The Growing Significance of Marriage in African Labor Markets: Implications for the Fertility Transition and Inequality

ABSTRACT

Many developing countries are undergoing rapid demographic transitions but few studies have documented the implications for women's employment. Using DHS data on 21 African countries and a set of complementary methods, I examine the correlation between changes in marriage and subsequent changes in women's employment between 1991 and 2005. I decompose the observed employment changes into components of changes in: marriage rates; the employment effect of marriage; and other country-specific factors. Results indicate that in most countries, the changing effect of marriage appears to drive the observed changes in women's employment, with implications for the African fertility transition and inequality.

1. Introduction

The last three decades have seen rapid changes in nuptiality. For the developing world as a whole, the percentage of married women between the ages of 15 to 19 years declined from 27% between 1970 and 1989 to 21% between 1990 and 2000. The decline was especially dramatic in Western/Central Africa, where the percentages fell from 53% to 38% (National Academy of Sciences 2005). In most of the 16 African countries with repeat DHS surveys (DHS 2007; 2008), the proportion never-married among the 45-49 year old women has steadily increased, suggesting a gradual retreat from marriage. In theory, such retreat might alter women's entry into the labor market, but these possible effects remain understudied in developing countries, especially in African countries.

This study uses data from the Demographic and Health Surveys (DHS) to examine the relationship between marriage and employment in sub-Saharan Africa. I ask three questions: 1) How much have recent changes in nuptiality been followed by changes in women's labor force participation? 2) How do the relationships between marriage and employment vary across countries? 3) What is the relative contribution of individual marriage versus aggregate marriage (i.e., the marriage transition) or country specific factors to observed employment changes?

Sub-Saharan Africa is a good setting for investigating these relationships. Compared to other developing regions, Africa's marriage transition is proceeding at a slower pace and from much higher levels of marriage (DHS 2007). Further, the onset of the marital transition is quite recent in the region. DHS data show a decline in marriage rates in a majority of countries, beginning in the 1990s. Yet, a few countries fail to show a significant decline during the same period. This diversity thus affords researchers a unique opportunity to monitor the link between declines in marriage and employment.

Our study is made timely by the slow progress in African countries toward the Millennium Development Goals (MDGs), especially gender equality. By analyzing the impacts of changing marriage behavior on women's employment, we hope to shed light on how demographic transitions in the region affect national prospects of realizing the MDGs. Our study might also refine theories on the link between marriage and women's labor force participation.

2. Theoretical perspectives

Micro-level explanations of women's employment emphasize factors that both enhance and impede women's participation in the labor market. A prime facilitating influence is women's increasing autonomy, which then results in greater labor force attachment. Such autonomy stems from several factors that may include human capital, modernization, political capital, delayed and non-marriage, and reduced fertility.

The human capital theory invokes an individual's ability, education, and experience/training that enhance productivity and labor market outcomes (Becker 1981; 1992; Mincer 1974). Within that framework, women's advances in schooling facilitate entry into the labor market. As the education gap between males and females narrows, so should the gap in labor force participation. The political capital perspective rests on the assumption that women's greater political and civic participation fosters their ability to influence decisions that impact their lives. Proponents recognize the lack of equity in political participation and leadership, and they advocate policies that promote women's increased engagement in political processes and in positions of leadership (UNICEF 2006; United Nations 2000; World Bank 2001).

Modernization theory emphasizes the changes in the demand and supply of labor arising from industrialization. It ties the growth in women's employment to an increased demand for labor stemming from industrialization and development (Caldwell 1980; Goldin 1990; Standing

1983). Also, as countries modernize and women become more educated, they delay marriage, which in turn, frees them of family obligations, availing them of more time to supply the labor that is increasingly needed outside the home (Caldwell 1982). Some theorists further argue that women may even abandon marriage in favor of greater work attachment in order to fully benefit from their human capital investments (Espenshade 1985; Goldscheider and Waite 1986). Yet, and even more applicable to developing societies, other theorists argue that the extent to which modernization benefits women economically depends on prevailing labor demands (Standing 1983). They argue that greater human capital and delayed marriage can only translate into women's greater economic activity where profitable employment prospects exists, otherwise the relationship between women's economic activity and modernization or development is inverse or is at best U-shaped(Standing 1983). Ultimately, the modernization perspective anticipates such greater economic activity to reduce gender inequality in all spheres of society thereby lifting women's social status (Goldin 1990).

The economic independence perspective (Becker 1981; 1992) posits that husbands' specialization in the provision of economic resources and that of wives' in the provision of household resources and reproduction is what makes marriage advantageous. Thus, women's increasing employment and economic independence is theorized to be a major factor in changing patterns of family formation, specifically, delayed and retreat from marriage and consequently reduced fertility (Becker 1981; 1992; Blossfeld 1995; Espenshade 1985; Goldscheider and Waite 1986). By inference, in all contexts where marriage is prevalent, a negative link between marriage and women's employment is predicted.

Microeconomic theories have also underscored a set of negative influences. The incompatibility theory argues that since childrearing and household responsibilities remain the primary responsibility of women, marriage and the presence of young children are associated with less economic activity for wives and mothers (Collver and Langlois 1962), coupled with frequent labor market withdrawals (Becker 1992). The thesis has been found to hold only in occupations where conflict between time demands of working and child care arises (Stycos and Weller 1967) or where the organization of economic opportunities limits women's work outside the home (Mason and Palan 1981). These qualifications are important because the time costs of additional children may spread across family members and networks.

The occupational segregation theory shifts the focus from the individual to the employer and society. The central argument here is that women are concentrated in low-skill jobs with limited prospects for advancement because of employer discrimination but also because of their lower human capital and occupational aspirations stemming from socialization (see Anker 1997; Anker and Heim 1985). Finally, a common explanation for women's limited participation in profitable and secure economic activities that focuses on society and the labor market is rooted in patriarchy (Birdsall and Sabot 1991) and ingrained socio-cultural norms and values operating at different levels: societal, educational and employment institutions, and family (Assie-Lumumba 2000; Birdsall and Sabot 1991; Stromquist 1990).

Of these perspectives, the economic independence argument is the most relevant to my study. While Becker's theories of the family (economic costs of childbearing and economic specialization in marriage) can explain a wide range of family transformations, they have rarely been tested in African contexts. Further, marriage confers economic benefits to women, both employed and unemployed, especially in contexts where household incomes are not pooled, therefore marriage and employment or economic security may not be inversely related. The second is polygyny, which contrary to predictions, has persisted in some West African cities (Antoine and Nanitelamio 1991) and which can compel married women to work for pay.

One objective of this study is to evaluate the applicability of the economic independence perspective in cross-national perspective. While micro-studies emphasize individual or family variables (e.g., the changing economic situation of women, conflict between worker and wife roles or discrimination against mothers) as the driver of changes in women employment, comparative explanations emphasize country- context. Accordingly, comparativists view micro-explanations as incomplete. Rosenfeld and Birkelund (1995) or Blau and Kahn (1992), for instance, invoke normative culture and context in explaining cross-country variation in women's employment. Within this framework, whether women's participation in the labor is hindered depends on country-specific forces beyond the individual woman, including aggregate education, marriage and fertility levels. Societies where overall educational levels are high and marriage and fertility levels are low tend to be more open and egalitarian. They may emphasize family-friendly policies that facilitate women's employment. Alternatively, countries or societies with low levels of women's education, marriage and fertility tend to be conservative and less favorable to women's outside employment. These societies relegate women's sphere of operation

to the household, exhibit gender asymmetric roles and have not enacted family friendly policies that facilitate wives' employment. Yet, no large-scale studies using recent African data exist.

3. Previous Studies

Empirical evidence about the relationship between marriage and labor force participation is thin in developing countries, especially in Africa. As data become increasingly available, marriage has been gradually considered in micro-level analyses of women's employment status in Cote d'Ivoire (Appleton, Collier and Horsnell 1990); Guinea (Glick and Sahn 1997); Ethiopia (Krishnan 1996); and South Africa (Naude and Serumaga-Zake 2001; Ntuli 2007). Yet, in all these analyses, marriage is usually included only as a control variable rather than a topic deserving individual attention. The information gleaned from these studies is mixed. In West Africa, the relationship between marriage and women's employment is reported as positive (Glick and Sahn 1997 for Guinea; Appleton et al. 1990 for Cote d'Ivoire) but negativein East Africa (Krishnan 1996 for Ethiopia) and in South Africa (Naude and Serumaga-Zake 2001; Ntuli 2007). Thus, the marriage-employment relationship appears to be conditioned by geography, being positive in West Africa and negative in the Eastern (Ethiopia) and South African sub-regions.

A review of the 1987 World Fertility Surveys (Lloyd 1991) offers some insight in such contextual differences in developing countries. It shows the employment stability (i.e., continuation of work after marriage) to be much lower in Latin America, suggesting that marriage is an impediment to work. In Africa on the other hand, most women who had worked prior to marriage continue to work. Put differently, marriage does not interrupt employment in the late 1970s in the region. A more recent analysis of marital transitions (Eloundou-Enyegue, Jah, Calves and Kusi-Appouh 2011) examined how employment changes with marriage across African countries at differing levels of development. It suggests that macro changes related to the economy, urbanization and the spread of TV ownership are the main drivers of marital transitions. How micro-level trends have shifted in recent times remains an empirical question.

4. Hypotheses

Against this background, I examine four hypotheses:

H1: Changes in marriage rates among women between the ages of 15 and 25 are not associated with changes in their employment opportunities.

H2: The association between changes in marriage and changes in employment, if any, will be stronger in the skilled than overall sector.

H3: The effects of changes in individual marriage on employment will be subordinate to the effects of country-specific factors.

4. Data and methods

The data analyzed in this study come from the Demographic and Health Surveys (DHS). The strength of the DHS data derives from replication across multiple countries over several periods thereby facilitating cross-country comparisons of a wide range of sub-Saharan countries. Most previous studies of marriage in sub-Saharan Africa were limited by small sample size, differences in research design, contextual variation and causal inference. Samples were smaller because large scale data were unavailable in the past, restricting analysis to urban (Glick and Sahn 1997; Krishnan 1996) or rural (Naude and Serumaga-Zake 2001) settings and making it difficult to generalize the findings. This study adopts a large-scale analysis of nationally representative data sets on multiple countries in SSA. Differences in research design, particularly in study conceptualization, times and data sources, also restricted the comparison of findings from previous studies. The study remedies these limitations by using data that is standardized in that it comes from the *same source* and collected around the *same time* periods to facilitate comparison. The large scale analysis of 21 culturally different African countries addresses concern about contextual variability.

Study Variables

To contribute to the existing literature, the study focuses on the effect of marriage on employment rather than income, distinguishes between employment sectors and controls for several individual and household characteristics that affect women's employment. The main dependent variable is employment status in two sectors: (1) overall and (2) skilled sectors[1].

[1] A finer distinction between occupation sectors is desirable, particularly within formal and informal sectors given women's over-representation in the latter sector, but the occupation classification adopted by the DHS precludes such level of distinction. However, given that overall employment includes all non-agricultural paid work outside the home and makes no distinction between occupation sectors it should have lower human capital requirements for access and success. And since the public compared with the informal sector is dwindling, overall

Overall employment is measured dichotomously by paid employment in any sector of the labor market with unemployment, engagement in agricultural activity or unpaid family-work as the reference category. Skilled employment is also measured dichotomously. It is measured by the proportion of women employed in professional, technical, and managerial as well as in skilled manual work. Thus, conditional on being employed, this outcome models skilled economic activity and coded as "1" against all other paid activity, coded "0" and the reference. The study's main independent variable is marriage, measured dichotomously. It is coded as "1" if married or in a stable union and "0" if single, divorced, or widowed and the reference[2].The study controls for four sets of correlates: basic demographic information; family composition/structural characteristics; economic constraints and the need to work; and cultural attributes. The basic correlates include four variables: age and education (measured as number of years of schooling) as well as their quadratic terms to address non-linearity issues[3]. Family/structural characteristics include four variables that measure: (1) whether the respondent had a birth in the year before the survey, (2) presence of other female adults in the household, (3) whether or not the respondent is wife of the household head and (4) whether she resides in an urban versus rural setting[4]. The third set of controls reflects economic constraints and includes four variables: husband's education; husband's work status; co-residence of respondent's spouse; and family socio-economic status[5]. The variables under the fourth and final set of correlates, cultural attributes, are

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employment should closely resemble informal work. On the other hand skilled participation denotes occupation types with greater human capital prerequisites; it should therefore provide a closer measure of formal work.

[2] Rather than being discrete, marriage is a protracted process, sometimes occurring over a long period of time with boundaries between stages very blurred, and made particularly complicated by cohabitation (DHS 2007). This can lead to problems of definition in the data. Indeed, the precise reason behind recognizing consensual unions as a marital status is to minimize this problem although this inclusion can over-estimate the prevalence of marriage where unions are unstable.

[3] Controlling for age has two uses. In addition to having a possible effect on employment in its own right, it may also indirectly adjust for experience which is not asked in the DHS surveys.

[4] The first variable in this second correlates set measures whether the respondent had a birth in the year before the survey, based on the rationale that a recent birth event is more relevant to women's employment than mere number of living children without age distinction, at least from a role incompatibility perspective. On the other hand, the presence of other female adults in the household is expected to relieve some of this time conflict thereby facilitating a mother's outside paid work (Gurak and Kritz 1996; Mason and Palan 1981)and is therefore controlled for. The third correlate, whether the respondent is wife of the household head is expected to be inversely related to a woman's paid work for several reasons, including household responsibilities, husband's economic support acting as a deterrent, and husband's opposition to her outside work. While urban settings offer greater work opportunities than rural ones, residence in an urban location can reduce potential childcare and household help from extended kin. Its effects can therefore be either negative (reflecting household structural effects) or positive (reflecting community development of child care resources).

[5] Two of the third set of economic need controls measure husband's education and work status. Both variables can work in either direction, negative - discouraging women's work where spouse's educational and

measured by respondent's ideal number of children and her approval of family planning. These variables are intended to capture changing perceptions and vary by family system across countries/sub-regions.

Methods

Quantifying the gains from social interventions is difficult, given the kind of longitudinal data needed to address causality and the possibility of reverse causation (Moffitt 2003; 2005). Thus, previous studies have relied on cross-sectional as opposed to longitudinal data despite the inadequacy of cross-sectional evidence in inferring causal influences (Thornton 2001). Additionally, many of the influential factors are not easily measured[6]. These empirical concerns complicate analyses, with failure to account for their influences leading to different interpretations/conclusions (Axinn and Thornton 1992).

This study attempts to address these various issues. First, it extends existing cross-sectional studies by exploiting the within country DHS survey replications to construct a unique historical data set to provide an update on changes in marriage, and to investigate how these changes have translated into gains in women's employment. Second, the constructed data contains over 404,000 cases to add rigor and enhance interpretations. Within each country, the analyses compare changes in women's employment over two time periods. The country surveys in the first/earlier study spans 1991 to 1997 while those in the second/final study spans 1997 to 2005[7]. Third, macro-level analyses assume compositional homogeneity across individuals while

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occupational status is high enough to provide for family economic needs or positive - fostering greater openness to women's changing family and economic roles and therefore support wife's economic activity. The third variable is spouse's co-residence is expected to reduce economic constraints and wife's need to seek paid employment. Family socio-economic standing is measured by a socio-economic index derived from a factor analysis of aggregated household amenities and assets. An inverse association is presumed to exist between the index and informal employment in situations where returns to human capital are low. Contrastingly, high family status is presumed to be influential in women's access to prestigious or formal occupations.

[6] Un-measured influences can derive from individual attributes critical to labor market success such as work experience (Mincer 1974), economic or family aspirations and how these affect work propensity. Unmeasured community attributes can include: variation in economic opportunities arising from broader national policies, earnings differentials across occupation sectors, labor market discrimination, norms, especially as it relates to the organization of paid work (Mason and Palan 1981) and societies' changing attitude toward women's evolving household and economic roles (Blanc and Lloyd 1992), all of which are hard to measure.

[7] The 21 sampled countries include only those with repeat surveys conducted from 1991 onwards but nonetheless provide a representative sample of the region: West Africa - Benin, Burkina Faso, Cote d'Ivoire, Ghana, Mali, Niger, Nigeria, Senegal; Central Africa - Cameroon, Chad; Eastern Africa - Ethiopia, Kenya, Madagascar, Malawi, Mozambique, Namibia, Rwanda, Tanzania, Uganda, Zambia, Zimbabwe. Southern Africa is unrepresented because no country in that region meets the selection criteria.

micro-level analyses ignore country-specific influences with interpretations based on both likely to lead to ecological fallacy (Eloundou-Enyegue 2011; Robinson 1950). In recognition that women's employment is governed by both individual characteristics and the institutional context, the study marries the macro and micro approaches in two unique ways: 1) analyzing individual-level data within each country but using country-period as the unit of analysis and 2) using multiple techniques at both the macro and micro levels, thereby achieving generalization without loss of contextual processes.

The macro-level analyses focused on cross country correlations using three analytical methods that include standard cross country correlations between marriage and employment, then cross country correlations between changes in marriage and changes in employment, and finally country-specific correlations of marriage and employment. The micro-level analyses employed three different analytical techniques of increasing complexity, including: 1) ordinary logistic regression ; 2) fixed effects modeling; and 3) regression decomposition to estimate the sources of changes in payoffs to women's marriage i.e., the relative contribution of marriage versus other country-specific factors to employment changes as elaborated below. Given the dichotomous nature of the outcome variables, logistic regression estimates the bivariate and gross/main effects of marriage on the two outcomes, overall and skilled employment across three sequential models. The first is a bivariate model (model I) with no control variables. The next (model II) estimates the gross/main effects by controlling for basic characteristics, including age, schooling and fertility and their quadratic terms. The third (model III) adjusts for the remaining three sets of correlates. Each model is more complex than its predecessor as it controls for additional variables as shown in equation 1[8].

$$(1) \qquad \text{Log } Y/(1-Y) = \beta_0 + \beta_m M + \beta_b B + \beta_f F + FE + \varepsilon$$

The logistic regressions used thus far do not adjust for unmeasured fixed effects of individuals/families. Model IV therefore re-estimates Model III by introducing a statistical procedure called PHREG in SAS software (Allison 1996). This gradual incorporation of variables serves to assess the overall robustness of the marriage variable, in particular how it is

[8] Where Log (Y/(1-Y) is the odds of being employed; M is the measure for marriage; B measures the basic correlates; F reflects the three remaining sets of correlates: family composition/structural, economic constraints, and cultural controls; ε the error term and the βs are the regression coefficients for these correlates, with β_0 being the intercept. FE reflects the fixed effects model.

entirely mediated by unmeasured factors. Thus, the estimates from this more sophisticated model reflect the net effects of marriage on employment. While logistic regression estimates the cross-sectional and absolute magnitude of the marriage effects on employment, decomposition methods are used to estimate these effects in relative terms. The regression decomposition analyses thus show how much of the total change in women's employment within countries is attributable to changes in marriage as opposed to change in other factors. The total change in women's labor force activity since 1991 is derived from predicted employment logits using the regression coefficients. This total change is then decomposed into three different components: changes in the effects of the baseline, which essentially is the constant; changes in the average marriage levels; and changes in the returns to marriage (also referred to as marriage effects) according to equation 2:

(2) $$\Delta Y = \Delta\alpha + (\overline{X} * \Delta\beta) + (\overline{B} * \Delta X)$$

where

ΔY is the total change in employment over the two periods of study; $(\overline{X} * \Delta\beta)$ is the component of this change due to changes in the returns to marriage; $(\overline{B} * \Delta X)$ is the component of the change due to changes in marriage rates; and $\Delta\alpha$ is the component stemming from changes in the baseline effects. This baseline component reflects country-specific influences that govern women's employment opportunities not included in the analysis, essentially the residual.

[TABLE 1 HERE]

5. Findings

5.1. Descriptive results

Table 1 presents an overview of the levels and trends in marriage rates of women between the ages of 15 and 25 for the first (1991-1997)[9] and second (1997-2005) study periods. The table also presents employment levels for all women within each country, for skilled and overall employment. Countries are grouped according to sub-regions.

As expected, marriage rates are high but vary across countries. Rates for the first study period ranged from as high as 30.7% in Niger to a low of 13.3% in Rwanda. Between the two study periods, marriage rates declined in all sub-regions: West Africa (Burkina Faso, Cote d'Ivoire, Ghana, Mali, Niger), Central Africa (Cameroon, Chad) and East Africa: (Madagascar, Mozambique, Rwanda, Uganda, Zambia). But they rose in some countries of West Africa

[9] Nigeria's first study sample was collected in 1999.

(Benin, Nigeria, Senegal) and East Africa (Ethiopia, Kenya, Malawi, Namibia, Tanzania and Zimbabwe). In terms of trends, the steepest annual decline of 5.9% was registered in Ghana while Nigeria registered the steepest increase. Despite this diversity, no clear-cut difference in marriage trends is visible across sub-regions. Overall, these descriptive findings suggest an incipient marriage transition, and the concomitant transformations on women's labor force participation are examined in subsequent chapters.

[Figure 1a-b HERE]

5.2. Macro-level associations between marriage and women's employment

Figure 1 shows cross-country correlations between marriage and women's labor force participation within the overall (figure 1a) and the skilled (figure 1b) sectors. *The figures show contrasting associations*: marriage is positively related to overall employment (beta = 0.33, R2= 0.01) but negatively related to skilled sector work (beta = -0.87, R^2 = .15). Further, the effect of marriage is stronger within the skilled sector, explaining 15% of the variability in employment. These first findings reveal that failure to differentiate occupation sectors can be misleading.

To move the discussion beyond cross-sectional evidence, figures 1c-d examines the same relationship in a more dynamic perspective, between changes in marriage and changes in employment at the level of country. The association is positive in terms of overall employment (figure 1c: beta = 0.42, R^2 = 0.03) and weakly negative (figure 1d: beta = -0.93, R^2 = 0.02) regarding skilled employment. Thus, the historical trends observed within both sectors are consistent with the cross-sectional evidence presented earlier: marriage positively enhances overall participation but is negatively related to skilled economic activities. So far, the evidence lends partial credence to the economic independence perspective: unsupported within the overall sector where marriage in the transitional stages of life appears not to interfere with women's employment but supported within the more regulated skilled sector where it hinders entry. Yet, macro-level analyses miss individual-level processes and how they play out across different countries. For that reason, we turn to multivariate micro-analyses.

[Figure 1c-d HERE]

5.3. Micro-level results

These analyses are done for each of the two employment outcomes and two time periods within each country. We can therefore look at the effects of marriage on employment within each country, as well as how these effects change between the two time periods studied. Tables 2 and

3 present the results. Panels 1 and 2 in each table respectively show the levels in the marriage returns for the first and second study periods.

[Table 2 Here]

5.3.1. Effects of marriage on employment

Beyond controlling for the full sets of four correlates, the coefficients obtained under the final model (model IV) control for unobserved heterogeneity. They are therefore referred to as the final effects of marriage on employment on which interpretations are based.

5.3.1.1. Overall employment

Focusing first on overall employment and the first study period (table 2, panel 1), the bivariate effect of marriage on young women's employment is statistically significant and negative in all countries. The picture remains the same under model 2 where the gross effects continue to be negative. At the same time, some country exceptions are discernible (nil in Cameroon and Zambia as well as in Benin and positive in Ghana and Nigeria).

When other controls are incorporated (full model), the initially negative effect of marriage on employment weakens. It stays negative in only about half the sample (Chad, Mozambique, Uganda; Benin, Niger, Cote d'Ivoire, Senegal Zimbabwe. In the rest (Burkina Faso, Cameroon, Tanzania, Zambia, Mali; Madagascar; Ghana and Nigeria), marriage is unrelated to young women's overall employment.

The negative effect of marriage continues to weaken when unmeasured factors were controlled for (final model). This final model shows that marriage impeded women's employment only in five countries: Chad (OR=0.75**) Zambia (OR=0.77*) Niger (OR=0.62***); Cote d'Ivoire (OR=0.62***) and Senegal (OR=0.62***). Based on these estimates, marriage hindered women's employment mostly in Niger, Cote d'Ivoire and Senegal by 38% and considerably in Chad and Zambia by 25% and 23%, respectively between 1991 and 1997. Thus, these initial study results reveal that non-married young women were more likely than married peers to access the overall sector in the early 1990s only in Chad, Uganda, Niger, Cote d'Ivoire, Nigeria and Senegal, representing about one third of the study sample. In the remaining countries, non-married women were no more likely than their married peers to be employed during the 1991 and 1997 study periods.

Panel 2 of table 2 presents the results of the relationship between marriage and overall employment in more recent times (between 1997 and 2005). Results are similar to the earlier results only at the bivariate level. While the direction and statistical significance of the bivariate effects still hold over time within countries, the picture is different for the final effects. Focusing on the West African region and in the final models, the trends in the effects of marriage have followed diverse paths. Marriage increases the odds of employment by 27% from being initially nil in Ghana and by 26% from being initially negative in Nigeria while it decreases the odds of employment from nil to 33% and 15% in Burkina Faso and Mali, respectively. Final marriage effects remain nil in Benin but negative in Niger and Senegal where the odds of women's employment are respectively decreased by 32% and 20%.

The paths taken by Central African countries are similarly diverse: trends in marriage effects in the overall sector have been nil in Cameroon throughout while they have only become nil from being negative earlier in Chad. Trends observed for countries are equally diverse in Eastern Africa. Final marriage effects have recently turned from being generally nil to increasing the odds of employment by 67% in Madagascar or decreasing it by 24% in Tanzania and 33% in Zimbabwe or to being unrelated to employment in Mozambique and Zambia. In Uganda marriage effects have also turned nil but from being originally negative.

Thus, the initial study results reveal that non-married young women were more likely than their married peers to access the overall sector in the early 1990s only in Cote d'Ivoire, Niger, Nigeria, Senegal, Chad and Uganda, representing about one third of the study sample. In the remaining countries, non-married women were no more likely than their married peers to be employed during the 1991 and 1997 study periods. Similarly, in more recent times, the delayed marriage employment advantage is observed in only about one third of the study sample (Burkina Faso, Mali, Niger, Senegal, Tanzania, Zimbabwe) but not in the same countries in most instances. There is no significant difference in the odds of employment between married and unmarried in the remaining countries across all the three regions but especially in East Africa (West Africa: Benin, Cote d'Ivoire; Central Africa: Cameroon, Chad; East Africa: Mozambique, Uganda, Zambia). Interestingly, young non-married women are less likely to work than their married peers in three countries: Ghana and Nigeria in West Africa and Madagascar in East Africa. Based on trends, the initial marriage disadvantage with respect to young women's overall employment appears to be weakening. Given that the effect of the marriage transition in the more

regulated and more homogeneous skilled employment sector is likely to be the different, the relationship between marriage and employment within this sector is examined below.

5.3.1.2. Skilled employment

Table 3 shows that the effect of marriage on skilled employment differs markedly from its effect on overall employment. Beginning with the initial study period (panel 1), the bivariate relationship between marriage and employment is mixed rather than negative as observed in the overall sector. Once controls are incorporated, the marriage effect weakens. Between 1991 and 1997, marriage was generally unrelated to women's skilled employment in the region. Three countries stand out, however. In Chad (OR=0.27**) and Tanzania (OR= 0.08**), the final estimates under model IV indicate that in the early 1990s, marriage impeded young women's employment substantially by 73% and 92% respectively. In Zimbabwe however, the final estimates under the fourth model indicate that marriage substantially boosts women's employment in the skilled sector.

The changes in the marriage effect in the presence of correlates deserve mention. Excluding a few cases, the bivariate effect of marriage was explained by the correlates considered in the analysis: mostly measured ones reflecting family composition and household structure (Burkina Faso, Cameroon, Mozambique, Mali, Niger, Cote d'Ivoire, Ghana, Nigeria and Senegal) or economic constraints (Zambia and Benin), with unmeasured factors being influential only in Chad and Madagascar. Next, I examine these skilled sector associations in more recent times.

An overall assessment of results from the second study period (panel 2) reveals some diverging findings since the initial period. Within most countries, the pattern of association has shifted over time across the models. In many cases, the bivariate effects have become positive where they were initially negative. Similarly, they have become negative where they were initially generally positive. Despite this mixed pattern and regardless of the direction, the marriage effects have generally emerged more statistically significant, larger in magnitude and positive once controls were considered. The final model indicates that being married is associated with higher odds of skilled sector employment in six West African countries (Burkina Faso: OR= 2.99***; Cote d'Ivoire: OR2.43**; Niger: = 1.61*; Senegal: OR = 1.62**) as well as in Cameroon: OR= 1.61*** (Central Africa) and Madagascar: OR= 2.31** (East Africa).

Contrary to conventional wisdom, non-married women in their early adult years are far less likely to work in this sector. However, several exceptions across the three regions are obvious in that the relationship has lost statistical significance in the final model. This is the case for Benin, Mali, Ghana, Nigeria Chad, Mozambique, Tanzania, Uganda and Zambia. In these countries therefore, non-married young women are no more likely than their married peers to be skilled sector employees.

In sum, findings for the second study period reveal that the marriage effects within the skilled labor market have become positive and larger. Thus, marriage is increasingly facilitating women's skilled employment prospects. Geography may be a factor, as the majority of cases recording significant net returns, Burkina Faso, Niger, Cote d'Ivoire and Senegal are located in the West African sub-region. Finally, the analyses call to question the reliance on country snapshots. In recent times, the net returns are statistically significant in countries where they were originally non-significant and lost significance where they were strongly significant. These findings have implications for the fertility transition, socio-economic equity and efforts to reduce poverty in the continent.

The *internal country variation* in the magnitude, direction and statistical significance in the observed correlations suggests that the effects of marriage are neither universal nor consistent over time. One additional issue, examined in the next section, is how these effects of marriage compare with other influences in explaining the changes in women's employment. In other words, beyond the absolute effects of marriage, what is its relative influence compared to other socioeconomic transformations. .

5.3.2. Decomposition results

The top panel of table 3 shows that young women's skilled employment grew in fourteen countries, representing about 67% of the study sample. The gains ranged from as low as about 0.40 in Malawi to as high as 54.8 logits in Tanzania. Results indicate that the effect of marriage is the dominant driver of women's skilled employment. It accounts for the majority of the gains observed in countries within this sector: 118%, 64%, 86%, 128%, 98%, 92%, 105%, 87%, 118%, 99%, 98%, 63% and 98% in Burkina Faso, Cameroon, Chad, Mozambique, Tanzania, Benin, Niger, Namibia, Madagascar, Cot d'Ivoire, Nigeria, Senegal and Ghana, respectively. In short, the rising number of young *married* female workers, rather than the changing prevalence of

marriage or country-wide changes in employment opportunity, explains the historical gains in women's labor force participation within this sector. The only exclusion from this generalization is Malawi, where country-specific factors inferred from the baseline component is the predominant factor. In other countries (Rwanda, Zambia, Uganda, Zimbabwe, Kenya, Ethiopia, and Mali), employment within the skilled sector has declined. Again, the returns to marriage is the dominant factor behind these reversals, except in Kenya, where the change is mainly tied to the baseline component.

Collectively, marriage is the dominant driver of reversals and gains alike in women's employment within both economic sectors in the sampled countries. On the basis of findings within the skilled employment sector, the implications for the fertility transition and the MDGs are discussed in the concluding remarks.

6. Conclusion

This research examined the effect of the marriage transition i.e., delayed marriage on African women's labor force participation. Three hypotheses were tested about the net influence, occupational distinctions, contextual variability, and the relative influence of marriage on women's employment. Results suggest the following.

Together, the multivariate micro evidence suggests that marriage delays can raise women's overall employment. Yet, the relationships governing these factors are complex. The effect of marriage on individual employment, net of measured and unmeasured individual/family factors, in the region varies by context, occupation sector and historical time. Focusing first on the overall sector and in the early 1990s, the effect was mixed. Marriage was unassociated with employment in the majority of countries in the Eastern sub-region (Madagascar, Mozambique, Tanzania, Zambia, Zimbabwe) and to a lesser extent in the remaining Western (Benin, Burkina Faso, Ghana, Mali) and Central (Cameroon) sub-regions. This means that in these countries young single women were no more likely than their married peers to work. In the remaining 6 countries (Cote d'Ivoire, Niger, Nigeria, Senegal, Chad, Uganda), most visible in West Africa, marriage impeded women's employment, meaning that young single women were more likely than their married peers to work. In more recent times, the significance of marriage in young women's overall employment has grown in the region (9 countries as opposed to 6 in the initial

study period). Further, the pattern of association has become more mixed, being negative in some cases and positive in some others.

Turning to the skilled sector and in the early part of the 1990 decade, marriage was unassociated with young women's employment, barring Chad, Tanzania where the effect is negative and Zimbabwe were it is positive. Like the overall sector, the effect of marriage on skilled employment is gradually becoming significant in the work lives of young women but unlike the overall sector where the direction of association generally mixed, these recent effects are becoming mostly positive in countries, especially in West Africa. Thus, contrary to evidence elsewhere (Jah 2007, 2011) that suggests that both schooling and fertility but mostly the former are funneling women to the overall sector, the evidence from this research indicates that the presumably more secure skilled sector is increasingly becoming the chief employer of *married* rather than *non-married* young women.

How do these findings tie with the broader literature in the region? While the evidence from past studies has suggested a tendency for marriage to impede employment in the eastern sub-region but to facilitate it in the West African sub-region, the evidence from this *large-scale* and *comparable historical* analysis reveals some new insights, depending on study period, individual country and which sector one is looking at. For the overall sector, this large-scale analysis suggests either a negative or nil effect in the initial study across *all* sub-regions. In the recent study a more mixed effect is discernible in *both* East Africa and West Africa, where the effect is observed to be nil in some instances and negative or positive in some others. Similarly, within the overall sector and in the initial study, the effect of marriage was nil in West Africa and mixed in Central and Eastern Africa with the effect clearly becoming gradually positive in recent times across all sub-regions. The divergence of the evidence here from older evidence can be due to this study's recency, rich control for correlates of employment, historical approach and its large-scale and comparable analysis.

The observed internal and cross country variation in trends in the direction and statistical significance in the observed employment effects of marriage suggests that they are neither universal nor consistent over time. This makes identifying the importance of marriage relative to country-specific factors that influence employment especially crucial. This is crucial because of contemporary stalls in African fertility transitions (Bongaarts 2006) and the unlikely attainment of the demographic-, gender- and poverty-related MDGs. The decomposition evidence indicates

that young married women rather than their non-married peers have been the driver of the skilled sector gains in women's employment in this 15-year study in the majority of the sample. This finding is compelling and novel for sub-Saharan Africa. Yet, it is consistent with the well documented evidence from the US (Blau and Khan 2007) about the leading role of married women and mothers in the expansion of women's employment in the US. It is also not inconsistent with the well documented importance of the social context in women's labor force participation in developing countries at the micro-level (Gurak and Kritz 1996; Kritz and Makinwa-Adebusoye 1997) and with the importance of nuances within marriage (Eloundou-Enyegue and Calves 2006).

Equally compelling is that this novel evidence on the significance of marriage de-emphasizes the possible mediating role of geography (i.e., sub-regions) that is commonly invoked, aside from fertility, in explaining the regional divides in socio-economic factors in the region. But even more compelling and novel is the fact that country specific factors that govern employment are subordinate to the influence of marriage in enhancing women's employment prospects in their early adult work lives. This latter statement has implications for the African fertility transition in so far as marriage is a proximate determinant of fertility. Finally, the evidence signals that while marriage can serve to reduce inequality across families/children by depressing a sharp rise in women headed households, the facilitating effect of marriage on employment can have a disequalizing effect among women, with implications for the MDGs for reducing poverty through equity across population groups.

Until now demographic related development policies have unilaterally focused on delayed marriage. The evidence suggests that more comprehensive marriage-related policies that emphasize and facilitate young women's (both single and married) access to focusing on appropriate marriage timing and the provision of *profitable* and *secure* employment opportunities accessible to all women should be the new direction. Despite the ubiquitous importance of marriage relative to other factors, there is need for greater understanding the subtle processes within marriage that drives employment to guide context-specific policies. These conclusions were aided by the innovative approaches adopted in this research: *large-scale* systematic and *historical* analyses and the triangulation of *multiple* methods. Thus, the study calls for a continued use of such approaches where data permit as well as detailed within country examination of factors that mediate the marriage employment link. Notwithstanding the study

strengths, there are caveats. Importantly, the analysis cannot identify the marriage-related factors or the nuances within marriage that emerged to be important in young women's employment behavior. Other caveats include not examining the effect of different marriage cohorts and macro-level factors and not including men in the analyses. Future analyses will attempt to address these shortcomings.

Acknowledgements

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	Survey sample		Survey period		Married (15-25 years)		
Countries and sub-regions	Study 1	Study 2	Study 1	Study 2	Study 1	Study 2	Annual change, %
West Africa							

Table 1. Levels and trends in marriage (15-25 years old) in 21 DHS countries in 21 SSA, 1991-2005

Benin	5491	6219	1996	2001	22.0	22.9	0.8
Burkina Faso	6354	12477	1992	2003	31.3	24.8	-2.1
Cote d'Ivoire	8099	3040	1994	1999	21.5	18.4	-3.3
Ghana	9405	5691	1993	2003	25.6	14.0	-5.9
Mali	9704	12849	1996	2001	23.8	25.1	1.1
Niger	6503	7577	1992	1998	30.7	30.3	-0.3
Nigeria	9810	7620	1999	2003	17.4	22.2	6.1
Senegal	6310	14602	1993	2005	18.7	20.9	0.9
Central Africa							
Cameroon	3871	10656	1991	2004	26.3	24.8	-0.4
Chad	7454	6085	1996	2004	34.1	29.1	-1.1
East Africa							
Ethiopia	15367	14070	1992	1997	20.0	21.1	1.1
Kenya	7540	8195	1993	2003	16.8	17.0	0.1
Madagascar	6260	7949	1992	2004	17.9	16.7	-0.6
Malawi	4849	13220	1992	2000	25.7	27.9	1.0
Mozambique	8779	12418	1997	2003	26.9	24.4	-1.6
Namibia	5421	6755	1992	2000	23.8	25.1	0.7
Rwanda	6551	10421	1992	2000	13.3	12.6	-0.6
Tanzania	9238	10329	1992	2004	20.4	22.5	0.8
Uganda	7070	7246	1995	2001	29.5	22.3	-4.7
Zambia	7060	7658	1992	2002	21.9	20.3	-0.8
Zimbabwe	6128	5907	1994	1999	19.9	21.5	1.5

Table 2. Effect of marriage (15-25 years old) on overall employment, 16 DHS countries in sub-Saharan Africa

	Overall employment															
	Panel 1: Study 1								Panel 2: Study 2							
	Logistic regression								Logistic regression							
	Bivariate		Gross		Net		Fixed effects		Bivariate		Gross		Net		Fixed effects	
	Model 1		Model 2		Model 3		Model 4		Model 1		Model 2		Model 3		Model 4	
Countries and region	OR	Sig	OR	Sig	OR	Sig	OR	Sig	OR	Sig	OR	Sig	OR	Sig	OR	Sig
West Africa																
Benin	0.8	***	0.9		0.7	***	0.9		0.9	***	1.3	***	1.0		1.2	
Burkina Faso	0.8	***	0.8	*	0.8		0.8		0.6	***	0.7	***	0.6	***	0.7	***
Cote d'Ivoire	0.7	***	0.7	***	0.6	***	0.6	***	0.8	***	0.7	***	1.2	***	1.1	
Ghana	1.2	***	1.4	***	1.0		1.1		1.1	***	1.3	**	1.2	*	1.3	*
Mali	0.8	***	0.9	*	1.1		1.0		0.7	***	0.8	***	0.8	***	0.9	*
Niger	0.4	***	0.6	***	0.7	***	0.6	***	0.5	***	0.7	***	0.7	***	0.7	***
Nigeria	0.7	***	1.3	***	0.9	***	0.8	*	0.8	***	1.7	***	1.3	**	1.3	*
Senegal	0.4	***	0.5	***	0.6	***	0.6	***	0.4	***	0.6	***	0.7	***	0.8	***
Central Africa																
Cameroon	0.6	***	1.1		0.9		0.8		1.1	***	1.1		0.9		0.9	
Chad	0.7	***	0.8	***	0.7	***	0.8	**	0.6	***	0.9	*	0.8		0.8	

East Africa															
Ethiopia	0.6	***	NA		NA		NA		0.6	***	NA		NA		NA	
Kenya	0.6	***	NA		NA		NA		0.6	***	NA		NA		NA	
Mad	0.7	***	0.8	*	0.9		1.0		0.7	***	1.1		1.5	***	1.7	***
Malawi	0.6	***	NA		NA		NA		0.7	***	NA		NA		NA	
Mozambique	0.3	***	0.5	***	0.5	***	0.8		0.5	***	0.7	***	1.0		1.1	
Namibia	0.8	***	NA		NA		NA		0.9	***	NA		NA		NA	
Rwanda	0.6	***	NA		NA		NA		0.6	***	NA		NA		NA	
Tanzania	0.6	***	0.8	***	0.9	***	0.8		0.6	***	0.6	***	0.6	***	0.8	*
Uganda	0.6	***	0.6	***	0.8	*	0.8	*	0.8	***	0.8	*	1.0		0.9	
Zambia	0.7	***	1.0		1.2		1.2		0.7		1.0		0.9		1.0	
Zimbabwe	0.7	***	0.6	***	0.8	*	0.8		0.6	***	0.7	***	0.7	***	0.7	***

***, **, *, and # indicate significance at the <0.001, 0.01, 0.05, and 0.10 levels, respectively.
NA = estimates could not be generated under these more complex models due to missing cases

Table 3. Effect of marriage (15-25 years old) within the skilled sector, 16 DHS countries in sub-Saharan Africa

	Skilled employment															
	Panel 1: Study 1								Panel 2: Study 2							
	Logistic regression								Logistic regression							
	Bivariate		Gross		Net		Fixed effects		Bivariate		Gross		Net		Fixed effects	
	Model 1		Model 2		Model 3		Model 4		Model 1		Model 2		Model 3		Model 4	
Countries and region	OR	Sig	OR	Sig	OR	Sig	OR	Sig	OR	Sig	OR	Sig	OR	Sig	OR	Sig
West Africa																
Benin	1.0	***	0.7	**	0.7		0.7		1.3	***	1.1		1.0		1.1	
Burkina Faso	1.1	***	1.3		1.0		0.5		1.3	***	2.0	***	2.5	***	3.0	***
Cote d'Ivoire	1.1	***	1.0		1.0		1.2		1.1	***	1.4		2.0	*	2.4	**
Ghana	1.1	***	1.0		1.1		1.1		1.2	***	1.1		1.1		0.9	
Mali	1.0	***	1.3		1.3		0.9		1.0	***	1.1		1.0		0.8	
Niger	1.4	***	1.1		1.4		1.2		1.5	***	1.6	***	2.0	***	1.6	*
Nigeria	1.1	***	0.9		0.9		0.8		1.3	***	1.1		1.0		1.0	
Senegal	1.7	***	1.4		1.5		1.5		1.8	***	1.5	***	1.6	***	1.6	***
Central Africa																
Cameroon	0.7	***	1.3		1.		2.6		1.9	***	1.5	***	1.6	***	1.6	**
Chad	0.6	***	0.7	***	0.5		0.3	**	1.3	***	1.2		1.2		1.3	

East Africa																
Ethiopia	1.2	***	NA		NA		NA		0.9	***	NA		NA		NA	
Kenya	0.8	***	NA		NA		NA		0.5	***	NA		NA		NA	
Madagascar	0.7	***	0.8		0.6	**	0.9		1.2	***	2.1	***	2.4	***	2.4	**
Malawi	1.0	***	NA		NA		NA		0.8	***	NA		NA		NA	
Mozambique	0.9	***	1.2		1.4		0.9		1.0	***	1.5		1.1		0.8	
Namibia	0.4	***	NA		NA		NA		0.7	***	NA		NA		NA	
Rwanda	1.4	***	NA		NA		NA		0.4	***	NA		NA		NA	
Tanzania	0.1	***	0.1	***	0.1	***	0.1	***	1.2	***	1.4	*	1.4		1.3	
Uganda	1.0	***	1.3		1.1		1.2		0.7	***	0.9		0.9		0.7	
Zambia	1.3	***	1.3	**	1.1		1.2		0.6	***	0.8		0.6	*	0.6	
Zimbabwe	1.6	***	2.8	***	2.0	***	2.5	***	0.8	***	1.7	***	1.1	***	1.2	

***, **, *, and # indicate significance at the <0.001, 0.01, 0.05, and 0.10 levels, respectively.
NA = estimates could not be generated under these more complex models due to missing cases

Table 4. Decomposition results for the relative contribution of marriage (15-25 years old) to changes in women's skilled labor force participation

	Predicted skilled employment (logits)					
	Study 1	**Study 2**	**Total change**	**Baseline**	**Aggregate marriage**	**Individual marriage effects (15-25 years old)**
COUNTRIES AND REGIONS						
Gains in Employment						
West Africa						
Benin	-12.8	-0.4	12.4	9%	-1%	92%
Burkina Faso	4.6	14.0	9.4	14%	-32%	118%
Cote d'Ivoire	-4.5	3.7	8.2	7%	-6%	99%
Ghana	-0.8	0.7	1.4	28%	-26%	98%
Niger	3.3	12.8	9.6	-4%	-1%	105%
Nigeria	-3.1	0.1	3.2	1%	1%	98%
Senegal	4.6	6.6	2.0	-4%	42%	63%
Central Africa						
Cameroon	0.5	8.2	7.7	42%	-6%	64%
Chad	-16.0	3.1	19.1	11%	3%	86%
East Africa						
Madagascar	-3.9	10.5	14.4	-16%	-2%	118%
Malawi	-1.7	-1.3	0.4	351%	13%	-265%
Mozambique	2.2	6.7	4.6	-13%	-16%	128%
Namibia	-12.4	2.1	14.5	14%	0%	87%
Tanzania	-48.7	6.1	54.8	6%	-3%	98%

Declines in Employment						
West Africa						
Mali	4.3	-1.6	-6.0	13%	-3%	90%
East Africa						
Ethiopia	6.8	-1.3	-8.0	20%	-3%	83%
Kenya	-1.9	-10.5	-8.7	77%	0%	23%
Rwanda	6.3%	-9.1	-15.4	18%	0%	82%
Uganda	6.9	-4.4	-11.4	18%	5%	77%
Zambia	-5.7	-5.9	-11.5	9%	1%	91%
Zimbabwe	19.3	9.0	-10.3	12%	-12%	100%

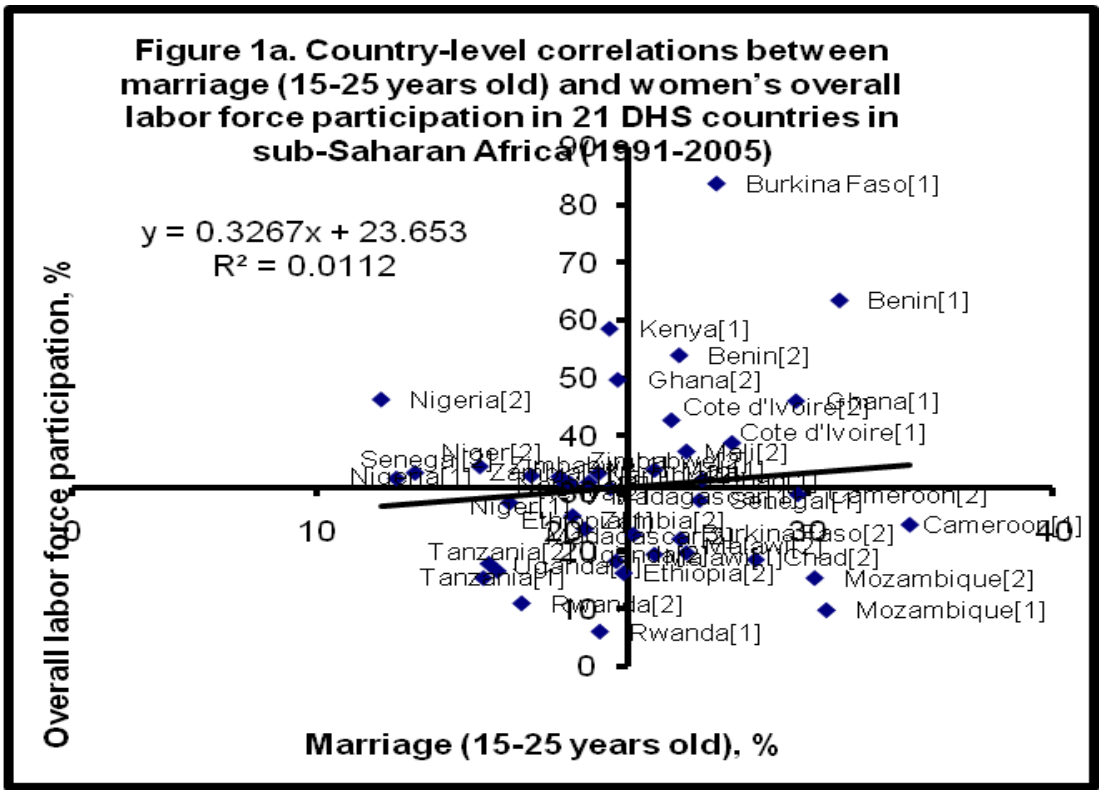
Figure 1a. Country-level correlations between marriage (15-25 years old) and women's overall labor force participation in 21 DHS countries in sub-Saharan Africa (1991-2005)
y = 0.3267x + 23.653
R² = 0.0112
Overall labor force participation, %
Marriage (15-25 years old), %
Burkina Faso[1]
Benin[1]
Kenya[1]
Benin[2]
Ghana[2]
Nigeria[2]
Ghana[1]
Cote d'Ivoire[2]
Cote d'Ivoire[1]
Mali[2]
Cameroon[2]
Cameroon[1]
Burkina Faso[2]
Chad[2]
Mozambique[2]
Mozambique[1]
Ethiopia[2]
Rwanda[2]
Rwanda[1]
Tanzania[1]
0
10
20
30
40
50
60
70
80
90

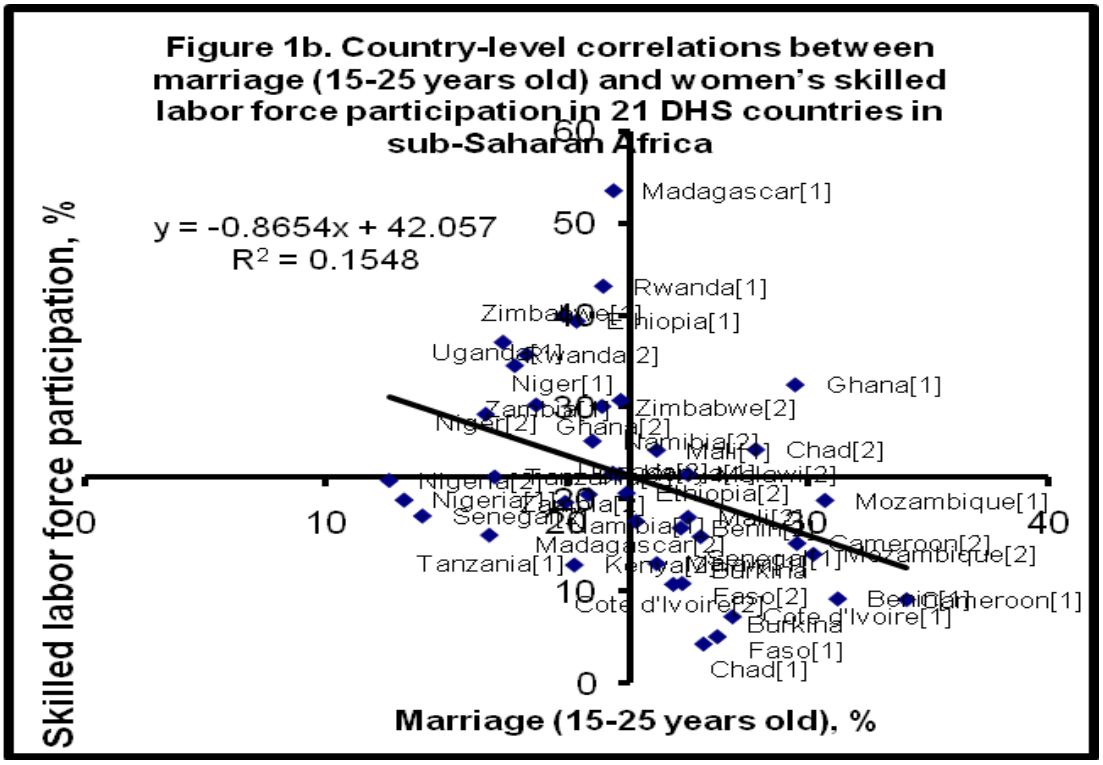
Figure 1b. Country-level correlations between marriage (15-25 years old) and women's skilled labor force participation in 21 DHS countries in sub-Saharan Africa
y = -0.8654x + 42.057
R² = 0.1548
Skilled labor force participation, %
Marriage (15-25 years old), %
Madagascar[1]
Rwanda[1]
Ethiopia[1]
Rwanda[2]
Niger[1]
Ghana[1]
Zimbabwe[2]
Ghana[2]
Chad[2]
Ethiopia[2]
Mozambique[1]
Cameroon[2]
Mozambique[2]
Madagascar[2]
Tanzania[1]
Kenya[2]
Cameroon[1]
Cote d'Ivoire[2]
Cote d'Ivoire[1]
Faso[1]
Chad[1]
0
10
20
30
40
50
60

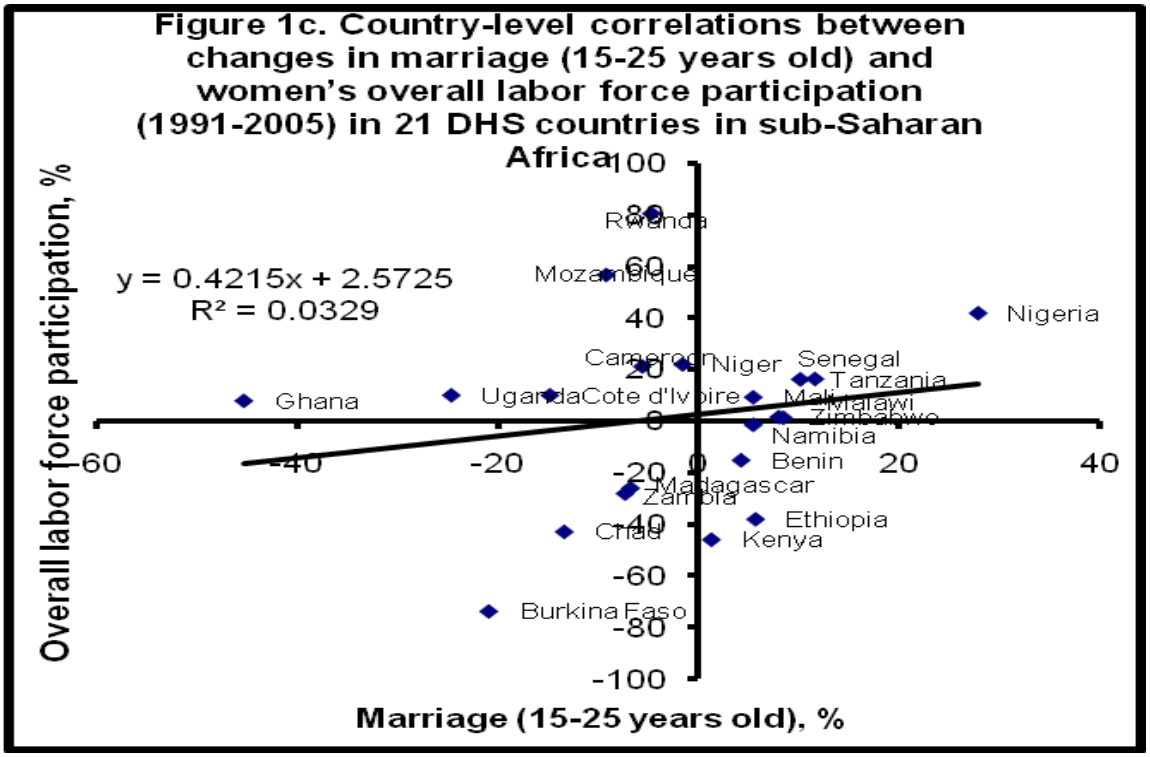
Figure 1c. Country-level correlations between changes in marriage (15-25 years old) and women's overall labor force participation (1991-2005) in 21 DHS countries in sub-Saharan Africa
y = 0.4215x + 2.5725
R² = 0.0329
Overall labor force participation, %
Marriage (15-25 years old), %
Rwanda
Mozambique
Nigeria
Cameroon
Niger
Senegal
Tanzania
Ghana
Uganda
Cote d'Ivoire
Malawi
Zimbabwe
Namibia
Benin
Madagascar
Zambia
Ethiopia
Chad
Kenya
Burkina Faso
100
80
60
40
20
0
-20
-40
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-80
-100
-60
-40
-20
0
20
40

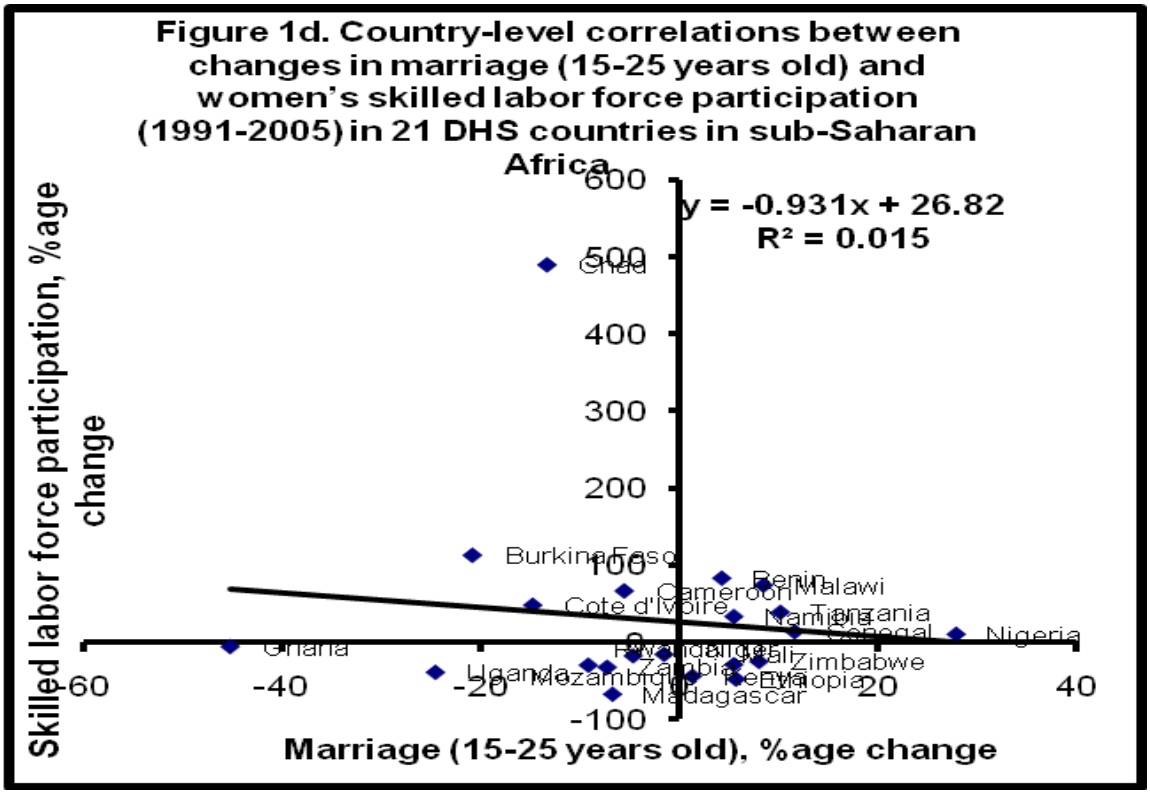
Figure 1d. Country-level correlations between changes in marriage (15-25 years old) and women's skilled labor force participation (1991-2005) in 21 DHS countries in sub-Saharan Africa
y = -0.931x + 26.82
R² = 0.015
Skilled labor force participation, %age change
Marriage (15-25 years old), %age change
Chad
Burkina Faso
Benin
Malawi
Cameroon
Cote d'Ivoire
Tanzania
Nigeria
Ghana
Zimbabwe
Madagascar
600
500
400
300
200
100
0
-100
-60
-40
-20
0
20
40

References

Allison, P.D. 1996. *Survival Analysis Using the SAS System: A Practical Guide*, Cary, NC: SAS Institute Inc.

Anker, R. 1997. "Theories of Occupational Segregation by Sex: An Overview." *International Labour Review* 136(3):315-339.

Anker, R. and C. Heim. 1985. "Why Third World Urban Employers Usually Prefer Men." *International Labour Review* 124(1):73-91.

Antoine, P. and Nanitelamio J., 1991. "More Single Women in African Cities: Pikine, Abidjan and Brazzaville." *Population* 3:149-169.

Appleton, S., P. Collier, and P. Horsnell. 1990. "Gender, Education, and Employment in Cote d'Ivoire. Social Dimensions of Adjustment in Sub-Saharan Africa." Working Paper No. 8. Washington DC: The World Bank.

Assié-lumumba, N. T. 2000. "Educational and Economic Reforms, Gender Equity, and Access to Schooling in Africa." *IJCS* 3:9:56.

Axinn, W.G., and A. Thornton 1992. "The Relationship Between Cohabitation and Divorce: Selectivity or Causal Influence?" *Demography* 29(3):357-374.

Becker, G.S. 1981. *A Treatise on the Family.* Cambridge, MA: Harvard University Press.

Becker, G. 1992. "Fertility and the Economy." *Journal of Population Economics* 5:185-201.

Beneria, L. and S. Feldman (eds.). 1992. *Unequal Burden: Economic Crises, Persistent Poverty, and Women's Work.* Boulder: Westview Press.

Birdsall, N. and R.H. Sabot. 1991. "Introduction" in N. Birdsall and R.H. Sabot (eds.). *Unfair Advantage: Labor Market Discrimination in Developing Countries*. Washington DC: The World Bank.

Blanc, A. K. and C. B. Lloyd. 1992. "Work, Childbearing and Rearing are the Life Cycle in Ghana" in A. Adepoju and C. Oppong (eds.), *Gender, Work and Demographic Issues in Sub-Saharan Africa.* London: James Currey.

Blau, F.D. and L.M. Kahn. 2007. "Changes in the Labor Supply Behavior of Married Women: 1980-2000." *Journal of Labor Economics* 25:393-438.

Blau, F.D. and L.M. Kahn. 1997. "The Gender Earnings Gap: Learning From International Comparisons." *American Economic Review* 82:533-538.

Blossfeld, H. P. 1995. "Introduction." Pp. 3-13 in H. P. Blossfeld (ed.), *The New Role of Women: Family Formation in Modern Societies*. Boulder, CO: Westview Press.

Bongaarts, J. 2006. "The Causes of Stalling Fertility Transitions." *Studies in Family Planning* 37(1):1-16.

Caldwell, J.C. 1980. "Mass Education as a Determinant of the Timing of Fertility Decline." *Population and Development Review* 6(2):225-255.

Caldwell, J. C. 1982. *Theory of Fertility Decline*. London: Academic Press.

Collver, A. and E. Langlois. 1962. *The Female Labor Force in Metropolitan Areas: An International Comparison* Berkeley: The University of California.

DHS. 2007. Demographic and Health Surveys, ORC Macro. Available online at: http:// www.measuredhs.com. Accessed January 2007.

DHS. 2008. Demographic and Health Surveys, ORC Macro. Available online at: http:// www.measuredhs.com. Accessed May 2008.

Eloundou-Enyegue, P.M. and A.E. Calves. 2006. "Till Marriage Do Us Part: The Family Returns to Female Education in Cameroon." *Comparative Education Research* 50(1):1-20.

Eloundou-Enyegue, P.M., F. Jah, A. Calves and D. Kusi-Appouh 2011. "Marital Transitions in sub-Saharan Africa: Cultural Diffusion or Economic Adaptation" in review.

Espenshade, T.J. 1985. "Marriage Trends in America: Estimates, Implications, and Underlying Causes." *Population and Development Review* 11(2):193-245.

Glick, P. and D. Sahn. 1997. "Gender and Education Impacts on Employment and Earnings in West Africa: Evidence from Guinea." *Economic Development and Cultural Change* 45(4):793-823.

Goldin, C. 1990. *Understanding the Gender Gap: An Economic History of American Women.* Oxford: Oxford University Press.

Goldscheider, F.K. and L.J. Waite. 1986. "Sex Differences in the Entry into Marriage." *The American Journal of Sociology* 92(1): 91-109.

Gurak, D.T. and M.M. Kritz. 1996. "Social Context, Household Composition and Employment Among Migrant and Non-migrant Dominican Women". *International Migration Review* 30: 399-422.

Jah, F. 2007. "Learning to Labor: What Happens to African Women's Employment in the Course of Educational Transitions, 1991-2005" *The Current* 10(2):29-48. Published by Public Policy Journal of the Cornell Institute for Public Affairs.

Jah, F. 2011. “Educational Expansion, Demographic Transitions and Implications for Women’s Employment in sub-Saharan Africa (1991-2005): A Multi-method Analysis.” PhD Thesis, Cornell University. Ithaca, NY, USA.

Krishnan, P. 1996. “Family Background, Education and Employment in Urban Ethiopia. *Oxford Bulletin of Economics and Statistics* (58)1:0305-9049.

Kritz, M.M. and P. Makinwa-Adebusoye. 1997. “Ethnicity, Work, and Family as Determinants of Women’s decision-making Autonomy in Nigeria.” Population and Development Program. Cornell University Working paper Series No. 97.06. Ithaca, New York.

Lloyd, C.B. 1991. “The Contribution of the World Fertility Surveys to an Understanding of the Relationship between Women’s Work and Fertility. *Studies in Family Planning* 22(3):141-161.

Mason, K.O. and V.T. Palan, 1981. “Female Employment and Fertility in Peninsular Malaysia: The Maternal Role Incompatibility Hypothesis Reconsidered,” *Demography* 18(4):549-575.

Mincer, J. 1974. *Schooling, Experience and Earnings*. New York: National Bureau of Economic Research.

Naude, W. and P. Serumaga-Zake. 2001. “An Analysis of the Determinants of Labor Force Participation and Unemployment in South Africa’s North-West Province.” *Development Southern Africa* 18(3):261-278.

National Academy of Sciences. 2005. *Growing Up Global: The Changing Transitions to Adulthood in Developing Countries.* Washington, DC.

Ntuli, M. 2007. “Determinants of South African Women’s Labour Force Participation, 1995-2004. IZA Discussion Paper No. 3119. Available at SSRN: http://ssrn.com/abstract=1031715.

Robinson, W.S. 1950. “Ecological Correlations and the Behavior of Individuals.” *American Sociological Review* 15: 351-57.

Rosenfeld, R. and G. Birkelund. 1995. “Women’s Part-Time: A Cross-National Comparison.” European Sociological Review 11:111-134.

Shapiro, D. and O. Tambashe. 1997. “Education, Employment, and Fertility in Kinshasa and Prospects for Changes in Reproductive Behavior.” *Population Research and Policy Review* 16 (3):259-287.

Standing, G. 1983. “Women’s Work Activity and Fertility.” Pp. 517-546 in Bulatao, R.A. and R.D. Lee (eds.). *Determinants of fertility in developing countries*. New York: Academic Press.

Stromquist N. P. 1990. “Women and Illiteracy: The Interplay of Gender, Subordination and Poverty.” *Comparative Education Review* 34 (1):95-111.

Stycos, J.M. and R.H. Weller. 1967. "Female Working Roles and Fertility." *Demography* 4:210-217.

Thornton, A. 2001. "The Development Paradigm, Reading History Sideways, and Family Change." *Demography* 38:449-465.

UNICEF 2006. *The State of the World's Children 2007. Women and Children: The Double Dividend of Gender Equality*. United Nations Children's Fund, 3 United Nations

United Nations 2000. *United Nations Millennium Declaration* [on line]. Available at http://www.un.org/millenniumgoals. Accessed May 2007

United Nations. 2005. *The Millennium Development Goals Report*. Available online at http:// www.un.org/millenniumgoals. Accessed May 2007.

World Bank. 2001. "*Engendering Development: Through Gender Equality in Rights, Resources, and Voice*." World Bank Policy Research Report. Washington, DC: The World Bank.