

Effective Gender Mainstreaming: The Contributions of Reduced Gender Inequality to GDP Growth Prospects in Uganda.

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Executive Summary

This study is motivated by the need to provide evidence based recommendations for improved policy making as Uganda embarks on the process of development of the National Development Plan (NDP), 2009/10 – 2014/15. The development of the NDP, whose theme is “Growth, Employment and Prosperity” requires the integration of gender issues in economic analysis. In particular, there is a need to deepen gender mainstreaming in growth strategies, partly through analytical work that quantifies the contribution of reduced gender inequality to growth in Uganda. There are some studies that have provided preliminary evidence about the existence of gender inequality in Uganda (see for example, Nalwadda and Kaggugube, 2007). However, the magnitude and statistical significance of different aspects of gender inequality have not been established. To address these issues and assess their implications on aggregate economic growth, the study follows a two-pronged approach. The first part is a micro level analysis which looks into gender inequality in education, wage income and participation in wage employment. The second part takes a macroeconomic perspective and assess the contribution of reducing different aspects of gender inequality including the aspects studied in part one

The econometric analysis in part one sets out to assess gender inequality in education and labor force participation using the 2002/3 and 2005/6 household surveys. It starts with a descriptive analysis of the distribution of human capital by gender across the four regions to highlight the gender gap in education among the economically active population. We find that the general level of education of the Ugandan labor force is very low with more than 50% having achieved no more than primary education. There is also a huge gender inequality as women account for about two-thirds of the uneducated labor force. In terms of regions, the Western region has the lowest achievement with nearly a quarter of its labor force having no formal education while the Central region has the highest concentration of skilled labor (those who have completed at least senior secondary school).

The study continues to examine wage determination in the Ugandan labor market based on human capital and other widely used determinants. Like in other countries the results show that education increases earnings significantly and the returns to education are higher for women as compared to men. However, there remain a substantial wage gap in Uganda after taking into account other factors. Education increases earnings directly through human capital and indirectly by broadening the scope of job opportunities in high wage sectors. The Ugandan labor market also seems segmented with the highest wage rates observed in the Central region and lowest in the Western region.

Further analysis provides a decomposition of the gender wage gap into differences in endowments (observed characteristics) and differences in returns to endowments and hence can be labeled discrimination. We find that education reduces the gender wage gap in Uganda and the overwhelming portion of the gender wage gap (about 80%) is associated with sector and occupation of work. The sector effect is observable in the sense that women tend to be segregated into low paying sectors as compared to men. In the case of occupation the gender gap arises as women with the same occupation as men end up receiving lower wages. While a policy of 'equal pay for equal work' could deal with part of the problem it does not solve the whole problem if women tend to face high entry barriers in high wage sectors.

Wage employment accounts for slightly less than 20% of the Uganda labor force. We analyze the determinants of participation in wage employment and find that education not only increases the likelihood of wage employment in general but it also increases the likelihood of employment in high wage sectors. In general women are less likely than men to work for pay even after controlling for education and other personal characteristics such as marital status, family size and presence of small children. Their participation rate is even lower in sectors that pay above the national average wage rate. The Western region stands out with the highest rate of participation in wage employment but mainly in the low-wage sectors. The high participation rate in the Western region in low wage sectors is almost entirely because most women work in those sectors. The Central region shows a higher participation rate in high wage sectors but the effect is noticeable only for men but not for women. There has been an increase in participation in wage employment between 2002/3 and 2005/6 and the rate of increase is higher in the low wage sectors. Women's participation has also increased during the same period but the increase is higher in the non-wage sectors.

The macroeconomic implications of reducing gender inequality are studied in Part Two using Social Accounting Matrices (SAM) and a Computable General Equilibrium (CGE) approach. It runs several simulations on key aspects of gender inequality based on macro and micro level information. At a macroeconomic level, increasing the labor participation of men in the labor force would increase real GDP by 0.5 percent on annual basis over the period 2008-2016. Second, if the number of skilled women labor force is increased by 5 percent every year, this would result into additional output of 0.3 percent. This reinforces the earlier studies which suggest that providing education to women is critical also to their involvement in higher paying sectors. Thirdly, the impact of providing more ownership to land by women would have a marginal impact on the overall growth rate but positive. By directly improving the productivity of women intensive activities where women are mostly employed, this would benefit women and result into higher GDP growth of 0.4 percent. Finally, combining all these interventions would result into an additional real GDP growth of 1.2 percent.

Introduction

This document has two parts. Part-I deals with gender inequality in education, wages and participation in wage employment. Section 1 of Part-I provides descriptive statistics on the distribution of education across gender and regions. At each level of education we look at the male-female distribution to find out the extent of gender inequality in education. In section two we assess wage determination in Uganda using the well known Mincerian wage equations. The regression models we estimate take into account human capital, personal and labor market characteristics. The gender inequality in pay is captured by a gender dummy. In section three we go further to analyze gender based wage differences using a decomposition analysis. The purpose of the decomposition analysis is to separate that part of the wage gap which can be attributed to differences in observed characteristics (such as education, experience as well as choice of sector and occupation) and that part which can be attributed to differences in returns to observed characteristics. The latter part is considered as discrimination against women as it represents differences in the manner in which the labor market rewards the endowments of men and women workers. Wage employment accounts for slightly less than 20% of the Uganda labor force and in section four we analyze the determinants of participation in wage employment. This is done using probability models and these models are estimated for high and low wage sectors and for men and women separately. Section five provides conclusions of the analyses in Part I.

Part II of the paper focuses on growth and poverty effects of gender mainstreaming. Section six provides the main results and policy implications of the macroeconomic effects of gender inequality. Section seven describes the channels through which gender inequalities affect the aggregate economy. The key factors identified in this section include labor force participation, skills acquisition by women, ownership of land by women, and labor productivity of women. Section eight describes the SAM used as a basis for the baseline and our simulations and a more detailed description is provided in the appendix. The focus of this section is to make the SAM more gender oriented. This is achieved by differentiating labor categories along gender lines and ownership of land by gender. Section nine presents the simulations. We identify five simulations which include: (i) increasing the labor participation of women in more productive sectors, (ii) increasing skills acquisition by women, (iii) improving the productivity of sectors considered to be women intensive, (iv) increasing ownership of land by women, and (v) combining all the above interventions. The conclusion and policy implications are provided in section 10.

Part I

Gender Inequality in Education, Employment and Wages

1. Introduction

Education is well recognized as an investment that enhances labor productivity and the long term trajectory of economic growth. Developing countries in general and Africa economies in particular have a long way to go in building human capital. The challenge for many countries however goes beyond sheer expansion of access to education as they also have to achieve gender equity in the process. The subsequent sections analyze the distribution of human capital and key features of the Ugandan labor market by focusing on gender based differences in education, wage employment and wage income. The empirical analysis is based on the 2002/3 and 2005/6 Ugandan Household Surveys.

Table 1: Level of Education of the Economically Active Population by Gender

	Male			Female			Total	
	2002/3	2005/6	Total	2002/3	2005/6	Total	2002/3	2005/6
No Education	894 8.06	588 6.19	1,482 7.20	2,366 19.13	1,928 19.6	4,294 19.34	3,260 13.89	2,516 13.02
Primary Incomplete	80 0.72	39 0.41	119 0.58	149 1.20	58 0.59	207 0.93	229 0.98	97 0.50
Primary	6,062 54.63	5,456 57.47	11,518 55.94	6,461 52.23	5,310 53.98	11,771 53.01	12,523 53.37	10,766 55.69
Lower Secondary	413 3.72	234 2.46	647 3.14	315 2.55	176 1.79	491 2.21	728 3.10	410 2.12
Upper Secondary	3,160 28.48	2,688 28.31	5,848 28.40	2,794 22.59	2,091 21.26	4,885 22.00	5,954 25.37	4,779 24.72
Tertiary	487 4.39	489 5.15	976 4.74	285 2.3	274 2.79	559 2.52	772 3.29	763 3.95
Total	11,096 100	9,494 100	20,590 100	12,370 100	9,837 100	22,207 100	23,466 100.00	19,331 100.00

Source: Authors' computation based on the 2002/3 and 2005/6 Household Surveys

Note: The upper numbers in each cell are number of people in the sample and the lower number are column percentage shares

Table 1 looks at the distribution of education within the male and female labor force in 2002/3 and 2005/6. The Ugandan labor force has a very low level of education with

about two-thirds having no more than primary education. Table 1 shows that nearly one in five economically active women have no formal education, a fraction which comes down to less than one in ten among the economically active men. Moreover while there is a two percentage points reduction in the fraction of uneducated men between 2002/3 and 2005/6, there is no such tendency in the female labor force. Substantial effort is therefore needed to equipping women with the most basic of formal education. About 55% of the Ugandan labor force has completed primary education and the proportion of the female labor force with primary education is not far behind that of men. The gender gap in primary education seems however to have increased slightly in 2005/6 as compared to 2002/3. A wider gender gap is observed at the level of upper secondary education with the fraction of men and women with upper secondary education standing at 28% and 22%, respectively. Similarly, nearly 5% of men have tertiary education as compared to less than 3% for women. While the level of education of the Ugandan labor force remains low, with most people having no more than primary education, women lag behind men especially at upper secondary and tertiary levels of educations.

Another way to look at the gender imbalance in human capital is to look at the fraction of men and women within each level of education. Although women account for slightly more than half of the economically active population in Uganda, Figure 1 shows that the fraction of women declines steadily with the level of education. Women are thus overly represented among the unskilled or poorly skilled segment of the labor force while the skilled labor is mainly comprised of men; a fact that will be shown later as having important implications on the employment opportunities of women.

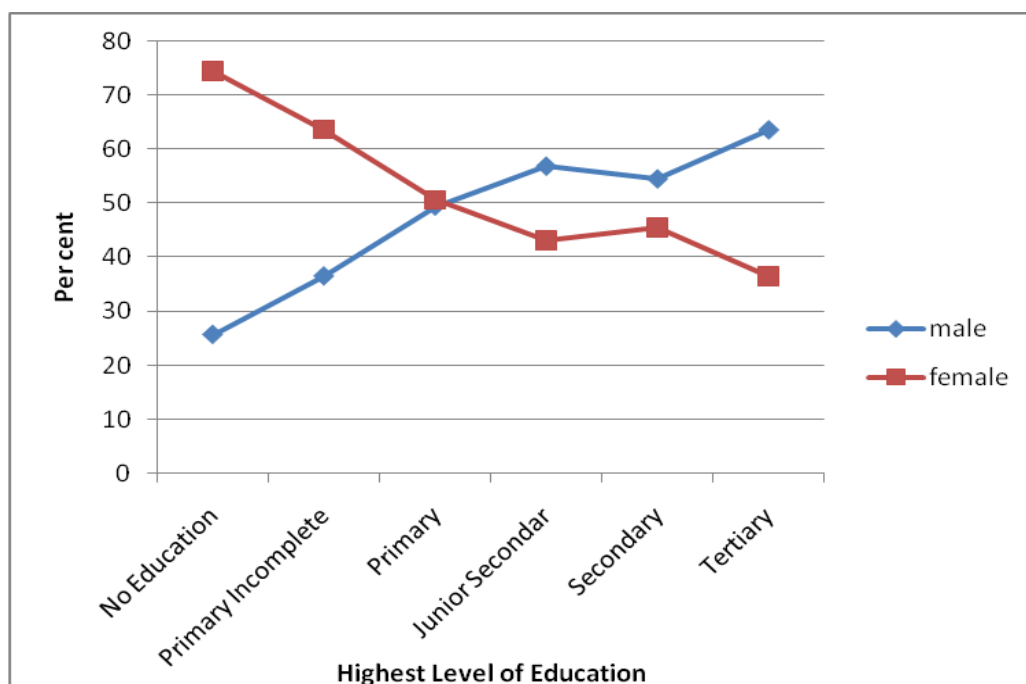


Figure 1: The Gender Composition of the Economically Active Population at Different Levels of Education

Source: Authors' computation based on the 2002/3 and 2005/6 Household Surveys

Table 2: The Distribution of the Economically Active Population by Region and Highest Level of Education (2002/3 and 2005/6)

	Central	Eastern	Western	Northern	All Regions
No Education	960 8.03	1,437 12.02	1,776 21.41	1,687 15.01	5,860 13.49
Primary Incomplete	53 0.44	105 0.88	94 1.13	80 0.71	332 0.76
Primary	6,332 52.98	6,599 55.19	4,605 55.51	6,095 54.23	23,631 54.40
Junior Secondary	301 2.52	310 2.59	209 2.52	347 3.09	1,167 2.69
Upper Secondary	3,757 31.44	3,136 26.23	1,408 16.97	2,591 23.05	10,892 25.07
Tertiary	548 4.59	370 3.09	204 2.46	439 3.91	1,561 3.59
Total	11,951 100.00	11,957 100.00	8,296 100.00	11,239 100.00	43,443 100.00

Source: Authors' computation based on the 2002/3 and 2005/6 Household Surveys

Note: The upper numbers in each cell are number of people and the lower numbers are column percentage shares

Most countries have segmented labor markets reflecting differences in the underlying institutions and economic structures of administrative units. Table 2 looks at differences in the human capital across the four regions of Uganda. The Western and Northern regions stand above the national average in terms of the proportion of their labor force with no formal education. The Central region has by far the highest concentration of educated labor force with nearly 36% having achieved at least upper secondary education. The Eastern and Northern regions follow distantly with 29% and 27% of their labor forces, respectively, having completed at least upper secondary education. The Western region lags far behind in upper secondary and tertiary education while having the largest fraction (nearly a quarter) of uneducated people.

Table 3: The Distribution of Education in the Economically Active Population by Region and Gender

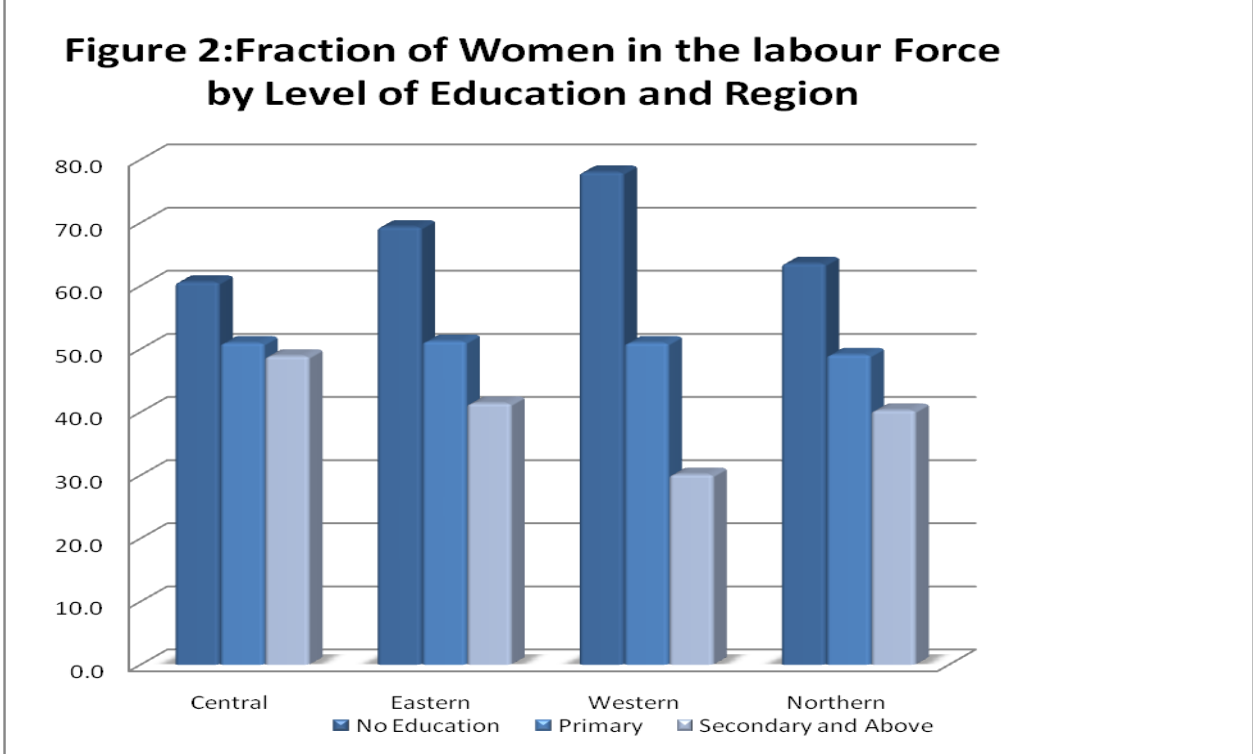
Region		No Education	Primary Incomplete	Primary	Lower Secondary	Upper Secondary	Tertiary	Total
Central	Male	31.63	47.17	49.05	46.42	49.57	57.38	48.13
	Female	68.37	52.83	50.95	53.58	50.43	42.62	51.87
Eastern	Male	24.07	37.25	48.79	53.00	55.78	67.04	48.21
	Female	75.93	62.75	51.21	47.00	44.22	32.96	51.79
Western	Male	21.42	22.58	49.03	70.30	65.23	74.11	46.70
	Female	78.58	77.42	50.97	29.70	34.77	25.89	53.30
Northern	Male	28.05	44.87	50.91	61.22	54.23	63.70	49.02
	Female	71.95	55.13	49.09	38.78	45.77	36.30	50.98

Source: Authors' computation based on the 2002/3 and 2005/6 Household Surveys

Note: The male female averages add up to 100% for each level of education for every region.

Table 3 goes further in showing regional variation in gender inequality in education. The better educational outcome in the Central region also manifests itself in a relatively higher shares of women with upper secondary and tertiary education which are far better than the national averages indicated in Figure 1. Similarly, the poor educational performance of the Western region is also accompanied by disproportionately fewer women with at least upper secondary education as compared to the national average. Figure 2 shows that in the Western region women account for more than 75% the labor force with no education while they account for less than a third of the skilled labor force

(those with upper secondary and tertiary education put together). The Northern region seems to have better outcomes as compared to the Eastern and Western regions in terms of the gender gap in educational achievements. Such variation across regions could be due to a combination of access to education as well as cultural and social differences towards women’s education.



2. Wage Employment

In this section we analyze the determinants of average monthly income for individuals who participate in wage employment. Since education is an investment in human capital, it is important that the returns to such investment are properly evaluated. Our analysis focuses on the individual returns rather than the social returns to education. The ultimate objective is to identify systematic gender based differences in which the labor market rewards human capital and other personal characteristics that may directly or indirectly affect an individual’s productivity at work.

We proceed by estimating the well known Mincerian earnings functions which have the following structure:

$$\ln(wage_i) = \beta_0 + \beta_1 H_i + \beta_2 P_i + \beta_3 L_i + u_i \quad (1)$$

Where $\ln(wage)$ is the logarithm of monthly wage and H stands for human capital acquired through formal education and work experience, P stands for personal characteristics such as gender and marital status, and L stands for labor market characteristics such as the size of the company, the occupation and sector of an individual's employment.

Table 4 presents the results of alternative specifications of the earnings function using the method of Ordinary Least Squares (OLS). Columns 2 and 3 of Table 4 capture human capital, personal characteristics and some interaction terms. Human capital is captured by a set of dummy variables indicating the highest level of education that an individual has achieved and the (potential) years of work experience. We are using potential years of experience rather than actual experience since the 2005/6 survey does not measure actual years of experience. The reference group in the set of education dummies are those individuals with no formal education. As an important element of our analysis we have a gender dummy which takes the value one for female workers. In column 3 we include marital status and being a household head and their interactions with the gender dummy. For marital status the reference category includes workers who have never married. In column 4 we control for regional differences in the labor market and the Northern region is our reference category. In column 5 we take into account sector effects and in column 6 we expand the model by including occupational differences. However, the coefficients on sector and occupational dummy variables are not reported here to keep the tables handy. However, a joint significance test shows that the sector and occupational dummy variables are jointly significant and their inclusion improves the explanatory power of the regression model significantly.

Table 4: Estimates of Earnings Functions

1	(2)	(3)	(4)	(5)	(6)
Potential experience	0.0312** (0.0020)	0.0244** (0.0027)	0.0234** (0.0027)	0.0245** (0.0026)	0.0232** (0.0026)
Potential experience squared	-0.0006** (0.0000)	-0.0005** (0.0001)	-0.0005** (0.0001)	-0.0005** (0.0001)	-0.0004** (0.0000)
Incomplete Primary	0.1919 (0.1902)	-0.0381 (0.1981)	-0.0584 (0.1947)	-0.0305 (0.1867)	-0.1013 (0.1835)
Primary	0.3090** (0.0476)	0.2628** (0.0506)	0.2622** (0.0497)	0.1440** (0.0471)	0.1282** (0.0464)
Lower Secondary	1.2747** (0.0655)	1.1868** (0.0682)	1.2164** (0.0670)	0.8146** (0.0679)	0.6251** (0.0691)
Upper Secondary	1.0164** (0.0516)	0.9266** (0.0550)	0.8973** (0.0541)	0.5369** (0.0528)	0.4520** (0.0526)
Tertiary	2.0093** (0.0580)	1.8982** (0.0611)	1.8891** (0.0600)	1.4432** (0.0624)	1.0961** (0.0671)
Female	-0.4532** (0.0587)	-0.4397** (0.0823)	-0.3723** (0.0809)	-0.2843** (0.0773)	-0.2915** (0.0764)
Female-Incomplete primary	0.0285 (0.2459)	-0.1085 (0.2708)	-0.0537 (0.2659)	-0.0588 (0.2522)	-0.0314 (0.2479)
Female-Primary	0.0050 (0.0666)	-0.0115 (0.0725)	-0.0534 (0.0713)	0.0165 (0.0672)	0.0222 (0.0661)
Female-Lower Secondary	0.4990** (0.0949)	0.5488** (0.1075)	0.4264** (0.1060)	0.2043* (0.1017)	0.1829+ (0.1008)
Female-Upper Secondary	0.2213** (0.0756)	0.1296 (0.0869)	0.0233 (0.0856)	0.0013 (0.0815)	0.0115 (0.0816)
Female-Tertiary	0.3078** (0.0865)	0.3022** (0.0982)	0.1984* (0.0967)	0.0292 (0.0920)	0.0935 (0.0915)
Married Monogamy		0.0981* (0.0393)	0.1719** (0.0389)	0.1181** (0.0371)	0.1085** (0.0368)
Married Polygamy		0.2459** (0.0533)	0.3630** (0.0530)	0.2473** (0.0506)	0.2393** (0.0503)
Divorced		-0.1191+ (0.0650)	-0.1298* (0.0638)	-0.1042+ (0.0603)	-0.0895 (0.0595)
Widowed		0.0501 (0.1107)	0.1048 (0.1087)	0.1088 (0.1026)	0.0956 (0.1023)
Female-Monogamy		0.0687 (0.0651)	0.0531 (0.0639)	0.0908 (0.0615)	0.1027+ (0.0610)
Female-Polygamy		-0.1452+ (0.0850)	-0.1377+ (0.0835)	-0.0550 (0.0798)	-0.0576 (0.0792)
Female-Divorced		0.2497** (0.0920)	0.2659** (0.0903)	0.2412** (0.0854)	0.2338** (0.0844)
Female-Widow		0.0994 (0.1315)	0.0907 (0.1291)	0.0615 (0.1225)	0.0883 (0.1219)
Household Head		0.2333** (0.0403)	0.1911** (0.0397)	0.0927* (0.0377)	0.0751* (0.0374)
Female Head		-0.0970 (0.0624)	-0.0755 (0.0612)	-0.0763 (0.0584)	-0.0794 (0.0578)
Eastern Region			0.0709* (0.0307)	0.0226 (0.0293)	0.0535+ (0.0291)
Western Region			-0.1651** (0.0303)	-0.1619** (0.0287)	-0.1200** (0.0286)
Central Region			0.3011** (0.0281)	0.2074** (0.0270)	0.2330** (0.0269)

Constant	10.0198** (0.0482)	9.9249** (0.0570)	9.8383** (0.0580)	9.7086** (0.0553)	9.9389** (0.0661)
Sector dummies	No	No	No	Yes	Yes
Occupation dummies	No	No	No	No	Yes
Observations	8411	6638	6638	6495	6387
R-squared	0.37	0.41	0.43	0.50	0.51

Note: +, * and ** represent significance at 10%, 5% and 1% level, respectively. Standard errors in parentheses

Source: Authors' computation based on the 2002/3 and 2005/6 Household Surveys

As in many other cases, the results in Table 4 indicate that human capital significantly improves the expected income of individuals in the Ugandan labor market. Looking at specific results, we observe that average monthly wage increases with experience but in a non-linear fashion. An additional year of experience increases average wage by about 2.5 per cent and reaches a turning point at about 25 years of experience after which more years of experience do not lead to higher wages. There are no statistically significant differences in the expected earnings of individuals with incomplete primary education and those with no formal education whatsoever. In all our specifications the returns to education become statistically significant after completing primary school. Since the education dummies are interacted with the gender dummy, the coefficients on the education dummies (without interaction) capture the effect of education on labor income regardless of gender while the coefficients on the interaction terms indicate the additional benefits of education for women. If the coefficients of the interaction terms are statistically insignificant it means that education increases the monthly wages of men and women by equal proportions.

In specifications that ignore sector and occupational effects (columns 2 to 4), completing primary education increases monthly wage by about 26% to 30% as compared to workers with no formal education. That means every additional year of primary education increases wages by about 4-5% on average. However, once sector and occupational choices of individuals are taken into account (columns 5 and 6), the coefficients on primary education decline by almost 50%. The coefficients on the indicators of lower-secondary, upper-secondary and tertiary education are also positive

and statistically significant at one percent in all the specifications although the increase in the size of the coefficients is not monotonic. For instance, those who have completed lower secondary school seem to earn slightly more than those with upper secondary education. Like in the case of primary education, the size of the other education coefficients also declines sharply once sector and occupational differences are taken into account. This observation suggests that apart from having a direct effect, education has an indirect effect on wages by expanding the occupational and sectoral job opportunities of individuals. There are important differences in average wage across industries and occupational groups, and individuals with better education are more likely to get jobs in higher wage industries. This issue will be discussed further in the section on labor force participation.

Not surprisingly, the regression results show that there is a female disadvantage in the Ugandan labor market. In the regression models that take into account only education and personal characteristics (columns 2-4), the average monthly wage of women is about 45% less than the average wage of men. Once labor market characteristics such as location, sector and occupation are taken into account, the gender pay differential narrows down to nearly 30%. This finding suggests that the sectoral and occupational distributions of the labor force differ widely along gender lines and that ignoring these differences tends to overstate the gender pay inequality. As will be discussed later on, there is clear segregation of women into low paying sectors which in itself is a feature of labor market imperfection and a manifestation of gender inequality.

Another interesting set of results is the coefficients on the interaction of gender and education. In columns 2 to 4 the interaction terms are statistically significant for lower secondary and tertiary education suggesting that the returns to education are higher for women as compared to men (by about 50% in the case of lower secondary school and about 30% in the case of tertiary education). In other words, although women on

average earn less than men, the individual returns to investment in education are higher for women. This also implies that the gender pay gap narrows down as women acquire more human capital. The coefficients on the interaction terms remain positive but they become statistically insignificant once sector and occupation differences are accounted for, except for the coefficient of lower secondary school which remains statistically significant. The conclusion is that education raises the earning potentials of the average person in the labor market and these benefits are even higher for women. This additional advantage however tends to work itself out mainly through providing an exit from low paying occupations and sectors.

Table 4 shows that marital status have important implications on wage income. Before interpreting these relationships however we will first look at the distribution of marital status by gender. There are some similarities and differences between the marital status of economically active men and women. A little more than 50% of men and women in the labor force are currently married predominantly in monogamous marriages. There are however proportionally more (43.37%) unmarried men than women in the economically active age group. On the other hand divorced and widowed women account for about 15% of the female labor force as compared to only 4% in the male labor force.

Table 5: Marital Status of Economically Active Men and Women (%)

Marital Status	Male	Female	Total
Never Married	43.37	29.91	36.39
Married -Monogamy	42.60	41.49	42.03
Married Polygamy	9.92	13.44	11.75
Divorced	3.12	7.78	5.54
Widowed	1.00	7.38	4.30
Total	100.00	100.00	100.00

Source: Authors' computation based on the 2002/3 and 2005/6 Household Surveys

Table 4 also shows that married employees earn significantly higher wages as compared to those who have never married after controlling for differences in education and years of experience. In the more complete specifications in columns 5 and 6, the increases in wage are about 11% for those in monogamous marriages and 24% for those in polygamous marriages. Divorced individuals tend to earn less than unmarried workers while there are no statistically significant differences in earnings between widows and unmarried workers. The coefficients on the interaction terms of gender and marital status also point out to striking differences in the manner in which the labor market responds to the marital statuses of men and women. Women in polygamous marriages, for instance, earn less than men in polygamous marriages although the former still earn higher wages than singles. On the other hand divorced women earn higher than divorced men and in fact the negative relationship between wage and being divorced is observed only among men. Being a household head significantly enhances one's standing in the labor market and there are no statistically significant differences between men and women heads of households although the positive effect is slightly higher for men heads of households.

Location of employment has a significant impact on an individual's earning potentials. Those who work in the Central region earn by far the highest average wage followed by those in the Eastern region. Column 6 shows that wages in the central and eastern regions are about 23% and 5% more than the average wage in the North. The Western region has the lowest average wage rate, i.e., about 12% lower than in the North. Since education and sector of work are already taken into account, the observed regional differences in average wage are not related with differences in human capital or economic structure. They might however reflect differences in firm size across regions (large firms usually paying higher wages), labor market institutions and regulations. Even then the wage differences do not necessarily reflect differences in well being as price differences between regions are not taken into account in this analysis. There are no location specific differences in the average wages of men and women. For instance,

both men and women in the Central region earn far better than other regions with the average wage always being higher for men¹.

3. Decomposition of Gender Pay Differentials

This section provides a detailed analysis of the gender pay differential in the Ugandan labor market. The widely used methodological approach is the decomposition analysis suggested by Blinder (1973) and Oaxaca (1973). The basic idea of this methodology is to estimate the magnitude of the total gender pay gap that can be attributed to differences in observed characteristics from that part which cannot be explained. The former is the explained part of the gap and the latter is the unexplained part which in the literature is regarded as discrimination against women. The main methodological challenge in this type of decomposition analysis is to determine the wage structure that would prevail in the hypothetical situation where there is no discrimination. There are three assumptions that one can make. The first is to assume that the current male wage structure would be the non-discriminatory wage structure. The second possibility is to assume the earnings equation estimated from a pooled sample (one that includes the male and female subsamples) as the wage structure that would prevail in the absence of discrimination. The third approach is to take the average of the coefficients from the male and female earnings equations estimated separately and consider that as the non-discriminatory wage structure.

Equation 1 above can be expressed succinctly as :

$$\ln W_i = X_i\beta + u_i \quad (2)$$

where $\ln W$ is the natural logarithm of monthly wage, X is a vector of personal and labor market characteristics, β is a vector of coefficients to be estimated and u_i represents unobserved variation in monthly wages that are assumed to be normally distributed

¹ These results are based on interaction of gender and region but the models are not reported here as the interaction terms were not significant.

and correlated neither with the observed characteristics nor with themselves. For the decomposition analysis, equation 2 will be estimated for male and female subsamples separately and we use the subscripts m and f for male and female workers.

The variable of interest is the difference in the mean log wage of the male and female subsamples which can be expressed as

$$\overline{\ln W_m} - \overline{\ln W_f} = \overline{X_m} \hat{\beta}_m - \overline{X_f} \hat{\beta}_f \quad (3)$$

where $\overline{\ln W_m}$ and $\overline{\ln W_f}$ are mean log wages of men and women, $\overline{X_m}$ and $\overline{X_f}$ are the sample means of the explanatory variables for the male and female subsamples, respectively.

Assuming that the wage structure would prevail in the absence of discrimination, the gender wage gap in equation 3 can be expressed as

$$\overline{\ln W_m} - \overline{\ln W_f} = (\overline{X_m} - \overline{X_f}) \hat{\beta}_m + (\hat{\beta}_m - \hat{\beta}_f) \overline{X_f} \quad (4)$$

The first term on the right hand side of equation 4 is part of the wage gap that can be explained by male-female differences in observable and measurable characteristics while the second term measures the wage gap that is due to differences in returns to observed characteristics. As already indicated it is the latter that will be attributed to discrimination against women.

On the other hand, if we make the other two assumptions about the non-discriminatory wage structure, the gender pay gap in equation 3 can be expressed as

$$\overline{\ln W_m} - \overline{\ln W_f} = (\overline{X_m} - \overline{X_f}) \hat{\beta}_p + (\hat{\beta}_m - \hat{\beta}_p) \overline{X_m} + (\hat{\beta}_p - \hat{\beta}_f) \overline{X_f} \quad (5) \text{ or}$$

$$\overline{\ln W_m} - \overline{\ln W_f} = (\overline{X_m} - \overline{X_f}) \hat{\beta} + (\hat{\beta}_m - \hat{\beta}) \overline{X_m} + (\hat{\beta} - \hat{\beta}_f) \overline{X_f} \quad (6)$$

where $\hat{\beta}_p$ is the coefficients from the pooled regression and $\hat{\beta} = \frac{\hat{\beta}_m + \hat{\beta}_f}{2}$. Equations 5 and 6 have three terms in the right hand side. The first term in each equation represents the explained part of the wage gap. The other two parts decompose the unexplained wage gap into two components. The second term in both equations captures a male advantage or a male favoritism while the last term captures a female disadvantage. Under male favoritism, employers do not necessarily pay women lower wages but tend to pay a premium for male employees. The third term captures situations where women employees would be subjected to a lower pay scale for the same job.

The results of the decomposition analyses will obviously be different depending on the assumptions made about the non-discriminatory wage structure. In this document we adopted a cautious approach and applied the three methods and compare the results rather than using only one method. Tables 6a to 6c present the summary of the results of the decomposition analyses using the three alternative decomposition methods, i.e. equations 4, 5 and 6, respectively. The detailed results are presented in Appendix Table 2a-2c.

Table 6a: Decomposition of Gender Wage Gap: Assuming the male wage as the non-discriminatory wage structure

	Total	Explained	Unexplained
Experience	0.0287	0.0218	0.0069
Education	-0.0695	0.0143	-0.0838
Marital Status	-0.0058	0.0157	-0.0215
Household Head	0.0539	0.0251	0.0288
Region	0.0203	0.0149	0.0054
Sector	0.1962	0.1090	0.0872
Occupation	0.1794	0.0114	0.1680
Intercept	0.0590	0.0000	0.0590

Total Wage Gap (ln)	0.4622	0.2122	0.2500
Share (%)	100	45.91	56.10

Table 6b: Decomposition of Gender Wage Gap: Assuming the pooled regression as the non-discriminatory wage structure

	Total	Explained	Male Advantage	Female Disadvantage
Experience	0.0287	0.0236	-0.0133	0.0184
Education	-0.0695	0.0241	-0.0781	-0.0155
Marital Status	-0.0058	0.0296	0.0091	-0.0445
Household Head	0.0539	0.0420	-0.0398	0.0517
Region	0.0203	0.0145	0.0086	-0.0028
Sector	0.1962	0.1518	0.0014	0.0430
Occupation	0.1794	0.0200	0.0552	0.1042
Intercept	0.0590	0.0000	0.1010	-0.0419
Total Wage Gap (ln)	0.4622	0.3056	0.0439	0.1127
Share (%)	100	66.12	9.50	24.38

Table 6c: Decomposition of Gender Wage Gap: Assuming the average of the male and female regressions as the non-discriminatory wage structure

	Total	Explained	Male Advantage	Female Disadvantage
Experience	0.0287	0.0215	0.0037	0.0035
Education	-0.0695	0.0164	-0.0440	-0.0419
Marital Status	-0.0058	0.0138	-0.0088	-0.0108
Household Head	0.0539	0.0145	0.0251	0.0144
Region	0.0203	0.0131	0.0045	0.0027
Sector	0.1962	0.1214	0.0312	0.0436
Occupation	0.1794	0.0345	0.0609	0.0840
Intercept	0.0590	0.0000	0.0295	0.0295
Total Wage Gap (ln)	0.4622	0.2352	0.1020	0.1250
Share (%)	100	50.89	22.11	27.05

Source: Authors' computation based on the 2002/3 and 2005/6 Household Surveys

As expected Tables 6a to 6c show that the exact magnitude of the wage gap that can be explained by observed characteristics and by differences in returns to those characteristics vary across decomposition methods. However, by looking at the last

rows of the three tables it becomes clear that approximately 46-66% of the gender wage gap is due to differences in the observed characteristics of male and female workers. That means on average men and women have different levels of human capital, participate in different sectors, choose different occupations etc.. On the other hand, about 34-55% of the gender wage gap remains unexplained by differences in observed characteristics but by gender based differences in rewards to those characteristics and hence represents the extent of discrimination. In Tables 6b and 6c, the discrimination is further divided into two parts: a male advantage (or male favoritism) versus a female disadvantage. In Table 6b the discrimination is overwhelmingly due to a female disadvantage while in Table 6c both effects seem to be strongly evident with female disadvantage taking the lead. In general it can be said that there is a substantial amount of discrimination against women in the Ugandan labor market. This discrimination is expected to undermine female labor force participation rate and ultimately impact the economy negatively. Most importantly, the fact that 46-66% of the wage gap is traceable to differences in observed characteristics suggests that a substantial part of the wage gap is potentially subject to action by policymakers and improve the wellbeing of working women and the female labor force participation rates.

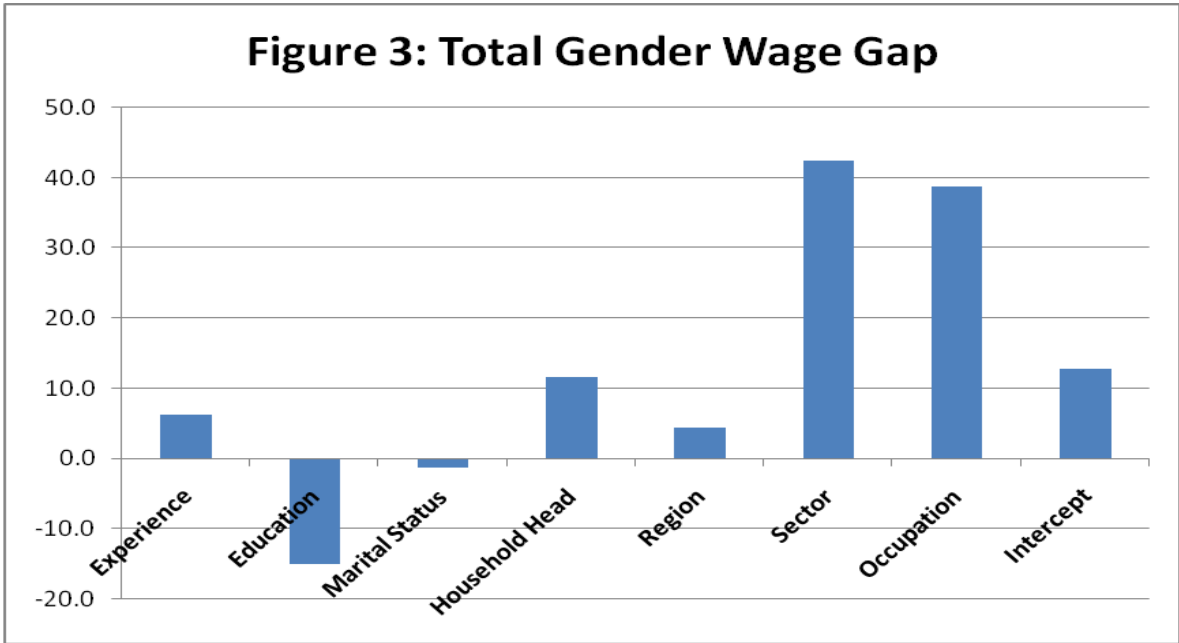
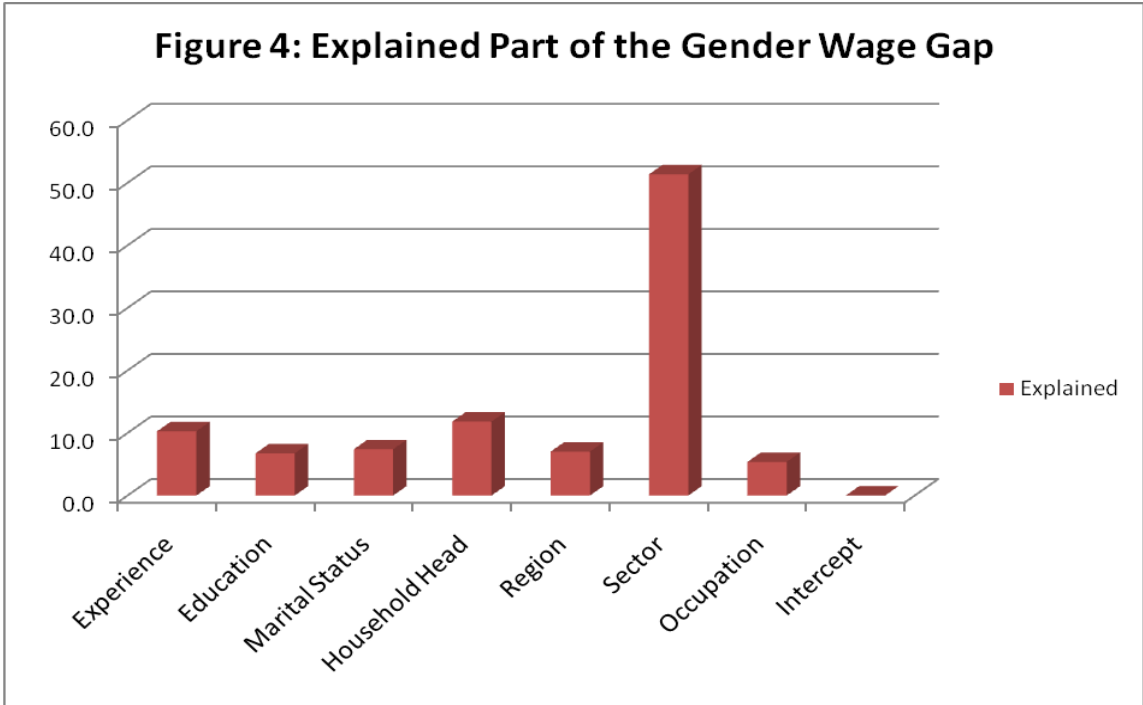


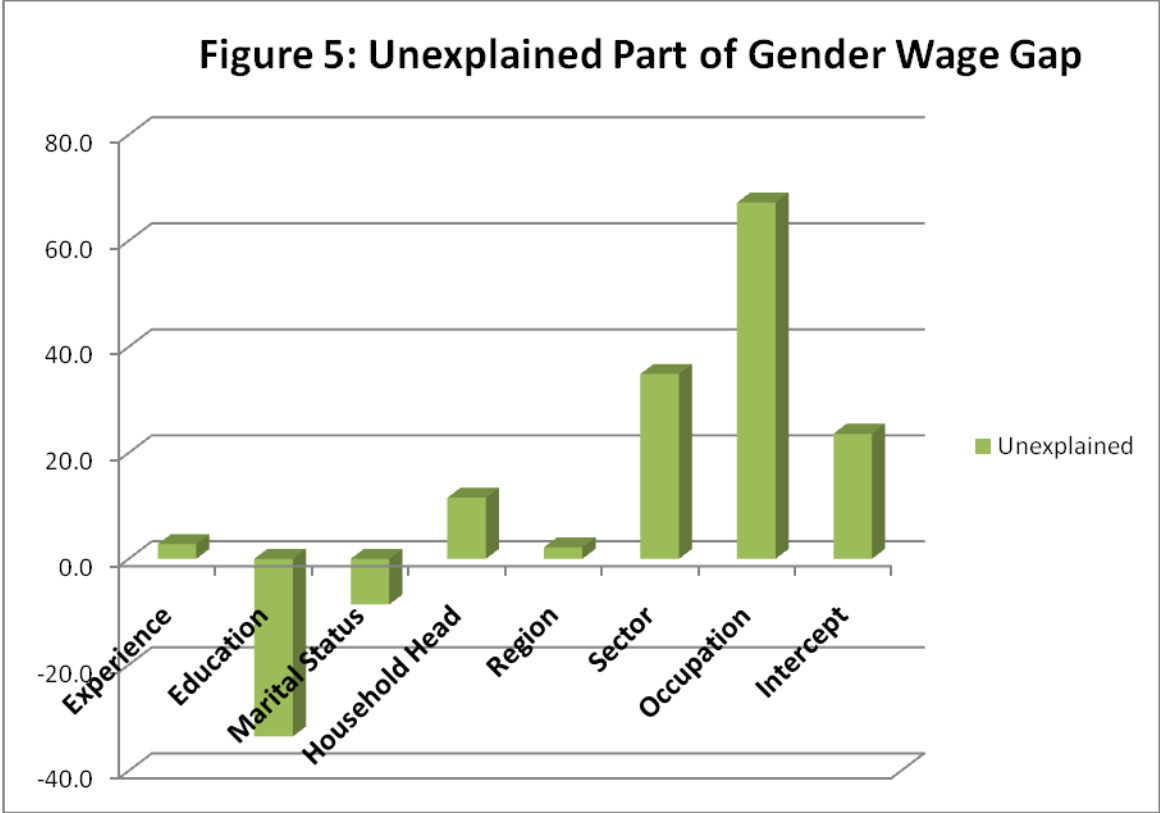
Figure 3 expresses the first column of the three tables (the total wage gap) in percentage terms. Examining the individual variables closely, one can see that education tends to reduce the gender wage gap. This is a favorable outcome and corroborates the results of the earning functions in the previous section where the returns to education are higher for women as compared to men especially at higher levels of education. Therefore an education policy aimed at increasing women's access to education can reduce gender pay inequality in the labor market.

It is important to notice that 42% of the total gender wage gap at the mean is due to sector of employment while another 38% is due to occupational (Figure 3). Together sector and occupational choice determine 81% of the total gender wage gap in Uganda. It is also interesting to notice that the sector and occupational effects work in dramatically different ways. More than half of the total sectoral effect (from 55 to 77% depending on the decomposition method) is due to observed differences in the choices of men and women in terms of their sector of employment. In other words, there is a tendency for most women to be employed in sectors where the average wage is below the national average. The remaining part of the sector effect (40% or less) is due to intra-sectoral differences in the average wages of men and women. This is the unexplained part of the sectoral effect resulting from different wage structures facing men and women within a sector.

When it comes to the occupation effect, the overwhelming phenomena is discrimination whereby women in the same occupation as men end up getting lower wages than men. The segregation of women in low paying occupations (the observed effect) is at most 20% and in one of the decomposition methods as low as 7% of the total effect of occupation on wages. Therefore, while the sector effect is explainable mainly by observed differences the choice of sectors (although why women chose low paying sectors is still a question), in the case of occupation it is overwhelmingly discrimination.

The nature of the occupational discrimination is more of a female disadvantage rather than male favoritism. Since sector accounts for more than half of the total explained variation and that occupation accounts for more than two-third of the unexplained differential, policy makers intent on reducing the wage gap has clear indications where to focus their effort. In the following paragraphs we probe further the sectoral and occupational aspects of the gender wage gap.





Figures 4 and 5 express the explained and unexplained parts of the gender wage gap in percentage form using the results of the decomposition in Table 6a. Table 4 shows that all the observed characteristics taken into account in our wage equations increase the gender wage gap. That means men on average have higher observed characteristics, such as education, experience etc., as compared to women. Perhaps what is striking in the case of Uganda is that the segregation of men and women in different sectors accounts for about 50% the explained part of the gender wage gap. Occupational differences of men and women do not contribute much to the explained part of the gender wage gap. However, Figure 5 reveals that occupation accounts for over 60% of the unexplained part of the gender wage gap while sector accounts for about 30% of the unexplained part of the gender wage gap. Figure 5 also shows that education reduces the unexplained part of the gender wage gap by about 30%.

Table 7: Distribution of Wage and Labor Force Across Sectors

Sector	Average Wage (Shil)		Wage Ratio (%)	Share of Workers (%)		
	Male	Female	Female/Male	Male	Female	Total
Agriculture	39,872.4	29,258.5	73.38	30.59	37.92	32.99
Household	55,375.9	28,122.3	50.78	2.42	11.58	5.42
Mining & Quarrying	65,187.9	30,000.0	46.02	0.60	0.15	0.45
Hotels , Restaurants & Tourism	139,370.4	59,626.5	42.78	0.98	6.07	2.65
Fishing	86,107.0	84,000.0	97.55	2.86	0.45	2.07
Other Services	96,098.8	67,696.9	70.45	6.00	5.81	5.94
Manufacturing	104,992.6	86,559.8	82.44	8.33	3.82	6.85
Sales & Repairs	103,879.5	94,113.8	90.60	6.58	4.61	5.94
Construction	104,655.2	107,841.0	103.04	10.01	0.97	7.05
Transport & Communications	130,914.2	132,531.3	101.24	8.15	1.20	5.87
Education	190,743.1	169,807.4	89.02	12.03	14.87	12.96
Health	266,908.4	172,992.8	64.81	2.93	7.16	4.32
Electricity, Gas & Water	155,516.1	187,142.9	120.34	0.57	0.26	0.47
Public Administration	222,077.3	193,034.4	86.92	6.22	3.56	5.35
Other Organizations	211,665.4	237,863.6	112.38	0.24	0.41	0.29
Real Estate	237,883.9	121,666.7	51.15	1.02	0.56	0.87
Finance	396,218.2	545,625.0	137.71	0.47	0.60	0.52
Total	110,522.6	82,542.1	74.68	100.00	100.00	100.01

Source: Authors' computation based on the 2002/3 and 2005/6 Household Surveys

Table 7 reports the average wages of men and women in the 17 sectors, the female average wage as a percentage of the male average wage and the share of workers across sectors. Notice that the sectors have been arranged in ascending order based on the sector average wage regardless of gender (not shown here). It is striking to notice that 50% of employed women work in the lowest paying three sectors (Agriculture, household and mining and quarrying) as compared to only 33% of men working in those sectors. If we include the 4th lowest paying sector, i.e., hotels and restaurants, the share of women in the lowest paying four sectors jumps to 56% as compared to only 35% for men. This represents a spread of about 21 percentage points. It is very clear that there is a sharp segregation of women into low paying sectors and in all these sectors women are paid far less than the male wage. Except for agriculture, women in the lowest paying four sectors receive at most half of the average male wage.

While further analysis is needed as to why women are segregated into low paying sectors, the first obvious observation is that those are sectors that do not require highly

skilled labor. The fact that women do not get equal access to education therefore seems to restrict them to sectors with low productivity and low wages. However, one should also notice that except for the health and real estate sectors, there is a general tendency for the gender wage gap to decline in sectors that pay above the national average wage (down the list starting from Construction in Table 7). In fact the average female wage is higher than the average male wage in some sectors such as construction and finance, although very few women get employment in those sectors. Therefore, by improving women's access to education, it is possible not only to improve their ability to join high paying sectors but also protect them from gender based discrimination.

Table 8: Distribution of Wage and Labor Force Across Occupations

Sector	Average Wage (Shil)		Wage Ratios (%)		Share of Workers (%)	
	Male	Female	Female/ Male	Occupation /National	Male	Female
Day laborer	55,027.5	29,800.0	54.15	37.17	48.14	52.43
Farmer	54,579.2	52,176.5	95.60	44.07	7.10	5.69
Sales Person	106,955.6	59,717.0	55.83	69.06	8.77	14.37
Craftsman	117,919.9	148,060.6	125.56	96.11	9.69	1.25
Machine-Operator	137,059.1	162,902.8	118.86	114.64	6.30	1.02
Office Clerk	184,737.7	143,091.5	77.46	127.50	1.12	3.11
Associate Professional	195,670.0	180,702.5	92.35	152.74	12.31	16.00
Professional	321,611.8	253,426.4	78.80	242.09	5.79	5.61
Legislator	406,381.0	294,198.2	72.39	306.46	0.77	0.53
Total	107,738.0	79,822.9	74.09	100.00	100.00	100.00

Source: Authors' computation based on the 2002/3 and 2005/6 Household Surveys

As already indicated in the decomposition analysis, occupation is one of the most important factors that accounts for the male-female wage gap. The decomposition analysis also suggests that the gender pay gap due to occupation is by and large discriminatory rather than a segregation of women into low paying occupation relative to men. Table 8 ranks occupations from the lowest to the highest paying one. Not surprisingly the extreme cases happen to be day laborers and legislators (we have not reported the occupational average disregarding gender to conserve space). The table

shows that 73% of women take up the lowest paying three occupations, i.e., day laborers, farmers and sales persons. While this shows a high degree of segregation, one has to consider that 68% of men also work in the same three occupations. This amounts to a 7 percentage points difference between the two genders, which is far less than the 21 percentage points gap in the case of sectoral segregation.

Another way of looking at the same issue is to compare the share of male and female labor force in occupations that pay above the national average in Table 8. If we look at associate professionals, professionals and legislators, the gender gap is even narrower with comparable proportion of men and women working in high paying occupations (notice however that within these occupations there are more men than women but this is the case in almost the entire wage employment sector and nothing different when it comes to occupations). The last two columns of Table 8 show that about 16% of women work as associate professional as compared to 12% of men. Professional men account for about 5.8% of the employed men as compared to 5.6% for women. It is therefore clear that while occupation plays an important part in the overall gender pay gap, its effect is not felt through the segregation of men and women in different occupations. However, it turns out in occupations, except craftsmanship and machine operation, women earn consistently less than men. In three occupations out of nine (farmers, day laborers and legislators), women earn less than 75% of the average male wage; in another two occupations (professionals and office clerks) women get only slightly above 75% of the male wage.

While the distribution of men and women across occupation is not very different with most men and women working in low paying occupations, women consistently earn less than men in almost all occupations and the gender gap does not decline as we go up the pay scale of occupation. This is different from the sector effect where the gender wage gap narrows down in high-wage sectors. In fact in five out of eight sectors that pay above the national average, the female average wage was higher than the male

average wage. While the sector effect seems to be at least partly explainable by levels of education, the gender pay gap associated with occupations is unexplained and can be classified broadly as discrimination against women.

4. Participation in Wage Employment

In this section we analyze wage employment in Uganda using the same 2002/3 and 2005/6 household surveys. The main thrust of the analysis is to identify the individual, household and labor market characteristics that determine the probability that an individual works for wage rather than engaging in self-employment, subsistence agriculture or staying unemployed. Our specific interest is to find out gender based differences in participating in paid employment. Methodologically we use a logit regression model to estimate the probability of wage employment. The individual level explanatory variables that we take into account include the highest level of education an individual has achieved, the person's age, marital status, gender, whether the person is attending school at the moment and whether he or she is a household head. We also look at household level characteristics such as the size of the household the person belongs to and the number of small children in the family. Regional differences in the labor market are captured by region dummy variables.

However, it is quite possible that different segments of the labor market may not behave in the same manner with respect to individual and labor market characteristics. For that reason our estimation of the logit model will proceed in two steps. We first estimate the probability of participation in wage employment conditional on all the variables stated above (including a gender dummy) and run the same model for low-wage and high-wage sectors. Sectors where the average wage is below the national average are considered to be low-wage sectors. Sectors that pay at least 90% of the national average wage or more are considered to be high-wage sectors. The former include wage employment in agriculture, fishing, mining and quarrying, household

activities, hotels and tourism, and other services while the high wage sectors include public administration, health, education, manufacturing, construction, electricity and water, finance, real estate, transport and communication, and sales and repairs.

The results of the logit model regressions are presented in Tables 10 and 11. Column 2 of Table 10 presents the first stage logit model results for all sectors, while columns 3 and 4 present the results for the low-wage and high-wage sectors, respectively. In the second stage we estimate these models for the male and female labor force separately. Therefore columns 2 and 3 in Table 11 present the male and female logit model results for the low-wage sectors while columns 4 and 5 present the male and female logit model results for the high-wage sectors.

Before discussing the regression results we will take a quick look at the descriptive statistics in Table 9. The table shows that wage employment is rather scarce and accounts for about 20% of the Ugandan labor force. It also shows huge difference between men and women participation rates in wage employment. While a quarter of the male labor force is engaged in wage employment as compared to only 12% of the female labor force working in wage employment. The male participation rate in high wage sectors is more than three times that of women but the gap declines substantially in the low-wage sectors.

Table 9: Wage Employment in Uganda by Gender (%)

	Male	Female	Total
Wage Employment	25.64	11.72	18.42
-High Wage	14.20	4.19	9.01
-Low Wage	10.48	6.71	8.53

Note: Low and high wage employment share do not add up precisely to total wage employment because of rounding errors and missing observations

Source: Authors' computation based on the 2002/3 and 2005/6 Household Surveys

Table 10 reports the results of the first stage logit models. Column 2 shows that education significantly increases the probability of wage employment but only after the completion of lower secondary school. Individuals with primary education, let alone those with incomplete primary education, do not seem to have any better chance of wage employment as compared to those with no formal education. However, if we run the probability model for low and high wage sectors separately, we observe that the effect of education is very distinct and stronger. The coefficients on education dummies are negative in columns 3 and positive 4 of Table 10 showing that as individuals acquire more education, they are less likely to work in low-wage sectors but more likely to work in high-wage sectors. Even the completion of primary education significantly reduces the chances of getting trapped in low wage sectors and hence broadens the probability of getting a better job. The low-wage sectors are therefore low-productivity sectors where most unskilled workers make a living.

After controlling for the effects of all other individual and household characteristics, it is clear from the coefficient of the gender dummy in Table 10 that women are significantly less likely to participate in wage employment as compared to men; confirming the descriptive statistics in Table 9. As would be expected, the negative coefficient on the gender dummy in the high-wage sectors is nearly twice the size of the coefficient in the low-wage sectors suggesting that there are more barriers for female employment in the high-wage sectors. Before moving on to discuss other coefficients in Table 10, let's turn briefly to Table 11 and see the effect of education on the wage employment probabilities of men and women in different sectors. Looking at columns 4 and 5 in Table 11 it becomes instantly clear that the coefficients on education in the female regression are larger than those in the male regression at each and every level of education. This finding suggesting that education increases women's chances of participating in high wage sectors more than it increases the male participation rate in those sectors. The segregation of women in low-wage sectors can therefore be reduced

significantly by increasing women’s education as its beneficial effects for women are much more stronger than its positive effects on men. In as much as the long-term growth of the economy depends on the expansion of the high-wage sectors, reducing the gender gap in education will also play a critical role by meeting the demand for skilled labor.

Table 10 also shows that participation in wage employment increases with age but in a non-linear fashion as participation rate tends to decline toward the retirement age. What is more important is however the negative relationship between school attendance and participation in wage employment among the economically active population. While schooling and work are substitutes in the short run, it is interesting to note that combining work and schooling is relatively more difficult in the low-wage sectors than in the high-wage sectors. This could be the result of either employers in the latter supporting education/training of their employees or the employees in the high-wage sectors being able to pay for their (part-time) education. It could also be related with the nature of work in the low wage sectors which make it difficult to combine work and schooling. Looking at the coefficients on school attendance in Table 10 we also observe that it is more difficult for women as compared to men to combine work and schooling in the low-wage sectors while in the high-wage sectors men are less likely to combine work and schooling as compared to women.

Table 10: Participation in wage employment

	Wage Employment	Low Wage Sectors	High Wage Sectors
Incomplete Primary	-0.0006 (0.2070)	0.0563 (0.2262)	0.3537 (0.4057)
Primary	-0.0727 (0.0513)	-0.2975** (0.0564)	0.8107** (0.1130)
Lower Secondary	1.6176** (0.0897)	-1.8476** (0.2017)	3.4773** (0.1321)
Upper Secondary	0.0986+ (0.0589)	-1.0464** (0.0771)	1.6967** (0.1158)

Tertiary	1.8121** (0.0812)	-1.7267** (0.1594)	3.6117** (0.1264)
Age	0.0689** (0.0090)	0.0641** (0.0113)	0.0854** (0.0131)
Age Squared	-0.0011** (0.0001)	-0.0009** (0.0001)	-0.0013** (0.0002)
Attending School	-1.6200** (0.0742)	-2.0738** (0.1194)	-1.0629** (0.0970)
Married Monogamy	-0.2862** (0.0531)	-0.6007** (0.0676)	-0.0310 (0.0709)
Married Polygamy	-0.4922** (0.0692)	-0.8281** (0.0896)	-0.1332 (0.0931)
Divorced	0.1061 (0.0781)	0.0689 (0.0927)	-0.1397 (0.1129)
Widowed	-0.2085* (0.0952)	-0.2846* (0.1152)	-0.3304* (0.1507)
Household Head	0.6797** (0.0510)	0.2989** (0.0620)	0.9347** (0.0753)
Female	-0.8116** (0.0414)	-0.5125** (0.0524)	-0.9962** (0.0607)
Family Size	-0.0542** (0.0059)	-0.0520** (0.0078)	-0.0442** (0.0081)
Small Children	-0.0727** (0.0197)	-0.0336 (0.0257)	-0.0695* (0.0271)
Eastern Region	-0.2844** (0.0453)	-0.4282** (0.0591)	-0.0887 (0.0625)
Western Region	0.2448** (0.0458)	0.2067** (0.0552)	0.1625* (0.0664)
Central Region	0.0216 (0.0424)	-0.2588** (0.0553)	0.3010** (0.0570)
Year 2006	1.0992** (0.0391)	1.3686** (0.0566)	0.7110** (0.0494)
Constant	-2.3518** (0.1600)	-2.5400** (0.1983)	-5.0373** (0.2503)
Observations	27927	27927	27927

Source: Authors' computation based on the 2002/3 and 2005/6 Household Surveys

Table 11: Participation in Wage Employment by Gender

	Low Wage Sectors		High Wage Sectors	
	Male	Female	Male	Female
Incomplete Primary	-0.2192 (0.3445)	0.2178 (0.3057)	0.1151 (0.4815)	0.8549 (0.7511)
Primary	-0.2812** (0.0848)	-0.3433** (0.0775)	0.7081** (0.1303)	0.7247** (0.2348)

Lower Secondary	-1.8008** (0.2388)	-2.0829** (0.3967)	2.9059** (0.1547)	4.7459** (0.2548)
Upper Secondary	-1.1363** (0.1047)	-0.8549** (0.1230)	1.5048** (0.1332)	2.2190** (0.2384)
Tertiary	-1.8405** (0.1951)	-1.5637** (0.2922)	3.2125** (0.1469)	4.5595** (0.2508)
Age	0.0739** (0.0150)	0.0710** (0.0174)	0.0649** (0.0144)	0.1914** (0.0332)
Age Squared	-0.0010** (0.0002)	-0.0012** (0.0002)	-0.0010** (0.0002)	-0.0028** (0.0005)
Attending School	-1.9079** (0.1421)	-2.4674** (0.2249)	-1.2180** (0.1133)	-0.6795** (0.1907)
Married- Monogamy	-0.3960** (0.0957)	-0.8539** (0.1140)	0.2264* (0.0888)	-0.1184 (0.1528)
Married- Polygamy	-0.8785** (0.1266)	-0.8054** (0.1342)	0.1367 (0.1119)	-0.3439+ (0.1930)
Divorced	0.0613 (0.1334)	0.0150 (0.1331)	0.0356 (0.1453)	-0.2112 (0.1959)
Widowed	-0.1275 (0.2197)	-0.3136* (0.1495)	0.0573 (0.2466)	-0.4980* (0.2199)
Household Head	0.0149 (0.0984)	0.4247** (0.0987)	0.5654** (0.1013)	1.2132** (0.1502)
Family Size	-0.0490** (0.0104)	-0.0788** (0.0130)	-0.0543** (0.0093)	-0.0351* (0.0177)
Small Children	-0.0502 (0.0337)	-0.0042 (0.0402)	-0.0533+ (0.0300)	-0.0658 (0.0644)
Eastern Region	-0.5047** (0.0755)	-0.2781** (0.0958)	-0.1186+ (0.0687)	-0.0171 (0.1481)
Western Region	0.0910 (0.0732)	0.3471** (0.0861)	0.1562* (0.0722)	0.3405* (0.1636)
Central Region	-0.1906** (0.0687)	-0.3561** (0.0948)	0.3453** (0.0628)	0.0529 (0.1333)
Year 2006	1.3010** (0.0650)	1.6332** (0.1161)	0.6825** (0.0524)	0.8024** (0.1406)
Constant	-2.6735** (0.2609)	-3.0513** (0.3111)	-4.3398** (0.2767)	-8.3871** (0.6126)
Observations	15765	12162	15765	12162

Standard errors in parentheses

+ significant at 10%; * significant at 5%; ** significant at 1%

Source: Authors' computation based on the 2002/3 and 2005/6 Household Surveys

In terms of marital status, Table 10 reveals that individuals who are never married (the reference group) are more likely to participate in wage employment as compared to those who are married or had once been married. Once again the labor market differs significantly in the high and low-wage sectors regarding the importance of marital

status. Marital status seems to negatively affect employment in the low-wage sectors while its negative effect is statistically insignificant in the high-wage sectors. The gender disaggregation in Table 11 shows further that while current or past marriage (by past marriage we refer to divorced or widowed individuals) is negatively associated with employment in low-wage sectors its effect is particularly stronger for women. Single women are in general more likely to work in high-wage sectors as compared to married, divorced or widowed women, although the negative effect is statistically significant for women who are widows and are currently in polygamous marriage. For men however, current or past marriage is positively associated with the probability of employment in high-wage sectors although the positive association is statistically significant only for those in monogamous marriage. What we see is that within the economically active women, employers in low and high wage sectors alike seem to have preference for single women and that this preference is particularly stronger in the low-wage sectors. In the high-wage sectors employers seem to have a preference for unmarried women and married men, hence the negative effect of current or past marriage in these sectors is restricted to women only. Further information and analysis are needed to identify areas of labor market reform in such a way that barriers against married, widowed or divorced women can be reduced substantially and gradually eliminated.

Household heads are more likely to participate in wage employment as compared to other members of a household and this is particularly true in the high-wage sectors. Table 11 shows that female household heads are more likely to work in low-wage sectors while this is not the case for male household heads. In the high-wage sectors, being a household head increases the probability of wage employment for both sexes but the effect is much larger for female heads of households. In the low-wage sectors (where agriculture is the main source of employment) the gender difference is more likely to be related with access to productive assets. Since women have in most cases restricted access to agricultural assets they might be forced to engage in wage

employment while for male household heads employment in low-wage activities is not a priority hence the coefficient is not statistically significant. One therefore has to question the welfare implications of increased rates of women employment in the low-wage sectors. (more on this later). Table 10 also shows that the presence of small children has a negative effect on labor force participation rates mainly in the high wage sector; however, its effect does not vary significantly along gender lines as one would normally expect it to be.

Labor markets in the four regions of the country are different in many respects. In Tables 10 and 11 the reference labor market is the Northern region. Column 2 of Table 10 shows that wage employment is in general very low in the Eastern region with the Western region showing the highest employment rate. There is no difference in the likelihood of wage employment between the Northern and Central regions although one would expect the latter to do better. Columns 3 and 4 in Table 10 reveal that the better employment situation in the Western region is mainly due to higher participation rate in low-wage sectors. This is consistent with the relatively poor educational performance of the Western region as described in Table 2. The Central region on the other hand boasts of the highest rate of employment in the high-wage sectors which again matches its superior position in terms of human capital. The Eastern region is far behind the North in terms of employment in low-wage sectors and is not doing any better than the North in high-wage sectors either. The West is the only region that exceeds the North in term of employment in low-wage sectors. In general the Central and to some extent the Western regions are the ones where employment in high-wage sectors is concentrated while employment in low-wage sectors is more prevalent in the Northern and Western regions.

Looking at these results gender wise, Table 11 unveils a couple of important points. The leading position of the Western region in the low-wage sectors is entirely a female phenomena and does not apply to men. From Table 3 we recall that the Western region

has the higher gender inequality in education with more than 75% of the uneducated labor force comprised of women. Therefore it should not be surprising if women are most likely than men to work in low wage activities. On the other hand, the better employment opportunities offered by the Central region in high-wage sectors are applicable only to men. Women in the Central region are not in a better position than women in the North when it comes to employment in high-wage sectors. When it comes to women employment rate therefore, the Western region stands out both in high and low paying sectors. While most women in the Western region are likely to work in low paying sectors, women in this region also face higher chances of working in high paying sectors as compared to other regions.

Finally Table 10 shows that wage employment rates have increased significantly between the years 2002 and 2005. While employment has increased in both high and low-wage sectors, unfortunately most of the expansion has been in the latter. In both sectors however the increase in employment rate of women has been higher than that of men.

5. Conclusions

The Ugandan labor force has a low level of human capital with most people having completed only elementary schooling. The Central region has a relatively skilled labor force with the highest concentration of workers (36%) who have completed at least upper secondary education. The region with the lowest level of human capital is the Western region where nearly a quarter of the labor force has no formal education. Nearly one in five economically active women in Uganda have no formal education and hence women are highly represented in the relatively unskilled segment of the labor force. The gender gap in education is particularly higher in the Western region where the general level of education is very low while the region with the best overall

educational outcome, i.e. the Central region has also the lowest gender inequality in education.

Wage employment accounts for less than 20% of the Ugandan labor force with most people making a living in self-employment, subsistence agriculture or simply remain unemployed. There is a huge gender inequality in participation rates in wage employment which stands at about 25% for men and 11% for women. The gender gap in participation rate is particularly higher in high-wage sectors. Within wage employment there is once again substantial gender inequality in payment. The decomposition analyses show that about 50% or more of the gender pay gap is due to lower payments for women with apparently similar observed characteristics as their male counter parts. The latter is more of a discrimination against women rather than male favoritism. Although women are less educated than men, in general education tends to reduce the gender pay gap as the returns to education are relatively higher for women. We also see that better education increases the probability of employment in high-wage industries. Therefore a policy that increases access to education in general with a special attention to increasing women's access to education will not only contribute to overall economic growth but also endures a more equitable income distribution by reducing the gender wage gap.

The gender wage gap in Uganda is overwhelmingly associated with sector and occupation effects. The sector effect is mainly due to the segregation of women into low-wage sectors rather than discrimination in wages within a sector. That means a policy of equal pay for equal work will not be sufficient to correct the gender wage gap in Uganda. While reducing gender inequality in education is one policy to deal with this problem policymakers also need to tackle implicit and explicit rules and regulations that tend to keep women in specific sectors that tend to pay well below the national average wage. In the Central region where there are better chances of wage employment in high paying sectors, such opportunities are mainly for men and not

available for women. The overall better employment participation of women in the Western region is a phenomenon observed mainly in the low-wage industries. Similarly the increase in labor force participation in 2005/6 is higher for women than for men but the overall increase is restricted in the low-wage sectors.

While increasing women's access to education and their participation rates in the labor force will have both individual and aggregate level benefits, policymakers should take into account the potential losses of welfare this might cause among women due to their unabated household responsibilities.

Part II

Growth and Poverty Effects of Gender Inequality

6. Introduction

Several studies have been undertaken to establish whether gender inequality in Uganda exists. Such studies have mainly tended to establish whether women have equal access to education, factors of production, wage discrimination and being allowed to work (See Nalwadda and Kagugube, 2007). In other studies research has focused on measuring the extent of gender violence and how this affects the productivity of women at work. While its well established that gender inequality indeed exists, it is useful also to understand the extent to which systematic discrimination of women or alienating them from the more productive sectors affects the overall economy.

This work extends some of the findings to a more general equilibrium setting. In particular we use the results in the empirical analysis by Shiferaw and Musisi (2009) as our basis for the study. The key findings in this study suggest that (i) women have less access to education, (ii) there is wage discrimination against women, (iii) productivity of workers is affected along gender lines, (iv) women also tend to be employed in the less paying activities especially agriculture. With these few facts, we extend this analysis by examining the extent to which all these factors might affect the overall economy. In essence, our objective is to quantify the lost output owing to the discrimination above. This will strengthen the case for policy makers that indeed by addressing the binding constraints that promote gender inequality this will come with additional benefits at the macroeconomic level.

The main channels through which discrimination of women affect the real economy are through the available labor supply of women in productive sectors, the quality of the labor supply available (skilled and unskilled), the productivity of women assuming that gender violence affects their health. In addition we examine other ways through which women are discriminated against especially their accessibility to land and capital. One of the cultural and traditional laws, few women own land notwithstanding the fact that some may have access. Its important to differentiate between "access" and "ownership"

as its only the later that enables the use of land in financial transactions. This has implications in the sense that women cannot use land as collateral to access financing from formal financial institutions. We therefore differentiate the ownership of land along gender lines in the production process. In addition, we explore the possibility of where the productivity of the sectors women are mainly employed are revamped. We apply a Dynamic Computable General Equilibrium model based on a Social Accounting Matrix (SAM) which has 42 activities, 42 commodities, 5 household types, and 3 labor categories.

The main findings suggest that increasing participation of women in more productive sectors to maintain gender balance in time use would increase real GDP by 0.4 percent on annual basis over the period 2008-2016. The quality of labor supplied by women is also important in the growth process. If the number of skilled women labor force is increased by 5 percent every year, this would result into additional output of 0.3 percent. This therefore reinforces the earlier studies which suggest that providing education to women is critical also to their involvement in higher paying sectors. An improvement in the productivity of women at work by 2 percent results into overall increase in the growth rate of GDP of 0.4 percent. Thirdly, the impact of providing more ownership to land by women would have a marginal impact on the overall growth rate but positive. With increasing sharing of household chores and reducing gender violence, this would have a direct impact on the productivity of women at work.

Also, female labor tends to be mostly employed in the agricultural sector and they are self employed. Since mobility to other sectors is to an extent limited due to skills, we run a simulation where government undertakes policy of improving the productivity of crops in which women are mainly involved. Such a policy would indirectly benefit women and result into higher GDP growth of 0.4 percent. Finally, we combine all these simulations into one simulation. While some of the previous simulations show marginal changes in the growth rate owing to gender inequalities, by simultaneously simulating

these gender inequalities we find that overall real GDP growth would be 1.2 percent on average.

The main policy implications of this paper suggest that there is a lot to gain by addressing gender inequalities. By addressing the gender inequalities, this would also circumvent the potential output losses over the next five years during which the National Development Plan will be implemented. Policy makers may implement laws which prohibit women being discriminated at work and thereby increasing their participation in the labor force. Second, it is imperative that women should have equal access to education. This would enable them to move into more productive sectors away from subsistence farming and self-employment. Enforcing laws that address the vice of domestic violence could go a long way to improve the productivity of women at work. Also the domestic relations bill which is under consideration should strengthen the case for more equal ownership of land between both genders since this would enable women to actively participate in formal financial transactions.

The rest of the paper is organized as follows. Section seven describes the channels through which gender inequalities affect the aggregate economy. Section eight describes the SAM used as a basis for the baseline and our simulations and a more detailed description is provided in the appendix. Section nine presents the results. The conclusion and policy implications are provided in section 10.

7. Channels of Gender Effects on the Macro economy

There are several channels through which gender inequality could have macroeconomic implications. Largely these channels could be broadly categorized into (i) labor force participation of women, (ii) access to factors of production, (iii) Wage discrimination, (iv) productivity of women's labor, (v) education and skill acquisition by women and (vi) activities in which women are involved.

Labor force participation

While from the recent household survey of 2002/03 its shown that female participation rates are comparable to those of men, other statistics suggest that women exhibit the highest unemployment rates. Unemployment among women is registered at 4.2 percent compared to 3 percent for men. Urban unemployment for women is estimated at 17 percent compared to 7.6 percent. The majority of the women employed can be considered to be self employed in the agricultural sector. For sectors like construction the majority of the employees are male. However, if women remain unemployed or restricted to household chores, this has direct effects on the available labor supply for the various activities in the economy.

Access to factors of production

Access to factors of production remains skewed in favor of men. The key factors of production are labor or human capital, physical capital, and land. Limited access for example to land by women also has implications on accessibility to other factors of production like physical capital. Land in Uganda is usually used as collateral to access financing for capital acquisition. Due to customary and cultural laws, women by default are excluded from the acquisition of land. In the event of death of a male household member, the immediate custodian of the land is supposed to be a male. This has systematically excluded women from acquiring land. Without access to both land and physical capital this also has indirect effects on the extent to which women can be able to develop their human capital. This partly explains why women predominantly remain employed in the informal sectors where skill requirements are not stringent.

Skills Acquisition

One important factor that could play a role in the emancipation of women is skills acquisition. There has been systematic discrimination of young girls in acquiring education. In most cases, the preference is given to boys which has long-term

implications on the labor force participation and the productivity of women. In addition, the lack of skills also excludes women from the more productive sectors.

Wage Discrimination

For the case of Uganda, there is no documented evidence that wage discrimination exists along gender lines. The study by Shiferaw and Musisi (2009) finds that women on average receive 45 percent less in wages for equal work compared to their male counterparts. Other forms of wage discrimination could be indirect where for example women who are employed on household firms are not fully compensated for their effort and time.

Labor Productivity

There is empirical evidence which suggests that women are generally subjected to violence in their homes. To the extent that this vice exists, it can be assumed that women subjected to violence would not be as productive in their work places compared to the scenario if violence did not exist. Under a general equilibrium framework this can be modeled by assuming that if violence did not exist, women would be more productive in their work places.

8. Building of the Base SAM

To understand the impact of major policy changes on women, it is essential to have a comprehensive macro framework. In this study we build a standard dynamic computable general equilibrium (CGE) model for a preliminary analysis of the impact of macro policy changes on women. Here, gender is analyzed within the urban and

rural sectors of the economy because a large section of women in Uganda are involved in rural activities.

The data base for a CGE model is a Social Accounting Matrix (SAM). The SAM combines information from different sources in a consistent framework to reflect the economic and social structure of an economy at a particular point in time. The SAM constructed in this work distinguishes factors of production by urban and rural, skills as well as by gender. We have mapped the flow of value added from sectors to the different types of factors of production and have also mapped the flow of factor earnings 'to different types of factor owners within households, thus determining the factor incomes of these households.

Labor is categorized along gender lines into eight categories. First we categorize labor according to whether its rural or urban based. This is further split into the category of male and female.

Being that women have less access to land, we also disaggregate the social accounting matrix by identifying the land that is owned by women. For the case of Uganda, we can confidently assume that women have less ownership to land. For most tribes and cultures, land is always inherited by the male population. It's always assumed that women would get married and the overall responsibility on land ownership lies with their husbands. Unfortunately, there is no empirical work that has been done to establish proportion of land owned by women. Yet land plays a vital role in accessing capital from banks or any organized lending institutions. For the purpose of our analysis, we assume in the SAM that women own about 5 percent of the total land used in production.

It is difficult to differentiate capital ownership in the SAM along gender lines. We therefore decided to use one type of capital which could be owned irrespective of gender.

Lastly we identify activities which are considered to be labor intensive. Since the bulk of women are mainly in the agricultural sector, there are crops which tend to use a lot of female labor. For instance legumes tend to be tended to by women compared to cash crops. Hence from the SAM, if a given activity uses more female labor than male then that's considered to be a female intensive sector.

9. Simulation Results

Based on the background above, we run several simulations to assess the channels through which gender discrimination affects the economy. The five simulations reported included (i) increased labor participation of the female population in more productive activities (LABPART), (ii) increased skills of the female population (LABSKLS), (iii) Increased productivity of labor provided by women (LABPROD), (iv) increase in productivity of activities in which women are engaged (TFPAGR), (v) increased access of women to land (WOMLAND), and (vi) combined simulation for all the interventions above (COM). Lastly, we combine all these simulations to find the overall impact of addressing the gender imbalances at the macroeconomic level. Overall, we find that under all these simulations, by addressing some of these factors that lead to gender inequality, the incomes for both rural and urban households increase compared to the baseline. By increasing incomes of households after addressing gender inequalities, this results into higher savings which can be used as future investments for the subsequent periods.

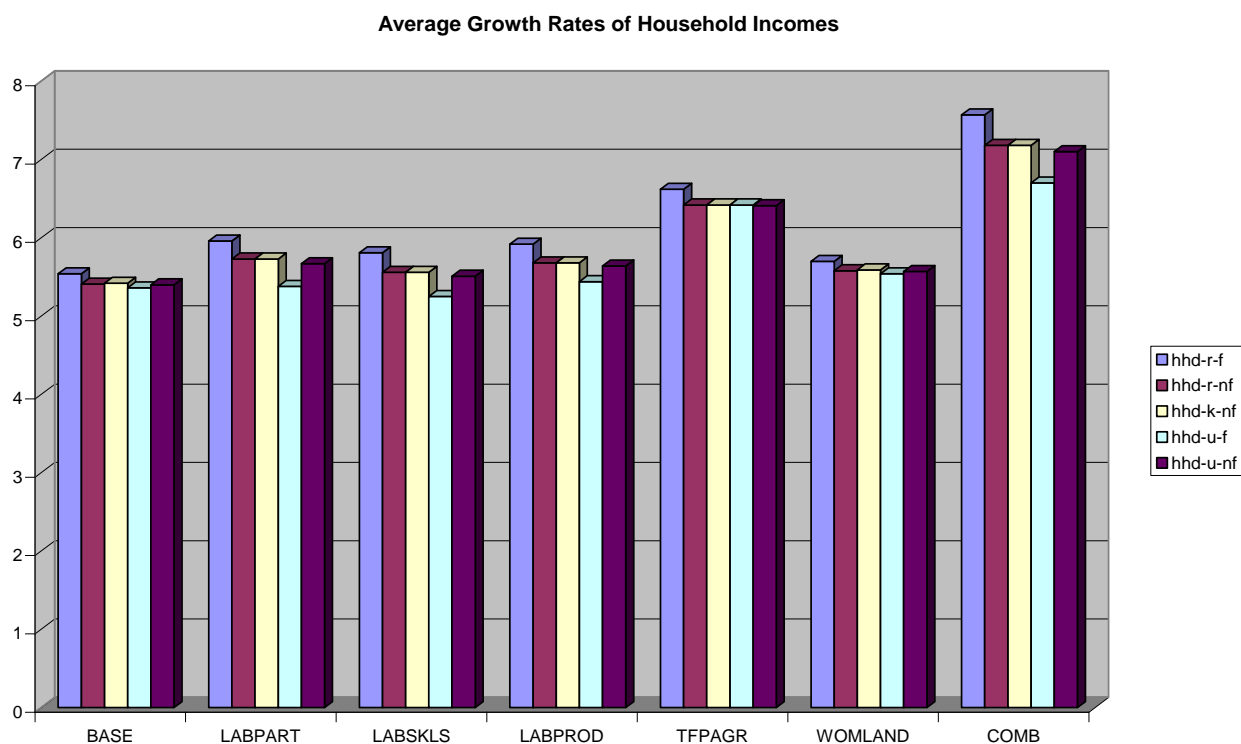


Figure 2: Average Growth Rates of Household Income

9.1 Increased Labor Participation

Using the results from the empirical analysis as a guide, we derive the labor participation growth rates which are then applied to the labor categories available in the SAM, thereby providing detailed labor profiles according to gender and labor type. We assume that the semiskilled and unskilled groups would exhibit similar labor growth rates under the different scenarios. With limited information, we also assume that the rural and urban skill types grow at the same rate.

Table 1. Selected Labour Market Indicators

Indicators	Male	Female	Total
Uganda Labor Force ('000)	4,634	5,138	9,773
Labor Force in Non-Agriculture informal sector ('000)	1,418	1,142	2,560
Working Poor ('000)	1,629	1,876	3,505
Labor force participation rate (%)	80.3	79.9	80.1
Employment to Population Ratio (%)	78.2	76.6	77.4
National Unemployment Rate (%)	2.6	4.2	3.5
Urban Unemployment Rate (%)	7.6	17.0	12.2
Youth Unemployment Rate (%)	7.5	8.8	6.3
Share of Youth to Total Unemployment (%)	51.0	62.0	58.0
Underemployment Rate (%)	18.9	15.1	16.9

Source: UNHS 2002/03

Table 1 above shows that Uganda's labor force stood at 9.9 million persons, of which 2.6 million were in non-agriculture informal sector. Of the 9.8 million persons in the labor force, 3.5 billion persons were the working poor. The underemployment rate is 3.5 percent, while the under employment rate is 17 percent. From a gender perspective, the number of women available for work is slightly higher than that of men. It's also the case that the labor force participation rates for both men and women are almost the same. However, it's also been found that women tend to be overworked compared to men given their involvement in domestic chores. In some regions, it's been found that men are indeed less active (or active for a few hours) than women. This therefore

suggests running a simulation where men are made more active in the labor force so as to circumvent the burden imposed on women in their time use.

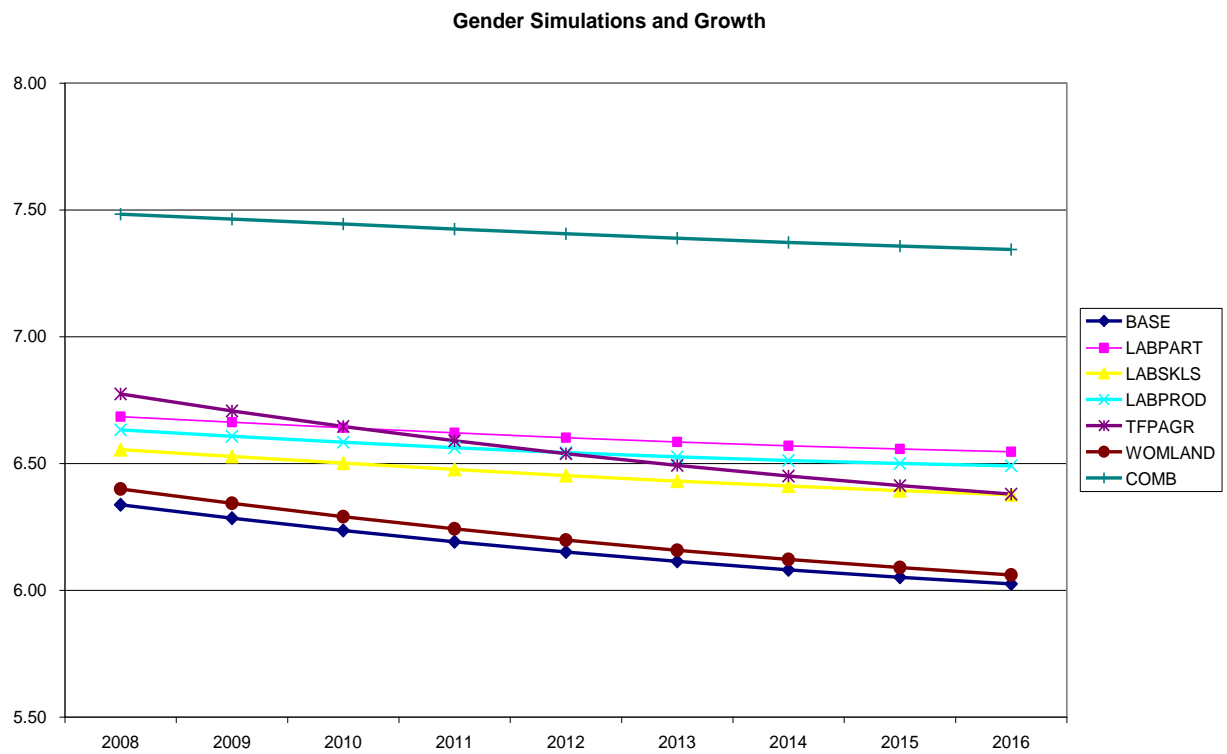
In this section we perform two simulations. First, we implement a status quo scenario where we assume that business remains as usual. In this simulation, we assume that there is no systematic policy initiatives undertaken to address gender inequalities. This scenario is important for comparison of our simulation results. While this is hypothetical, it helps us to assess the lost output as a result of not addressing the gender inequalities. We also assume that total factor productivity growth is 1 percent. These assumptions are used through all other simulations except in the subsequent simulations where we assume that the productivity growth rate also changes.

We increase the labor participation of women in more paying sectors by 5 percent during the period 2008-16. The results for the baseline show GDP growing at 6.2 percent annually during the period 2008-16 (see Figure 2). When we increase labor participation of women in more paying sectors, we observe that the growth path is relatively high and steadily increasing through the simulation

Table 2. Average Growth Rate by Sectors (2008-2015)

	BASE	LABPART	LABSKLS	TFPAGR	WOMLAND	COMB
Overall GDP	6.2	6.6	6.5	6.6	6.3	7.4
Agriculture	4.2	4.1	4.1	6.1	4.4	6.8
<i>Of which</i>						
Cereals	2.1	2.2	2.2	5.8	2.7	6.7
Root Crops	4.0	4.1	4.0	6.6	4.4	7.3
Pulses	2.5	2.6	2.5	6.2	3.1	7.0
Matooke	4.2	4.3	4.2	6.6	4.6	7.3
Horticulture	4.6	4.8	4.6	6.7	4.9	7.4
Export Crops	2.6	2.6	2.6	7.2	3.1	8.0
Livestock	3.6	3.8	3.6	3.7	3.6	4.2
Forestry	5.3	5.4	5.3	5.3	5.3	6.0
Fishing	7.0	6.3	6.9	6.5	6.9	6.7
Industry	6.0	6.3	6.5	6.1	6.0	6.9
<i>Of which</i>						
Mining	6.5	6.4	6.8	6.4	6.5	6.8
Manufacturing	6.2	6.3	6.4	6.4	6.2	6.9
Food Processing	5.9	6.1	6.0	6.3	5.9	7.1
Non-Food Processing	6.5	6.1	6.9	6.5	6.5	6.7
Services	7.1	7.7	7.4	7.0	7.1	8.0
Private	8.1	8.7	8.3	8.0	8.0	8.8
Public	4.0	4.8	4.7	4.0	4.0	5.3

period as a result of capital deepening and increased availability of labor. From the expenditure side, the growth is mainly driven by investment and higher private consumption. The higher investment is a result of households earning higher incomes and thereby saving more. Likewise, the higher consumption is driven by the larger disposable income due to increased labor income from both men and women. In addition, production tends to be more labor intensive as producers have access to abundant labor of various skill types.



Turning to households, with increased labor supply of women in productive sectors, this leads to higher household incomes. In the simulations we assume that labor is fully employed, and that the semiskilled and unskilled labor categories are mobile between sectors while skilled labor is sector specific. As a result of increased labor supply, the equilibrium wage rates fall. However, the quantity of labor supplied increases, which on the overall increases labor income. In addition, given that households are also proprietors of the different

production activities, the higher production due to more labor utilized would result into increased profit income. This leads to higher savings which encourage investments and subsequent capital accumulation for the following years.

9.2 Female Skills Acquisition

The second simulation focuses on the scenario where we specifically improve the skills of the women population. Part of the reason why women are largely employed in the low paying sectors is because their education attainment tends to be lower compared to that of men. By improving on their skills acquisition, this would help women move to more remunerative sectors like industry and services.

Under this scenario, we find that there is a small positive impact on the aggregate economy. First, GDP in real terms would grow by 6.5 percent on annual basis. Compared to the “baseline” scenario, this would imply that every year we gain about 0.3 percent of GDP as a result of improving the skills for women. The growth rate path is relatively higher than the baseline scenario through the simulation period, as there is a significant improvement in production for all economic activities. As a result, for most activities which are mainly labor intensive, there would be a marked increase in labor use and production.

From the expenditure side, we also note that there is increase in both consumption and investment. The increase in consumption is a result of reduced economic activity and income. With increased earnings, savings are also higher and hence more capital accumulation over the years.

This simulation presumes that labor is fully mobile and as more women get educated and acquire special skills, they would naturally start switching to

other sectors with higher paying jobs. However, in the real world, its more difficult to change for example from the agriculture sector to work with financial services. This therefore justifies spending resources in sectors where women are most actively employed.

9.3. Improved Productivity of Women's Labor Force

The third simulation is where female productivity is improved. In this simulation, we assume that women's labor productivity is reduced considerably as a result of domestic violence. For the case of Uganda there is empirical evidence that about 9 percent of women the women interviewed loose on average about 11 days of work owing to domestic violence, EPRC (2009). In addition 26 percent of the women reported that their daily work had suffered as a result of domestic violence. Also 40 percent of the women reported that domestic violence affects their productivity. Based on this background there is a case that by addressing domestic violence this would enhance the labor productivity of women.

We implement this simulation by assuming that there would be improved labor productivity of women in all the sectors they are involved of 2 percentage points relative to the baseline. The increased labor productivity of women would have beneficial effects in all sectors. Overall GDP growth is increased by 0.4 percent compared to the baseline where its assumed that domestic violence continues. This also results into higher incomes and savings by households.

9.4 Factor Productivity of Sectors Where Majority of Women Work

In Uganda the majority of women remain largely employed in informal activities especially the agriculture sector. The alternative options to improve the welfare of women, is to support the sectors in which women are actively engaged. While its widely believed that with time there would be a structural transformation where the majority of the rural population will move to urban areas and away from subsistence agriculture, this process will take considerable time. Therefore, it would be more pragmatic to improve the productivity of sectors in which most female are employed – as this would considerably reduce the gender gap. For the case of the agricultural sector this can be done by for example providing agricultural fertilizers and extension services to women involved in farming.

The table derived from the UNHS 2005/06 clearly shows that the bulk of women (80 percent) are mainly in the agricultural sector. Therefore for policies aimed at gender mainstreaming, there is a need to recognize where most women are actively employed.

Table 3: Occupation Types by Sex of Household Members (%)

OCCUPATION CATEGORY	Sex	
	Male	Female
Legislators	0.3	0.1
Professionals	4.2	2.2
Clerical	0.2	0.3
Personal and Protective Service Workers	1.5	2.1
Sales	5.7	6.1
Skilled Agricultural and Fisheries Worker	2.3	1.8
Subsistence Agricultural Workers	67.5	80.5
Crafts and Related Workers	4.9	2.2
Machine Operators	2.9	0
Others	10.5	4.5
Total	100	100

Source: UNHS 2005/06.

In the baseline we assumed that all agricultural activities exhibit total factor productivity of 1 percent. This simulation identifies activities that are considered to be women intensive in the use of labor. In this regard we choose the following crops (Maize, Rice, Cassava, Sweet Potatoes, Irish Potato, Matoke, Beans, and

Groundnuts). On the other hand we regard all the cash crops as male intensive activities. We increase the productivity of the chosen crops by 2 percent. The increase in productivity is assumed to be equal across all years of the simulation.

The implications of this adjustment are as expected where there would be higher output relative to the baseline. The increase in growth is mainly driven by the substantial increase in output for all the sectors. As shown in figure 3, compared to the *baseline* scenario, overall GDP would grow more, by 0.4 percentage points. As expected, agriculture would grow the most compared to other sectors like industry and services. In addition, with increased incomes in the population involved in agriculture, this would also increase the aggregate demand for commodities produced by other sectors especially the manufacturing sector.

9.5 Land Ownership

Land ownership remains one of the most important assets to hold. This is especially so for a country like Uganda whose range of financial assets that can be acquired by households remains few. Hence one of the characteristics that can distinguish households by wealth is land ownership. For the most part, land in the past was allocated using traditional rules that govern the various tribes and cultures. In Uganda, men take the leading role in the allocation of land. In the event of a household death by a male, the land is generally inherited by the sons or male relatives. With the exception of a few cases where women purchase their own land, these traditional rules have tended to exclude women from wealth distribution.

Table 4: Land Ownership By Sex And Marital Status Of Household Head

	Sex									
	Male					Female				
	Marital Status				All	Marital Status				All
	Unmarried	Married	Divorced	Widowed		Unmarried	Married	Divorced	Widowed	
0.01 To 0.5 Acres	1.5	94.2	2.6	1.7	100	1	33.3	13.6	52.1	100
0.5 To 1.00 Acres	1.3	93.9	2.5	2.3	100	2.6	38.6	10.4	48.4	100
1.01 To 2.00 Acres	1.7	93	3.4	1.9	100	0.9	34.4	11.8	52.9	100
2.01 To 5.00 Acres	0.7	94.7	2.4	2.1	100	2.5	37.8	10.9	48.8	100
5.01 To 10.00 Acres	1	95	2.9	1.1	100	5.4	28.6	4.2	61.7	100
10.01 To 20.00 Acres	1.4	96.3	0.8	1.6	100		19.7	9.3	71	100
Above 20.00 Acres		98.9	0.3	0.8	100	2.7	33.1	13.8	50.4	100
Total	1.3	94.1	2.7	1.9	100	1.7	35.1	11.8	51.4	100
How Land Was Acquired										
Purchased	0.7	95.1	2.3	2	100	0.6	37.6	13	48.8	100
Inherited Or Gift From Head's Family	2	93.3	2.9	1.8	100	3.5	28.1	14.5	54	100
Inherited Or Gift From Spouse's Family		96.3	1.4	2.3	100		42.3	4.8	52.9	100
Cleared		92.7	4.8	2.5	100	5.1	51	2.7	41.2	100
Other		89.8	8.7	1.5	100		31.3	20.9	47.8	100
Total	1.4	94.1	2.7	1.9	100	1.7	35	11.8	51.5	100

Table 4 derived from the UNHS shows that most women who own land only own it when they are widowed. On average about 30 percent of women own land when they are still married. With this systematic discrimination of women to possess land, this has also affected their wellbeing through other implicit ways. For instance, land is usually provided as collateral to banks in the process of accessing loans. With minimal rights to land ownership, this indirectly excludes women from the formal sector lenders. By excluding the female population from borrowing in the formal sector, this restricts them into activities that are mainly informal and less paying.

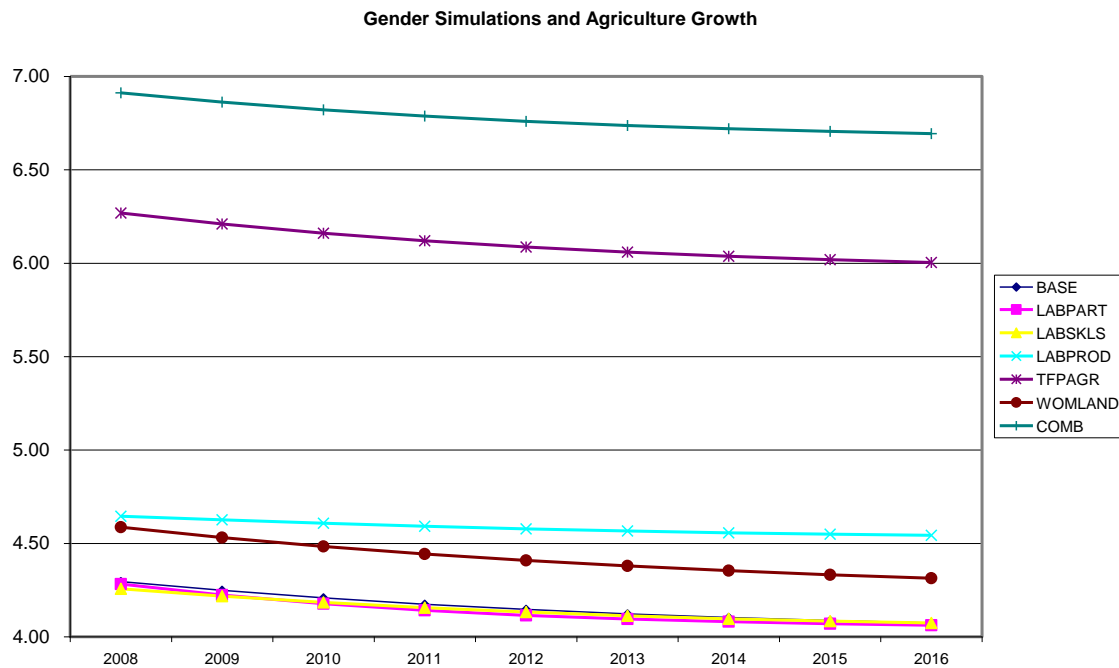
We run a simulation where there is an increase in ownership to land by women. This simulation assumes that for every year there is an increase in accessibility to land by women of 5 percent. While at the aggregate level there is no noticeable

change, we observe that agriculture production would be boosted by 0.3 percent every year if women had more access to land.

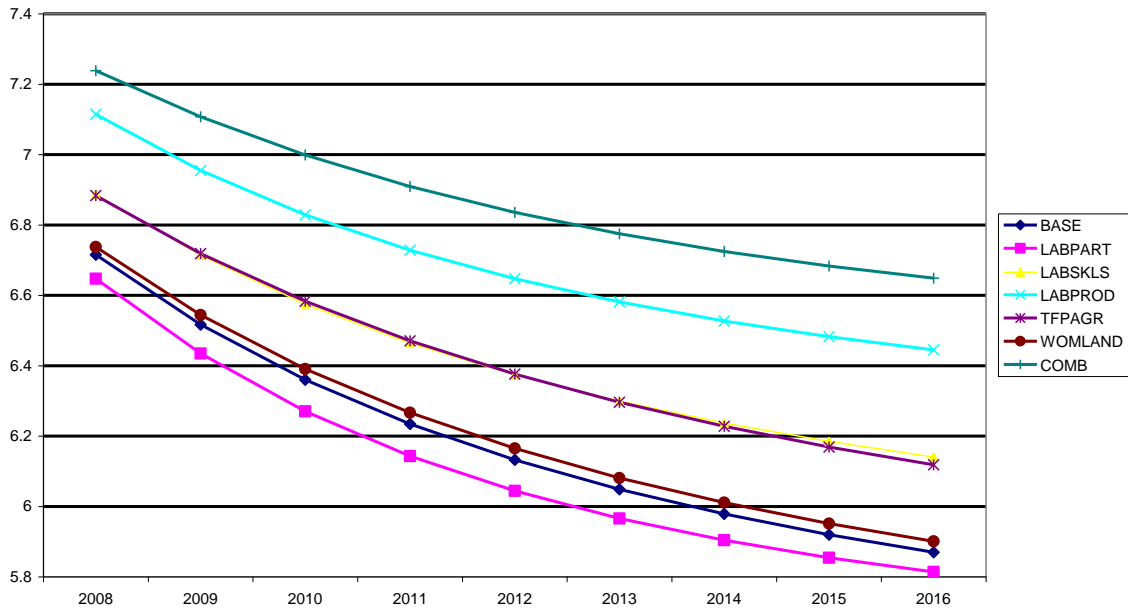
9.6 Sectoral Effects

At the sectoral level, we note that forecast growth rates vary considerably between sectors. Of particular interest is the agricultural sector, which employs nearly 70 percent of women Uganda's labor force. Agriculture is mainly dominated by less-skilled labor, and in addition is a largely manual activity with very little capital equipment being used. With labor abundantly available for this sector, we note that the agricultural sector growth is about 4 percent. However, although growth is positive, it is lower than in other sectors and hence the share of agriculture in GDP is forecast to decline. Industry (manufacturing) and particularly services are where much more rapid growth is forecast to occur. The rapid growth in industry and services reflects the impact of skilled labor availability, and of investment and capital accumulation in those sectors, which are more important than in agriculture.

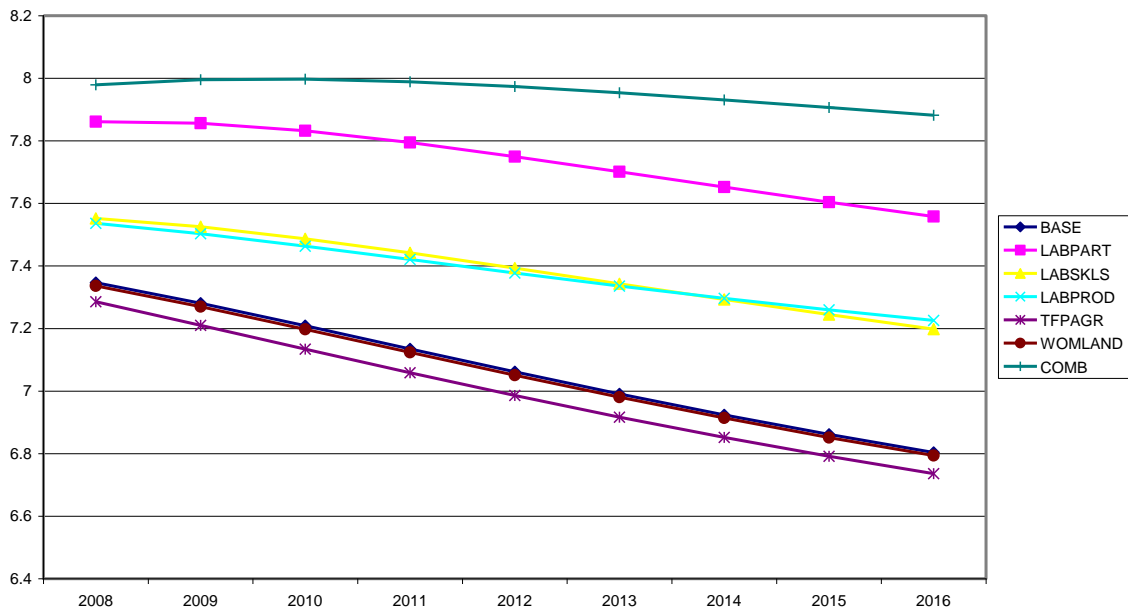
In all simulations, we find that there would be a marked increase in production for the agricultural sector (Figure 3). This is partly due to the fact that agriculture employs a significant proportion of women. Therefore by increasing the participation rates of women in the labor force this would greatly increase production in the agricultural sector. The combined simulations shows that agriculture would be boosted by a significant 2.5 percent annual growth rate. By women have more access to land this would result into higher production for the agricultural sector by 0.5 percent. The effects in the manufacturing and services sectors are mute due to the fact that these two sectors employ comparatively less women. Of interest for these two sectors is that if the quality of labor provided by women is improved, this greatly increases the production levels for the two sectors. This is due to the fact that the two sectors require more skilled labor compared to agriculture.



Gender Simulations and Manufacturing Growth



Gender Simulations and Services Growth



9.8 Poverty Impacts

From the above analysis, we have observed that by addressing gender inequalities this would greatly enhance the incomes of households. Using the poverty module which is part of the dynamic general equilibrium model, we simulate the poverty implications for addressing gender inequalities. The results are consistent with the growth effects derived above. In particular, poverty at the national level would be considerably reduced. For the case of a combined simulation, we observe that the number of people leaving below the poverty line would be 17 percent compared 22 percent for the baseline in 2016.

Figure 6: Poverty Rates - all scenarios

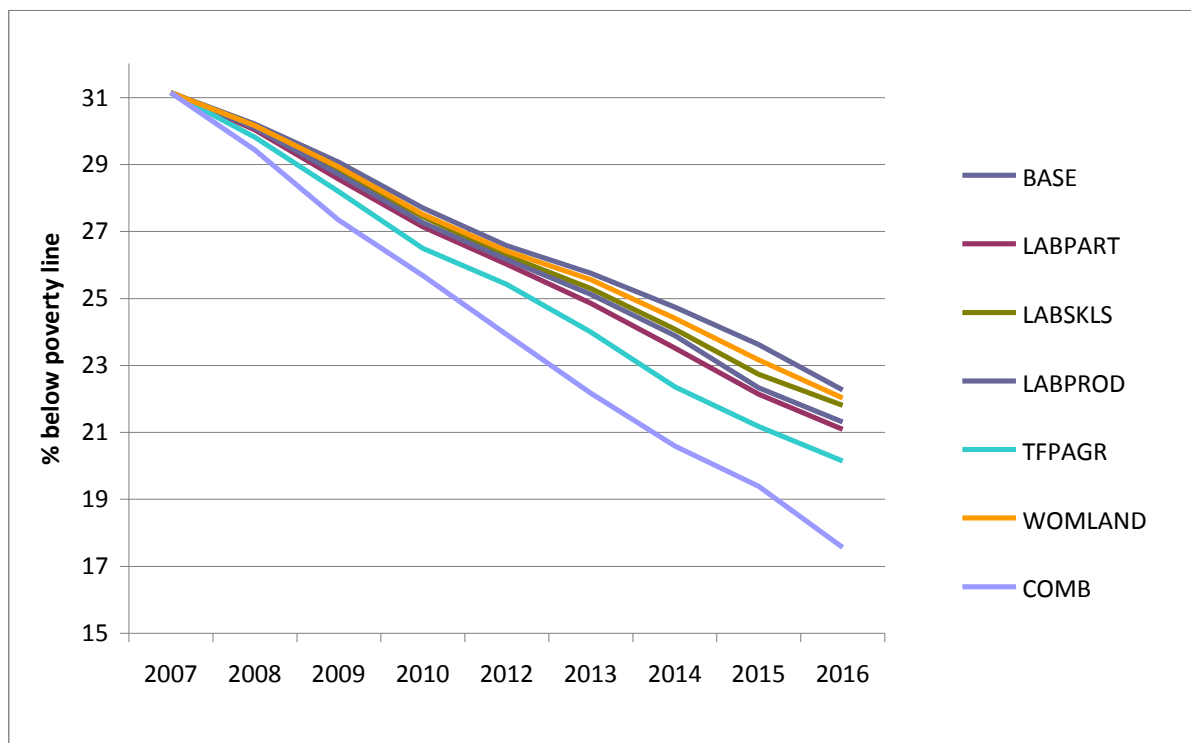


Figure 7: Poverty Rates in 2016

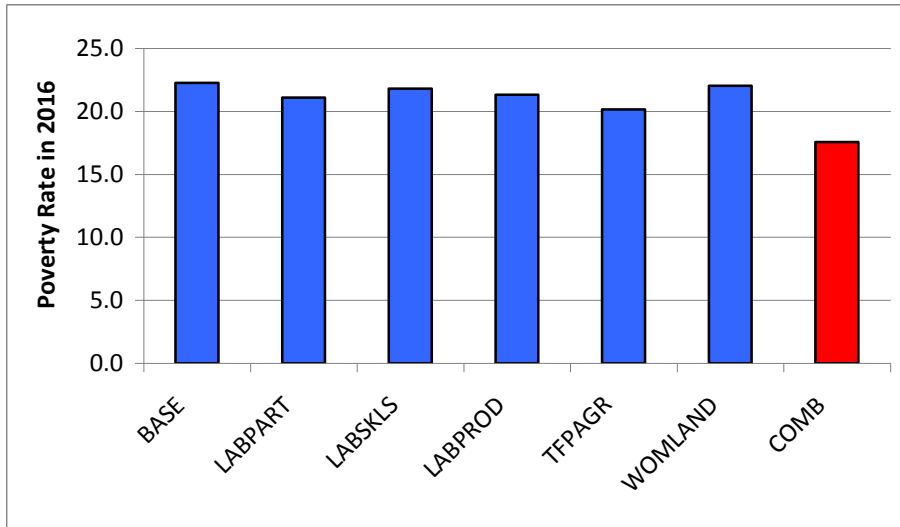


Table 5. Poverty Indices Under Various Scenarios

	BASE	LABPART	LABSKLS	LABPROD	TFPAGR	WOMLAND	COMB
National							
2007	31.14	31.14	31.14	31.14	31.14	31.14	31.14
2008	30.20	30.03	30.16	30.09	29.81	30.16	29.43
2009	29.07	28.56	28.79	28.70	28.19	28.92	27.34
2010	27.70	27.14	27.44	27.26	26.50	27.51	25.68
2012	26.57	26.02	26.28	26.16	25.42	26.41	23.92
2013	25.75	24.85	25.29	25.12	23.99	25.56	22.17
2014	24.74	23.51	24.08	23.89	22.36	24.40	20.59
2015	23.62	22.14	22.73	22.33	21.17	23.16	19.39
Rural							
2007	34.29	34.29	34.29	34.29	34.29	34.29	34.29
2008	33.23	33.03	33.18	33.09	32.79	33.18	32.44
2009	32.10	31.50	31.76	31.66	31.06	31.93	30.05
2010	30.54	29.91	30.23	30.05	29.18	30.32	28.19
2011	29.26	28.61	28.92	28.78	27.91	29.08	26.19
2012	28.33	27.32	27.79	27.60	26.34	28.10	24.31
2013	27.24	25.89	26.46	26.23	24.64	26.84	22.60
2014	26.13	24.40	25.04	24.62	23.35	25.61	21.30
2015	24.62	23.26	24.05	23.52	22.17	24.35	19.26
Urban							
2007	13.77	13.77	13.77	13.77	13.77	13.77	13.77
2008	13.52	13.52	13.52	13.52	13.43	13.52	12.85
2009	12.38	12.38	12.45	12.38	12.38	12.38	12.37
2010	12.06	11.87	12.06	11.87	11.75	12.06	11.82
2011	11.75	11.75	11.75	11.75	11.68	11.73	11.43
2012	11.55	11.25	11.50	11.43	11.05	11.55	10.36
2013	10.99	10.36	10.97	10.97	9.82	10.97	9.49
2014	9.76	9.66	10.00	9.66	9.17	9.63	8.86
2015	9.26	9.12	9.41	9.12	8.95	9.21	8.19

10. Conclusion and Policy Implications

This paper has investigated the main channels through which discrimination of women affect the real economy. Of specific interest the paper analyzes the extent to which the available labor supply of men, the quality of the labor supply available (skilled and unskilled) of women, the productivity of women assuming that gender violence affects their health can affect the macro economy. The paper

also examined other ways through which women are discriminated against especially their accessibility to land and capital. The analysis uses a dynamic general equilibrium model using a SAM which is gender oriented as its database.

The key findings suggest that increasing the labor participation of women in the labor force in more paying sectors would increase real GDP by 0.4 percent on annual basis over the period 2008-2016. Second, if the number of skilled women labor force is increased by 5 percent every year, this would result into additional output of 0.3 percent. An improvement in the productivity of women at work by 2 percent results into overall increase in the growth rate of GDP of 0.4 percent. Thirdly, the impact of providing more ownership to land by women would have a marginal impact on the overall growth rate but a large impact on the agricultural sector. The results also suggest that poverty would be greatly reduced if some of these gender inequalities are adequately addressed.

The policy implications of this paper suggest that there is a lot to gain by addressing gender inequalities. Policy makers may implement laws which prohibit women being discriminated at work and thereby increasing their participation in the labor force. Second, it's imperative that women should have equal access to education. This would enable them to move into more productive sectors away from subsistence farming and self-employment. Enforcing laws that address the vice of domestic violence could go a long way to improve the productivity of women at work. Also the domestic bill being considered should strengthen the case for more equal ownership of land between both genders since this would enable women to actively participate in formal financial transactions.

Appendix

Appendices to Part I

Appendix Table 1: Estimates of Earnings Functions by Gender

	Male	Female
Potential experience	0.0241** (0.0032)	0.0214** (0.0042)
Potential experience squared	-0.0005** (0.0001)	-0.0004** (0.0001)
Incomplete Primary	-0.0937 (0.1891)	-0.1648 (0.1531)
Primary	0.1124* (0.0481)	0.1656** (0.0453)
Lower Secondary	0.6028** (0.0733)	0.8512** (0.1029)
Upper Secondary	0.4228** (0.0550)	0.5306** (0.0694)
Tertiary	1.0677** (0.0723)	1.2564** (0.0989)
Married Monogamy	0.1197** (0.0388)	0.1591** (0.0536)
Married Polygamy	0.2546** (0.0532)	0.1230+ (0.0660)
Divorced	-0.0791 (0.0624)	0.1183+ (0.0625)
Widowed	0.1238 (0.1065)	0.1148 (0.0728)
Household Head	0.0724+ (0.0387)	0.0109 (0.0427)
Eastern Region	0.0338 (0.0353)	0.0938+ (0.0503)
Western Region	-0.1194** (0.0353)	-0.1157* (0.0481)
Central Region	0.2519** (0.0320)	0.1827** (0.0496)
Constant	9.8862** (0.0738)	9.8271** (0.0931)
Sector Dummies	Yes	Yes
Occupation Dummies	Yes	Yes

Observations	4554	1833
R-squared	0.46	0.57

Note: +, * and ** represent significance at 10%, 5% and 1% level, respectively.
Standard errors in parentheses

Appendices to part II

Appendix A1: The Uganda Social Accounting Matrix (SAM) 2002

Like other conventional SAMs, the Uganda SAM contains the block of activities, factors of production, households, government, stocks and the rest of the world (ROW). The Uganda SAM is a 193 by 193 matrix, showing GDP at factor cost amounting to 3,389,424 million Uganda shillings at 2002 prices (see Table A1 in the Appendix). The various commodities (domestic production) supplied are purchased and used largely by households (40 per cent) for final consumption, but also a considerable percentage (35 per cent) is demanded and used by producers as intermediate inputs. Although only 7 per cent of the domestic production is exported, a considerable amount (11 per cent) is used for investment and stocks, while the remaining 8 per cent is used by government for final consumption. Households are shown to derive 68 per cent of their income from factor income payments while the rest accrues from government, inter-household transfers, corporations and the ROW. The government account earns 33 per cent income from import tariffs, a characteristic typical of developing countries. It derives 42 per cent from the ROW which includes international aid and interest. Domestic producers pay 14 per cent in taxes on products, while only 6 per cent is income taxes paid by households and only 5 per cent is corporate taxes paid by corporations.

Government is the main source of investment finance (28 per cent) followed by domestic producers (27 per cent), households (26 per cent) and lastly the

corporations that provide only 20 per cent. Imports of goods and services account for 87 percent of total expenditure to the ROW. The rest is paid to ROW by domestic household sectors in form of remittances; wage labor from domestic production activity; domestic corporations payments of dividends; income transfers paid by government; and net lending and external debt related payments.

The extent of household dis-aggregation is very important for policy reform analysis involving representative household groups as opposed to individual households. Pyatt and Thorbecke (1976) argue persuasively for a household dis-aggregation that minimizes within-group heterogeneity.

The Uganda SAM identifies four labor categories disaggregated by gender and skill namely; male and female, distinguished by unskilled, semi-skilled, skilled and highly skilled. These are further classified according to rural and urban as well as by geographic regions.

Appendix A2: Salient Features of the CGE Model

The CGE model used in the present study is based on a standard CGE model developed by Lofgren, Harris, and Robinson (2002). The CGE model is calibrated to the 2007 SAM. GAMS software is used to calibrate the model and perform the simulations.

Productions and commodities

For all activities, producers maximize profits given their technology and the prices of inputs and output. The production technology is a two-step nested structure. At the bottom level, primary inputs are combined to produce value-added using a CES (constant elasticity of substitution) function. At the top level, aggregated value added is then combined with intermediate input within a fixed coefficient (Leontief) function to give the output. The profit maximization gives the demand for intermediate goods, labor and capital demand. The detailed disaggregation of production activities captures the changing structure of growth due to the pandemic.

The allocation of domestic output between exports and domestic sales is determined using the assumption that domestic producers maximize profits subject to imperfect transformability between these two alternatives. The production possibility frontier of the economy is defined by a constant elasticity of transformation (CET) function between domestic supply and export.

On the demand side, a composite commodity is made up of domestic demand and final imports and it is consumed by households, enterprises, and government. The Armington assumption is used here to distinguish between domestically produced goods and imports. For each good, the model assumes imperfect substitutability (CES function) between imports and the corresponding

composite domestic goods. The parameter for CET and CES elasticity used to calibrate the functions used in the CGE model are exogenously determined and are taken from Chung-I Li (1999).

Factor of production

There are 18 primary inputs: 16 labor types, capital and land. Wages and returns to capital are assumed to adjust so as to clear all the factor markets. Both types of labor are mobile across sectors while capital is assumed to be sector-specific.

Institutions

There are three institutions in the model: households, enterprises and government. Households receive their income from primary factor payments. They also receive transfers from government and the rest of the world. Households pay income taxes and these are proportional to their incomes. Savings and total consumption are assumed to be a fixed proportion of household's disposable income (income after income taxes). Consumption demand is determined by a Linear Expenditure System (LES) function. Firms received their income from remuneration of capital; transfers from government and the rest of the world; and net capital transfers from households. Firms pay corporate tax to government and these are proportional to their incomes.

Government revenue is composed of direct taxes collected from households and firms, indirect taxes on domestic activities, domestic value added tax, tariff revenue on imports, factor income to the government, and transfers from the rest of the world. The government also saves and consumes.

Macro closure

Equilibrium in a CGE model is captured by a set of macro closures in a model. Aside from the supply-demand balances in product and factor markets, three

macroeconomic balances are specified in the model: (i) fiscal balance, (ii) the external trade balance, and (iii) savings-investment balance. For fiscal balance, government savings is assumed to adjust to equate the different between government revenue and spending. For external balance, foreign savings are fixed with exchange rate adjustment to clear foreign exchange markets. For savings-investment balance, the model assumes that savings are investment driven and adjust through flexible saving rate for firms. Alternative closures, described later, are used in a subset of the model simulations.

Recursive Dynamics

To appropriately capture the dynamic aspects of the economy, this model is extended by building some recursive dynamics. The dynamics is captured by assuming that investments in the current period are used to build on the new capital stock for the next period. We assume that the capital depreciates at a rate of 5 percent. The new capital is allocated across sectors according to the profitability of the various sectors. The labor supply path under different policy scenarios is exogenously provided from a demographic model. The model is initially solved to replicate the SAM of 2007.

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