cluster(cluster_nb)
(MWFE estimator converged in 15 iterations)

HDFE Linear regression                            Number of obs   =     15,717
Absorbing 4 HDFE groups                           F(  11,    375) =      17.29
Statistics robust to heteroskedasticity           Prob > F        =     0.0000
                                                  R-squared       =     0.1355
                                                  Adj R-squared   =     0.1110
                                                  Within R-sq.    =     0.0233
Number of clusters (cluster_nb) =        376      Root MSE        =     0.4589

                                          (Std. Err. adjusted for 376 clusters in cluster_nb)
---------------------------------------------------------------------------------------------
                            |               Robust
              husb_largedec |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
```

```
------------------------------+----------------------------------------------------------------
                      distggw |   .0000376     .00027     0.14   0.889    -.0004934    .0005685
               1.before_after |  -.1017807   .0639021    -1.59   0.112     -.227432    .0238705
                              |
        before_after#c.distggw |
                            1  |   .0008661   .0003661     2.37   0.019     .0001462     .001586
                              |
                      1.rural |  -.0589416   .0585882    -1.01   0.315    -.1741442     .056261
                              |
              rural#c.distggw |
                            1  |   .0006889   .0002967     2.32   0.021     .0001055    .0012724
                              |
           before_after#rural |
                          1 1  |   .1963385   .0851989     2.30   0.022      .028811    .3638659
                              |
before_after#rural#c.distggw |
                          1 1  |  -.0013413   .0004317    -3.11   0.002    -.0021901   -.0004925
                              |
              tot_livingchild |   .0267958   .0029128     9.20   0.000     .0210683    .0325234
                    educ_year |  -.0023806   .0007438    -3.20   0.001    -.0038432    -.000918
            polygamy_presence |   .0491003   .0117739     4.17   0.000     .0259493    .0722514
                       worked |  -.0820264   .0113489    -7.23   0.000    -.1043419   -.0597109
                        _cons |   .5278875   .0465818    11.33   0.000     .4362932    .6194819
-----------------------------------------------------------------------------------------------
```

Appendix 35. **Reg 060**

```
global ylist other_largedec
goobal xlist c.distggw##i.before_after##i.married tot_livingchild educ_year polygamy_presence worked
reghdfe $ylist $xlist  [pw=weight], absorb (cluster_nb age resi_region rural_urban) cluster(cluster_nb)
(MWFE estimator converged in 16 iterations)

HDFE Linear regression                            Number of obs   =     15,717
Absorbing 4 HDFE groups                           F(  11,    375) =      34.56
Statistics robust to heteroskedasticity           Prob > F        =     0.0000
                                                  R-squared       =     0.1960
                                                  Adj R-squared   =     0.1733
                                                  Within R-sq.    =     0.0403
Number of clusters (cluster_nb) =        376      Root MSE        =     0.3597

                                             (Std. Err. adjusted for 376 clusters in cluster_nb)
------------------------------------------------------------------------------------------------
                               |               Robust
                other_largedec |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------------------------+----------------------------------------------------------------
                       distggw |  -.0000911   .0004058    -0.22   0.822     -.000889    .0007068
                1.before_after |   .0635675   .3204986     0.20   0.843    -.5666322    .6937672
                               |
         before_after#c.distggw |
                             1  |  -.0034546   .0016112    -2.14   0.033    -.0066229   -.0002864
                               |
                     1.married |  -.3402695   .1044318    -3.26   0.001    -.5456149   -.1349241
                               |
             married#c.distggw |
                             1  |  -.0003335   .0003573    -0.93   0.351    -.0010361    .0003691
                               |
          before_after#married |
                           1 1  |  -.1531229   .3163693    -0.48   0.629     -.775203    .4689572
                               |
before_after#married#c.distggw |
                           1 1  |      .0037   .0015935     2.32   0.021     .0005665    .0068334
                               |
               tot_livingchild |  -.0230176   .0021269   -10.82   0.000    -.0271997   -.0188355
                     educ_year |   .0012025   .0005465     2.20   0.028     .0001279    .0022772
             polygamy_presence |  -.0281868   .0089403    -3.15   0.002    -.0457662   -.0106074
                        worked |  -.0224911   .0074982    -3.00   0.003    -.0372348   -.0077473
                         _cons |    .696765   .1109242     6.28   0.000     .4786536    .9148764
------------------------------------------------------------------------------------------------
```

Appendix 36. **Reg 066**

```
global ylist resp_husb_visitsdec
global xlist c.distggw##i.before_after##i.rural tot_livingchild educ_year polygamy_presence worked
reghdfe $ylist $xlist  [pw=weight], absorb (cluster_nb age resi_region marital_status)
cluster(cluster_nb)
(MWFE estimator converged in 16 iterations)

HDFE Linear regression                            Number of obs   =     15,710
Absorbing 4 HDFE groups                           F(  11,    375) =       7.19
Statistics robust to heteroskedasticity           Prob > F        =     0.0000
                                                  R-squared       =     0.1305
                                                  Adj R-squared   =     0.1058
                                                  Within R-sq.    =     0.0092
Number of clusters (cluster_nb) =        376      Root MSE        =     0.3344
```

```
                                      (Std. Err. adjusted for 376 clusters in cluster_nb)
---------------------------------------------------------------------------------------------
                             |               Robust
           resp_husb_visitsdec |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-----------------------------+---------------------------------------------------------------
                     distggw |   .0005434   .0002138     2.54   0.011     .0001229    .0009639
              1.before_after |   .1524623   .0553982     2.75   0.006     .0435322    .2613924
                             |
        before_after#c.distggw |
                           1 |  -.0008968   .0003189    -2.81   0.005    -.0015239   -.0002698
                             |
                     1.rural |   .0643589   .0437773     1.47   0.142    -.0217208    .1504386
                             |
               rural#c.distggw |
                           1 |  -.0003492    .000217    -1.61   0.108    -.0007759    .0000775
                             |
           before_after#rural |
                         1 1 |  -.1781883   .0701887    -2.54   0.012    -.3162011   -.0401755
                             |
before_after#rural#c.distggw |
                         1 1 |   .0007769   .0003844     2.02   0.044      .000021    .0015327
                             |
             tot_livingchild |   .0005731   .0023597     0.24   0.808    -.0040667     .005213
                   educ_year |   .0006103   .0004974     1.23   0.221    -.0003677    .0015883
           polygamy_presence |  -.0135439   .0076891    -1.76   0.079    -.0286631    .0015753
                      worked |   .0591599   .0079824     7.41   0.000     .0434641    .0748558
                       _cons |   .0345477   .0392352     0.88   0.379    -.0426008    .1116963
---------------------------------------------------------------------------------------------
```

Appendix 37. **Reg 074**

```
global ylist husb_visitsdec
global xlist c.distggw##i.before_after##i.rural tot_livingchild educ_year polygamy_presence worked
reghdfe $ylist $xlist  [pw=weight], absorb (cluster_nb age resi_region marital_status)
cluster(cluster_nb)
(MWFE estimator converged in 16 iterations)

HDFE Linear regression                            Number of obs   =     15,710
Absorbing 4 HDFE groups                           F(  11,    375) =      31.89
Statistics robust to heteroskedasticity           Prob > F        =     0.0000
                                                  R-squared       =     0.1938
                                                  Adj R-squared   =     0.1710
                                                  Within R-sq.    =     0.0493
Number of clusters (cluster_nb) =        376      Root MSE        =     0.4474

                                      (Std. Err. adjusted for 376 clusters in cluster_nb)
---------------------------------------------------------------------------------------------
                             |               Robust
              husb_visitsdec |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-----------------------------+---------------------------------------------------------------
                     distggw |  -.0002962   .0002592    -1.14   0.254    -.0008059    .0002135
              1.before_after |    .103045   .0653042     1.58   0.115    -.0253633    .2314534
                             |
        before_after#c.distggw |
                           1 |    .000874   .0003791     2.31   0.022     .0001285    .0016195
                             |
                     1.rural |  -.0904618    .059827    -1.51   0.131    -.2081003    .0271767
                             |
               rural#c.distggw |
                           1 |   .0006902   .0002948     2.34   0.020     .0001105    .0012699
                             |
           before_after#rural |
                         1 1 |   .1779136   .0932672     1.91   0.057    -.0054787    .3613059
                             |
before_after#rural#c.distggw |
                         1 1 |  -.0010713   .0004602    -2.33   0.020    -.0019762   -.0001664
                             |
             tot_livingchild |   .0181947   .0026322     6.91   0.000     .0130189    .0233704
                   educ_year |  -.0017331   .0007031    -2.46   0.014    -.0031157   -.0003505
           polygamy_presence |   .0093249   .0106196     0.88   0.380    -.0115566    .0302065
                      worked |  -.0808938   .0115031    -7.03   0.000    -.1035124   -.0582752
                       _cons |   .5287575   .0459055    11.52   0.000      .438493    .6190219
---------------------------------------------------------------------------------------------
```

Appendix 38. **Reg 076**

```
global ylist husb_visitsdec
global xlist c.distggw##i.before_after##i.married tot_livingchild educ_year polygamy_presence worked
reghdfe $ylist $xlist  [pw=weight], absorb (cluster_nb age resi_region rural_urban) cluster(cluster_nb)
(MWFE estimator converged in 16 iterations)

HDFE Linear regression                            Number of obs   =     15,710
Absorbing 4 HDFE groups                           F(  11,    375) =      75.02
Statistics robust to heteroskedasticity           Prob > F        =     0.0000
                                                  R-squared       =     0.1935
```

```
                                              Adj R-squared   =     0.1706
                                              Within R-sq.    =     0.0622
Number of clusters (cluster_nb) =        376      Root MSE        =     0.4475

                                          (Std. Err. adjusted for 376 clusters in cluster_nb)
------------------------------------------------------------------------------------------------
                               |               Robust
                husb_visitsdec |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------------------------+----------------------------------------------------------------
                       distggw |  -.0001204    .000304    -0.40   0.692    -.0007181    .0004774
                1.before_after |  -.2374027   .2844122    -0.83   0.404    -.7966452    .3218399
                               |
        before_after#c.distggw |
                            1  |   .0045102   .0013258     3.40   0.001     .0019032    .0071171
                               |
                     1.married |    .304473   .0567566     5.36   0.000      .192872    .4160741
                               |
             married#c.distggw |
                            1  |   .0003149   .0002652     1.19   0.236    -.0002067    .0008364
                               |
          before_after#married |
                          1 1  |   .4612376   .2838975     1.62   0.105     -.096993    1.019468
                               |
before_after#married#c.distggw |
                          1 1  |  -.0043687   .0013131    -3.33   0.001    -.0069505   -.0017868
                               |
              tot_livingchild |   .0182248   .0026358     6.91   0.000     .0130419    .0234077
                    educ_year |  -.0017352   .0007042    -2.46   0.014      -.00312   -.0003505
            polygamy_presence |    .009683   .0105945     0.91   0.361    -.0111491    .0305151
                       worked |  -.0811147   .0115461    -7.03   0.000    -.1038178   -.0584115
                        _cons |   .1651018   .0615095     2.68   0.008     .0441551    .2860485
------------------------------------------------------------------------------------------------
```

Appendix 39. **Reg 080**

```
global ylist other_largedec
global xlist c.distggw##i.before_after##i.married tot_livingchild educ_year polygamy_presence worked
reghdfe $ylist $xlist  [pw=weight], absorb (cluster_nb age resi_region  rural_urban) cluster(cluster_nb)
(MWFE estimator converged in 16 iterations)

HDFE Linear regression                            Number of obs   =     15,717
Absorbing 4 HDFE groups                           F(  11,    375) =      34.56
Statistics robust to heteroskedasticity           Prob > F        =     0.0000
                                                  R-squared       =     0.1960
                                                  Adj R-squared   =     0.1733
                                                  Within R-sq.    =     0.0403
Number of clusters (cluster_nb) =        376      Root MSE        =     0.3597

                                          (Std. Err. adjusted for 376 clusters in cluster_nb)
------------------------------------------------------------------------------------------------
                               |               Robust
                other_largedec |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------------------------+----------------------------------------------------------------
                       distggw |  -.0000911   .0004058    -0.22   0.822     -.000889    .0007068
                1.before_after |   .0635675   .3204986     0.20   0.843    -.5666322    .6937672
                               |
        before_after#c.distggw |
                            1  |  -.0034546   .0016112    -2.14   0.033    -.0066229   -.0002864
                               |
                     1.married |  -.3402695   .1044318    -3.26   0.001    -.5456149   -.1349241
                               |
             married#c.distggw |
                            1  |  -.0003335   .0003573    -0.93   0.351    -.0010361    .0003691
                               |
          before_after#married |
                          1 1  |  -.1531229   .3163693    -0.48   0.629     -.775203    .4689572
                               |
before_after#married#c.distggw |
                          1 1  |      .0037   .0015935     2.32   0.021     .0005665    .0068334
                               |
              tot_livingchild |  -.0230176   .0021269   -10.82   0.000    -.0271997   -.0188355
                    educ_year |   .0012025   .0005465     2.20   0.028     .0001279    .0022772
            polygamy_presence |  -.0281868   .0089403    -3.15   0.002    -.0457662   -.0106074
                       worked |  -.0224911   .0074982    -3.00   0.003    -.0372348   -.0077473
                        _cons |    .696765   .1109242     6.28   0.000     .4786536    .9148764
------------------------------------------------------------------------------------------------
```

Appendix 40. **Reg 081**

```
global ylist yes_gooutbeating
global xlist c.distggw##i.before_after tot_livingchild educ_year polygamy_presence worked
reghdfe $ylist $xlist  [pw=weight], absorb (cluster_nb age resi_region marital_status rural_urban)
cluster(cluster_nb)
(MWFE estimator converged in 16 iterations)
```

```
HDFE Linear regression                            Number of obs   =     15,716
Absorbing 5 HDFE groups                           F(   7,    375) =      33.02
Statistics robust to heteroskedasticity           Prob > F        =     0.0000
                                                  R-squared       =     0.2323
                                                  Adj R-squared   =     0.2107
                                                  Within R-sq.    =     0.0385
Number of clusters (cluster_nb) =        376      Root MSE        =     0.4426

                                     (Std. Err. adjusted for 376 clusters in cluster_nb)
----------------------------------------------------------------------------------------
                       |               Robust
      yes_gooutbeating |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-----------------------+----------------------------------------------------------------
               distggw |  -.0005686    .000263    -2.16   0.031    -.0010857   -.0000516
        1.before_after |  -.3895716    .056863    -6.85   0.000    -.5013819   -.2777613
                       |
before_after#c.distggw |
                     1 |   .0012534   .0003569     3.51   0.000     .0005516    .0019551
                       |
       tot_livingchild |   .0134138   .0026519     5.06   0.000     .0081994    .0186283
             educ_year |  -.0041173   .0008226    -5.01   0.000    -.0057348   -.0024999
     polygamy_presence |   .0234602   .0109454     2.14   0.033     .0019383    .0449822
                worked |  -.0157601   .0107525    -1.47   0.144    -.0369028    .0053827
                 _cons |   .6009811   .0413666    14.53   0.000     .5196416    .6823206
----------------------------------------------------------------------------------------
```

Appendix 41. **Reg 085**

```
global ylist yes_childneglbeating
global xlist c.distggw##i.before_after tot_livingchild educ_year polygamy_presence worked
reghdfe $ylist $xlist  [pw=weight], absorb (cluster_nb age resi_region marital_status rural_urban)
cluster(cluster_nb)
(MWFE estimator converged in 16 iterations)

HDFE Linear regression                            Number of obs   =     15,717
Absorbing 5 HDFE groups                           F(   7,    375) =      25.63
Statistics robust to heteroskedasticity           Prob > F        =     0.0000
                                                  R-squared       =     0.2243
                                                  Adj R-squared   =     0.2025
                                                  Within R-sq.    =     0.0283
Number of clusters (cluster_nb) =        376      Root MSE        =     0.4441

                                     (Std. Err. adjusted for 376 clusters in cluster_nb)
----------------------------------------------------------------------------------------
                       |               Robust
  yes_childneglbeating |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-----------------------+----------------------------------------------------------------
               distggw |  -.0007053   .0002667    -2.64   0.009    -.0012297   -.0001808
        1.before_after |  -.3762384   .0551378    -6.82   0.000    -.4846563   -.2678204
                       |
before_after#c.distggw |
                     1 |   .0013506   .0003481     3.88   0.000     .0006661     .002035
                       |
       tot_livingchild |   .0097559   .0028973     3.37   0.001     .0040589    .0154529
             educ_year |  -.0032931   .0008125    -4.05   0.000    -.0048907   -.0016955
     polygamy_presence |   .0201599   .0113332     1.78   0.076    -.0021248    .0424445
                worked |   -.011163   .0111857    -1.00   0.319    -.0331575    .0108315
                 _cons |    .607225    .040606    14.95   0.000     .5273811    .6870689
----------------------------------------------------------------------------------------
```

Appendix 42. **Reg 088**

```
global ylist yes_childneglbeating
global xlist c.distggw##i.before_after##i.married tot_livingchild educ_year polygamy_presence worked
reghdfe $ylist $xlist  [pw=weight], absorb (cluster_nb age resi_region  rural_urban) cluster(cluster_nb)
(MWFE estimator converged in 16 iterations)

HDFE Linear regression                            Number of obs   =     15,717
Absorbing 4 HDFE groups                           F(  11,    375) =      23.25
Statistics robust to heteroskedasticity           Prob > F        =     0.0000
                                                  R-squared       =     0.2246
                                                  Adj R-squared   =     0.2026
                                                  Within R-sq.    =     0.0287
Number of clusters (cluster_nb) =        376      Root MSE        =     0.4441

                                             (Std. Err. adjusted for 376 clusters in cluster_nb)
------------------------------------------------------------------------------------------------
                               |               Robust
          yes_childneglbeating |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------------------------+----------------------------------------------------------------
                       distggw |  -.0012805   .0004678    -2.74   0.006    -.0022003   -.0003607
                1.before_after |  -.8736663   .1576145    -5.54   0.000    -1.183585   -.5637474
                               |
        before_after#c.distggw |
                             1 |   .0055336    .000721     7.67   0.000     .0041159    .0069513
```

```
                              |
                    1.married |  -.1512978   .1212008    -1.25   0.213    -.3896163    .0870206
                              |
            married#c.distggw |
                            1  |    .000594   .0003913     1.52   0.130    -.0001755    .0013635
                              |
         before_after#married |
                          1 1  |   .4995953   .1496091     3.34   0.001     .2054174    .7937732
                              |
before_after#married#c.distggw |
                          1 1  |  -.0041989    .000638    -6.58   0.000    -.0054534   -.0029443
                              |
               tot_livingchild |   .0097716    .002895     3.38   0.001     .0040792    .0154639
                     educ_year |  -.0032703   .0008123    -4.03   0.000    -.0048676   -.0016731
             polygamy_presence |   .0202499   .0113316     1.79   0.075    -.0020317    .0425314
                        worked |  -.0114266    .011198    -1.02   0.308    -.0334454    .0105922
                         _cons |   .7554487   .1267311     5.96   0.000     .5062561    1.004641
-----------------------------------------------------------------------------------------------
```

Appendix 43. **Reg 089**

```
global ylist yes_arguebeating
global xlist c.distggw##i.before_after tot_livingchild educ_year polygamy_presence worked
reghdfe $ylist $xlist  [pw=weight], absorb (cluster_nb age resi_region marital_status rural_urban)
cluster(cluster_nb)
(MWFE estimator converged in 16 iterations)

HDFE Linear regression                            Number of obs   =     15,713
Absorbing 5 HDFE groups                           F(   7,    375) =      15.36
Statistics robust to heteroskedasticity           Prob > F        =     0.0000
                                                  R-squared       =     0.2172
                                                  Adj R-squared   =     0.1952
                                                  Within R-sq.    =     0.0234
Number of clusters (cluster_nb) =        376      Root MSE        =     0.4470

                                 (Std. Err. adjusted for 376 clusters in cluster_nb)
------------------------------------------------------------------------------------
                      |               Robust
     yes_arguebeating |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
----------------------+-------------------------------------------------------------
              distggw |  -.0009593   .0003017    -3.18   0.002    -.0015525    -.000366
       1.before_after |  -.3663006   .0697049    -5.26   0.000    -.5033621   -.2292391
                      |
before_after#c.distggw |
                    1  |   .0014547   .0004435     3.28   0.001     .0005826    .0023267
                      |
      tot_livingchild |   .0097463   .0029842     3.27   0.001     .0038784    .0156142
            educ_year |  -.0029793   .0007415    -4.02   0.000    -.0044374   -.0015212
    polygamy_presence |   .0231975   .0113733     2.04   0.042     .0008341    .0455609
               worked |   -.017865   .0116408    -1.53   0.126    -.0407544    .0050244
                _cons |   .6458228   .0466201    13.85   0.000     .5541533    .7374923
------------------------------------------------------------------------------------
```

Appendix 44. **Reg 093**

```
global ylist yes_sexrefusalbeating
global xlist c.distggw##i.before_after tot_livingchild educ_year polygamy_presence worked
reghdfe $ylist $xlist  [pw=weight], absorb (cluster_nb age resi_region marital_status rural_urban)
cluster(cluster_nb)
(MWFE estimator converged in 16 iterations)

HDFE Linear regression                            Number of obs   =     15,716
Absorbing 5 HDFE groups                           F(   7,    375) =      24.01
Statistics robust to heteroskedasticity           Prob > F        =     0.0000
                                                  R-squared       =     0.2239
                                                  Adj R-squared   =     0.2020
                                                  Within R-sq.    =     0.0233
Number of clusters (cluster_nb) =        376      Root MSE        =     0.4444

                                 (Std. Err. adjusted for 376 clusters in cluster_nb)
------------------------------------------------------------------------------------
                      |               Robust
 yes_sexrefusalbeating |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
----------------------+-------------------------------------------------------------
              distggw |  -.0013389   .0002634    -5.08   0.000    -.0018568    -.000821
       1.before_after |  -.3965052   .0591336    -6.71   0.000    -.5127802   -.2802302
                      |
before_after#c.distggw |
                    1  |   .0019302   .0003837     5.03   0.000     .0011758    .0026846
                      |
      tot_livingchild |   .0114241   .0025624     4.46   0.000     .0063856    .0164627
            educ_year |  -.0047357   .0006996    -6.77   0.000    -.0061112   -.0033601
    polygamy_presence |   .0173589   .0112181     1.55   0.123    -.0046994    .0394172
               worked |  -.0175428   .0102434    -1.71   0.088    -.0376845    .0025989
                _cons |   .6867227   .0400995    17.13   0.000     .6078747    .7655707
```

```
------------------------------------------------------------------------------------------
```

Appendix 45. **Reg 100**

```
global ylist yes_foodbbeating
global xlist c.distggw##i.before_after##i.married tot_livingchild educ_year polygamy_presence worked
reghdfe $ylist $xlist  [pw=weight], absorb (cluster_nb age resi_region rural_urban) cluster(cluster_nb)
(MWFE estimator converged in 16 iterations)

HDFE Linear regression                            Number of obs   =     15,715
Absorbing 4 HDFE groups                           F(  11,     375) =      18.37
Statistics robust to heteroskedasticity           Prob > F        =     0.0000
                                                  R-squared       =     0.1632
                                                  Adj R-squared   =     0.1395
                                                  Within R-sq.    =     0.0065
Number of clusters (cluster_nb) =        376      Root MSE        =     0.3924

                             (Std. Err. adjusted for 376 clusters in cluster_nb)
------------------------------------------------------------------------------------------------
                             |               Robust
            yes_foodbbeating |      Coef.   Std. Err.      t    P>|t|      [95% Conf. Interval]
-----------------------------+------------------------------------------------------------------
                     distggw |  -.0000962   .0003706    -0.26   0.795     -.0008249    .0006326
              1.before_after |  -.3763716   .0992646    -3.79   0.000     -.5715566   -.1811867
                             |
        before_after#c.distggw |
                           1 |   .0044132   .0005213     8.47   0.000      .0033881    .0054383
                             |
                   1.married |   .0368204   .0865564     0.43   0.671     -.1333763    .2070171
                             |
             married#c.distggw |
                           1 |  -.0002786   .0003007    -0.93   0.355     -.0008699    .0003126
                             |
         before_after#married |
                         1 1 |   .2688444    .093673     2.87   0.004      .0846542    .4530347
                             |
 before_after#married#c.distggw |
                         1 1 |  -.0037424     .00045    -8.32   0.000     -.0046272   -.0028577
                             |
             tot_livingchild |   .0098889   .0027119     3.65   0.000      .0045564    .0152215
                   educ_year |  -.0030103   .0005753    -5.23   0.000     -.0041414   -.0018792
           polygamy_presence |   .0072222   .0089458     0.81   0.420      -.010368    .0248123
                      worked |  -.0100914   .0100036    -1.01   0.314     -.0297616    .0095788
                       _cons |   .2448177   .0912185     2.68   0.008      .0654539    .4241815
------------------------------------------------------------------------------------------------
```

Appendix 46. **BH Correction 2005-2012**

No regression	p-value	rank	p-adj	Appendix	No regression	p-value	rank	p-adj
81	0	1	0	40	72	0.3	58	0.6
85	0	2	0	41	6	0.306	59	0.601627
88	0	3	0	42	15	0.286	55	0.6032
93	0	4	0	44	115	0.297	57	0.604421
100	0	5	0	45	27	0.334	64	0.605375
89	0.001	7	0.016571	43	113	0.344	65	0.613908
76	0.001	6	0.019333	38	91	0.35	66	0.615152
54	0.002	9	0.025778	34	43	0.368	69	0.618667
1	0.002	8	0.029	27	3	0.368	68	0.627765
33	0.022	15	0.170133		57	0.363	67	0.628478
80	0.021	14	0.174		50	0.394	70	0.652914
60	0.021	13	0.187385		52	0.403	71	0.658423
4	0.018	11	0.189818		62	0.426	75	0.65888
74	0.02	12	0.193333		63	0.439	77	0.661351
17	0.017	10	0.1972		44	0.434	76	0.662421
24	0.034	17	0.232		41	0.424	74	0.664649
46	0.032	16	0.232		111	0.459	80	0.66555
36	0.045	19	0.274737		56	0.419	73	0.665808
66	0.044	18	0.283556		105	0.466	81	0.667358
78	0.078	31	0.291871		16	0.416	72	0.670222
37	0.073	29	0.292		90	0.458	79	0.672506
110	0.071	28	0.294143		7	0.477	82	0.67478
25	0.069	27	0.296444		71	0.483	83	0.675036

23	0.057	22	0.300545		31	0.454	78	0.675179
58	0.078	30	0.3016		83	0.505	84	0.697381
77	0.06	23	0.302609		102	0.523	86	0.705442
97	0.068	26	0.303385		21	0.532	87	0.709333
10	0.056	21	0.309333		94	0.523	85	0.713741
61	0.054	20	0.3132		116	0.544	88	0.717091
34	0.068	25	0.31552		109	0.554	89	0.722067
8	0.067	24	0.323833		45	0.576	92	0.726261
101	0.109	38	0.332737		18	0.564	90	0.726933
92	0.099	34	0.337765		69	0.573	91	0.730418
98	0.108	37	0.338595		73	0.611	96	0.738292
26	0.094	32	0.34075		106	0.599	94	0.739191
96	0.107	36	0.344778		68	0.606	95	0.739958
107	0.116	39	0.345026		49	0.596	93	0.743398
20	0.099	33	0.348		55	0.627	97	0.749814
84	0.106	35	0.351314		75	0.654	98	0.774122
35	0.126	40	0.3654		11	0.742	101	0.852198
28	0.137	42	0.378381		108	0.735	100	0.8526
2	0.147	45	0.378933		19	0.75	102	0.852941
39	0.144	44	0.379636		103	0.73	99	0.855354
86	0.136	41	0.38478		42	0.768	103	0.864932
65	0.143	43	0.385767		47	0.777	104	0.866654
13	0.203	47	0.501021		40	0.799	105	0.882705
95	0.2	46	0.504348		22	0.812	106	0.888604
14	0.212	48	0.512333		79	0.909	112	0.941464
114	0.219	49	0.518449		9	0.92	113	0.944425
38	0.224	50	0.51968		30	0.88	108	0.945185
12	0.231	51	0.525412		29	0.898	110	0.946982
64	0.241	53	0.527472		53	0.892	109	0.949284
51	0.24	52	0.535385		59	0.909	111	0.949946
87	0.265	54	0.569259		112	0.877	107	0.950766
48	0.316	63	0.581841		67	0.971	116	0.971
5	0.312	62	0.583742		104	0.967	115	0.975409
82	0.309	61	0.587607		70	0.966	114	0.982947
32	0.287	56	0.5945					
99	0.308	60	0.595467					

8.3 Children's school attendance

Appendix 47. **Reg 011**

```
global ylist chnever_attsch
global xlist c.lndistggw##i.before_after##i.rural##i.female mean_adhhdeduc nb_adhhd parents_alive
reghdfe $ylist $xlist [pw=weight], absorb (cluster_nb resi_region year_birth) cluster(cluster_nb)
(MWFE estimator converged in 14 iterations)

HDFE Linear regression                          Number of obs   =     52,929
Absorbing 3 HDFE groups                         F(  18,    375) =      51.89
Statistics robust to heteroskedasticity         Prob > F        =     0.0000
                                                R-squared       =     0.3019
                                                Adj R-squared   =     0.2962
                                                Within R-sq.    =     0.0814
Number of clusters (cluster_nb) =        376    Root MSE        =     0.4165

                                  (Std. Err. adjusted for 376 clusters in cluster_nb)
------------------------------------------------------------------------------------------------------
                              |               Robust
               chnever_attsch |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
------------------------------+-----------------------------------------------------------------------
                   lndistggw  |  -.0633398   .0259509    -2.44   0.015    -.1143674   -.0123123
               1.before_after |  -.2624845   .1857522    -1.41   0.158    -.6277311     .102762
                              |
      before_after#c.lndistggw |
                           1  |   .0030174   .0383611     0.08   0.937    -.0724125    .0784473
                              |
                     1.rural  |   .0964055   .1582359     0.61   0.543    -.2147354    .4075464
                              |
```

```
                rural#c.lndistggw |
                                1  |   .0013401   .0324703     0.04   0.967    -.0625065    .0651867
                                   |
               before_after#rural |
                              1 1  |   .2481659    .221098     1.12   0.262    -.1865813    .6829131
                                   |
    before_after#rural#c.lndistggw |
                              1 1  |  -.0344539   .0458608    -0.75   0.453    -.1246304    .0557226
                                   |
                          1.female |  -.2037968   .0603994    -3.37   0.001    -.3225608   -.0850328
                                   |
               female#c.lndistggw |
                                1  |   .0460581   .0123216     3.74   0.000       .02183    .0702861
                                   |
              before_after#female |
                              1 1  |   .1097897   .1076132     1.02   0.308    -.1018113    .3213907
                                   |
   before_after#female#c.lndistggw |
                              1 1  |  -.0285476   .0220768    -1.29   0.197    -.0719574    .0148622
                                   |
                     rural#female |
                              1 1  |   .0919739    .082025     1.12   0.263    -.0693126    .2532604
                                   |
         rural#female#c.lndistggw |
                              1 1  |  -.0164286     .01665    -0.99   0.324    -.0491676    .0163104
                                   |
        before_after#rural#female |
                            1 1 1  |  -.3046587   .1341298    -2.27   0.024    -.5683996   -.0409179
                                   |
before_after#rural#female#c.lndistggw |
                            1 1 1  |    .055768   .0276004     2.02   0.044     .0014972    .1100389
                                   |
                   mean_adhhdeduc |   -.041586   .0021469   -19.37   0.000    -.0458074   -.0373645
                         nb_adhhd |   .0022373       .001     2.24   0.026      .000271    .0042037
                    parents_alive |   -.028702   .0095243    -3.01   0.003    -.0474297   -.0099743
                            _cons |   .8948892   .1273239     7.03   0.000     .6445311    1.145247
------------------------------------------------------------------------------------------------------
```

Appendix 48. **Reg 022**

```
global ylist chenteredsch
global xlist c.lndistggw##i.before_after##i.rural##i.female mean_adhhdeduc
reghdfe $ylist $xlist [pw=weight], absorb (cluster_nb resi_region year_birth) cluster(cluster_nb)
(MWFE estimator converged in 14 iterations)

HDFE Linear regression                            Number of obs   =     52,929
Absorbing 3 HDFE groups                           F(  16,    375) =      20.95
Statistics robust to heteroskedasticity           Prob > F        =     0.0000
                                                  R-squared       =     0.0908
                                                  Adj R-squared   =     0.0834
                                                  Within R-sq.    =     0.0141
Number of clusters (cluster_nb) =        376      Root MSE        =     0.2322

                                    (Std. Err. adjusted for 376 clusters in cluster_nb)
------------------------------------------------------------------------------------------------------
                                   |               Robust
                      chenteredsch |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-----------------------------------+------------------------------------------------------------------
                        lndistggw |   .0182252   .0076841     2.37   0.018     .0031159    .0333345
                   1.before_after |  -.0273431   .0577042    -0.47   0.636    -.1408074    .0861212
                                   |
          before_after#c.lndistggw |
                                1  |  -.0166243   .0122553    -1.36   0.176     -.040722    .0074735
                                   |
                          1.rural |   .0258417   .0437197     0.59   0.555    -.0601247    .1118081
                                   |
                rural#c.lndistggw |
                                1  |  -.0046518   .0094308    -0.49   0.622    -.0231956    .0138921
                                   |
               before_after#rural |
                              1 1  |  -.1260569   .0699468    -1.80   0.072     -.263594    .0114802
                                   |
    before_after#rural#c.lndistggw |
                              1 1  |   .0236348   .0144886     1.63   0.104    -.0048544    .0521239
                                   |
                         1.female |   .0609923   .0256134     2.38   0.018     .0106285    .1113562
                                   |
               female#c.lndistggw |
                                1  |   -.012772   .0053442    -2.39   0.017    -.0232803   -.0022636
                                   |
              before_after#female |
                              1 1  |  -.1211504   .0352775    -3.43   0.001    -.1905168   -.0517839
                                   |
   before_after#female#c.lndistggw |
                              1 1  |   .0237099   .0076443     3.10   0.002     .0086789     .038741
                                   |
```

```
                   rural#female |
                            1 1  |  -.0412496   .0324972    -1.27   0.205    -.1051493      .02265
                                 |
         rural#female#c.lndistggw |
                            1 1  |   .0094933   .0068494     1.39   0.167    -.0039746    .0229613
                                 |
         before_after#rural#female |
                          1 1 1  |   .1366727    .043665     3.13   0.002     .0508137    .2225316
                                 |
before_after#rural#female#c.lndistggw |
                          1 1 1  |  -.0272932   .0093845    -2.91   0.004    -.0457461   -.0088403
                                 |
                  mean_adhhdeduc |   .0013009   .0007575     1.72   0.087    -.0001885    .0027904
                           _cons |    .032834   .0350521     0.94   0.350    -.0360894    .1017573
------------------------------------------------------------------------------------------------------
```

Appendix 49. **Reg 041**

```
global ylist chrepeat_sch
global xlist c.lndistggw##i.before_after##i.teenage mean_adhhdeduc nb_adhhd
reghdfe $ylist $xlist [pw=weight], absorb (cluster_nb resi_region rural_urban) cluster(cluster_nb)
(MWFE estimator converged in 12 iterations)

HDFE Linear regression                            Number of obs   =     52,929
Absorbing 3 HDFE groups                           F(   9,    375) =      11.15
Statistics robust to heteroskedasticity           Prob > F        =     0.0000
                                                  R-squared       =     0.0360
                                                  Adj R-squared   =     0.0287
                                                  Within R-sq.    =     0.0053
Number of clusters (cluster_nb) =        376      Root MSE        =     0.1737

                                   (Std. Err. adjusted for 376 clusters in cluster_nb)
-------------------------------------------------------------------------------------------------
                                 |               Robust
                    chrepeat_sch |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
---------------------------------+---------------------------------------------------------------
                       lndistggw |   .0114555   .0024892     4.60   0.000      .006561      .01635
                  1.before_after |   .0225655   .0186321     1.21   0.227     -.014071    .0592019
                                 |
          before_after#c.lndistggw |
                              1  |  -.0075297   .0039519    -1.91   0.058    -.0153004    .0002411
                                 |
                       1.teenage |   .0272184   .0110343     2.47   0.014     .0055216    .0489152
                                 |
               teenage#c.lndistggw |
                              1  |  -.0023746   .0024667    -0.96   0.336    -.0072249    .0024757
                                 |
            before_after#teenage |
                            1 1  |  -.0596539   .0158957    -3.75   0.000    -.0909097    -.028398
                                 |
before_after#teenage#c.lndistggw |
                            1 1  |   .0117506   .0035923     3.27   0.001     .0046871    .0188142
                                 |
                  mean_adhhdeduc |   .0033928   .0008023     4.23   0.000     .0018154    .0049703
                        nb_adhhd |  -.0003973   .0003364    -1.18   0.238    -.0010587    .0002642
                           _cons |  -.0271411   .0117309    -2.31   0.021    -.0502077   -.0040745
-------------------------------------------------------------------------------------------------
```

Appendix 50. **Reg 044**

```
global ylist chrepeat_sch
global xlist c.lndistggw##i.before_after##i.rural mean_adhhdeduc nb_adhhd
reghdfe $ylist $xlist [pw=weight], absorb (cluster_nb resi_region year_birth sex) cluster(cluster_nb)
(MWFE estimator converged in 14 iterations)

HDFE Linear regression                            Number of obs   =     52,929
Absorbing 4 HDFE groups                           F(   9,    375) =       7.89
Statistics robust to heteroskedasticity           Prob > F        =     0.0000
                                                  R-squared       =     0.0438
                                                  Adj R-squared   =     0.0361
                                                  Within R-sq.    =     0.0040
Number of clusters (cluster_nb) =        376      Root MSE        =     0.1730

                                 (Std. Err. adjusted for 376 clusters in cluster_nb)
-----------------------------------------------------------------------------------------------
                               |               Robust
                  chrepeat_sch |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------------------------+---------------------------------------------------------------
                     lndistggw |   .0058876   .0040082     1.47   0.143    -.0019937     .013769
                1.before_after |  -.0112947   .0266401    -0.42   0.672    -.0636775    .0410881
                               |
      before_after#c.lndistggw |
                            1  |   .0065797   .0056781     1.16   0.247    -.0045851    .0177446
                               |
```

```
                   1.rural |  -.0417925   .0222058    -1.88   0.061    -.0854559    .0018709
                           |
          rural#c.lndistggw |
                         1  |    .006758   .0047356     1.43   0.154    -.0025537    .0160697
                           |
         before_after#rural |
                       1 1  |   .0699604   .0328938     2.13   0.034     .0052809    .1346398
                           |
before_after#rural#c.lndistggw |
                       1 1  |  -.0138607   .0068161    -2.03   0.043    -.0272633   -.0004581
                           |
             mean_adhhdeduc |    .003363   .0008138     4.13   0.000     .0017629    .0049632
                   nb_adhhd |  -.0004456   .0003379    -1.32   0.188      -.00111    .0002187
                      _cons |  -.0070063    .019109    -0.37   0.714    -.0445805     .030568
------------------------------------------------------------------------------------------------
```

Appendix 51. **Reg 052**

```
global ylist chdrop_sch
global xlist c.lndistggw##i.before_after##i.teenage mean_adhhdeduc nb_adhhd nb_oldhhd parents_alive
reghdfe $ylist $xlist [pw=weight], absorb (cluster_nb resi_region sex rural_urban) cluster(cluster_nb)
(MWFE estimator converged in 14 iterations)

HDFE Linear regression                           Number of obs   =     52,929
Absorbing 4 HDFE groups                          F(  11,    375) =       9.43
Statistics robust to heteroskedasticity          Prob > F        =     0.0000
                                                 R-squared       =     0.0168
                                                 Adj R-squared   =     0.0093
                                                 Within R-sq.    =     0.0046
Number of clusters (cluster_nb) =        376     Root MSE        =     0.0735

                                              (Std. Err. adjusted for 376 clusters in cluster_nb)
--------------------------------------------------------------------------------------------------
                                |               Robust
                     chdrop_sch |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
--------------------------------+-----------------------------------------------------------------
                      lndistggw |  -.0006033   .0013536    -0.45   0.656     -.003265    .0020583
                 1.before_after |  -.0010391   .0083009    -0.13   0.900    -.0173613     .015283
                                |
        before_after#c.lndistggw |
                              1 |   .0008089   .0017647     0.46   0.647    -.0026611    .0042788
                                |
                      1.teenage |   .0101103   .0090246     1.12   0.263    -.0076349    .0278555
                                |
             teenage#c.lndistggw |
                              1 |  -.0005247   .0018508    -0.28   0.777     -.004164    .0031147
                                |
            before_after#teenage |
                            1 1 |   .0328499   .0129393     2.54   0.012     .0074072    .0582926
                                |
before_after#teenage#c.lndistggw |
                            1 1 |  -.0068266   .0026317    -2.59   0.010    -.0120013   -.0016519
                                |
                 mean_adhhdeduc |   -.000338   .0002666    -1.27   0.206    -.0008622    .0001862
                       nb_adhhd |  -.0002473   .0001079    -2.29   0.022    -.0004595   -.0000351
                      nb_oldhhd |  -.0009163   .0004379    -2.09   0.037    -.0017773   -.0000552
                  parents_alive |  -.0012643   .0014687    -0.86   0.390    -.0041523    .0016237
                          _cons |   .0072817   .0063848     1.14   0.255    -.0052728    .0198362
--------------------------------------------------------------------------------------------------
```

Appendix 52. **Reg 068**

```
global ylist cheduc_year
global xlist c.lndistggw##i.before_after##i.foster mean_adhhdeduc nb_adhhd nb_oldhhd
reghdfe $ylist $xlist [pw=weight], absorb (cluster_nb resi_region year_birth sex rural_urban)
cluster(cluster_nb)
(MWFE estimator converged in 15 iterations)

HDFE Linear regression                           Number of obs   =     57,334
Absorbing 5 HDFE groups                          F(  10,    375) =     154.75
Statistics robust to heteroskedasticity          Prob > F        =     0.0000
                                                 R-squared       =     0.4147
                                                 Adj R-squared   =     0.4103
                                                 Within R-sq.    =     0.1975
Number of clusters (cluster_nb) =        376     Root MSE        =     1.9096

                                            (Std. Err. adjusted for 376 clusters in cluster_nb)
------------------------------------------------------------------------------------------------
                              |               Robust
                  cheduc_year |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
------------------------------+-----------------------------------------------------------------
                    lndistggw |   .1657287   .0650792     2.55   0.011     .0377628    .2936947
               1.before_after |   3.691922   .6156158     6.00   0.000     2.481431    4.902414
                              |
      before_after#c.lndistggw |
```

```
                          1  |   -.08704   .1267402    -0.69   0.493    -.3362504    .1621705
                             |
                    1.foster |  .3078165   .1559098     1.97   0.049     .0012494    .6143836
                             |
         foster#c.lndistggw |
                          1  |  -.1032786   .0330382    -3.13   0.002    -.1682419   -.0383153
                             |
          before_after#foster |
                        1 1  |   -.564728   .3028616    -1.86   0.063    -1.160248    .0307918
                             |
before_after#foster#c.lndistggw |
                        1 1  |  .1539665   .0636364     2.42   0.016     .0288376    .2790955
                             |
                mean_adhhdeduc |  .2177678   .0103543    21.03   0.000     .1974081    .2381276
                     nb_adhhd |  -.017787   .0042569    -4.18   0.000    -.0261573   -.0094166
                    nb_oldhhd |  .0839054   .0204053     4.11   0.000     .0437823    .1240285
                        _cons | -1.263942   .3026382    -4.18   0.000    -1.859023   -.6688618
------------------------------------------------------------------------------------------
```

Appendix 53. **PR correction**

No regression	p-value	rank	p-adj	Appendix	No regression	p-value	rank	p-adj
41	0.001	1	0.077	49	30	0.499	39	0.985205
22	0.004	2	0.154		29	0.508	40	0.9779
52	0.01	3	0.256667		20	0.511	41	0.959683
68	0.016	4	0.308		21	0.514	42	0.942333
44	0.043	5	0.6622		62	0.514	43	0.920419
11	0.044	6	0.564667		2	0.515	44	0.90125
38	0.072	7	0.792		61	0.519	45	0.888067
71	0.074	8	0.71225		6	0.546	46	0.913957
55	0.077	9	0.658778		8	0.547	47	0.896149
18	0.091	10	0.7007		15	0.559	48	0.896729
27	0.103	11	0.721		34	0.565	49	0.887857
51	0.107	12	0.686583		14	0.579	50	0.89166
50	0.108	13	0.639692		23	0.582	51	0.878706
54	0.149	14	0.8195		1	0.584	52	0.864769
53	0.15	15	0.77		47	0.614	53	0.892038
13	0.192	16	0.924		48	0.614	54	0.875519
66	0.199	17	0.901353		31	0.628	55	0.8792
40	0.206	18	0.881222		58	0.628	56	0.8635
39	0.207	19	0.838895		37	0.629	57	0.849702
56	0.207	20	0.79695		36	0.63	58	0.836379
45	0.208	21	0.762667		59	0.641	59	0.836559
9	0.228	22	0.798		35	0.646	60	0.829033
60	0.266	23	0.890522		32	0.703	61	0.887393
16	0.298	24	0.956083		67	0.728	62	0.904129
10	0.319	25	0.98252		43	0.731	63	0.893444
7	0.356	26	1.054308		42	0.732	64	0.880688
72	0.358	27	1.020963		33	0.789	65	0.934662
5	0.362	28	0.9955		12	0.798	66	0.931
73	0.363	29	0.963828		63	0.802	67	0.921701
46	0.37	30	0.949667		4	0.823	68	0.931926
17	0.371	31	0.921516		70	0.827	69	0.922884
24	0.382	32	0.919188		69	0.828	70	0.9108
57	0.475	33	1.108333		76	0.832	71	0.90231
28	0.485	34	1.098382		3	0.893	72	0.955014
64	0.488	35	1.0736		26	0.897	73	0.946151
65	0.489	36	1.045917		77	0.898	74	0.934405
49	0.492	37	1.023892		25	0.918	75	0.94248
19	0.499	38	1.011132		75	0.938	76	0.950342
					74	0.949	77	0.949