THE PENNSYLVANIA STATE UNIVERSITY
SCHREYER HONORS COLLEGE

DEPARTMENT OF ECONOMICS

URBANIZATION AND WOMEN'S EDUCATION, EMPLOYMENT AND FERTILITY IN THE DEMOCRATIC REPUBLIC OF THE CONGO

THOMAS MCCREARY
Spring 2010

A thesis
submitted in partial fulfillment
of the requirements
for a baccalaureate degree
in Economics
with honors in Economics

Reviewed and approved* by the following:

David Shapiro
Professor of Economics and Co-director of
Undergraduate Studies
Thesis Supervisor

Bee-Yan Roberts
Professor of Economics and Asian Studies
Honors Adviser

* Signatures are on file in the Schreyer Honors College.

Abstract:

This thesis presents evidence that links population growth, women's status, and urbanization in the Democratic Republic of the Congo (DRC). Urbanization, or a society's transformation to a more urban-based society, provides varying factors that can affect women's opportunities and status. In particular, this paper examines the differences in education and employment across urban and rural places, and how they influence fertility. A particular interest will be placed on the economic and political crisis that occurred in the 1990's, which has the potential to affect education and employment opportunities in the DRC.

Previous work by Shapiro suggests an inverse relationship between secondary levels of education and fertility. Also, linkages have been made between modern sector employment and fertility. This paper will try to examine these influences across urban and rural places, and how they ultimately affect fertility differentials across urban and rural places.

Table of Contents

Tables

Figures

Acknowledgements

I'd like to thank all my family and friends who have supported me throughout my collegiate career. I'd also like to send a special thanks to Dr. David Shapiro, who introduced me to this topic and has provided great assistance in the thesis writing process.

Introduction:

The Democratic Republic of Congo (DRC) is often considered one of the least developed countries in the world. In terms of GDP per capita, the United Nations estimates the DRC to be at $181, which is near the very bottom of the list for all the countries in the world (United Nations Statistics Division, 2009). In conjunction with low standards of living, the DRC experiences a higher mortality rate, where the life expectancy of a person is about 54 years and the median age of a citizen is about 16 years old (CIA World Factbook, 2010). Economists have searched for different policy measures to solve the issues of severely poverty stricken nations, through means such as structural adjustment or microfinance. While such programs have had varying degrees of success or failure, an underlying answer to improving social welfare in developing countries seems to be a demographic one. More specifically, if the population in extremely impoverished nations can be stabilized through fertility transition, then a higher standard of living can be acquired in those nations.

Historically speaking, the DRC presents an ideal situation for study by having accurate population data, which is rare among developing nations in sub-Saharan Africa. Formerly under Belgian rule, the DRC, then known as the Belgian Congo, was chronicled by historians and demographers from an early point in its history and highlighted by a national survey conducted in 1955. After the country gained its independence in the 1960, the country fell under Mobutu Sésé Seko's leadership and changed its name to Zaire. Despite the change in ruling power, the country still kept an accurate account of population data through a national survey conducted in 1984. Relatively recently, the country has emerged with a newly formed government as the Democratic Republic of the Congo, and officials have conducted a third national survey in 2007

– a Demographic and Health Survey. In terms of demographic study, the recent 2007 survey data can provide insight into what currently shapes fertility behavior in the DRC.

Along those same lines, the status of women, in certain circumstances, can also be measured from the 2007 survey. The importance of measuring the status of women can be shown through international efforts such as the Millennium Development Goals (MDG). The MDG established eight goals in the year 2000 and recognized the interdependence of population growth, poverty reduction, and sustainable development (United Nations, 2009). Many of the eight goals relate to women's status and my topic of study, for example universal education, gender equality, and child and maternal health. Also, due to its widespread cases of poverty, the African region has been one of the primary focuses of the MDG. Measures suggest the African continent has been lagging in meeting the standards set by the MDG, where the recent global downturn has stalled or reversed the progress toward achieving goals. For example, 55 million to 90 million more people will be living in extreme poverty than before the economic downturn (United Nations, 2009, 4). High population growth accentuates these problems associated with poverty, where smaller amounts of resources are divided among a greater number of people.

Despite what one may think, the trend of high population growth can be reversed through enhancement of women's status. An example of this reasoning can be seen in the Clinton Global Initiative (CGI), which was founded by former President Bill Clinton. In an interview with Jon Stewart, President Clinton said the primary focus of the CGI is women and girls in developing nations (Clinton, 2009). He said that a universal understanding exists that if women and girls are put in schools and given access to the labor market, then population growth will slow and per capita income will increase. President Clinton cited Rwanda as a prime example, which went through a horrible genocide during the 1990's. Following the genocide, the country has

stabilized and presented women with a great deal of economic and political opportunity. Not coincidentally, Rwanda quadrupled the per capita income of its citizens during the same timeframe.

As President Clinton noted, two of the best measures of women's status are education and employment, which will be the primary measures used in this paper. A factor which will greatly influence education and employment opportunities across the DRC is urbanization. Howard Handelman explains its importance in saying, "…urbanization – accompanied by increased industrialization, literacy, and exposure to the mass media – would offer women greater occupational and educational opportunities, thereby enhancing their status" (2005, 143). Therefore, by comparing education and employment across urban and rural places, fertility differences across different parts of the country can be better understood.

Following this introduction, the paper is divided into 4 more sections. The first section examines urbanization in the DRC, and includes a historical aspect into determinants of urban growth. The next two sections focus on women's education and employment, respectively, which will compare opportunities for women across urban and rural places. The paper concludes with a section on fertility, which incorporates urban and rural differences, education, and employment into an analysis on population growth and fertility behavior. The primary goal of this paper is to examine how women's opportunities differ across urban and rural places, and the subsequent effects on population growth.

Section 1: Urbanization

This section will provide an analysis of the regions of the DRC, with a large emphasis on urbanization within the country. As my hypothesis states, I want to examine urbanization's importance in modernizing a society by increasing educational and employment opportunities, which has the potential to decrease fertility as well as increase living standards. In order to prove this point, I will first need to establish the context for urbanization and its extent, which is what this section aims to do. The first part of this section is an analysis of projections from the UN on urban and rural population shares for the DRC and sub-Saharan Africa. In this part, a historical aspect will be incorporated into the projections, which will provide a good context for urbanization looking forward. The second part of this section delves deeper into urban and rural population growth by examining each region of the country from 1984 to 2007. The final part of this section will deal with humanitarian concerns associated with urbanization in the DRC and other third-world countries.

Given prior statistics and projections, it's expected that the DRC and sub-Saharan Africa are trending toward more urban-based societies. Using the United Nations Population Division as a source, Tables 1.1.a. and 1.1.b. show estimated and predicted population distributions across urban and rural places for sub-Saharan Africa and the DRC, respectively. The estimations and predictions span from 1975-2050 and provide an indication of relative urban growth within sub-Saharan Africa and the DRC and how it is expected to evolve over the course of time. The data shows that both sub-Saharan Africa and the DRC are expected to transfer from mainly a rural and agrarian society into a more modern and urban society. From these projections, urban environments in both sub-Saharan Africa and the DRC will account for the majority of each

Table 1.1.a. Sub-Saharan Africa - Estimated Urban and Rural Population Share		
Year	Percentage Urban	Percentage Rural
1975	21.7	78.3
1980	23.9	76.1
1985	25.9	74.1
1990	28.2	71.8
1995	30.6	69.4
2000	32.8	67.2
2005	35.0	65.0
2010	37.3	62.7
2015	39.8	60.2
2020	42.4	57.6
2025	45.2	54.8
2030	48.2	51.8
2035	51.2	48.8
2040	54.3	45.7
2045	57.4	42.6
2050	60.5	39.5

Source: United Nations Population Division of the Department of Economic and Social Affairs, 2007

Table 1.1.b. Democratic Republic of Congo - Estimated Urban and Rural Population Share		
Year	Percentage Urban	Percentage Rural
1975	29.5	70.5
1980	28.7	71.3
1985	28.0	72.0
1990	27.8	72.2
1995	28.4	71.6
2000	29.8	70.2
2005	32.1	67.9
2010	35.2	64.8
2015	38.6	61.4
2020	42.0	58.0
2025	45.6	54.4
2030	49.2	50.8
2035	52.8	47.2
2040	56.3	43.7
2045	59.8	40.2
2050	63.2	36.8

Source: United Nations Population Division of the Department of Economic and Social Affairs, 2007

population set around 2035. Also, future predictions indicate urban areas in the DRC are expected to grow at a faster rate than the urban areas in the entire sub-Saharan region, which may be a reflection of Kinshasa's growing attraction throughout the DRC as a relatively dependable urban center.

By examining the DRC's data set solely, it can be seen that the urban population share was fairly stagnant from 1975-2000 and actually declined from 1975-1990. It is likely that urban growth was slowed during this time due to economic and political constraints. From an economic perspective, the decline of the urban population share starting in 1975 coincides with the 1973 oil shock and subsequent decline in copper prices, which led to a recession and a debt crisis in the DRC (World Bank, 2005). Furthermore, the Mobutu regime, which was plagued by corruption, did very little in terms of implementing effective economic policy to stimulate recovery. Due to these issues, the 1975-1990 timeframe became characterized by stagnant economic growth and high inflation (Shapiro et al., 2009). Also during the timeframe from 1975-1990, production shifted towards the mining and agriculture sectors (World Bank, 2005). Therefore, the decline of urban population share during the 1975-1990 timeframe makes perfect sense given the conditions in the country at the time.

The 1990's in the DRC were characterized by political instability and subsequent civil war, as well as the overthrow of the Mobutu government. A characteristic of the war was destruction of infrastructure, where " destruction of roads led to low incomes for farmers, who were unable to sell their agricultural surplus, and high food prices in urban centers, eroding real incomes of the urban population" (World Bank, 2005, 12). These events contributed to ongoing issues with inflation and hit the agriculture sector especially hard. During the timeframe, citizens and soldiers looted Kinshasa in 1991 and 1993, which increased instability and made urban

centers dangerous and unreliable places to live (U.S. Department of State, 2009). This created a situation where both rural and urban centers were unreliable living centers, which is reflected in the slow and stagnant growth of urban centers in the 1990's. Conflict in the DRC waned beginning in December 2002 and a government was elected in 2006, which has provided some semblance of stability in the region. But clearly, the economic and political events that occurred from 1975-2000 had a significant impact on the relative urban population decline and subsequent slow growth during the time frame.

Looking forward, urban areas will likely present the most opportunity in terms of education, employment, and healthcare, and therefore will see the most growth in terms of population. As a consequence of better opportunities, net migration to urban places will shape the excess urban growth relative to rural growth[1]. Furthermore, prior instability in the DRC may be accentuating its urban growth by resulting in the most opportunity being available in urban places. For example, the destruction of the road infrastructure during the 1990's has "…led to the influx of population in urban areas, particularly Kinshasa, in order to access basic services such as education or health" (World Bank, 2005, 6). Also, political instability in surrounding nations such as Rwanda and Burundi has led to an increase in refugees in the eastern part of the country, where they can be expected to migrate to urban centers (World Bank, 2005). Ultimately, these underlying social and economic conditions have contributed to the overall trend where urban areas in the DRC are growing relatively as well as absolutely and can expect future growth. The United Nations statistics reflects this trend, where they estimate that from 2005-2010, urban areas in the DRC grew at a 5.1% annual rate while rural areas grew at a 2.3% annual rate (United Nations Population Division, 2009). Provided that there is relative stability

[1] Population Growth = births – deaths + inmigrants – outmigrants.

(which may be a fairly big assumption), urbanization seems to be the clear trend moving forward.

Before discussing Table 1.2., it needs to be explained why Table 1.1.b., which was generated from predictions by the UN Population Divison, deviates significantly from the Measure DHS data for 2007 presented in Table 1.2. In Table 1.1.b., the UN Population Division defined urban places as: "Places with 2,000 inhabitants or more where the predominant economic activity is non-agricultural" (United Nations Population Division, 2007). Measure DHS characterized urban and rural places as: "Urban areas are classified into large cities (capital cities and cities with over 1 million population), small cities (population over 50,000), and towns (other urban areas), and all rural areas are assumed to be countryside" (Measure DHS, 2007). The United Nations Population Division based their definition largely on economic activity, whereas Measure DHS based its definition on population density. In the DRC, agricultural activity accounts for 42.5% of the labor force, which would skew the UN Population Division's predictions downward, based on their definition of urban places (World Bank, 2008). This would explain why the UN Population Division predicted a 32.1% urban population share in 2005 while the Measure DHS data showed a 50.1% urban population share in 2007. Keeping these differences in mind, we will now move into a discussion of the Measure DHS data on urban places presented in Table 1.2.

Table 1.2. shows a comparison from 1984 and 2007 of the percentage urban by region and the distribution of the urban population by region for females. The first and third columns examine percent urban for each region, which provides an indication of relative urban growth within each region over the time frame. By examining the percent urban columns for 1984 and 2007, a relative increase in the urban environment can be seen within every region (except for

Table 1.2. Percentage Urban by Region and Distribution of Urban Population According to Region (Female) - 1984 and 2007				
	1984		2007	
Region	Percent Urban	Distribution of Urban Population	Percent Urban	Distribution of Urban Population
Kinshasa	100	31	100	33.9
Bas-Congo	25.2	5.8	42.7	3.2
Bandundu	16	7	23.4	5.7
Equateur	14.7	6.1	34.4	7.1
Orientale	16.1	8.1	20.5	3.9
Kivu (Nord-Kivu, Maniema, Sud-Kivu)	12.6	7.9	38.9	7.9
Katanga	38.8	17.9	60.4	12
Kasai Oriental	32.6	10	54.4	17.7
Kasai Occidental	22.1	6.2	40.6	8.7
Congo (Total)	28	100	50.1	100

Sources:

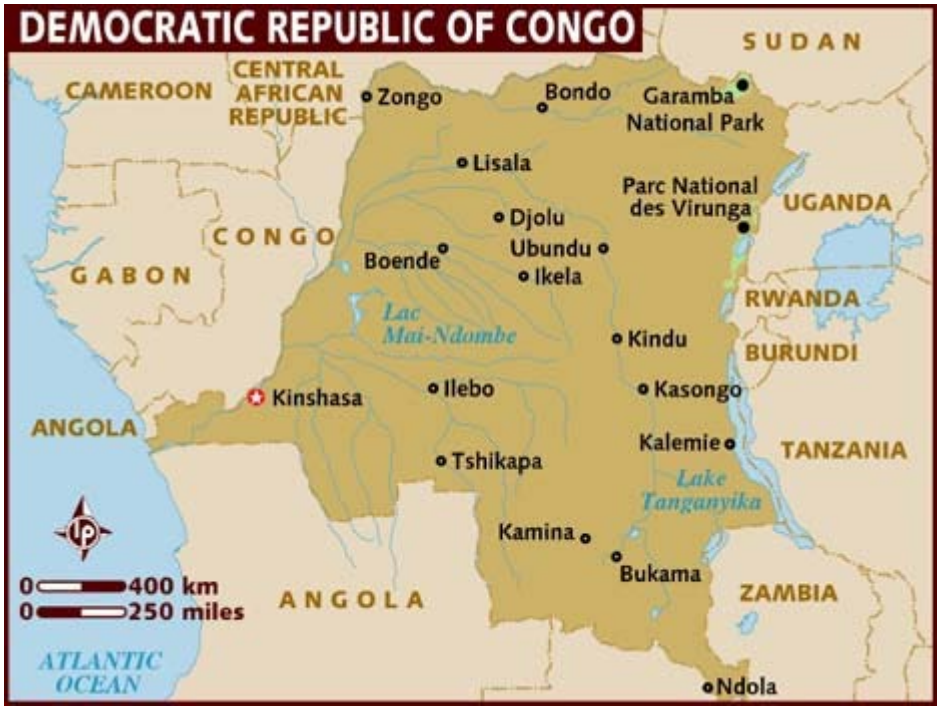
Un Apercu Demographique , 1984 (Percent Urban).

Profil De La Femme Au Zaire, 1984 (Distribution of Urban Population according to region).

Measure DHS – Congo Democratic Republic, 2007.

Kinshasa, which remained at 100% urban). While urban growth varies from region to region, the overall trend indicates urban development across the DRC during the 1990's. A factor that likely played a role in the variance of urban development from region to region is instability, which caused a large amount of migration and disruption among the DRC's population during the 1990's.

Figure 4.1 – Map of the DRC



Source: Lonely Planet Publications, 2009

Also in Table 3, columns 2 and 4 present the distribution of the urban population for 1984 and 2007, which provides an indication of each region's urban growth within the general context of the rest of the nation. Relative declines of the urban population occurred in Bas-Congo, Bandundu, Orientale, and Katanga. For Bas-Congo and Bandundu, this can be explained by Kinshasa's growing attraction throughout the country. Geographically, Bas-Congo and Bandundu border Kinshasa on the west and east sides, which makes migration to the capital easier than from all the other regions. Therefore, it doesn't make sense from a geographical

standpoint for urban growth in those regions because of Kinshasa's large presence. Alternatively, Orientale and Katanga are large regions that border the northeast and southeast parts of the DRC and have been subject to political instability in surrounding nations. The nations that border those regions are Sudan (borders Orientale) and Angola (borders Katanga). Both Sudan and Angola have experienced instability, which likely played a role in diminishing growth in Orientale's and Katanga's relative urban populations.

In subsequent sections on employment, education, and fertility, Kinshasa has been treated as a special case within the DRC data set. As we will see, Kinshasa stands out in terms of employment and educational opportunities as well as much lower fertility levels than the rest of the country. Consequently, in order to avoid skewing urban analysis, urban data has been separated into "Kinshasa" and "Other urban places" for much of the remaining parts of this paper. By doing this, the best case of urbanization (Kinshasa) can be examined and compared against lesser cases of urbanization (Other urban places) as well as the converse of urbanization (Rural places). These three categories will provide a relative context for urban growth, and how employment, education, and fertility differ across the respective categories.

Humanitarian concerns have arisen in the DRC and sub-Saharan Africa due to the expectations presented above on urban growth associated with overall population growth. For example, the DRC is predicted to grow from 58,741,000 people in 2005 to 186,837,000 people by 2050 (UN Population Division, 2007). As seen in the urban estimates given in Table 1.1.b. and 1.2., the population growth is expected to occur mostly in existing urban places or lead to the creation of new urban places. Economist and demographer Richard Easterlin presents two arguments for population growth associated with mortality decline, where it can have two opposing effects:

1) Mortality Revolution → increased population growth → lower economic productivity

2) Mortality Revolution → better health → higher economic productivity

Source: Easterlin, 1996, 90

Past economic performance in the DRC has resembled the first argument, where the population has grown tremendously and per capita income has actually declined over time. In the DRC, the GDP per capita in current US dollars was $249 in 1984, but by 2006, the GDP per capita had declined to $141 (UN Population Division, 2007). Given the association between these two aspects, low economic productivity and high population growth, humanitarian concerns pose a serious threat to the country. As the population density increases and economic growth stagnates across the country, things like food availability, health care, and uncontrolled urban growth will become serious problems. For these reasons and others, excessive population growth is an issue that needs to be addressed in order to increase the measures of social welfare in the DRC as well as in other countries within the sub-Saharan region. Women need to be the primary focus in order to address excessive population growth, which is the concern for the remaining parts of this paper.

Section 2: Education

Educational attainment varies across the country in the DRC, and as will later be seen, influences fertility behavior. This section looks at women's educational attainment in the DRC and how it has evolved over the course of time. A particular emphasis will be placed on funding for education and gender differences in education, both of which play significant roles in affecting educational opportunities around the country. The section begins with a historical examination of education and how funding for education has evolved along with it. In particular, a focus will be placed on the economic performance of the 1980's and 1990's and its effect on educational opportunities. Next, the section will incorporate an analysis of the opportunities for educational attainment of women across rural and urban places. Lastly, gender differences in educational attainment will be examined across urban and rural places.

Due to the economic stagnation from 1975-2000 and failed structural adjustment efforts during the 1980s, federal provisions for public schools declined during the timeframe (Shapiro and Tambashe, 2003). Further problems for school funding were created due to the age structure of the DRC, which is considerably young. A World Bank study on education in the DRC estimates that roughly 62% of the population is under the age of 19. Furthermore, the same study figures that the potential demand for education among primary and low level secondary education is quite high, as children aged 5-14 make up about 30% of the DRC's population (2005). By having such a young age structure, the workforce is faced with funding a large proportion of children, who are dependent on them in order to attain an education.

As revenues for the federal government fell by as much as 80%, private funding became the primary source of funding for all levels of education during the 1980's (World Bank, 2005). Because of private funding by families, a common practice in the DRC and sub-Saharan Africa

is “interhousehold resource transfers”, where children, typically ones later in the birth order of a family, have their education partially funded by extended family members (Shapiro and Tambashe, 2003). While the majority of funding is normally provided by the parents, the existence of such a practice indicates a strong preference among families to put children through school.

Since education is predominantly funded through private means, the amount of educational opportunity is often times a reflection of a family’s economic well-being. Consequently, the costs faced by poor families form a large portion of the household income, which creates inequality issues in the education system (Shapiro and Tambashe, 2003). Table 2.14 is taken from the Work Bank report on education, and presents some of these inequality issues. The data suggests that the poor tend to enroll at later ages and generally drop out as class level increases. On the other hand, the wealthy tend to enroll at earlier ages, but generally repeat grades as they attain higher education levels. The World Bank notes that, “In the current system of private financing, households bear the costs of repetition, and hence the rich are able to provide for repetition while the poor are not” (World Bank, 2005, 40).

Table 2.14. Mean Age by Class and Wealth Group

	Mean Age in Each Class (in years)						Difference between class 1 and 6
	1	2	3	4	5	6	
WI I—poorest 20%	9.1	10.6	12.2	13.2	14.3	14.6	5.5
WI II	8.7	10.8	12.1	13.4	14.5	15.0	6.3
WI III	8.8	10.4	11.8	12.9	13.8	14.7	6.0
WI IV	8.3	9.7	11.4	12.5	13.6	14.2	5.9
WI V—richest 20%	6.9	8.4	9.9	11.4	12.6	13.5	6.7
Difference between richest and poorest	−2.3	−2.2	−2.3	−1.8	−1.6	−1.1	

Source: World Bank, 2005, 41

Given the issues with poor economic performance and large dependency on private funding, it may be expected that during the 1980's and 1990's the educational attainment in the DRC decreased. But it turns out that the opposite was true – educational attainment for girls increased throughout the 1990's despite severe economic and political circumstances. An advantage possibly lies within the interhousehold resource transfers, where more children were able to attend school than if funded solely by parents. Also, private funding of education eliminated the reliance on the federal and local governments, who are often times ineffective and corrupt when instituting policy. In examination of the changes of educational attainment, data suggests that private funding of schooling was effective at increasing schooling levels for women. Table 2.1 looks at educational attainment by region for women for the years 1984 and 2007. The sample used to construct the table was limited to women aged 5 and over. In general, most regions experienced decreases in no education and increases in primary education[1]. This indicates that over the timeframe, there were more opportunities for enrollment for females across most of the country. Along with this increase in enrollment, secondary education also saw gains, as attainment more than doubled in most of the regions. The downside is that in all regions, excluding Kinshasa, roughly 75-80% of females attain a primary education or less, which shows secondary and university levels of education are still unattainable for the majority of girls.

Such educational increases vary greatly depending on the region, which is to some extent a reflection of urban and rural differences that exist in those regions. Table 2.2 takes into account urban and rural differences in educational attainment, by differentiating between rural places, Kinshasa, and other urban places. Rural places exhibit the lowest attainment, where

[1] The exceptions are Kinshasa and Kasai Occidental. Kinshasa had a decrease in primary, but a large increase in secondary. Kasai Occidental had a slight decrease in primary.

Table 2.1. Female Educational Attainment by Region, 1984 and 2007							
Kinshasa			**None**	**Primary**	**Secondary**	**Univ**	**Total**
		1984	21.31	45.7	31.76	1.23	100
		2007	12.59	32.49	49.65	5.27	100
Bas- Congo/ Bas-Zaire			**None**	**Primary**	**Secondary**	**Univ**	
		1984	46.89	40.27	12.84	0	100
		2007	31.94	43.43	24.44	0.19	100
Bandundu			**None**	**Primary**	**Secondary**	**Univ**	
		1984	54.69	36.52	8.6	0.19	100
		2007	37.03	41.42	21.26	0.29	100
Equateur			**None**	**Primary**	**Secondary**	**Univ**	
		1984	68.87	26.46	4.67	0	100
		2007	45.47	40.94	13.44	0.15	100
Orientale/ Haut-Zaire			**None**	**Primary**	**Secondary**	**Univ**	
		1984	61.17	34.56	4.27	0	100
		2007	48.36	44.11	7.42	0.1	100
Kivu			**None**	**Primary**	**Secondary**	**Univ**	
		1984	69.45	25.88	4.67	0	100
		2007	43.47	42.77	13.36	0.39	100
Shaba/ Katanga			**None**	**Primary**	**Secondary**	**Univ**	
		1984	49.1	41.52	9.18	0.2	100
		2007	33.92	42.55	21.91	1.62	100
Kasai Oriental			**None**	**Primary**	**Secondary**	**Univ**	
		1984	47.05	43.11	9.84	0	100
		2007	32.41	47.23	19.61	0.75	100
Kasai Occidental			**None**	**Primary**	**Secondary**	**Univ**	
		1984	46.47	45.49	8.04	0	100
		2007	38.41	45.04	16.43	0.12	100
DRC							
			None	**Primary**	**Secondary**	**Univ**	
		2007	35.78	41.8	21.28	1.14	100

Sources: Profil De La Femme Au Zaire, 1984.
Measure DHS, Congo Democratic Republic, 2007.
Both sources are for women aged 5 and greater.

approximately 90% of females acquire a primary education or no education at all. This shows that attainment in rural places is less than average attainment for the whole country, and much less than average attainment in urban places. Families in rural places, which are typically characterized by low levels of wealth, can't provide as much private funding and therefore higher education levels become increasingly difficult for women to acquire. Also, on the supply side for schooling, rural places are often limited in the amount of physical schools that are available nearby. On the other hand, the majority of women in Kinshasa, and to a lesser extent other urban places, are able to get past the primary education levels and attain secondary and university education. This could be attributed to a higher income in urban places and the prevalence and accessibility of schools in urban places.

Table 2.2. Female Educational Attainment, 2007

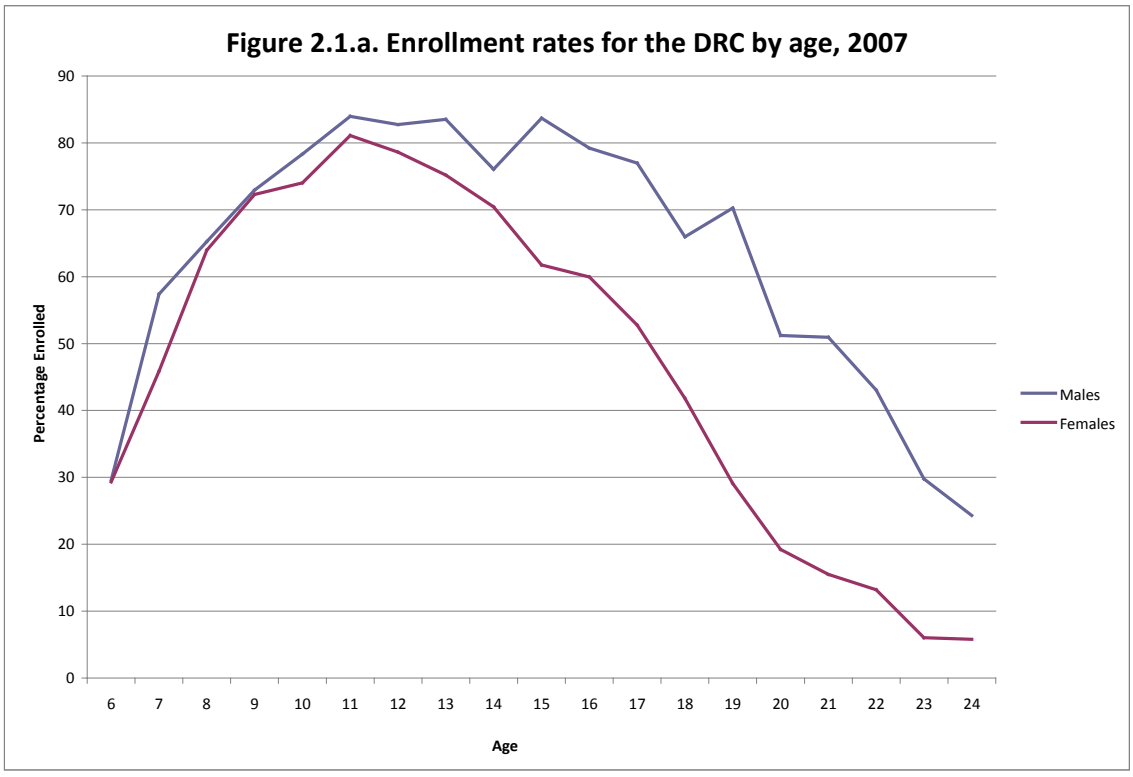
	Rural	Kinshasa	Other Urban	Country
None	46.2	12.6	27.1	35.8
Primary	43.6	32.5	42.8	41.8
Secondary (7-8)	5.1	15.2	12.3	8.7
Secondary (9-10)	3.1	15.5	8.7	6.5
Secondary (11-12)	1.9	18.9	7.8	6.1
University	0.0	5.3	1.3	1.1
Total	100.0	100.0	100.0	100.0
Mean Education Level	2.3	6.9	4.4	3.6
Median Education Level	1.0	7.0	4.0	2.0

Source: Measure DHS, Congo Democratic Republic, 2007. (Women aged 5 and greater)

Lastly, we turn to gender differences and examine how women compare to men in enrollment in education. Figures 2.1.a, 2.1.b, 2.1.c, and 2.1.d look at enrollment rates for males and females at different ages. In this analysis, it's important to keep in mind that age isn't indicative of grade level in the DRC. For example, a person at the age of 16 could be enrolled anywhere from 2nd grade to the 10th grade. This is typical in the DRC and elsewhere in sub-

Saharan Africa, where it's common for children to enroll at varying ages and repeat grades throughout an academic career.

Turning to Figure 2.1.a, the country level results show that male and female enrollment rates are fairly similar from ages 6-11. At age 6, enrollment is around 30% for males and females, which suggests later enrollment for the majority of children. As age increases past age 11, females experience a larger drop in enrollment and a distinct gender gap emerges between males and females. By the time age reaches 20, the difference between male and female enrollment rates is about 35 percentage points. The results show a greater difficulty for females to stay enrolled in school at higher ages as compared to males. This may be a reflection on the parents' choice to fund a male child's education over a female child's education due to greater

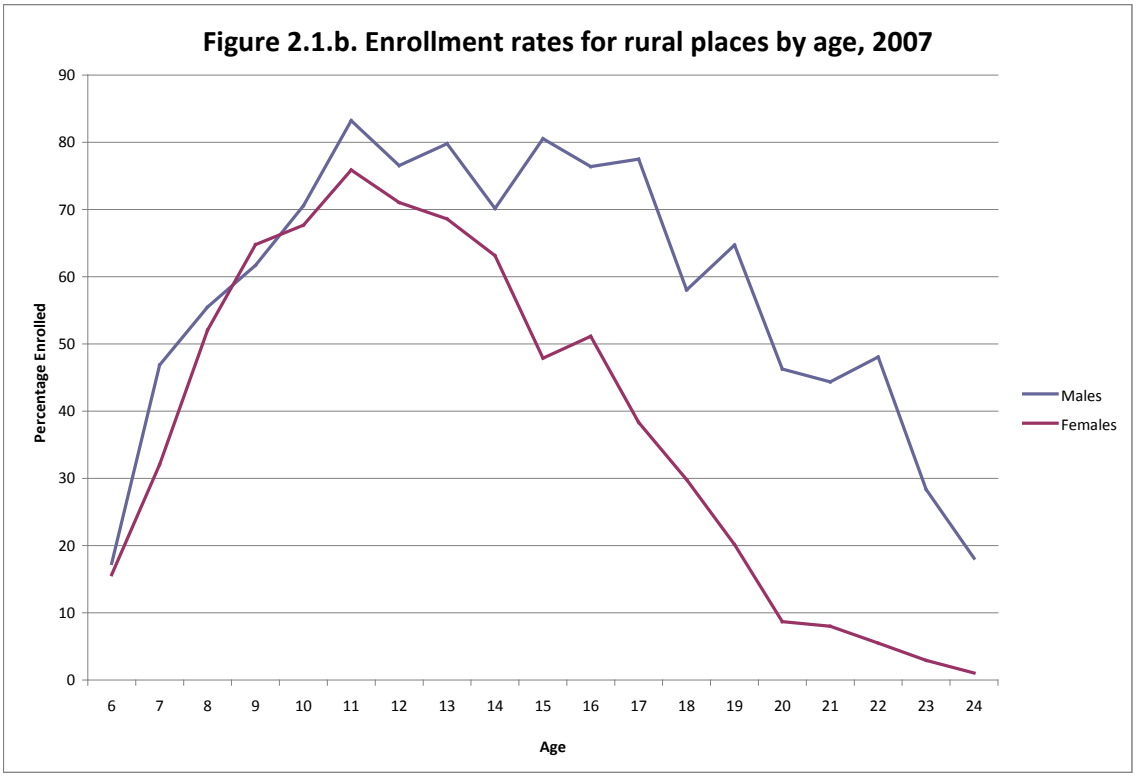


Source: Measure DHS – Congo Democratic Republic, 2007.

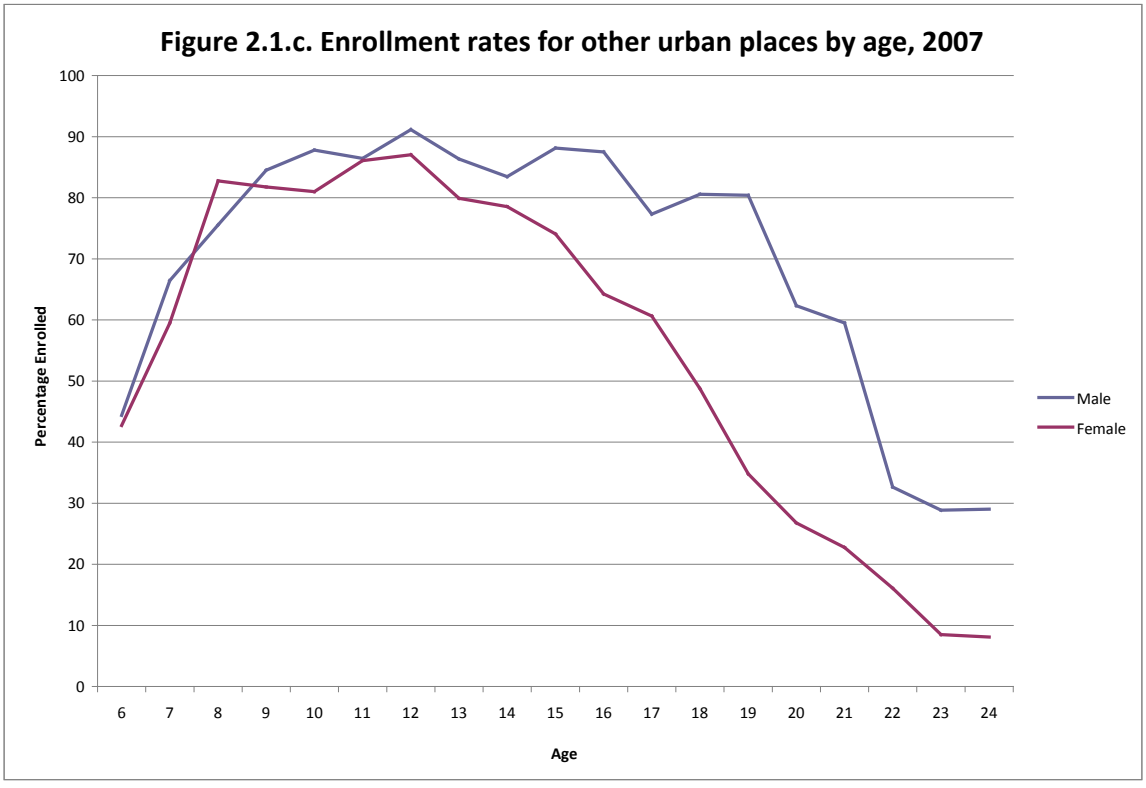
preferences or benefits associated with education of males. Also, greater opportunity costs may arise for females as they reach later ages, where pressures to marry and begin childbearing increase.

Focusing on Figures 2.1.b, 2.1.c, and 2.1.d, the gender gap varies according to place of residence. In particular, Figures 2.1.b and 2.1.c show that the gender gap becomes substantial in rural and other urban places past age 14. By the time of age 20, the differences in enrollment between males and females are roughly 40 percentage points in rural and other urban places. On the other hand, Figure 2.1.d for Kinshasa shows limited signs of a gender gap. At later ages, enrollment for males and females remains closer together, where female enrollment briefly exceeds male enrollment at age 20 and substantial differences seem to be very limited.

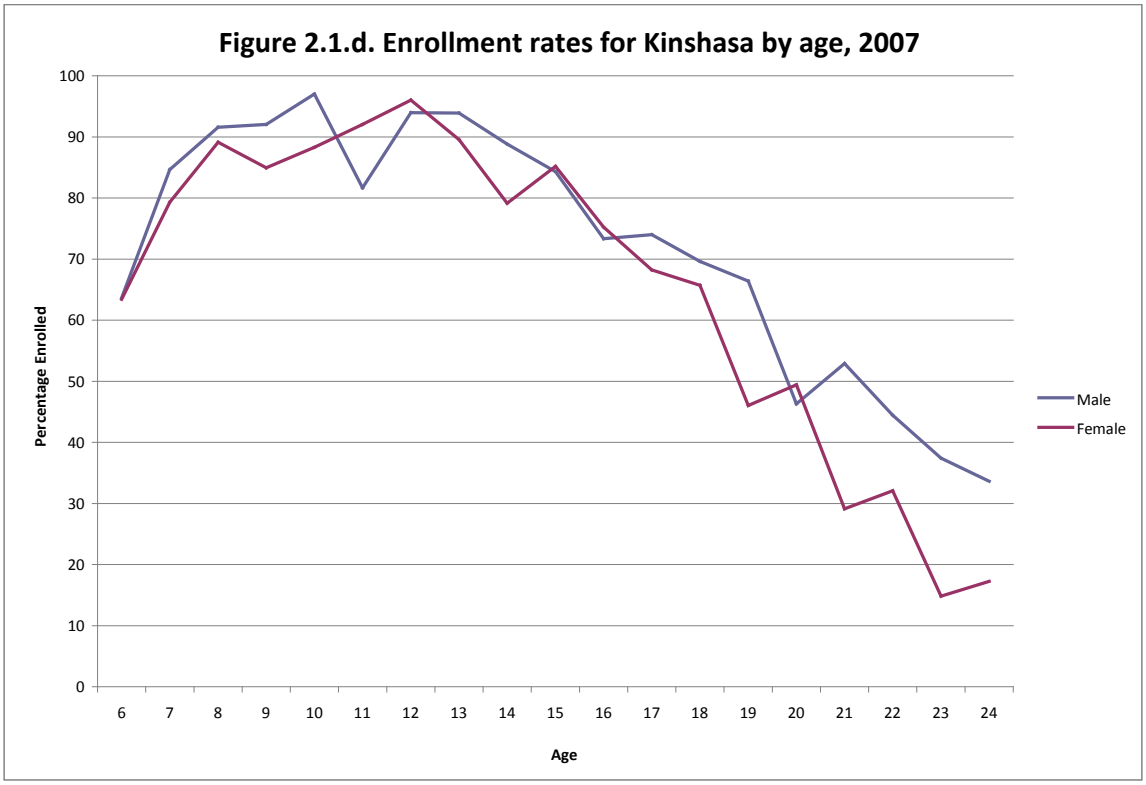
Lastly, enrollment rates at early ages vary according to place of residence. For Kinshasa, enrollment at age 6 is roughly 65%, which shows about 2/3 of children begin schooling at what is normally considered an 'appropriate age' in the United States. This suggests that parents are better prepared, both financially and psychologically, to enroll their children in Kinshasa at younger ages. In comparison, enrollment at age 6 is about 15% in rural places and 45% in other urban places. Such a large disparity in early enrollment reveals differences in educational preferences by families in Kinshasa, other urban places, and rural places. Also, it suggests a greater ability for parents to fund education in Kinshasa, and a lesser ability for parents to fund education in rural places and other urban places.



Source: Measure DHS – Congo Democratic Republic, 2007.



Source: Measure DHS – Congo Democratic Republic, 2007.

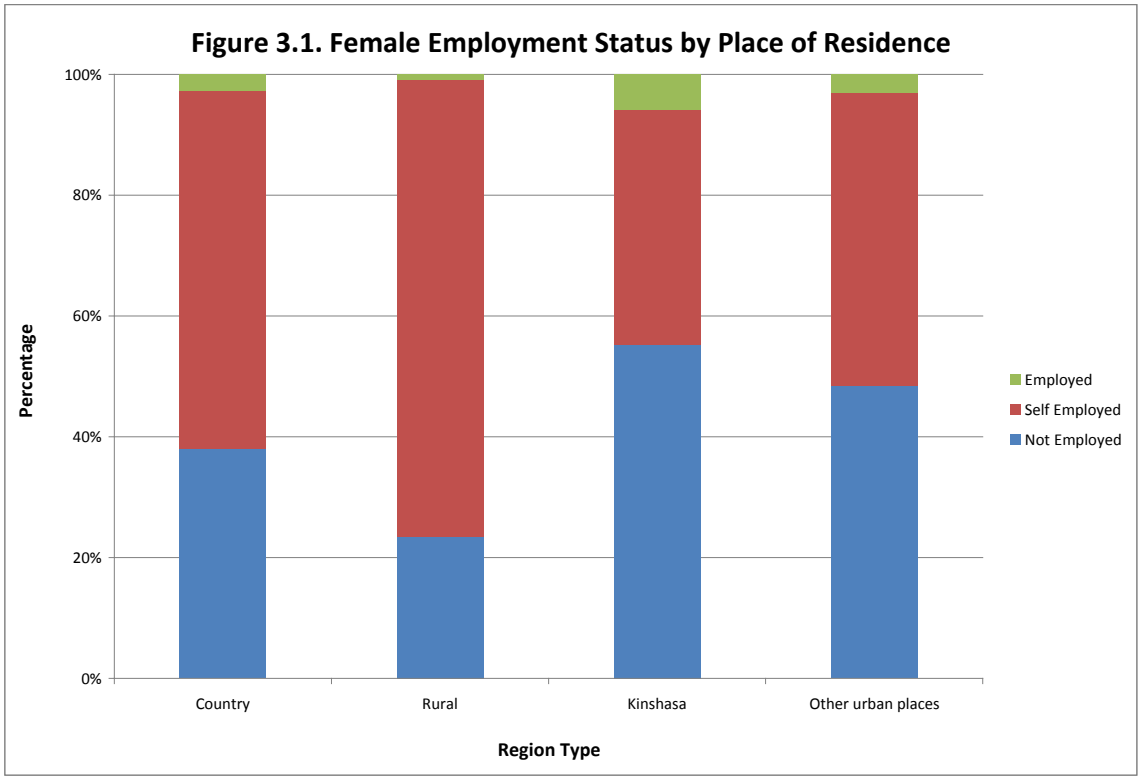


Source: Measure DHS – Congo Democratic Republic, 2007.

Section 3: Employment

The labor market in the DRC has been recovering from the economic turmoil that began in the mid-1970's and lasted into the 2000's. Coinciding with poor economic performance during this timeframe, female participation in the labor market increased. The bulk of the increase can be attributed to increased female participation in the informal sector, while increased female participation in the modern sector was very limited (Shapiro et al., 2009). This section highlights these occurrences in the labor market with Measure DHS 2007 data and examines urban and rural differences in the labor market structure. Additionally, analyses used in the previous section on educational attainment will be incorporated to examine education's effect on female employment opportunities.

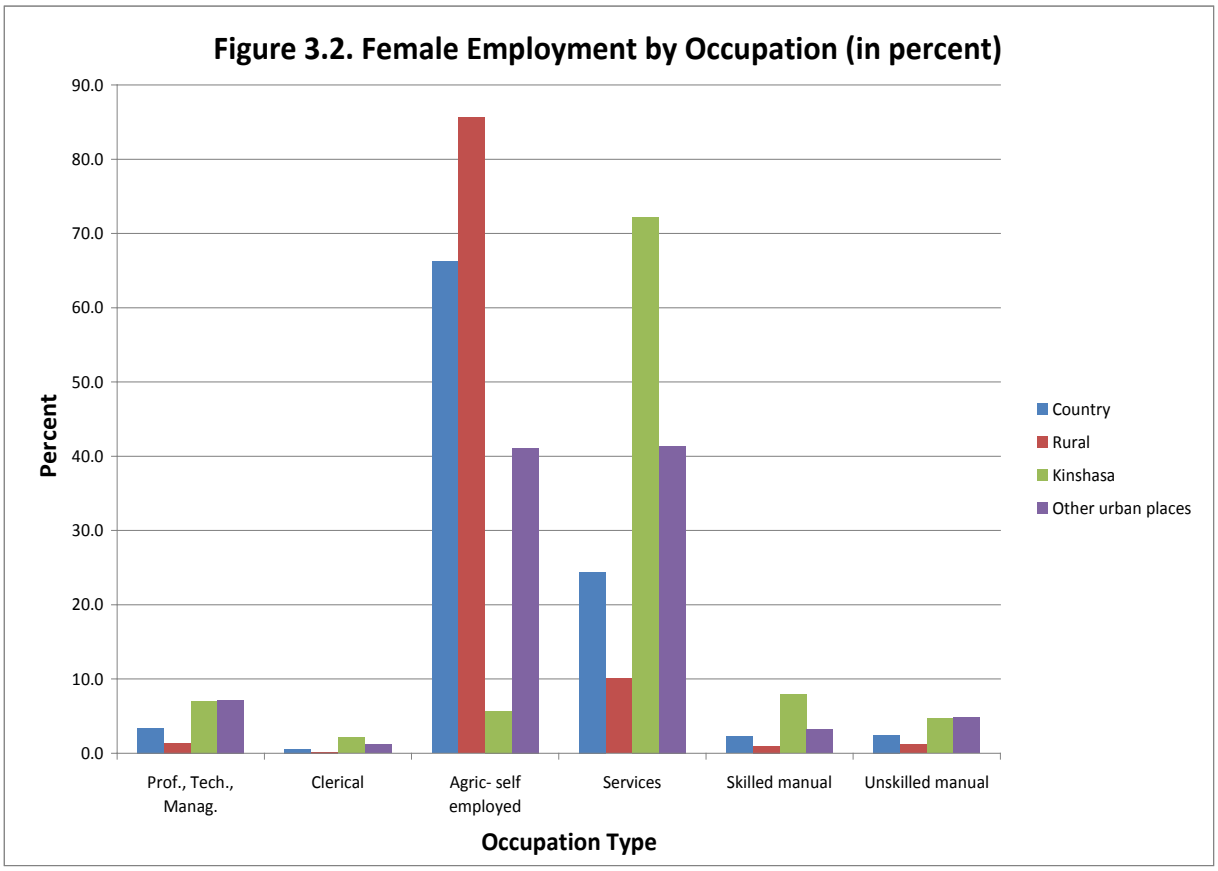
The employment status in the labor market for females can be seen in Figure 3.1, which reports data for the entire country, rural places, Kinshasa, and other urban places. At the country level, nearly 62% of females are either self-employed or employed. Self-employed women make up almost 96% of the total amount of working women, which conveys a significant amount of informal sector employment. Women in rural places account for the greatest amount of participation in the labor market, where over 76% of females are either self-employed or employed. Almost all of the participation occurs in the self-employed sector, where agricultural activities account for practically all of the labor force participation. In comparison to rural places, Kinshasa and other urban places show an increased proportion of employed women and a decreased proportion of self-employed women. Also, the percentages of women in Kinshasa and other urban places who are not employed are significantly greater than in rural places.



Source: Measure DHS, Congo Democratic Republic, 2007.

Figure 3.2 provides a further breakdown of female labor market participation and excludes women who are not employed. The graph displays employment by occupation type and place of residence, and provides an indication of where the majority of female employment activity takes place. The bulk of female employment occurs in either the agricultural or service occupations, which accounts for over 90% of female employment at the country level. Large differences exist in the distributions between agricultural or service industries occur across rural, Kinshasa, and other urban places. In rural places, over 86% of employment activity is in the agricultural sector, while only 10% is in the service sector. Other urban places split evenly between the two sectors with roughly 41% of employment occurring in both the agricultural and service sectors. This even distribution reflects the importance of agriculture in smaller urban places, which includes small cities and towns. In Kinshasa, the service sector accounts for the vast majority of employment at 72% while agricultural employment accounts for only 6%.

Primarily composed of petty commerce, the service sector has easy entrance and the requirements for skill and capital are very low (Udall, 1976). Despite its large service sector, Kinshasa, and to a lesser degree other urban places, saw some participation in the other occupation types, such as skilled and unskilled manual labor, clerical, and managerial, technical and professional work. These employment sectors require greater skill and are generally rewarded with more frequent and higher pay.



Source: Measure DHS, Congo Democratic Republic, 2007.

Table 3.1 provides a relationship between educational attainment and types of female employment status, by place of residence. In the table, educational attainment is presented in mean number of years of schooling for not employed, self-employed, and employed women. .

Table 3.1. Average Female Educational Attainment by Employment Status (Average number of years of schooling)				
	Country	Rural	Kinshasa	Other urban places
Not Employed	7.1	4.9	9.3	7.8
Self-Employed	5.2	4.1	9.2	6.5
Employed	8.6	4.0	11.1	8.7

Source: Measure DHS, Congo Democratic Republic, 2007.

For the country results, attainment for the employed is greater than attainment for not employed and self-employed women, which shows better job placement associated with higher educational attainment. Self-employed shows the lowest attainment and may indicate that women enter the informal sector at the expense of attending school. In rural places, not employed, self-employed, employed women attain very low amounts of education on average. The averages for rural places are a reflection on the large agricultural presence in those areas and very limited amount of paid employment. Consequently, the results suggest that rural places lack employment incentives associated with higher education. On the other hand, women who are considered employed have the highest relative averages of educational attainment in Kinshasa and other urban places. This shows some monetary benefit of higher education levels urban places and provides an added incentive for women to attain higher levels of education.

Section 4: Fertility

The concluding substantive section of this paper is an analysis of fertility that will examine fertility behavior across the DRC and how it differs across urban and rural places. Similar to previous sections, places of residence will be broken into 3 categories of Kinshasa, other urban places, and rural places, which will provide evidence of fertility transition across varying levels of urbanization. The section will begin with a review of economic theory by Gary Becker and Richard Easterlin, and how their respective works relate to the present circumstances in the DRC. Following this discussion, an analysis of fertility will be presented, which can provide a link between the data in the DRC and the economic theory by Becker and Easterlin. This analysis will involve an examination of fertility rates across urban and rural places. Afterwards, education variables will be incorporated into the analysis, which will show the relative influence of education in fertility behavior. Finally, multivariate regression analyses conclude this section, which will incorporate relative determinants of fertility into a mathematical model.

Economist Gary Becker was instrumental in shaping studies of fertility through his work on household utility models. Becker, who wrote *A Treatise on the Family* (1981), provided the foundation for the determinants of demand for children in a household. Becker conveyed that household income, the relative costs for children, and the tastes of parents will dictate how many children are produced from a given household. He emphasized a quality-quantity tradeoff – where if the quantity of children produced is high, then the resources devoted to each child are less, which implies lower quality children. The costs associated with having a child include direct costs, such as food and shelter, and opportunity costs of the mother, such as earning an

income or attending school. As these costs of children increase, the number of children demanded will decrease.

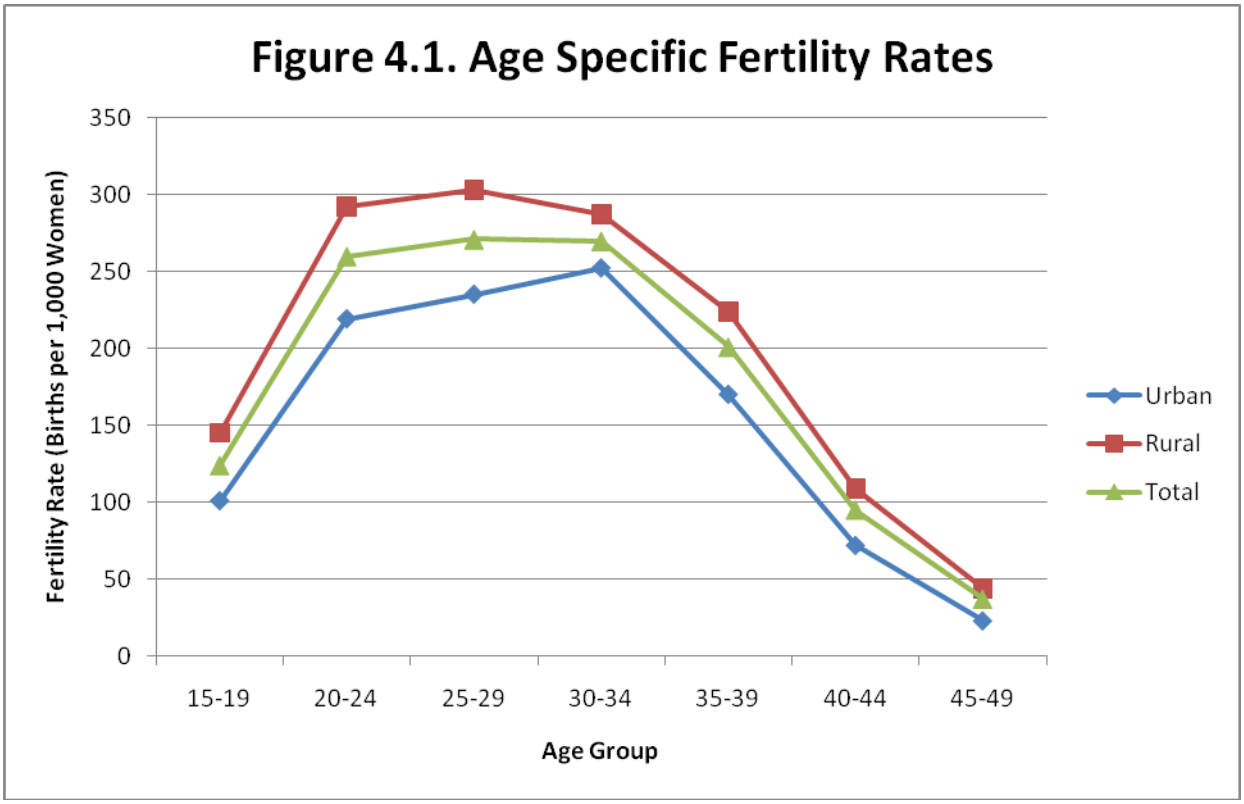
In his book entitled *Growth Triumphant: The 21st Century in Historical Perspective* (1996), Economist Richard Easterlin expanded on Becker's ideas to present a framework for fertility transition in societies. Easterlin uses three key factors pertaining to fertility in his framework: demand for children, supply of children, and the costs of fertility regulation. Easterlin's framework says that fertility transition is dependent on the Mortality Revolution, where the Mortality Revolution results in a greater number of living children and leads to an excess supply situation. In an excess supply situation, an intentional limitation of family size emerges and the costs and availability of contraceptives will play a key role in influencing fertility behavior.

On the demand side of the Easterlin Framework, Easterlin notes that there are modernization factors, cultural factors, and genetic factors, which play a role in affecting the demand for children. In general, nothing can be done to affect cultural or genetic factors, and therefore modernization factors often become the focus when trying to influence fertility transition through policy. Examples of modernization factors are urbanization, educational attainment, introduction of new goods, and modern sector employment (Easterlin, 1996). As has been shown earlier, due to the fragile state of the DRC's economy, introduction of new goods and modern sector employment seem like unlikely candidates to have considerable impact on the demand for children. But as the human capital in education increases, it could be likely that the economy will improve, which would make new goods and modern sector employment more of a factor in the demand for children.

At present, the two factors that will have the greatest influence in affecting the demand for children in the DRC will be educational attainment and urbanization. Easterlin shows that education raises the cost of children, partially by lost wages that the child could earn and partially by the opportunity costs that better-educated women have, such as paid employment (Easterlin, 1996). Furthermore, higher levels of educational attainment teach a greater understanding of contraceptive use, which better controls fertility behavior when intentionally limiting family size. In the case of urbanization, urban areas will usually cost more per child than in rural areas, and present fewer opportunities for children to work at younger ages. Also, urban areas present more opportunity for women's paid work than in rural areas, which would raise the opportunity costs for mothers. These two factors of education and urbanization seem to be related to each other, as Easterlin notes "Urbanization tends to lower the demand for children in a way similar to education, by opening up new lifestyles competitive with a family-centered life" (Easterlin, 1996, 110). As evidence in Kinshasa, often times education and urbanization go hand-in-hand, as they both contribute to changing societal expectations and improving women's status.

Moving to the data analysis of the DRC, Figure 4.1 uses the Stat Compiler from Measure DHS to show age-specific fertility rates for the country, and for urban and rural places. Provided in births per 1,000 women, the rates were based on births in the 3 years prior to the Measure DHS survey. Unfortunately, the program used to create the table was unable to separate urban places into Kinshasa and other urban places. It's important to keep this in mind, as Kinshasa's fertility rates are lower than suggested in the graph and the fertility rates for other urban places are higher than suggested in the graph[1]. Despite this problem, the figure is useful in showing

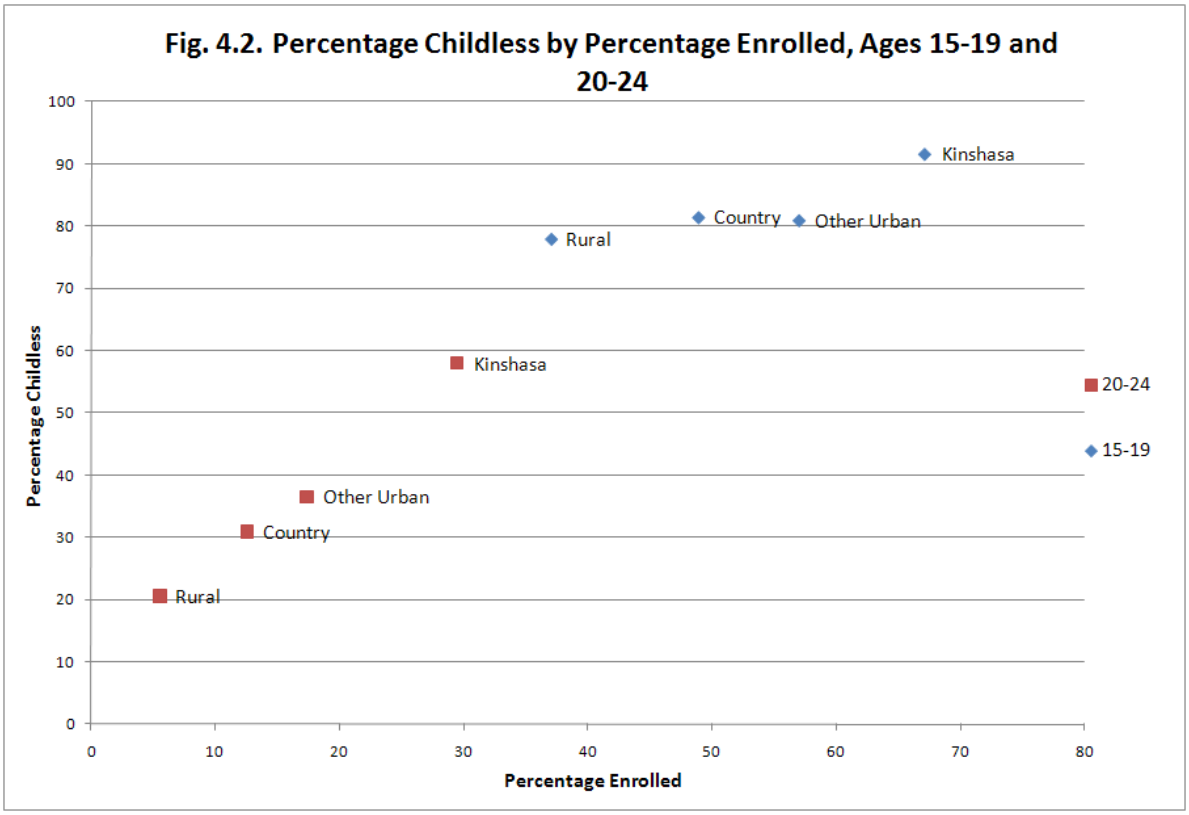
[1] The Measure DHS STATcompiler estimates 2007 total fertility to be 3.7 for Kinshasa and 5.4 for urban places. Due to urban population distributions, total fertility for other urban places is estimated to be approximately 6.3.



Source: Macro International Inc, 2010. Measure DHS STATcompiler.

that over the course of a lifespan, rural women will have higher fertility rates than urban women. As will later be shown in the multivariate regression, rural women enter the childbearing phase at younger ages than urban women. This is shown in the graph by a higher initial level for rural women at ages 15-19 and a steeper increase in fertility rates from the ages 15-19 to 20-24. Then, as the age of rural women increases to 25-29, the fertility rates plateau, and this is followed by a decline in fertility rates at later stages of life. In contrast, urban women at ages 15-19 start at a lower fertility rate than rural women. As the age for urban women increases from 15-19 to 20-24, the slope is less steep and consequently urban women have a fertility of about 100 fewer births per 1,000 than rural women in the 20-24 age group. Unlike rural women, urban women steadily increase their fertility levels until age 30-34, at which point they hit the pinnacle of their fertility rates. The differences in apexes of fertility rates, ages 25-29 for rural women and ages 30-34 for urban women, suggest postponement of childbearing by urban women.

Provided these differences in childbearing, it becomes important to examine what aspects of the urban environment contribute to a later entrance into childbirth. Keeping in mind the earlier section on educational attainment, Figure 4.2 looks at percentage childless by percentage enrolled for the 15-19 and 20-24 age groups, respectively. The graph's aim is to show the point of entrance into childbearing, and its relationship with enrollment in school. Despite not knowing the level of education being acquired, the age groups used indicate a prolonged academic career and often relate to secondary schooling. In the figure, a strong, positive relationship exists between secondary and university education and entrance into childbearing. Since enrollment in secondary and university education levels is high in Kinshasa, entrance into childbearing is delayed by a greater percentage of women there. In contrast, enrollment in secondary and university levels is the least in rural places, and not surprisingly, the percentage of childless women in those places is far less. This also suggests a direct relationship between



Source: Measure DHS – Congo Democratic Republic, 2007.

urbanization and percentage childless, where a large urban center will coincide with a higher percentage of childless women, and therefore later entrance into childbearing.

Table 4.1 provides a general context for urbanization and education and their relation to the demand for children. Coinciding with the theories of Becker and Easterlin, the data shows that increasing the level of a woman's education raises the opportunity costs of having a child, and thus lowers the demand for children. Furthermore, as shown in Becker's quality-quantity tradeoff, women with higher levels of education will strive for children with higher education, which increases the costs per each child and decreases the quantity demanded. In particular, the table shows as attainment increases, especially at secondary and university levels, the demand for children decreases for the country, rural places, Kinshasa, and other urban places. This shows that regardless of place of residence, increased schooling is effective at decreasing the demand for children.

Table 4.1. Desired fertility, by educational attainment and place of residence

	Country	Rural	Kinshasa	Other Urban
None	7.2	7.1	5.4	7.6
Primary	6.7	6.9	5.1	6.7
Secondary (1-2)	5.9	6.2	4.9	6.1
Secondary (3-4)	5.6	6.0	4.8	6.1
Secondary (5-6)	5.3	5.9	4.7	5.6
University	4.5	4.4	4.4	4.6
Total	6.3	6.8	4.8	6.4

Source: Measure DHS – Congo Democratic Republic, 2007

In Kinshasa, much lower levels of desired fertility exist at none and primary schooling levels. This could suggest other influences among the lesser educated, such as the cost of raising a child is greater, or the amount of paid employment for females is greater in Kinshasa. Such motivations coincide with urbanization, and its effect on decreasing the demand for children in urban places.

Multivariate Analyses of Fertility

Table 4.2.a and 4.2b are composed of 8 weighted ordinary least squares regressions for children ever born. In the regressions, total children ever born is the dependent variable and age, ethnic group, and schooling level are the independent variables. The use of age and age-squared allows for a nonlinear relationship with children ever born. Ethnic group and schooling level are each represented by a series of dummy variables, where Kwilu-Kwango and Secondary 1-2 were used as the reference category within each respective group. Regressions were estimated for the entire country, rural places, Kinshasa, and other urban places in order to compare the impacts of the explanatory variables on children ever born. Due to Kinshasa's outlier status in the context of fertility behavior, separate regressions were estimated for Kinshasa and all other urban places. Equations were estimated both for all women and for married women.

The first equation examines all women across the whole country and provides a reference for where the DRC stands in terms of fertility and its relative influences. Looking at age and age-squared, the coefficients indicate that the number of children increase as a woman's age increases, but at a decreasing rate[1]. In the schooling level section, the results coincide closely with the reasoning and theory that has been argued throughout much of this paper with regards to education and fertility. Using secondary 1-2 as the reference category, women with no education have roughly .15 more children while women with primary education have about .3 more children. Alternatively, on average women in the secondary 5-6 category have a little over 1 less child and women in the university category have a little over 2 less children in comparison to the secondary 1-2 reference category. If the coefficients for schooling level were plotted on a graph, they would resemble an upside-down U shape with women in the primary category at the apex.

[1] Using the partial derivative of age, children ever born would increase up until age 65, which is well beyond the ages used in the sample.

Table 4.2.a. Regression Analyses of Children Ever Born - 2007 (weighted ordinary least squares regression coefficients)					
		All Women			
		COUNTRY	RURAL	KINSHASA	OTHER URBAN
VARIABLE		**1**	**2**	**3**	**4**
AGE AT SURVEY	AGE	0.441**	0.508**	0.255**	0.411**
	AGE SQUARED	-0.0034**	-0.0044**	-0.0009+	-0.0027**
ETHNIC GROUP	BAKONGO	-0.126+	0.104	-0.153+	-0.288+
	KWILU-KWANGO	---	---	---	---
	MONGO	-0.102	-0.051	-0.043	-0.346*
	UBANGI	0.060	0.166	-0.323*	0.076
	LUBA	0.442**	0.450**	0.011	0.387**
	OTHER	0.202**	0.1991*	-0.181	0.141
SCHOOLING LEVEL	NONE	0.167**	0.151	0.997**	0.108
	PRIMARY	0.308**	0.381**	0.337**	0.097
	SECONDARY 1-2	---	---	---	---
	SECONDARY 3-4	-0.348**	-0.213	-0.362**	-0.265**
	SECONDARY 5-6	-1.0340**	-0.789**	-0.787**	-0.996**
	UNIVERSITY	-2.072**	-0.584	-1.684**	-2.065**
PARAMETERS	CONSTANT	-6.592	-7.653	-3.812	-6.121
	R^2/ADJUSTED R^2	.6044/.6040	.5769/.5760	.6089/.6061	.6349/.6335
	F-RATIO	1271.1	590.2	214.5	450.6
	Number of Observations (N)	9995	5206	1666	3123
	Mean Number of Children	2.98	3.34	2.02	2.85
	(Weighted average)				
	**	Significant at the .01 level.			
	*	Significant at the .05 level.			
	+	Significant at the .10 level.			
	Note: The OTHER URBAN sample is composed of all urban places, excluding Kinshasa				

Source: Measure DHS – Congo Democratic Republic, 2007.

Ethnic groups are provided in order to show they do wield some influence in determining children ever born, for example in the Luba and Other categories and, to a lesser degree, Bakongo women. But ultimately, the fertility differences among ethnic groups are smaller than the differences across education levels. This shows that educational attainment has a greater influence on fertility behavior than ethnicity.

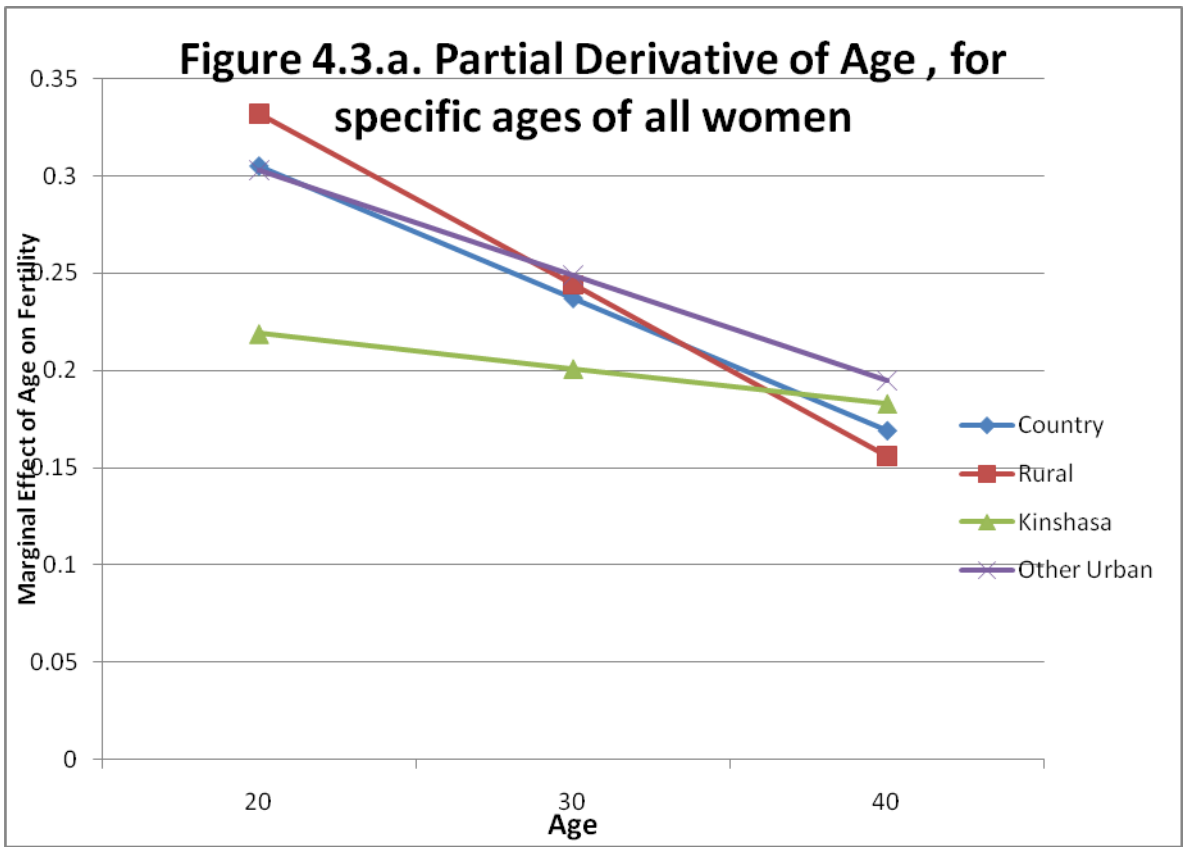
The second, third, and fourth equations use the same independent variables as the first equation, except they divide the sample among rural places, Kinshasa, and other urban places. Age and age-squared provide an immediate indication of relative fertility levels across the three

regional categories. Figure 4.1.a. utilizes the results from the regressions from all women shown in Table 4.2.a by taking the partial derivative of age. By taking a partial derivative, the following formula was created:

$$\text{Change in fertility associated with a change in age of one year} = ß_{age} + 2 * ß_{aqe\text{-}squared} * Age$$

Age levels of 20, 30, and 40 were inputted into the formula, which provided the marginal change in fertility at each given age. Also, the ethnic group and schooling level categories were held constant, which allows for a direct comparison between age and fertility level.

The rural sample exhibited the highest fertility behavior at age 20, where the marginal effect of age on fertility was between .3-.35 births. In the other urban places sample, the marginal effect of age on fertility of 20 year old women was roughly .3, which fell close to the country level results for 20 year olds. Finally, Kinshasa women age 20 exhibited the lowest marginal effect of age on fertility at roughly .2-.25 births, which is considerably lower than the levels for rural and other urban women. In comparison, such low numbers suggest that Kinshasa women delay childbearing, particularly at younger ages. Recalling the education data on Kinshasa presented earlier, higher levels of educational attainment coincide closely with a delay in childbearing. On the other hand, the results for the rural sample suggest that women in those places enter the childbearing phase at younger ages. As age increases to the 30 and 40 year old levels, the level of fertility in rural places declines at a quicker rate than the national averages and other place-of-residence categories. For example at age 40, women in Kinshasa and other urban places have a marginal effect of age on fertility close to .2, while rural women have a marginal effect of age on fertility close to .15. As the results at the 20 year level have shown, women in Kinshasa, and to some extent women in other urban places, delay their childbearing relative to women in rural places. In such circumstances, it makes sense that women in Kinshasa



Source: Measure DHS – Congo Democratic Republic, 2007.

and other urban places increase their fertility levels in later stages of life as they try to attain their desired number of children. On the other hand, women in rural places see a decline in fertility rates in their later stages of life as they have already achieved, to a certain degree, their desired number of children.

Referring back to the regressions in Table 4.2.a, the schooling level section shows decreasing fertility as educational attainment increases, holding age and ethnicity constant. In Kinshasa and other urban places, a particular emphasis is placed on the upper levels of educational attainment, which had significant results across secondary 3-4, secondary 5-6, and university levels. The results indicate an inverse relationship among higher levels of education, where increasing upper levels of education reduces the number of children ever born in comparison to the reference category. In Kinshasa, the relationship departs from the upside-

down U shown in equation 1 and forms an inverse relationship across all levels of education (even at none and primary levels). On the other hand, the effect of schooling level in the rural sample shows a lesser impact. For instance, insignificant results at the secondary 3-4 and university levels show that upper-level differences in schooling play a lesser role in influencing total children ever born. In rural places, less than 19% of women attain a secondary education of any kind and less than .01% of women attain a university education. Therefore it's to be expected that upper-level differences would play a lesser role in influencing fertility behavior in rural places. Consequently, the regression results suggest that the lack of higher education in rural areas plays a role in earlier entrance into childbearing and higher fertility.

The fifth equation in Table 4.2.b is comparable to the first equation in Table 4.1.a, but limits the country-wide results to married women. By limiting the results to married women, the coefficient for age saw an increase that suggests higher fertility among married women. The influence of schooling level on married women, in comparison to all women, shows small increases and the same general pattern of differences across schooling levels. Also, upper levels of schooling have a similar relationship with fertility among married women, where an inverse relationship still exists between higher levels of schooling and fertility. Ethnic group differences among married women are similar to those in equation one, but with slight increases in most categories.

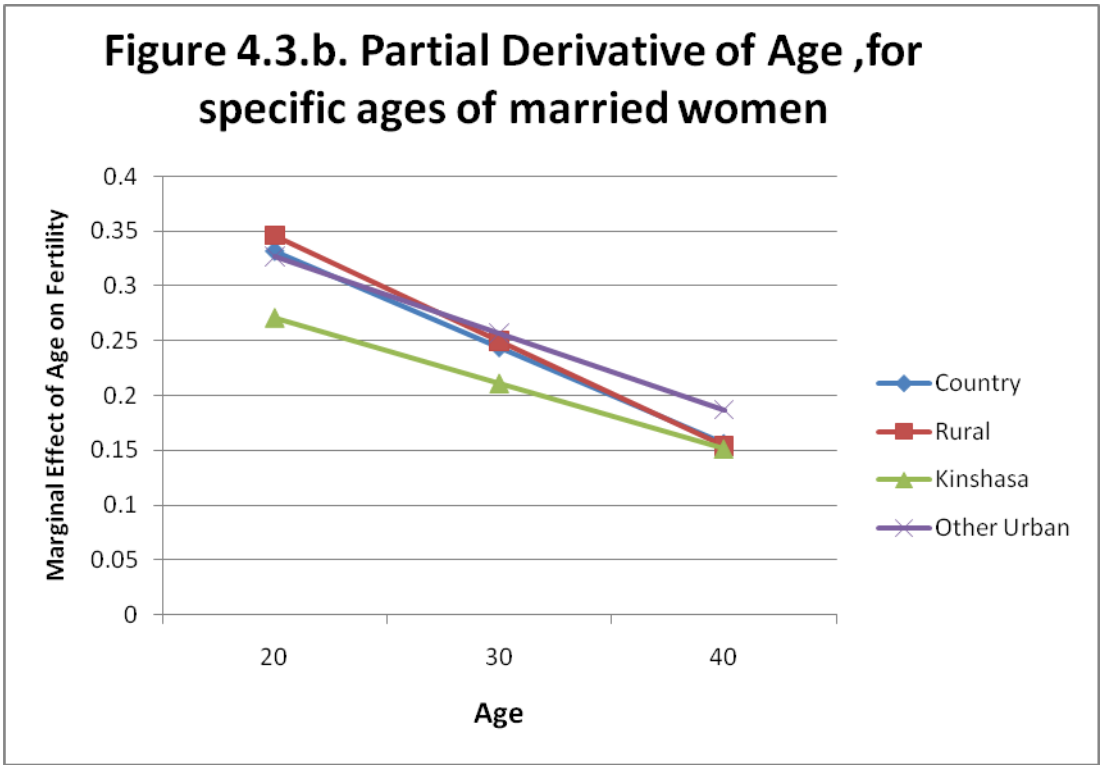
Equations six, seven, and eight are comparable to equations two, three, and four, respectively, but are limited to married women. The effects of upper levels of education on fertility still exist as secondary 5-6 and university remained significant for women in Kinshasa and other urban places. Also, the effects of schooling level on married women in rural places is similar to that seen in equation two, where upper levels of education other than secondary 5-6

Table 4.2.b. Regression Analyses of Children Ever Born - 2007 (weighted ordinary least squares regression coefficients)					
		Married Women			
		COUNTRY	RURAL	KINSHASA	OTHER URBAN
VARIABLE		**5**	**6**	**7**	**8**
AGE AT SURVEY	AGE	0.508**	0.538**	0.391**	0.467**
	AGE SQUARED	-0.0044**	-0.0048	-0.003**	-0.0035**
ETHNIC GROUP	BAKONGO	-0.185+	-0.072	-0.143	-0.313
	KWILU-KWANGO	---	---	---	---
	MONGO	-0.165	-0.119	-0.289	-0.303
	UBANGI	0.086	0.125	-0.322	0.118
	LUBA	0.486**	0.441	-0.091	0.587**
	OTHER	0.217*	0.157	-0.225	0.312+
SCHOOLING LEVEL	NONE	0.196*	0.166	1.79**	0.204
	PRIMARY	0.337**	-0.113**	0.638**	0.119
	SECONDARY 1-2	---	---	---	---
	SECONDARY 3-4	-0.256*	-0.113	-0.313+	-0.184
	SECONDARY 5-6	-0.864**	-0.636**	-0.623**	-0.865**
	UNIVERSITY	-2.130**	-0.496	-1.876**	-2.0932**
PARAMETERS	CONSTANT	-7.480	-7.917	-5.499	-6.967
	R^2/ADJUSTED R^2	.5090/.5081	.5005/.4990	.4891/.4810	.5412/.5384
	F-RATIO	567.8	319.5	60.5	193.1
	Number of Observations (N)	6586	3838	771	1977
	Mean Number of Children	3.94	4.05	3.48	3.87
	(Weighted average)				
	**	Significant at the .01 level.			
	*	Significant at the .05 level.			
	+	Significant at the .10 level.			
	Note: The URBAN sample is composed of all urban places, excluding Kinshasa				

Source: Measure DHS – Congo Democratic Republic, 2007.

had no discernible impact on fertility behavior.

Similar to Figure 4.1.a., Figure 4.1.b. uses partial derivatives to look at the change in fertility associated with a change in age of one year, but limits the results to married women. In comparison to all women, the marginal effect of age on fertility for married women displays a smaller gap in marginal change in fertility between women in rural places, Kinshasa, and other urban places. The convergence of marginal effect of age on fertility among married women suggests that marriage increases fertility behavior, regardless of the place-of-residence. This



Source: Measure DHS – Congo Democratic Republic, 2007.

indicates that a key aspect to Kinshasa's overall lower fertility is delayed entry into marriage.

From a different perspective, using the number of observations as a source, married women account for 46% of women in the Kinshasa sample, while married women make up 74% of women in the rural sample. As previous results have shown, married women generally have more children than non-married women, which would raise fertility levels in areas of higher marriage rates. In Kinshasa, one of the effects of higher educational attainment could be the postponement of marriage, which explains the lower proportion of married women in the region. This corresponds with the results presented above, where higher educational attainment lead to the delay of childbirth and everything associated with it, such as marriage.

Section 5: Conclusion

The evidence presented throughout this paper links women's status to fertility behavior, and shows how women's opportunity varies across urban and rural places. Due to such variances in opportunity, especially in women's education, the fertility differences between Kinshasa and rural and other urban places are significant. As seen elsewhere in sub-Saharan Africa, the large city of Kinshasa has emerged in the DRC to offer substantially greater educational opportunities, especially at secondary and university levels. One of the consequences of Kinshasa's greater educational opportunities has been much lower fertility than in the rest of the country.

Despite economic and political turmoil, educational attainment increased throughout the DRC between 1984 and 2007. As financing for schooling shifted from public to private funding, a strong demand for schooling remained and attainment increased among children. But as a result of private funding, the ability to reach higher levels of education was very class driven, where families at low income levels had greater difficulties in financing higher levels of education. In general, families in rural areas have lower income levels and families in urban areas have higher income levels, which influences educational opportunity across urban and rural places. Furthermore, the supply and demand for schooling, especially upper-levels of schooling, has influenced educational opportunities across urban and rural places.

As a consequence of the economic crisis, female participation in the labor market increased. Most of the increase occurred in the informal sector, where women in rural areas were employed in the agricultural sector and women in urban areas were employed in the service sector. Due to prolonged economic struggles, the modern sector consists of a small proportion of economic activity, which has resulted in only a small proportion of women receiving paid

employment. Although, a linkage does exist between modern sector work and higher levels of education, which shows some monetary benefit to acquiring higher levels of education.

As education and employment opportunities have seen varying increases, population growth has also varied in the DRC. Since employment in the modern sector has been limited, the prevailing influence in fertility behavior has been education. In general, attainment of secondary and higher levels of education has delayed entrance into childbearing. In urban places, secondary education is more prevalent, which has translated into lower fertility. On the other hand, rural places have limited attainment of secondary education, which has translated into higher fertility.

This paper has presented the capital city of Kinshasa as leading the way in fertility transition within the DRC. If urbanization can impact other large cities in the DRC in a similar way, then we can expect declines in total fertility for those cities in the future. In order to do so, policy should reflect what has been successful in Kinshasa, which has been greater opportunity for higher education.

A broader predicament to future outlook resides in political stability for the DRC and surrounding nations. Due to the DRC's plethora of ethnic groups and large area, it has been extremely difficult to remain a unified country. Continuing international support would go a long way in aiding stabilization. If it can remain stable, the people of the DRC seem to have the potential to improve their standard of living. Evidence of this exists in financing of education, where during a horrible economic crisis, families managed to somehow fund their children's education despite having very little income. This shows a sincere desire to acquire education and increase human capital. Hopefully this effort will benefit the country in improving measures of social welfare by fueling long term economic growth as well as aiding in fertility transition.

Works Cited

Becker, Gary S. *A Treatise on the Family*. President and Fellows of Harvard College, 1981. Print.

Clinton, Bill. "President Clinton Interview." Interview by Jon Stewart. *The Daily Show*. Comedy Central. New York City, New York, Thursday Sept. 2009. Television.

Easterlin, Richard A. *Growth Triumphant: The 21st Century in Historical Perspective (Economics, Cognition, and Society)*. New York: University of Michigan, 1996. Print.

Handelman, Howard. *Challenge of Third World Development*. 5th ed. Upper Saddle River, N.J: Pearson/Prentice Hall, 2005. Print.

Institut National de la Statistique. *Zaire: Profil de la Femme au Zaire, 1984*. Kinshasa: Institut National de la Statistique, Ministère du Plan et Aménagement du Territoire, République du Zaïre.

Institut National de la Statistique. *Zaïre: Un aperçu démographique. Recensement scientifique de la Population, 1984*. Kinshasa: Institut National de la Statistique, Ministère du Plan et Aménagement du Territoire, République du Zaïre.

Lonely Planet. "Democratic Republic of Congo." Map. Lonely Planet Publication. Web.

Measure DHS. Congo Democratic Republic: Standard DHS, 2007. Aug. 2007. Raw data. ICF Macro, Calverton, MD.

Measure DHS. Democratic Republic of the Congo: STATCompiler. ICF Macro, 2007. Web.

Measure DHS. *Democratic Republic of the Congo: Demographic and Health Survey 2007 Key Findings*. Measure DHS, Aug. 2007. Web. 8 Oct. 2009. <www.measuredhs.com>.

Population Division of the Department of Economic and Social Affairs of the United Nations Secretariat, *World Population Prospects: The 2006 Revision* and *World Urbanization Prospects: The 2007 Revision*, http://esa.un.org/unup, Monday, October 26, 2009.

Shapiro, David, Roger Nyuba Pongi, and Mark D. Gough. “Gender, Education, and the Labor Market in Kinshasa.” Working paper. May, 2009. Print.

Shapiro, David, and B. Oleko Tambashe. *Kinshasa in Transition: Women's Education, Employment, and Fertility*. Chicago: University of Chicago, 2003. Print.

Udall, Alan T. "The Effects of Rapid Increases in Labor Supply on Service Employment in Developing Countries." *Economic Development and Cultural Change* 24.4 (1976): 765-85.

U.S. Department of State. Bureau of African Affairs. Background Note: Democratic Republic of the Congo. U.S. Department of State, Sept. 2009. Web. 23 Nov. 2009. <www.state.gov>.

World Bank. *Congo, Dem. Rep. at a glance*. The World Bank Group, 24 Sept. 2008. Web.

World Bank. *Education in the Democratic Republic of the Congo: Priorities and Options for Regeneration*. Publication. Washington D.C.: World Bank, 2005. Print.

Spring 2010

VITA

Tom McCreary
1204 Cutler Circle
Lancaster, PA 17601
Phone: 717-606-3491
Email: tpm5023@psu.edu

Education: Bachelor of Science Degree in Economics, Penn State University, Spring 2010
Minor in Supply Chain and Information Systems
Honors in Economics
Thesis Title: Urbanization and Women's Education, Employment, and Fertility in the Democratic Republic of the Congo
Thesis Supervisor: Dr. David Shapiro

Experience: Research Experience for Undergraduates program. Research work on fertility transition in Kinshasa – the capital city of the Democratic Republic of the Congo.
Supervisor: Dr. David Shapiro
Summer 2009