Determinants of Declining Marriage in South Africa: 1995-2006

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Abstract

In this study, we ask "why the distribution of marriages has changed over time among African women". In light of the decline in the recent decline in marriages rates between 1995 and 2006 documented for South Africa, we go a step further to quantify the individual contribution of specific factors to the marriage decline. To this end, we use the Blinder-Oaxaca type decomposition analysis. Declining marriage is decomposed into a part explained by differences in the individual characteristics and a part explained by differences in coefficients.

Datasets used for the analyses were the October Household Surveys from 1995 to 1999 and the September wave of the Labour Force Surveys from 2000 to 2006.

The results from the decomposition analysis have shown that the predominant part of the marriage decline between year t and year 2006 is unexplained rather than explained. In other words, the effects of differences in coefficients outweigh those of differences in individual characteristics. However, this conclusion is not general across all the cross-sections. In years 2001 to 2003, for example, the explained portion of the marriage decline was predominant in explaining the gap when year 2006 coefficients are used. When year coefficients are used, we also find that the characteristic effect in much higher in a few more cross-sections.

As expected, the estimates for education and labour force participation were found to predominantly contribute to the explained portion of the marriage decline. In line with the women's economic independence hypothesis, we do find that increases in education contributed significantly to the decline in marriage. In fact, it is the main variable that explains the changes over time, as the other variables mostly lead to changes in the opposite direction. Age, sex ratio and province had a contractionary effect on the characteristic effect of the marriage decline.

1 Introduction

Thus far, we have established new evidence confirming dropping marriage rates for young African women in the period 1995 to 2006. After confirming the marriage decline, a natural next step is to seek to explain the decline. Recent evidence indicate that there is a time-period change (in the same period that marriage rates have dropped) in the distribution of some of the factors which are likely to influence a woman's marriage decisions. In this study, we seek to investigate whether the marriage decline is due to change in the distribution of

the characteristics which has taken place over time, or if it is due to temporal change in the relationship between these characteristics and marriage.

This directs us to decomposition analysis, a technique which enables us to identify and quantify the separate contributions of temporal group differences in measurable characteristics to the marriage decline. In other words, we want to understand what the South African marriage market would have looked like if the individuals sampled between 1995 through 2005 had faced 2006 marriage market conditions. Conversely, we want to understand how the marriage decisions for individuals sampled in 2006 would have looked had they faced marriage market conditions of the earlier years.

The rest of the paper progresses as follows. In section 2, we present some of the arguments from the literature to explain time-period gaps in marriage rates. Section 3 describes the data. In section 4, we outline the methodology for achieving our objectives and discuss the results of these. Estimations are done for cases where marriage decisions are independently and jointly modelled with labour force participation decisions. All estimations which correct for the endogeneity problem are reported in appendix 5. Finally, section 5 concludes the paper.

2 Literature Review

2.1 Theoretical Explanations for Declining Marriages

Becker's (1973) theory of marriage explains the decision to marry (or stay single) as the utility maximizing behaviour of any rational individual of marriageable age. Technically, a union that will likely make an individual well off is the one that he or she will choose. Thus, a marriage between two people will occur if, for both partners, the expected gains from marriage exceed the gains from being single. Becker asserts that gains from marriage arise from production complementarities and specialization as well as enjoyment of economies of scale in consumption. With regard to declining marriages, it follows that diminishing gains from marriage should result in non-marriage behaviour. A reasonable economic explanation of declining marriages must account for diminished gains to production specialization and/or vanishing consumption complementarities in marital unions.

Theoretical literature appraises the women's economic independence and shortage of men hypotheses as driving forces of the phenomenal "modern" non-marriage behaviour among young (black) women. The former claims that a rise in human capital power possessed by women in recent years has granted women opportunities in the labour market, directing their services to paid jobs. Empirical work uses earnings, education attainment and/or labour market status to proxy women's economic independence. The last two are preferred because they do not present the difficulty of estimating potential earnings for those who do not work. According to Becker's gender specialization notion, the gains from the gender division of labour within the household production unit are reduced by a rise in women's education attainment and their labour force participation. Thus falling marriage rates for

women might be explained, at least partly, by increases over time in education attainment and labour force participation for women.

The latter hypothesis is accredited to Wilson (1987), who claims, in his often-quoted "the truly disadvantaged", that the increasing delay of marriage and low rate of marriage among black women seem to be directly associated with the increasing labour force problems of men. According to this view, declining marriage is associated with shrinking over time of the pool of economically and socially advantaged men of marrying age. With gains from marriage influencing marriage decision, women tend to be picky when choosing marriage partners, and men whose current or future earning capabilities are "questionable" and likely to make a negative net contribution to the marriage tend to be "sorted out" of the marriage market.

2.2 Prior Studies on Declining Marriages

Previous international studies have attempted to explain the substantial shifts in family formation in general, and marriage decline in particular. While some explanations are common across countries, others are exclusive to a particular country or region. Generally speaking, the reasons for fewer marriages in recent years can be divided into two categories. The first category relates explanations of marriage decline to differences in the distribution of characteristics of individuals between time periods. The second category, which aligns with theoretical ideas, comprises explanations which attribute the drop in marriage rates to differences in returns (or gains) from marriage between periods. In other words, the characteristics of individuals between the two periods under comparison may be the same, but their marriage behaviour, given their characteristics, may be different. These notions are respectively termed the characteristic and coefficient effects in the terminology of decomposition analysis, and will be discussed in detail in the methodology section below.

Changes in the distribution of variables that influence marriage decisions fall into the first category. Changing trends in age, education, labour force participation and sex ratio are some of the factors that have been identified to be contribute to marriage decline. In this respect, changing distribution in variables does not directly influence the individual's decision to marry. For instance, with respect to age, the demographic composition of the population may have changed in such a way that in recent years the population is comprised of a younger population who are not thinking of marriage yet. Similarly, the economic prospects of individuals may have changed, enabling them to put off marriage, without necessarily attaching prospects from marriage to their decisions. Regarding this, one might think of change in legislature, for example, in post apartheid South Africa, which enabled women to acquire higher levels of education as well as obtain higher paid jobs. Marriage may be one aspect that might be unintentionally affected by such changes.

With regard to the differences in returns to characteristics, it may be argued that the expected gains from marriage from a particular characteristic (such as education) may be different with time. Couples marry (and stay married) when the gains from marriage exceed

the gains from being single. According to Becker (1973), these gains come from several sources, such as production complementarities (gender role specialization) and consumption complementarities (such as joint consumption, which yields benefits from economies of scale)[1]. Economic (in)capability has been cited as a contributor to marital decline (for example Wilson, 1987; Wilson and Neckerman, 1986). The specific economic processes include declining male economic power, increasing female economic power, and a declining differential between male and female economic power, just to mention a few. Possibly, change in economic incentives to marry may be related to shifts in marriage patterns. For instance, declining male economic power may be associated with fewer marriages, due to shortage of economically attractive men[2]. On the other hand, increasing female economic power, and a declining differential between male and female economic power are associated with women's financial independence, and hence non-marriage behaviour.

There is compelling empirical evidence in support of Wilson's and Neckerman's contention. For example, Oppenheimer (1988) and others (for example Ross and Sawhill, 1975; Hannan and Tuma, 1978; Cherlin, 1979; Moore and Waite, 1981; Tzeng, 1992) have presented evidence that changes in marital patterns are linked to women's continued economic advances. Gender equity in societies now enables women to get more education, just like their men counterparts. This gives women job opportunities in market work. An increase in women's labour force participation has increased their economic independence and hence have greatly reduced the desirability of marriage. Since women are not as dependent on marriage for financial upkeep, they are less likely to enter or remain in a bad marriage out of financial necessity.

The opportunity cost of marriage may also be different between time periods. With increasing female labour force participation and higher education levels for women, most women would be more likely to stay unmarried in recent years. McDonald (2000) and others argue that many professional women prefer the social and economic independence that they have gained. Thus, the opportunity cost of staying at home and performing traditionally gender specialized home work is higher with the advent of professional jobs for women. In addition, reduced market discrimination against women and technological advances that allow much of what was once produced by skilled-labour in the home to be purchased or produced with little skill reduce the benefits from specialization of spouses in the home and market spheres, thereby decreasing the gains from marriage. Thus, both the opportunity

[1]Needless to say, others have argued that one need not marry in order to have children, have fun, or have gender-specialised work done. All these can be purchased in the market place. For example, one can have children outside marriage or adopt; sex can be purchased from the sex market, and one does not need to marry in order to enjoy leisure activities.

[2]In the perspective of the United States, number of males, relative to females, in the African American population declined steadily in the 1920s, compared to the white sex ratios. Given this background, it is widely believed that sex ratio imbalance is a significant factor in black marital decline in that country (Guttentag and Secord, 1983; Staples, 1981). However, Espenshade (1985) has argued that decreases in black marriages have only been evident in the 1960s, and he concludes that sex ratio imbalances could not be the primary cause of this change. Tucker and Mitchell-Kernan (1995) attempted to reconcile the inconsistencies noted by Espenshade (1985) by among other factors, accounting for the economic eligibility dimension in the calculation of the sex ratio.

cost and the altered gains from marriage, emanating from the characteristics of individuals, may encourage non-marriage behaviour and lead to declining marriages.

Attitudes towards marriage may also change between different generations of individuals. In part, this is explained by escalating rates of divorce. In the United States, it was reported in the "State of Our Unions: The Social Health of Marriage in America" that younger people have lost confidence in the idea of finding a lifetime mate, having witnessed marital failure. This is sometimes found to be key in explaining the decline of marriages. Instead, many people tend to opt for alternative family forms, such as cohabitation and out-of-wedlock childbearing. These family forms are widely accepted, as a result, marriage is no longer viewed as the traditional, expected route into adulthood.

The major difference between the explanations of marriage decline related to change in the distribution of characteristics and change in marriage behaviour of individuals is that the former mainly affects the workings of the marriage market. In particular, availability of marriageable partners is affected, influencing the timing of marriage. Women tend to be choosy when looking for potential spouses, and sometimes take longer when searching. The later, on the other hand, mainly influences the intention to marry. In other words, the problem of non-marriage behaviour is seen as not with the marriage market but with marriage itself. Here, discontent with marriage is the driver of marital change. This is associated with forgoing marriage altogether.

These are some of the reasons that motivate the decomposition analysis, which enables us to calculate which of these broad categories is the predominant explanation for the marriage decline in post-apartheid South Africa. A further disaggregated decomposition analysis enables us to look at each individual characteristic's contribution to the marriage decline.

3 Data Description

The sample used here comes from the series of independent nationally representative household surveys used previously, namely, the October Household Surveys (OHS; 1995 to 1999) and the September round of the Labour Force Surveys (LFS; 2000 to 2006). The working sample includes African women aged 20 to 49 years old.

Table 1 shows the mean values (and the standard deviations) of selected variables in the sample. Using the weighted sample, it shows marriage rates have dropped from 50 percent in 1995 to 45 percent in 2006. In addition, we notice that marriage rates in the intermediate years are all higher than that of 2006. According to an independent group t test between mean marriages in year t and year 2006, as shown in Table 4, we see evidence that the differences in the mean marriages are statistically significant, except for years 1999, 2000 and 2001. The results from the mean t test show that studying time period differences in marriage rates makes sense in this context.

The characteristics of married and single women are different, as shown in Tables 2 and 3. Most younger women are single, and older women who are mostly married. For example

in 1995, about 45 percent of women aged between 20 and 24 years old were single, compared to only 8 percent in the same age range who were married. Of the oldest women in the sample (aged between 45 and 49 years old), about 15 percent are married, compared to only about 3 percent in the same age range, who have never been married.

The sample shows evidence of an increase in education levels for African women. We notice that the numbers in lower levels of education, such as no schooling, uncomplete primary and primary are decreasing. In Table 1, we show that for all women aged between 20 and 49 years old, about 11 percent had no schooling in 1995. By 2006, this proportion had been reduced to about 6 percent. Similarly, proportions for women with incomplete primary and primary schooling had declined from 18 and 8 percent respectively in 1995 to 15 and 7 percent in 2006. On the other hand, we show astounding evidence of an increase in education levels with regard to secondary qualifications. In 1995, the proportion was 16 percent and a 10 percentage point increase was registered by 2006. For incomplete secondary education, the proportion was about 38 percent in 1995, which increased to about 43 percent in 2006. Both married and single women have higher rates with regard to incompleted secondary education. However, the rates are higher for single women throughout the years. Single women also have higher education rates with a secondary qualification across the years, compared to the married sample. Overall, married women have lower levels of education than single women. Rates are higher for lower education categories such as those with no schooling, incomplete primary and primary schooling for married women, compared to the single women. However, the rates for higher education categories, diploma and degree, are similar between the single and the married women.

Labour force participation rates are higher for married women than for single women. This is evident across the cross-sections. Our data shows compelling evidence of increased female labour force participation. The proportion of women who are economically active has increased from 1995 to 2006 (here, we use the broad definition of unemployment). The increase is recorded at 20 percentage points (from 61 percent in 1995 to 81 percent in 2006) in Table 1, which is quite astounding. This concurs with recent evidence of increase in female labour force participation by others.

Also interesting are the means from the sex ratio. Free mobility enabled by change in regimes means that local marriage markets for women have also adjusted, thereby affecting their likelihood of marriage. In all the years, the sex ratio is less than one, indicating that there are more African women than there are men. With fewer men than women, the likelihood of marrying may go down, and even more when potential men with good jobs and good education are few. On the other hand, availability of potential spouses improves marriage prospects.

4 Methodology

Previous studies do not fully explain the substantial shifts in marital behaviour that characterize African women in South Africa. Elsewhere, a number of studies have attempted to compare and test various explanations of marital change. Although these studies confirm that both demographic and economic factors are implicated in family formation trends, the results have been varied and inconclusive. Below, we present the empirical strategy for our investigation of declining marriages in South Africa. The discussion is for a single-equation linear probability model, where the marriage equation is estimated independently with all the explanatory variables assumed exogenous. We additionally present the results from a probit model and a simultaneous-equation linear probability model estimation. The latter accounts for the endogeneity of women's labour force participation decisions in their marriage decisions.

4.1 The Linear Probability model

We commence by establishing the modeling framework for the specific procedures to be undertaken in this study. The basic model for our purposes is a linear latent marriage model, given by:

$$m_i^* = \mathbf{x}_i\boldsymbol{\beta}+\mu_i \tag{1}$$

The dependent variable, m_i^* denotes gains from marriage, which indicates the propensity to marry. In the dataset, we observe $m_i = 1$ if $m_i^* > 0$ (the woman is married), and $m_i = 0$, otherwise. $\mathbf{x}$ is a $1 \times K$ vector of individual characteristics. β is a vector of estimable parameters and μ is the error term. In a general binary response modeling framework, we conventionally write:

$$E[m|\mathbf{x}_i] = \Pr(m_i = 1|\mathbf{x}_i) = \Phi(\mathbf{x}_i\boldsymbol{\beta}) \tag{2}$$

where $E[.]$ and $\Pr(.)$ respectively indicate expected value and probability. In the linear case, $\Phi(\mathbf{x}_i\boldsymbol{\beta}) = \mathbf{x}_i\beta$, we have the linear probability model (LPM) which can be consistently estimated by ordinary least squares (OLS). Even though estimating a linear probability model when the dependant variable is binary is viewed as unattractive, mainly due to heretoskedasticity and because LPMs can potentially predict probabilities outside the zero-one bounds, we prefer to estimate a linear probability model, first of all, because of its computational simplicity. But most of all, we prefer to use a linear probability model because we are interested in predicting the conditional mean (or expected value) of marriage, rather than making inferences about individual parameters (Angrist and Pischke, 2009). On that basis, LPM will be adequate, especially in the decomposition analysis.

4.2 Decomposition Analysis

The objective of this section is to outline the estimation strategy for an understanding of the time-period differences in marriage rates. In linear models, possible distributional shifts in characteristics are corrected by using ideas from the fundamental Blinder-Oaxaca decomposition technique. The technique is widely used to identify and quantify the separate contributions of measurable characteristics to racial and gender differences in outcomes. In this study, decomposition analysis enables separation of the effect of the changing coefficients from the changing characteristics on marriage decline, widely known respectively as the coefficient effect (or unexplained part) and the characteristic effect (or explained part).

The "explained" part of the decline is that part that is explained by group differences in the determinants of marriage and the unexplained portion is the residual part that cannot be accounted for by such differences in marriage determinants. So, for example, the former would be what the distribution of marriages would be in year 2006 if women sampled in 2006 faced similar marriage market conditions as in year 1995, or vice-versa. If the aggregate characteristics of women in the sample are found to have a large effect on the decline in marriages, this would suggest that overall the values of the explanatory variables had changed in such a way that would discourage marriage. If, on the other hand, the coefficient effect on the decline in marriages is found to be large, it would suggest that the marriage model relationship has changed in such a way that individuals in 2006 with similar characteristics as in 1995 would be less likely to marry. In addition, a detailed decomposition of the characteristic effect enables us to identify the major factors driving the marriage decline. For example, a detailed decomposition of the characteristic effect[3] would provide insight into how much women's participation in the labour force contributes to the marriage decline. Knowledge of the factors that discourage marriages is informative to policy makers.

Female labour force participation decisions, however, are potentially endogenous in a woman's marriage decisions. Thus, we get consistent estimates when we jointly model these two decisions. It is therefore important that similar adjustments be made to the decomposition analysis to account for the simultaneous-equation modeling[4]. To this end, we make use of the instrumental variable approach in a two-stage least squares estimation framework. Note however, that the instrument, women's job variable performs weakly, hence, discussion of the results focuses on naïve estimates, which ignore the endogeneity prpoblem.

We apply the standard Blinder-Oaxaca decomposition method (independently Blinder (1973) and Oaxaca (1973)) because we are estimating a linear probability model[5]. Thus, having estimated the marriage equation separately on each year's dataset, relative to 2006, we use the estimated coefficients, $\widehat{\beta}$, assuming these are consistent estimates of β_i, to consistently approximate the differences in the means of choosing option 1 (marrying) over option 0 (not

[3]Our focus is on the detailed decomposition of the characteristic effect only due to interpretational problems associated with the coefficient effect.

[4]Yun (2000) provides an extension for the decomposition analysis to the case where the choice equation is estimated jointly with other equations in a maximum likelihood estimation framework.

[5]An extension of the Blinder-Oaxaca decomposition for binary choice models is normally used for logit and probit models (Fairlie, 2005; Yun, 2000; Even and Macpherson, 1990).

marrying) between two groups (time periods t and 2006), in order to find the effects of the differences in each characteristic and coefficient. Yun (2000) calls the part explained by differences in coefficients behavioral response if the choice is made by an individual's own will, or discrimination if the choice is made by others (like in wage gap studies). In this study, since an individual is viewed to decide whether to get married or stay single, we interpret that part of the decline explained by differences in coefficient as a behavioral response.

The marriage model is outlined again here in order to accommodate the dynamic component of the current study. We include in our notation the time factor, t, to allow for the time dimension, which is the grouping variable required for the decomposition analysis. Assume we have T cross-sectional datasets, each of which has observations denoted N. Therefore, we observe the marital status of an n^{th} woman in the t^{th} period (m_{tn}) which takes the value of 1 if the latent variable (m^*_{tn}) is positive (indicating that she has ever married) and 0 otherwise. With the t component, the marriage regression model is estimated separately for the groups $t = (t, 2006)$, for $t = 1995, ..., 2005$ and it is defined as follows:

$$m^*_{tn} = \mathbf{x}_{tn}\boldsymbol{\beta}_t + \mu_{tn} \tag{3}$$

$$\left.\begin{array}{c} m_{tn} = 1 \text{ if } m^*_{tn} > 0 \text{ (experience marriage)} \\ m_{tn} = 0 \text{ Otherwise (remain single)} \end{array}\right\} \tag{4}$$

In the case of the linear probability model, decomposition of differences in mean values between 2006 and time period t, proposed by Blinder (1973) and Oaxaca (1973) is given by[6]:

$$\overline{m}_t - \overline{m}_{06} = \left(\overline{\mathbf{x}}_t\widehat{\beta}_t - \overline{\mathbf{x}}_{06}\widehat{\beta}_{06}\right) = \left[\left(\overline{\mathbf{x}}_t - \overline{\mathbf{x}}_{06}\right)\widehat{\beta}_t\right] + \left[\overline{\mathbf{x}}_{06}\left(\widehat{\beta}_t - \widehat{\beta}_{06}\right)\right] \tag{5}$$

All the terms are as previously defined. The term in the first square bracket captures the characteristic effect component of the marriage decline. It is also known as the explained portion of the decline in marriages. It represents the change in marriages that arise due to changing characteristics of the population from year 2006 to year t values, while holding constant the determinants of marriage at year t (i.e. unchanged at $\widehat{\beta}_t$). Put differently, it represents the change in marriages that occur if the coefficients were held constant at year t values and only the sample's characteristics were to change from year t to year 2006 values. These are also known as endowment effects in gender or racial wage discrimination studies, a typical application of the Blinder-Oaxaca decomposition.

The term in the second square bracket captures the coefficient effect portion of the characteristics that explain the marriage decline. It is also referred to as the unexplained portion of the decline in marriage. It describes the change in marriages arising from changing coefficients of the characteristics. This occurs if for the sample in year t, the determinants

[6] $\overline{m}_{06} - \overline{m}_t = \left[\overline{\Phi\left(x_{06}\widehat{\beta}_{06}\right)} - \overline{\Phi\left(x_t\widehat{\beta}_{06}\right)}\right] + \left[\overline{\Phi\left(x_t\widehat{\beta}_{06}\right)} - \overline{\Phi\left(x_t\widehat{\beta}_t\right)}\right]$ or alternatively, $\overline{m}_{06} - \overline{m}_t = \left[\overline{\Phi\left(x_{06}\widehat{\beta}_t\right)} - \overline{\Phi\left(x_t\widehat{\beta}_t\right)}\right] + \left[\overline{\Phi\left(x_{06}\widehat{\beta}_{06}\right)} - \overline{\Phi\left(x_{06}\widehat{\beta}_t\right)}\right]$ for the nonlinear analogue of the decomposition equations.

of marriage are held constant at year 2006 values. In this case, $\widehat{\beta}_t$ changes to $\widehat{\beta}_{06}$. The unexplained portion is the part of the decline that results from a given individual being less likely to be married and is conventionally known as the price effect or "discrimination" in wage discrimination studies.

An alternative method of decomposition can be derived by swapping the reference and comparison time periods to get an equally valid decomposition formulation as follows:

$$\overline{m}_t - \overline{m}_{06} = \left[\left(\overline{\mathbf{x}}_t - \overline{\mathbf{x}}_{06} \right) \widehat{\beta}_{06} \right] + \left[\overline{\mathbf{x}}_t \left(\widehat{\beta}_t - \widehat{\beta}_{06} \right) \right] \tag{6}$$

In this case, year 2006 is used as a base year, and the corresponding coefficients are used as weights in the first term while year t distributions of independent variables are used as weights for the second term. Thus, the difference between the alternative decompositions is that, while the first decomposition in equation (5) uses $\overline{\mathbf{x}}_{06}\widehat{\beta}_t$ to divide the differences in mean marriages into a part that depicts the effect of different coefficients between the two time periods and a part that depicts differences in the effects of different individual characteristics between the two time periods, the alternative decomposition in equation (6) uses $\overline{\mathbf{x}}_t\widehat{\beta}_{06}$. In other words, equation (5) uses year t coefficients in the counterfactual, while equation (6) uses year 2006 coefficients in the counterfactual. The former implies that if there was no gap in average marriage rates between year t and year 2006, the marriage profile of year t would prevail. On the other hand, use of year 2006 coefficients in the alternative decomposition model implies that if there was no gap in average marriage rates, the marriage structure of year 2006 would prevail. These alternative methods of calculating the decomposition often provide different estimates, which is the familiar index problem with decomposition analyses (Fairlie, 2005; Jones, 1983)[7].

4.3 Detailed Decomposition Analysis

Equations (5) and (6) only give the aggregate measures of the effects of differences in characteristic and their coefficients between two time periods[8]. A detailed decomposition helps to account for the contribution of each individual predictor in terms of the characteristic and coefficient effect to the marriage decline. From the decomposition model in equation (5), the contribution that a k^{th} variable $(k = 1, ..K)$ makes to the explained portion of the total marriage rate gap is given by

$$\left(\overline{\mathbf{x}}_t - \overline{\mathbf{x}}_{06} \right) \widehat{\beta}_t = \left(\overline{\mathbf{x}}_t - \overline{\mathbf{x}}_{06}^k \right) \widehat{\beta}_t + \left(\overline{\mathbf{x}}_{06}^k - \overline{\mathbf{x}}_{06} \right) \widehat{\beta}_t \tag{7}$$

A detailed decomposition analysis allocates shares to the marriage decline according to the relative size of the explanatory variable's impact on marriage. The analogue detailed decom-

[7]Another alternative is to weight the explained portion of the decomposition equation using coefficient estimates from a pooled sample of the two groups as proposed independently by Neumark (1988) and Oaxaca and Ransom (1994).

[8]Refer Yun (2000) for a two-step modification of the decomposition for non-linear models with endogenous variables. Yun also offers a procedure for the detailed decomposition of such models.

position of the characteristic effect when year 2006 coefficients are used in the counterfactuals is given by:

$$\left(\overline{\mathbf{x}}_t - \overline{\mathbf{x}}_{06}\right)\widehat{\beta}_{06} = \left(\overline{\mathbf{x}}_t - \overline{\mathbf{x}}_{06}^k\right)\widehat{\beta}_{06} + \left(\overline{\mathbf{x}}_{06}^k - \overline{\mathbf{x}}_{06}\right)\widehat{\beta}_{06} \tag{8}$$

The proportion for contribution of the kth variable to the characteristic effect (denoted CharEffect_k) is given in equations (9). From this equation, we can see that the contribution of each variable, k, to the explained portion of the marriage decline, is equal to the change in mean marriages from replacing the year t distribution with the year 2006 distribution of that variable while holding the distribution of the other variables, $-k$, constant [9].

$$\text{CharEffect}_k = \frac{\left(\overline{\mathbf{x}}_t^k - \overline{\mathbf{x}}_{06}^k\right)\widehat{\beta}_t^k}{\left(\overline{\mathbf{x}}_t - \overline{\mathbf{x}}_{06}\right)\widehat{\beta}_t} * 100 \tag{9}$$

Similarly, a detailed decomposition for the coefficient effect for when year t coefficients are used in the counterfactuals is given by equation (10) and its analogue for year 2006 coefficients is given by equation (11).

$$\overline{\mathbf{x}}_{06}\left(\widehat{\beta}_t - \widehat{\beta}_{06}\right) = \overline{\mathbf{x}}_{06}\left(\widehat{\beta}_t - \widehat{\beta}_{06}^k\right) + \overline{\mathbf{x}}_{06}\left(\widehat{\beta}_{06}^k - \widehat{\beta}_{06}\right) \tag{10}$$

$$\overline{\mathbf{x}}_t\left(\widehat{\beta}_t - \widehat{\beta}_{06}\right) = \overline{\mathbf{x}}_t\left(\widehat{\beta}_t - \widehat{\beta}_{06}^k\right) + \overline{\mathbf{x}}_t\left(\widehat{\beta}_{06}^k - \widehat{\beta}_{06}\right) \tag{11}$$

However, Oaxaca and Ransom (1999) show that the detailed decomposition of the coefficient effect is not invariant to the choice of the reference category when dummy variables are used. Yun (2005) proposes a solution to this problem by using normalised regressions to identify the estimates of the each dummy variable. Using Yun's (2005) remedy[10], marriage equation (3) can be transformed into what Yun calls a normalised equation as follows:

$$m^* = \sum_{p=1}^{P}\overline{\beta}_p + \sum_{q=1}^{Q} x_q\beta_q + \sum_{p=1}^{P}\sum_{r_p=1}^{R_p} D_{pr_p}\left(\beta_{pr_p} - \overline{\beta}\right) + \mu \tag{12}$$

where Q is the number of continous variables (x), and P are the sets of dummy variables (D). The P^{th} set of the dummy variables has r_p categories. All the other variables are as previously defined and n^{th} woman and t^{th} group subscripts are surpressed. The idea is to use equation (12) to calculate the contribution to the marriage decline of each dummy variable in regression analysis by averaging the measured contributions (coefficients) with the different specifications of the reference category, including the constant. Refer Yun (2005) for a detailed illustration and derivation of the normalised coefficients.

It is necessary that the total sum of the contribution from individual variables to the characteristic (coefficient) effect of the marriage decline be equal to the total contribution of

[9]Implementation of the non-linear decomposition technique uses Jann's (2008) stata routine *fairlie* from the stata website. Standard errors are also provided. For a linear decomposition, an analogous command, *oaxaca* is used.

[10]Refer Nielsen (2000) and Gardeazabal and Ugidos (2005) for other solutions to this identification problem.

the characteristic (coefficient) effect from all the variables.

4.4 Determinants of Marriage Decline between 1998 and 2006

In this section, we preliminarily focus on the 1998 cross-section in a discussion of marriage decline. We first consider the case where labour force participation is assumed to be exogenous, in the single-equation linear probability model as well as in the probit model estimations. The estimates for the linear probability model are reported in Tables 5 and 6. Year 2006 coefficients and year t coefficients are respectively used in the counterfactual. Tables 9 and 10 report the same for the non-linear counterpart. Further, we present the results where the endogeneity of labour force participation is accounted for in the simultaneous-equation linear probability modeling framework. Tables 11 and 12 in appendix 5 report the results for the respective year 2006 and t coefficients. These results are relegated to the appendix because they are problematic. The endogeneity problem arising from endogenous labour force participation variable in our marriage model needs to be corrected by the instrumentation approach. However, weak instrument problems are affecting our results but we report these results anyway.

We report both the aggregated and the individual contributions of the explanatory variables to the marriage decline. We discuss the results of the aggregate decomposition first, followed by a discussion of the results of the detailed decomposition of the characteristics effect. Again, our discussion here focuses on the results from the single-equation linear probability model. The results from probit model estimation are however, very similar to the those for the linear probability model.

4.4.1 Results of the Aggregated Decomposition

From the predicted marriages, it is clear that the marriage rate for 2006 is lower (at 45 percent), than that for 1998 (at 50 percent)[11]. Of the 5 percentage point marriage decline in this period, 0.0016 (about 3 percent) is attributable to the characteristic effect, while 0.0507 (97 percent) is attributable of the coefficient effect. This applies when the 2006 coefficients are used in the counterfactuals. The implications of the decomposition results do not vary much when the 1998 sample is used for the coefficients. In that case, we find that 0.0062 (12 percent) of the marriage decline is explained, while 0.0461 (88 percent) is unexplained.

Using year 2006 (t) coefficients in the counterfactuals, the figures from the aggregate decomposition suggest that about 3 (12) percent of the marriage decline that occurred between 1998 and 2006 can be attributable to change in the distribution of the characteristics that affect a woman's marriage decision. On the other hand, 97 (88) percent of the marriage decline in that period can be attributed to changes in the relationship between marriage and its determinants. The results mean that if 1998 and 2006 characteristics were to be equalized, 3 (12) percent of the marriage decline would vanish. On the other hand, if marriage

[11]Note that all results are weighted to represent a population, rather than a sample.

behaviour for 1998 and 2006 individuals were the same, at least 88 percent of the marriage decline would disappear.

These results indicate that the marriage decline between 1998 and 2006 is largely due to differences in coefficients, that is, is due to behavioral differences. This means that the marriage decline cannot be simply explained by change in the average characteristics of women. Clearly, there has also been a change in the way the probability of marriage is determined. This finding is unsurprising, considering that there are some temporal changes in the relationship between marriage and some of its determinants.

4.4.2 Results of the Detailed Decomposition

In the detailed decomposition of the explained portion of the marriage decline, we are interested in whether (and how much) time period differences in the most likely "suspects" (age groups, education, labour market status, sex ratio and location) contribute to marriage decline over a specific year, t and year 2006. In particular, we are interested in the contribution of these variables to the explained portion of the marriage decline that we found in the aggregate decomposition. The findings are informative regarding the causes and policy implications of declining marriages. We look at each one of the characteristics that we controlled for, in turn.

Labour Force Participation Ever since the post-apartheid regime enforced constitutional changes[12] to South African labour legislation to reverse both legalised and informal racial and gender discrimination in the workplace, African women's labour force participation rates have been trending positively. It was theoretically predicted that labour force participation rate for married women would be lower than for unmarried women, due to the conflicting time demands between market work and home work that women face. This suggests that we are likely to observe an increase in female labour force participation trending with a decline in women's marriages.

Using the 2006 coefficients in the counterfactuals when a linear probability model is estimated, the detailed decomposition estimates show that labour force participation contributed positively to the marriage decline. Out of 0.0016 which is attributable to the total characteristic effect, 0.0014 is attributable to an increase in female labour force participation. This finding is robust to choice of the coefficients in the counterfactuals. Increase in labour force participation continues to widen the marriage decline. For example, when the 1998 sample is used for coefficients, the estimates shows that 0.0038 out of 0.0062 of the total characteristic effect is explained by labour force participation.

Education Evidence shows a general increase in the proportion of educated women in post-apartheid South Africa. The estimates from the detailed decomposition analysis shows

[12]The Employment Equity Act (1998) aimed to abolish discrimination in the work place and provides a platform for the implementation of Affirmative Action by firms and for the monitoring and reduction of wage differentials.

that education contributed positively to the marriage decline in the period 1998-2006. This finding is in line with the theoretical prediction as well as the prior empirical evidence that marriage decline is linked to women's economic advances. When the 2006 sample is used for coefficients and the linear probability model is estimated, education contributes a phenomenol 0.0130 to the total characteristic effect of the marriage decline. The analogue of education effects when year 1998 coefficients are used in the counterfactuals is 0.0189. In all model specifications, education is found to be the largest contributor of all variables to the marriage decline. Estimates from both the 1998 and 2006 coefficients show that education was very important in affecting the marriage decline. The statistical levels of the estimates are both very strong at 1 percent level of significance.

Age Age also shows high levels of significance in predicting marriage decline. Using the 2006 sample for coefficients, age is found to narrow the marriage decline between 1998 and 2006 by 0.0074. Likewise, change in the distribution of age between 1998 and 2006 narrows the marriage decline by 0.0082 when the 1998 sample is used for coefficients. What this means is that the distribution of women's age between 1998 and 2006 has changed and there are more older women in 2006 than there were in 1998. Such a change in age distribution will result in more marriages among older women in 2006. This has an effect of narrowing the marriage decline.

Sex Ratio Ideally, we expect availability of "good quality" men in 2006 to contribute positively to narrowing the marriage decline. However, calculations for sex ratio show that there are generally more women than (employed) men in South Africa in the marriageable age category. Like age, changes in the distribution of men and women between 1998 and 2006 contribute to narrowing the marriage decline in that period, both when year 2006 and year t coefficients are used in the counterfactuals. This implies that fewer men than women in 2006 than there were in 1998 contribute to narrowing the marriage decline.

Province The estimates for province show that the location where a woman lives contributes negatively to the marriage decline between 1998 and 2006. When 2006 (1998) coefficients are used in the counterfactuals, -0.0032 (-0.0004) of the total characteristic effect of the marriage decline is attributed to the province dummies. This contribution is minimal and signify negligible changes in the distribution of the female population across the provinces between 1998 and 2006. If, on the other hand, female migration to places of perceived job opportunity rises, locational distributional change that might have happened would be expected to contribute to fewer marriages in 2006 than in 1998. This is because women who move are likely to move to areas where they can get employment, and such women who are willing to work in paid jobs are the ones who are unlikely to marry.

4.5 A General Outlook on the Determinants of Time Period Differences in Women's Marriages

In this section, we analyse all the other years to see how the variables and their coefficients generally contributed to time period differences in marriage rates. The estimates for the linear probability model are reported in Tables 5 and 6 for the year 2006 and year t coefficients respectively. As for the marriage decline between 1998 and 2006, we find that the coefficient effect is generally dominant in explaining the marriage decline between each of the year t and year 2006. We find that behavioral differences (coefficient effect), rather than distributional differences, predominantly contribute to the total marriage decline.

In a detailed decomposition of the characteristic effect, we find that all the variables included in our marriage model contribute to the marriage decline in some way, in at least a year. Regardless of the coefficients used in the counterfactuals, the general picture coming out of the detailed decomposition results is that a big part of the characteristic effect is taken up by the education factor. Labour force participation also contributes substantially to the explained portion of the marriage decline. Age, sex ratio and province on the other hand are generally found to have a contractionary effect on the marriage decline.

From the results of the decomposition analysis, we find that the bulk of the marriage decline is not explained. Marriage decline in this period is driven by temporal changes in the behavioral relationships. A detailed decomposition of the coefficient effect is useful in establishing whether women's intentions to marry are influenced by some of the economic changes that have taken place in post-apartheid South Africa. To this end, we further decomposed the coefficient effect from the single-equation linear probability model and the results are presented in Tables 7 and 8, respectively using year 2006 and year t coefficients in the counterfactuals.

Contrary to theoretical predictions, we find that increases in women's labour force participation and educational attainment contributed negatively to the coefficient effect of the marriage decline. What this means is that the gains from marriage did not diminish with the gains from a rise in women's economic power. Similarly, high levels of male joblessness for Africans which have characterised post-apartheid South Africa do not seem to have diminished the gains in marriage enough to drive women to sort the "ineligible" men out of the marriage market.

A straightforward conclusion can be made from these outcomes. The economic changes that have taken place in post-apartheid South Africa are not extensive enough to diminish gains from marriage to levels where women do not want to marry. For instance, in line with Casale's (2003) finding, women might be having opportunities in post-aparthied's paid job markets. However, the pay is still so low that the popular women's economic independence hypothesis fails in the context of South Africa.

Several other explanations can be made for this supposed "no result" finding. For the case where labour force participation decisions are assumed to be exogenous in a woman's marriage decision, it is possible that the results are leading us to make wrong conclusions

because we are estimating a wrong model. Female labour force participation decisions are evidently endogenous in the marriage decision. We continue to get no improvements in achieving significant explanations for declining marriages where an attempt has been made to correct the potential endogeneity problem. For the latter case, this is probably due to the weak instrument problem, which is the biggest limitation of this study.

However, from expected theoretical predictions, it is likely that the gains from the institution of marriage have changed to levels that drive drops in marriage rates between time periods. The literature offers alternative economic explanations for decreasing marriage rates of young (black) women. Women's economic independence and the man shortage hypotheses are especially highlighted. The former relates declining marriage to the diminishing degree of gender specialization in a marriage, resulting in shrinking gains from marriage that arise from changes in production specialization and renders marriage unattractive. Clearly, evidence indicates that education and labour force participation for African women have increased in post-apartheid South Africa. In addition, there is evidence also of an increase in male joblessness for African South Africans. Perhaps, what is driving the marriage decline in South Africa is not the changes that have taken place in the labour market (or in any of the variables that might affect the gains from marriage), per se, but that younger women are behaving differently from their older counterparts. What is lacking however, is pinning down what is causing such changes in marital behaviour.

A straightforward conclusion can be made from these outcomes. The economic changes that have taken place in post-apartheid South Africa are not extensive enough to diminish gains from marriage to levels where women do not want to marry. For instance, in line with Casale's (2003) finding, women might be having opportunities in post-aparthied's paid job markets. However, the pay is still so low that the popular women's economic independence hypothesis fails in the context of South Africa.

Policy intervention to help the African South African family in crisis may not be obvious in this case because the large portion of the marriage decline remains unexplained. However, for the most part, demographic issues seem to be important here. In particular, labour migration to places of employment might have reset the distribution in the provincial composition, thereby influencing numbers and quality in the local marriage market. In addition, it appears from the decomposition analysis that the determination of age in the marriage model highly influenced the marriage decline. The population appears to be younger in 2006, up to the levels of driving marriage rates to low levels, relative to the earlier years.

Clearly, the question that we set out to answer has not been adequately answered. We need adequate instruments as well as adequate information on the legal, cultural and demographic changes which might have influenced marriage decline.

5 Conclusion

In this study, we ask why the distribution of marriages has changed over time among young African women. In light of the time-period differences in marriage rates between 1995 and 2006, we go a step further to quantify the individual contribution of specific factors to the marriage decline. To this end, we use the Blinder-Oaxaca type decomposition analysis. Declining marriage is decomposed into a part explained by differences in the individual characteristics and a part explained by differences in coefficients.

Datasets used for the analyses were the October Household Surveys from 1995 to 1999 and the September wave of the Labour Force Surveys from 2000 to 2006. The data generally produces reasonable results.

The results from the decomposition analysis have shown that the predominant part of the marriage decline between year t and year 2006 is unexplained rather than explained. In other words, the effects of differences in coefficients outweigh those of differences in individual characteristics. This conclusion is robust, regardless of whether year t or year 2006 coefficients are used in the counterfactuals. As expected, the estimates for education and labour force participation education were found to predominantly contribute to the explained portion of the marriage decline. On the other hand, age, sex ratio and province had a contractionary effect on the characteristic effect of the marriage decline.

This detailed decomposition analysis of the characteristic effect shows that declining marriages cannot be attributable exclusively to changing levels in only one characteristic. In particular the findings suggest that marriage decline over the 12 year period under review is not just attributable to an increase in female labour force participation among African women.

The findings in this study have shown that attempts to understand changing outcomes in marital behaviour are not straightforward. From the estimates of the detailed decomposition of the coefficient effect, we conclude that increases in employment opportunities for women and joblessness for men do not adequately explain why (financial) gains from marriage have diminished over the study period. Clearly, the realities in a marriage market are complex and an explanation for why marriages have declined requires an extensive account of what is happening in other possibly influential areas, in relation to marriage. In other words, ommited variables problem makes interpretation of the coefficient effect difficult.

Table 1: Means and Standard Deviations of Sample Characteristics for Women Aged 20 to 49 Years Old

Variables	**1995**	**1996**	**1997**	**1998**	**1999**	**2000**	**2001**	**2002**	**2003**	**2004**	**2005**	**2006**
Married	0.4981	0.5142	0.4943	0.5008	0.4789	0.4839	0.4669	0.4826	0.4628	0.4823	0.4525	0.4486
	(0.50)	(0.50)	(0.50)	(0.50)	(0.50)	(0.50)	(0.50)	(0.50)	(0.50)	(0.50)	(0.50)	(0.50)
Participation	0.6107	0.579	0.6167	0.6451	0.7059	0.7656	0.7968	0.8013	0.8105	0.7944	0.8063	0.81
	(0.49)	(0.49)	(0.49)	(0.48)	(0.46)	(0.42)	(0.40)	(0.40)	(0.39)	(0.40)	(0.40)	(0.39)
No Schooling	0.1059	0.1135	0.1115	0.1064	0.0887	0.081	0.0812	0.077	0.0675	0.0659	0.0605	0.0556
	(0.31)	(0.32)	(0.31)	(0.31)	(0.28)	(0.27)	(0.27)	(0.27)	(0.25)	(0.25)	(0.24)	(0.23)
Incomplete Primary	0.184	0.1949	0.178	0.1844	0.1901	0.1811	0.1769	0.1681	0.1545	0.1456	0.136	0.125
	(0.39)	(0.40)	(0.38)	(0.39)	(0.39)	(0.39)	(0.38)	(0.37)	(0.36)	(0.35)	(0.34)	(0.33)
Primary	0.0832	0.0826	0.0876	0.0856	0.0807	0.0854	0.0853	0.0791	0.0774	0.0691	0.0683	0.0658
	(0.28)	(0.28)	(0.28)	(0.28)	(0.27)	(0.28)	(0.28)	(0.27)	(0.27)	(0.25)	(0.25)	(0.25)
Incomplete Secondary	0.3812	0.3773	0.4023	0.3972	0.3759	0.3897	0.3851	0.3916	0.3908	0.4231	0.4175	0.4255
	(0.49)	(0.48)	(0.49)	(0.49)	(0.48)	(0.49)	(0.49)	(0.49)	(0.49)	(0.49)	(0.49)	(0.49)
Secondary	0.1627	0.1704	0.1697	0.1668	0.1882	0.1869	0.1898	0.2018	0.2285	0.2372	0.2534	0.2647
	(0.37)	(0.38)	(0.38)	(0.37)	(0.39)	(0.39)	(0.39)	(0.40)	(0.42)	(0.43)	(0.43)	(0.44)
Diploma	0.0587	0.0387	0.0398	0.0477	0.0491	0.0531	0.056	0.0581	0.0588	0.0381	0.0431	0.0435
	(0.24)	(0.19)	(0.20)	(0.21)	(0.22)	(0.22)	(0.23)	(0.23)	(0.24)	(0.19)	(0.20)	(0.20)
Degree	0.012	0.0106	0.008	0.0103	0.0163	0.0177	0.0198	0.0196	0.0183	0.0167	0.0187	0.016
	(0.11)	(0.10)	(0.09)	(0.10)	(0.13)	(0.13)	(0.14)	(0.14)	(0.13)	(0.14)	(0.13)	(0.13)
20-24 Years	0.2584	0.252	0.2428	0.2586	0.2572	0.2469	0.2322	0.2251	0.2343	0.2478	0.2419	0.2387
	(0.44)	(0.43)	(0.43)	(0.44)	(0.44)	(0.43)	(0.42)	(0.42)	(0.42)	(0.43)	(0.43)	(0.43)
45-49 Years	0.0848	0.0876	0.0913	0.0857	0.0855	0.0971	0.099	0.0993	0.1078	0.1028	0.1042	0.1032
	(0.28)	(0.28)	(0.29)	(0.28)	(0.28)	(0.30)	(0.30)	(0.30)	(0.31)	(0.30)	(0.31)	(0.30)
Sex Ratio	0.6	.6399	.7203	.7805	.8355	.9007	.9416	.9427	.9507	.9552	.9549	.9611
	(0.31)	(0.24)	(0.26)	(0.26)	(0.25)	(0.26)	(0.26)	(0.26)	(0.27)	(0.28)	(0.28)	(0.29)
Observations	20202	12734	23303	13619	18015	18371	18360	17080	16517	18474	18365	18071

Table 2: Means and Standard Deviations of Sample Characteristics for Married Women

Variables	**1995**	**1996**	**1997**	**1998**	**1999**	**2000**	**2001**	**2002**	**2003**	**2004**	**2005**	**2006**
Participation	0.6494	0.6032	0.6397	0.6758	0.7295	0.7819	0.7925	0.8083	0.8012	0.7966	0.8201	0.8247
	(0.48)	(0.49)	(0.48)	(0.47)	(0.44)	(0.41)	(0.41)	(0.39)	(0.40)	(0.40)	(0.38)	(0.38)
No Schooling	0.1475	0.1618	0.1581	0.1506	0.1242	0.1178	0.1233	0.1139	0.0981	0.0978	0.0833	0.0795
	(0.35)	(0.37)	(0.36)	(0.36)	(0.33)	(0.32)	(0.33)	(0.32)	(0.30)	(0.30)	(0.28)	(0.27)
Incomplete Primary	0.2345	0.2319	0.2188	0.2376	0.2427	0.2354	0.2313	0.2289	0.2085	0.1917	0.18	0.1707
	(0.42)	(0.42)	(0.41)	(0.43)	(0.43)	(0.42)	(0.42)	(0.42)	(0.41)	(0.39)	(0.38)	(0.38)
Primary	0.1017	0.1016	0.1029	0.1058	0.0997	0.1039	0.1055	0.0967	0.0968	0.0869	0.0911	0.0817
	(0.30)	(0.30)	(0.30)	(0.31)	(0.30)	(0.31)	(0.31)	(0.30)	(0.30)	(0.28)	(0.29)	(0.27)
Incomplete Secondary	0.3295	0.3332	0.3638	0.342	0.3265	0.3468	0.3291	0.341	0.354	0.378	0.3754	0.3897
	(0.47)	(0.47)	(0.48)	(0.47)	(0.47)	(0.48)	(0.47)	(0.47)	(0.48)	(0.48)	(0.48)	(0.49)
Secondary	0.1072	0.1103	0.1025	0.0992	0.1206	0.1204	0.1254	0.1345	0.1602	0.1782	0.1942	0.1995
	(0.31)	(0.31)	(0.30)	(0.30)	(0.33)	(0.33)	(0.33)	(0.34)	(0.37)	(0.38)	(0.40)	(0.40)
Diploma	0.0583	0.0391	0.0408	0.0513	0.0509	0.0538	0.0542	0.0566	0.056	0.041	0.0465	0.0483
	(0.23)	(0.19)	(0.20)	(0.22)	(0.22)	(0.23)	(0.23)	(0.23)	(0.23)	(0.20)	(0.21)	(0.21)
Degree	0.0117	0.0133	0.0098	0.0121	0.0186	0.0164	0.0239	0.0227	0.0217	00202	0.0264	0.0254
	(0.11)	(0.11)	(0.10)	(0.11)	(0.14)	(0.13)	(0.15)	(0.15)	(0.15)	(0.14)	(0.16)	(0.16)
20-24 Years	0.0787	0.0809	0.0721	0.0859	0.0895	0.092	0.0786	0.0718	0.0785	0.0908	0.0896	0.0917
	(0.27)	(0.27)	(0.26)	(0.28)	(0.29)	(0.29)	(0.27)	(0.26)	(0.27)	(0.29)	(0.29)	(0.29)
45-49 Years	0.1434	0.1462	0.1528	0.1436	0.1416	0.1566	0.1711	0.1672	0.1797	0.1699	0.1719	0.1737
	(0.35)	(0.35)	(0.36)	(0.35)	(0.35)	(0.36)	(0.38)	(0.37)	(0.38)	(0.38)	(0.38)	(0.38)
Sex Ratio	0.6356	0.6527	.0724	0.7756	0.8144	0.8682	0.8971	0.89	0.9025	0.9104	0.9131	0.9155
	(0.32)	(0.23)	(0.27)	(0.26)	(0.25)	(0.26)	(0.26)	(0.27)	(0.27)	(0.28)	(0.29)	(0.30)
Observations	10216	6642	11678	7066	8991	8747	8783	8232	7660	8495	7931	7681

Table 3: Means and Standard Deviations of Sample Characteristics for Single Women

Variables	**1995**	**1996**	**1997**	**1998**	**1999**	**2000**	**2001**	**2002**	**2003**	**2004**	**2005**	**2006**
Participation	0.5722	0.5535	0.5943	0.6142	0.6841	0.7502	0.8005	0.7949	0.8185	0.7924	0.7949	0.7979
	(0.49)	(0.50)	(0.49)	(0.49)	(0.46)	(0.43)	(0.40)	(0.40)	(0.39)	(0.41)	(0.40)	(0.40)
No Schooling	0.0646	0.0623	0.0661	0.0621	0.0561	0.0466	0.0443	0.0426	0.0413	0.0363	0.0416	0.0362
	(0.25)	(0.24)	(0.25)	(0.24)	(0.23)	(0.21)	(0.21)	(0.20)	(0.20)	(0.19)	(0.20)	(0.19)
Incomplete Primary	0.1339	0.1558	0.1381	0.1311	0.1417	0.1301	0.1293	0.1114	0.108	0.1027	0.0995	0.0878
	(0.34)	(0.36)	(0.35)	(0.34)	(0.35)	(0.34)	(0.34)	(0.31)	(0.31)	(0.30)	(0.30)	(0.28)
Primary	0.0648	0.0624	0.0728	0.0653	0.0632	0.0679	0.0676	0.0626	0.0607	0.0525	0.0495	0.0529
	(0.25)	(0.24)	(0.26)	(0.25)	(0.24)	(0.25)	(0.25)	(0.24)	(0.24)	(0.22)	(0.22)	(0.22)
Incomplete Secondary	0.4324	0.4241	0.4399	0.4526	0.4213	0.43	0.4341	0.4387	0.4225	0.4652	0.4522	0.4546
	(0.50)	(0.49)	(0.50)	(0.50)	(0.49)	(0.50)	(0.50)	(0.50)	(0.49)	(0.50)	(0.50)	(0.50)
Secondary	0.2177	0.2341	0.2354	0.2346	0.2504	0.2492	0.2462	0.2646	0.2873	0.2921	0.3022	0.3178
	(0.41)	(0.42)	(0.42)	(0.42)	(0.43)	(0.43)	(0.43)	(0.44)	(0.45)	(0.45)	(0.46)	(0.47)
Diploma	0.0591	0.0384	0.0388	0.044	0.0474	0.0525	0.0576	0.0594	0.0611	0.0354	0.0402	0.0396
	(0.24)	(0.19)	(0.19)	(0.21)	(0.22)	(0.22)	(0.23)	(0.23)	(0.24)	(0.18)	(0.20)	(0.20)
Degree	0.0123	0.0076	0.0063	0.0086	0.0141	0.019	0.0162	0.0167	0.0154	0.0134	0122	0.0083
	(0.11)	(0.09)	(0.08)	(0.09)	(0.12)	(0.14)	(0.13)	(0.13)	(0.12)	(0.11)	0.11	(0.09)
20-24 Years	0.4368	0.4332	0.4096	0.4319	0.4114	0.3921	0.3667	0.368	0.3685	0.394	0.3678	0.3584
	(0.50)	(0.50)	(0.49)	(0.50)	(0.49)	(0.49)	(0.48)	(0.48)	(0.48)	(0.49)	(0.48)	(0.48)
45-49 Years	0.0266	0.0255	0.0312	0.0276	0.0339	0.0414	0.0359	0.0359	0.0458	0.0402	0.0482	0.0458
	(0.16)	(0.16)	(0.16)	(0.17)	(0.16)	(0.18)	(0.20)	(0.19)	(0.21)	(0.20)	(0.21)	(0.21)
Sex Ratio	0.5643	0.6263	0.7167	0.7853	0.855	0.9311	0.9806	.0.9918	0.9921	0.9969	0.9894	0.9981
	(0.30)	(0.24)	(0.25)	(0.25)	(0.25)	(0.25)	(0.25)	(0.26)	(0.26)	(0.27)	(0.27)	(0.28)
Observations	9986	6092	11625	6553	9024	9624	9577	8848	8857	9979	10434	10390

Table 4: Mean-Comparisons of Marriage Rates Between Year t and Year 2006

	1995	**1996**	**1997**	**1998**	**1999**	**2000**	**2001**	**2002**	**2003**	**2004**	**2005**
t-statistic	11.4191	-31.6071	27.0926	-26.0144	-0.3081	1.6433	1.5833	-5.5184	-8.7177	2.2047	1.6106
$M_t - M_{06}$	0.01	-0.03	0.02	-0.02	-0.0003	0.001	0.001	-0.005	-0.007	0.002	0.001
Standard Error	(0.0009)	(0.0008)	(0.0009)	(0.0008)	(0.0009)	(0.0009)	(0.0009)	(0.0008)	(0.0008)	(0.0009)	(0.0009)
$\Pr(\lvert T\rvert > \lvert t\rvert)$	0.0000	0.0000	0.0000	0.0000	0.7580	0.1003	0.1134	0.0000	0.0000	0.0275	0.1073

Table 5: Decomposition Analysis: year 2006 sample used for coefficients; LFP assumed exogenous in an LPM

	1995	**1996**	**1997**	**1998**	**1999**	**2000**	**2001**	**2002**	**2003**	**2004**	**2005**
Aggregate Decomposition											
Raw Gap	0.0526***	0.0656***	0.0457***	0.0523***	0.0303***	0.0354***	0.0182***	0.0338***	0.0141**	0.0337***	0.0038
	(0.0066)	(0.0072)	(0.0063)	(0.0071)	(0.0067)	(0.0071)	(0.0067)	(0.0068)	(0.0068)	(0.0073)	(0.0073)
Total Explained	0.0028	0.0057	0.0074	0.0016	0.0018	0.0055	0.0133***	0.0166***	0.0152***	0.0005	0.0000
	(0.0090)	(0.0083)	(0.0063)	(0.0054)	(0.0042)	(0.0034)	(0.0032)	(0.0031)	(0.0030)	(0.0031)	(0.0031)
% of Raw Gap	5.32%	8.69%	16.19%	3.06%	5.94%	15.54%	73.08%	49.11%	107.8%	1.48%	0%
Total Unexplained	0.0498***	0.0600***	0.0383***	0.0507***	0.0285***	0.0300***	0.0049	0.0172***	-0.0012	0.0332***	0.0038
	(0.0100)	(0.0097)	(0.0078)	(0.0075)	(0.0066)	(0.0066)	(0.0061)	(0.0062)	(0.0062)	(0.0066)	(0.0066)
% of Raw Gap	94.68%	91.46%	83.81%	96.94%	94.06%	84.75%	26.92%	50.89%	-8.51%	98.52%	100%
Detailed Decomposition											
Participation	0.0017	0.0019	0.0016	0.0014	0.0009	0.0004	0.0001	0.0001	-0.0000	0.0001	0.0000
	(0.0026)	(0.0030)	(0.0025)	(0.0021)	(0.0013)	(0.0006)	(0.0002)	(0.0001)	(0.0000)	(0.0002)	(0.0001)
Education	0.0141***	0.0145***	0.0123***	0.0130***	0.0126***	0.0116***	0.0116***	0.0096***	0.0063***	0.0039***	0.0022***
	(0.0022)	(0.0023)	(0.0020)	(0.0019)	(0.0018)	(0.0016)	(0.0015)	(0.0013)	(0.0011)	(0.0009)	(0.0007)
Age	-0.0071***	-0.0040	-0.0005	-0.0074***	-0.0067***	-0.0032	0.0052**	0.0091***	0.0107***	-0.0015	-0.0007
	(0.0024)	(0.0026)	(0.0023)	(0.0026)	(0.0025)	(0.0026)	(0.0024)	(0.0025)	(0.0026)	(0.0027)	(0.0026)
Province	-0.0016	-0.0029**	-0.0032***	-0.0032***	-0.0035***	-0.0026**	-0.0034***	-0.0020*	-0.0016*	-0.0019*	-0.0014
	(0.0012)	(0.0012)	(0.0011)	(0.0012)	(0.0012)	(0.0011)	(0.0013)	(0.0012)	(0.0010)	(0.0010)	(0.0010)
Sex Ratio	-0.0043	-0.0039	-0.0029	-0.0022	-0.0015	-0.0007	-0.0002	-0.0002	-0.0001	-0.0001	-0.0001
	(0.0088)	(0.0079)	(0.0059)	(0.0044)	(0.0031)	(0.0015)	(0.0005)	(0.0005)	(0.0003)	(0.0002)	(0.0002)

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table 6: Decomposition Analysis: year t sample used for coefficients; LFP assumed exogenous in LPM

	1995	**1996**	**1997**	**1998**	**1999**	**2000**	**2001**	**2002**	**2003**	**2004**	**2005**
Aggregate Decomposition											
Raw Gap	0.0526***	0.0656***	0.0457***	0.0523***	0.0303***	0.0354***	0.0182***	0.0338***	0.0141**	0.0337***	0.0038
	(0.0066)	(0.0072)	(0.0063)	(0.0071)	(0.0067)	(0.0071)	(0.0067)	(0.0068)	(0.0068)	(0.0073)	(0.0073)
Total Explained	0.0164**	0.0098	0.0264***	0.0062	0.0109**	0.0089**	0.0197***	0.0227***	0.0158***	0.0005	-0.0006
	(0.0077)	(0.0096)	(0.0052)	(0.0058)	(0.0043)	(0.0036)	(0.0033)	(0.0033)	(0.0031)	(0.0034)	(0.0031)
% of Raw Gap	31.18%	14.94%	57.77%	11.85%	35.97%	25.14%	108.24%	67.16%	112.06%	1.48%	-15.79%
Total Unexplained	0.0362***	0.0559***	0.0193***	0.0461***	0.0194***	0.0265***	-0.0014	0.0111*	-0.0018	0.0333***	0.0044
	(0.0092)	(0.0113)	(0.0071)	(0.0080)	(0.0068)	(0.0066)	(0.0061)	(0.0062)	(0.0062)	(0.0066)	(0.0067)
% of Raw Gap	68.82%	85.21%	42.23%	88.15%	64.03%	74.86%	-7.69%	32.84%	-12.77%	98.81%	115.79%
Detailed Decomposition											
Participation	0.0074***	0.0108***	0.0099***	0.0038**	0.0027***	0.0015***	0.0007**	0.0003	-0.0000	0.0007**	0.0000
	(0.0014)	(0.0021)	(0.0013)	(0.0015)	(0.0009)	(0.0005)	(0.0003)	(0.0002)	(0.0003)	(0.0003)	(0.0001)
Education	0.0152***	0.0122***	0.0150***	0.0189***	0.0133***	0.0138***	0.0114***	0.0099***	0.0046***	0.0037***	0.0018***
	(0.0014)	(0.0018)	(0.0012)	(0.0017)	(0.0013)	(0.0015)	(0.0012)	(0.0011)	(0.0009)	(0.0008)	(0.0006)
Age	-0.0080***	-0.0048	0.0001	-0.0082***	-0.0068**	-0.0035	0.0064**	0.0110***	0.0128***	-0.0017	-0.0006
	(0.0031)	(0.0033)	(0.0028)	(0.0031)	(0.0027)	(0.0028)	(0.0027)	(0.0028)	(0.0028)	(0.0029)	(0.0027)
Province	-0.0028***	-0.0004	-0.0020**	-0.0004	-0.0013	-0.0009	0.0008	0.0014	-0.0014	-0.0024**	-0.0019*
	(0.0010)	(0.0011)	(0.0009)	(0.0010)	(0.0010)	(0.0011)	(0.0011)	(0.0010)	(0.0009)	(0.0011)	(0.0011)
Sex Ratio	0.0046	-0.0080	0.0034	-0.0079	0.0031	-0.0019	0.0005	0.0000	-0.0002	0.0001	0.0000
	(0.0072)	(0.0092)	(0.0042)	(0.0049)	(0.0030)	(0.0017)	(0.0004)	(0.0004)	(0.0003)	(0.0002)	(0.0002)

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table 7: Detailed Decomposition for Coefficient Effect (LPM) using 2006 coefficients

	1995	**1996**	**1997**	**1998**	**1999**	**2000**	**2001**	**2002**	**2003**	**2004**	**2005**
Participation	-0.0173	-0.0222	-0.0265	-0.0095	-0.0124	-0.0188	-0.0371	-0.0223	-0.0391	-0.0293	-0.0015
Education	-0.0051	-0.0119	-0.0285	-0.0279	-0.0207	-0.0306	-0.0373	-0.0390	-0.0059	-0.0231	0.0185
Age	0.0818	0.0824	0.0812	0.0624	0.0427	0.0335	0.0322	0.0408	0.0287	0.0318	0.0092
Province	0.0601	0.0352	0.0287	0.0397	0.0238	0.0330	0.0531	0.0433	0.0450	0.0326	0.0078
Sex Ratio	-0.0149	0.0083	-0.0188	0.0247	-0.0307	0.0173	-0.0332	-0.0135	0.0083	-0.0311	-0.0138

Table 8: Detailed Decomposition for Coefficient Effect (LPM) using t coefficients

	1995	**1996**	**1997**	**1998**	**1999**	**2000**	**2001**	**2002**	**2003**	**2004**	**2005**
Participation	-0.0230	-0.0311	-0.0348	-0.0120	-0.0143	-0.0199	-0.0377	-0.0225	-0.0391	-0.0298	-0.0015
Education	-0.0062	-0.0096	-0.0312	-0.0338	-0.0213	-0.0327	-0.0371	-0.0394	-0.0042	-0.0229	0.0189
Age	0.0828	0.0833	0.0807	0.0632	0.0428	0.0337	0.0311	0.0389	0.0265	0.0319	0.0090
Province	0.0613	0.0326	0.0275	0.0369	0.0217	0.0314	0.0490	0.0400	0.0448	0.0330	0.0082
Sex Ratio	-0.0239	0.0125	-0.0251	0.0304	-0.0353	0.0184	-0.0339	-0.0138	0.0084	-0.0313	-0.0139

Table 9: Decomposition Analysis: year 2006 sample used for coefficients in Probit Model

	1995	**1996**	**1997**	**1998**	**1999**	**2000**	**2001**	**2002**	**2003**	**2004**	**2005**
Aggregate Decomposition											
Total Explained	0.0015	.007	0.008	0.0023	0.0023	0.0057	0.0134	0.0167	.0152	0.0004	0.0002
% of Raw Gap	2.85%	10.67%	17.51%	4.40%	7.59%	16.1%	73.63%	49.41%	107.8%	1.19%	5.26%
Total Unexplained	0.0511	0.0586	0.0377	0.05	0.028	0.0297	0.0048	0.0171	-0.0011	0.0333	0.0036
% of Raw Gap	97.15%	89.33%	82.49%	95.60%	92.41%	83.9%	26.37%	50.59%	-7.8%	98.81%	94.74%
Detailed Decomposition											
Participation	0.0011	0.0020	0.0016	0.0014	0.0009	0.0004	0.0001	0.0001	0.0000	0.0001	0.0000
	(0.0026)	(0.0030)	(0.0025)	(0.0021)	(0.0013)	(0.0006)	(0.0002)	(0.0001)	(0.0001)	(0.0002)	(0.0001)
Education	0.0145***	0.0150***	0.0126***	0.0131***	0.0129***	0.0119***	0.0118***	0.0102***	0.0067***	0.0041***	0.0025***
	(0.0020)	(0.0022)	(0.0019)	(0.0018)	(0.0017)	(0.0014)	(0.0014)	(0.0013)	(0.0009)	(0.0006)	(0.0004)
Age	-0.0080***	-0.0044***	-0.0011***	-0.0079***	-0.0072***	-0.0043***	0.0041***	0.0076***	0.0096***	-0.0020***	-0.0011***
	(0.0004)	(0.0004)	(0.0004)	(0.0004)	(0.0004)	(0.0004)	(0.0005)	(0.0006)	(0.0007)	(0.0003)	(0.0003)
Province	-0.0006	-0.0023**	-0.0025***	-0.0024***	-0.0029***	-0.0021***	-0.0024**	-0.0008	-0.0009**	-0.0014***	-0.0010**
	(0.0009)	(0.0009)	(0.0009)	(0.0008)	(0.0008)	(0.0007)	(0.0010)	(0.0009)	(0.0004)	(0.0005)	(0.0005)
Sex Ratio	-0.0055	-0.0031	-0.0023	-0.0017	-0.0012	-0.0006	-0.0002	-0.0002	-0.0001	-0.0001	-0.0001
	(0.0088)	(0.0080)	(0.0060)	(0.0044)	(0.0031)	(0.0015)	(0.0004)	(0.0005)	(0.0003)	(0.0002)	(0.0002)

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table 10: Decomposition Analysis: year t sample used for coefficients in Probit Model

	1995	**1996**	**1997**	**1998**	**1999**	**2000**	**2001**	**2002**	**2003**	**2004**	**2005**
Aggregate Decomposition											
Total Explained	0.0177	0.01	0.0273	0.0075	0.0115	0.0093	0.0195	.0228	.016	0.0002	-.0004
% of Raw Gap	33.65%	15.24%	59.74%	14.34%	37.95%	26.27%	107.14%	67.46%	113.48%	0.59%	-10.53%
Total Unexplained	0.0349	0.0556	0.0184	0.0448	0.0188	0.0261	-0.0013	0.011	-0.0019	0.0335	0.0042
% of Raw Gap	66.35%	84.76%	40.26%	85.66%	62.05%	73.73%	-7.14%	32.54%	-13.48%	99.41%	110.53%
Detailed Decomposition											
Participation	0.0073***	0.0106***	0.0099***	0.0038***	0.0029***	0.0016***	0.0006***	0.0003***	0.0000	0.0007***	0.0000
	(0.0014)	(0.0020)	(0.0012)	(0.0015)	(0.0009)	(0.0005)	(0.0001)	(0.0001)	(0.0001)	(0.0002)	(0.0001)
Education	0.0165***	0.0133***	0.0145***	0.0192***	0.0135***	0.0139***	0.0112***	0.0108***	0.0048***	0.0041***	0.0019***
	(0.0014)	(0.0017)	(0.0011)	(0.0015)	(0.0012)	(0.0014)	(0.0010)	(0.0010)	(0.0007)	(0.0005)	(0.0003)
Age	-0.0077***	-0.0039***	-0.0003	-0.0073***	-0.0070***	-0.0043***	0.0056***	0.0101***	0.0128***	-0.0021***	-0.0016***
	(0.0003)	(0.0004)	(0.0003)	(0.0004)	(0.0003)	(0.0004)	(0.0004)	(0.0005)	(0.0006)	(0.0003)	(0.0003)
Province	-0.0037***	-0.0011*	-0.0007	-0.0014*	-0.0011*	-0.0005	0.0015**	0.0018***	-0.0012***	-0.0029***	-0.0008*
	(0.0007)	(0.0007)	(0.0005)	(0.0007)	(0.0006)	(0.0006)	(0.0007)	(0.0006)	(0.0003)	(0.0005)	(0.0005)
Sex Ratio	0.0055	-0.0082	0.0040	-0.0068	0.0034	-0.0017	0.0005	0.0001	-0.0002	0.0001	0.0001
	(0.0069)	(0.0097)	(0.0040)	(0.0051)	(0.0030)	(0.0017)	(0.0004)	(0.0005)	(0.0003)	(0.0002)	(0.0002)

*** p<0.01, ** p<0.05, * p<0.1
Standard errors in parentheses

References

Angrist, J. and Pischke, J. (2009). Mostly harmless econometrics: An empiricist's companion, *Princeton: Princeton University Press* .

Becker, G. (1973). A theory of marriage: Part i, *The Journal of Political Economy* **81**(4): 813–846.

Blinder, S. (1973). Wage discrimination; reduced form and structural estimates, *Journal of Human Resources* **8**(4): 436–455.

Casale, D. (2003). The rise in female labour force participation in south africa: An analysis of household survey data, 1995 – 2001, *PhD thesis, School of Economics, University of Natal, Durban* .

Cherlin, A. (1979). Work life and marital dissolution. in levinger, g. and moles, o. (eds.), divorce and separation, *New York: Basic Books* pp. 151–166.

Espenshade, T. (1985). Marriage trends in america: Estimates, implications and underlying causes, *Population and Development Review* **11**: 193–245.

Even, W. and Macpherson, D. (1990). Plant size and the decline of unionism, *Letters* **32**(4): 393–98.

Fairlie, R. (2005). An extension of the blinder-oaxaca decomposition technique to logit and probit models, *Journal of Economic and Social Measurement* **30**: 305–316.

Gardeazabal, J. and Ugidos, A. (2005). More on identification in detailed wage decompositions, *Review of Economics and Statistics* **86**(4): 1034–1036.

Guttentag, M. and Secord, P. (1983). Too many women?, *Thousand Oaks: Sage* .

Hannan, M. and Tuma, N. (1978). Income and independence effects on marital dissolution: Results from the seattle and denver income maintenance experiments, *The American Journal of Sociology* **84**(3): 611–33.

Jann, B. (2008). A stata implementation of the blinder-oaxaca decomposition, *ETH Zurich Sociology Working Paper 5* .

Jones, F. (1983). On decomposing the wage gap: A critical comment on blinder's method, *Journal of Human Resources* **18**(1): 126–130.

McDonald, P. (2000). Gender equity, social institutions and the future of fertility, *Journal of Population Research* **17**(1): 1–16.

Moore, K. and Waite, L. (1981). Marital dissolution, early motherhood, and early marriage, *Social Forces* **60**: 20–40.

Neumark, D. (1988). Employers' discriminatory baehaviour and the estimation of wage discrimination, *Journal of Human Resources* **23**: 279–295.

Nielsen, H. S. (2000). Wage discrimination in zambia: An extension of the oaxaca-blinder decomposition, *Applied Economics Letters* **7**(6): 4058.

Oaxaca, R. (1973). Male female wage differentials in urban labour markets, *International Economic Review* **14**(3): 693–709.

Oaxaca, R. and Ransom, M. (1994). On discrimination and the decomposition of wage differentials, *Journal of Econometrics* **61**: 5–21.

Oaxaca, R. and Ransom, M. (1999). Identification in detailed wage decomposition, *Review of Economics and Statistics* **81**(1): 154–157.

Oppenheimer, V. K. (1988). A theory of marriage timing, *American Journal of Sociology* **94**(3): 563–591.

Ross, H. and Sawhill, I. (1975). Time of transition: The growth of families headed by women, *Washington, DC: Urban Instititute* .

Staples, R. (1981). Race and marital status: An oerview in h.p. mcadoo (ed.), black families, *Beverly Hills, Sage Publications* pp. 173–175.

Tucker, M. and Mitchell-Kernan, C. (1995). Marital behaviour and expectations: Ethnic comparisons of attitudinal and structural correlates. in tucker, m.b. and mitchell-kernan, c. (eds.), the decline in marriage among african americans: Causes, consequences and policy implications, *New York: Russell Sage Foundation* .

Tzeng, M. (1992). The effects of socioeconomic heterogamy and changes on marital dissolution for first marriages, *Journal of Marriage and the Family* **54**: 609–19.

Wilson, W. (1987). The truly disadvantaged, *Chicago: University Press* .

Wilson, W. J. and Neckerman, K. (1986). Poverty and family structure. in danziger, s.h. and weinberg, d.h. (eds.). the widening gap between evidence and public policy issues in fighting poverty, *Harvard University Press* pp. 232–59.

Yun, M. (2000). Decomposition analysis for a binary choice model, *Department of Economics, Rutgers University, Departmental Working Papers* .

Yun, M. (2005). A simple solution to the identification problem in detailed wage decomposition, *Economic Inquiry* **43**(4): 766–772.

(Chapter head:)Appendix

6 Additional Estimation results

Table 11: Decomposition Analysis: year 2006 sample used for coefficients; LFP assumed endogenous in IVLPM

	1995	**1996**	**1997**	**1998**	**1999**	**2000**	**2001**	**2002**	**2003**	**2004**	**2005**
Aggregate Decomp.											
Total Explained	-0.6458**	-0.7851**	-0.6663**	-0.5669**	-0.3325**	-0.1080**	0.0087**	0.0131***	0.0338***	-0.0317**	0.0026
	(0.2563)	(0.3120)	(0.2657)	(0.2242)	(0.1319)	(0.0450)	(0.0038)	(0.0038)	(0.0078)	(0.0131)	(0.0033)
Total Unexplained	0.6985***	0.8507***	0.7120***	0.6192***	0.3628***	0.1435***	0.0095	0.0207***	-0.0197**	0.0654***	0.0013
	(0.2564)	(0.3122)	(0.2659)	(0.2243)	(0.1321)	(0.0454)	(0.0065)	(0.0065)	(0.0096)	(0.0144)	(0.0068)
Detailed Decomp.											
Participation	-0.9225**	-1.0603**	-0.8870**	-0.7569**	-0.4780**	-0.2038**	-0.0606**	-0.0393**	0.0020	-0.0714**	-0.0165*
	(0.3635)	(0.4179)	(0.3496)	(0.2984)	(0.1885)	(0.0807)	(0.0248)	(0.0169)	(0.0067)	(0.0291)	(0.0097)
Education	0.0869***	0.1026***	0.0925***	0.0849***	0.0687***	0.0551***	0.0516***	0.0398***	0.0195***	0.0257***	0.0087*
	(0.0290)	(0.0350)	(0.0318)	(0.0287)	(0.0225)	(0.0177)	(0.0163)	(0.0127)	(0.0067)	(0.0096)	(0.0050)
Age	0.0059	0.0045	0.0005	0.0070	0.0064	0.0037	-0.0023	-0.0053	0.0039	0.0059	0.0023
	(0.0060)	(0.0048)	(0.0030)	(0.0066)	(0.0061)	(0.0044)	(0.0044)	(0.0065)	(0.0042)	(0.0046)	(0.0037)
Province	0.0046	0.0087*	0.0083*	0.0084*	0.0081*	0.0071*	0.0104*	0.0087*	0.0032	0.0051*	0.0050*
	(0.0028)	(0.0049)	(0.0047)	(0.0048)	(0.0048)	(0.0040)	(0.0057)	(0.0045)	(0.0022)	(0.0031)	(0.0029)
Sex Ratio	0.1791**	0.1594**	0.1195**	0.0896**	0.0623**	0.0300**	0.0096**	0.0091**	0.0052*	0.0029	0.0031
	(0.0717)	(0.0638)	(0.0478)	(0.0359)	(0.0250)	(0.0122)	(0.0043)	(0.0041)	(0.0029)	(0.0024)	(0.0025)

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table 12: Decomposition Analysis: year t sample used for coefficients; LFP assumed endogenous in IVLPM

	1995	**1996**	**1997**	**1998**	**1999**	**2000**	**2001**	**2002**	**2003**	**2004**	**2005**
Aggregate Decomp.											
Total Explained	0.1780***	-0.0449	-0.0182	0.0552*	0.0358**	-0.0065	0.0282***	0.0243***	0.0173***	-0.0049	-0.0001
	(0.0324)	(0.1003)	(0.0350)	(0.0321)	(0.0140)	(0.0063)	(0.0041)	(0.0036)	(0.0042)	(0.0038)	(0.0032)
Total Unexplained	-0.1253***	0.1105	0.0639*	-0.0029	-0.0056	0.0419***	-0.0099	0.0095	-0.0032	0.0387***	0.0040
	(0.0327)	(0.1003)	(0.0352)	(0.0326)	(0.0150)	(0.0087)	(0.0066)	(0.0063)	(0.0068)	(0.0071)	(0.0067)
Detailed Decomp.											
Participation	0.1961***	-0.0765	-0.0443	0.0653*	0.0501**	-0.0268***	0.0266***	0.0040	0.0001	-0.0113***	-0.0056**
	(0.0372)	(0.1583)	(0.0421)	(0.0395)	(0.0253)	(0.0096)	(0.0082)	(0.0033)	(0.0005)	(0.0040)	(0.0027)
Education	0.0073***	0.0171*	0.0197***	0.0139***	0.0080***	0.0161***	-0.0017	0.0075***	0.0056**	0.0078***	0.0042**
	(0.0022)	(0.0091)	(0.0039)	(0.0037)	(0.0031)	(0.0020)	(0.0041)	(0.0023)	(0.0023)	(0.0019)	(0.0018)
Age	-0.0115***	-0.0043	0.0000	-0.0096***	-0.0084**	-0.0020	0.0097**	0.0126***	0.0123***	-0.0004	0.0006
	(0.0045)	(0.0029)	(0.0025)	(0.0037)	(0.0035)	(0.0021)	(0.0046)	(0.0036)	(0.0028)	(0.0023)	(0.0016)
Province	-0.0071***	0.0018	-0.0003	-0.0017	-0.0020*	-0.0001	0.0001	0.0016	-0.0013	-0.0018*	-0.0010
	(0.0019)	(0.0041)	(0.0016)	(0.0013)	(0.0011)	(0.0012)	(0.0015)	(0.0011)	(0.0008)	(0.0010)	(0.0010)
Sex Ratio	-0.0068	0.0170	0.0066	-0.0126**	-0.0119	0.0063**	-0.0066***	-0.0014	0.0005	0.0007	0.0017
	(0.0076)	(0.0456)	(0.0049)	(0.0056)	(0.0085)	(0.0031)	(0.0025)	(0.0014)	(0.0014)	(0.0006)	(0.0012)

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1