Conference Paper

Does having a Child Impact on Employment Prospects for Young Black Urban Women?

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27 - 29 October 2010
Indaba Hotel and Conference Centre
Johannesburg
South Africa

Hosted by

DPRU Development Policy Research Unit

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DPRU conference paper

October 2010

African Micro-Economic Research Unity (AMERU)

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Abstract

Unemployment is one of the most serious, chronic economic problems in South Africa today. This paper looks at how unemployment is related to fertility in a black, urban South African context. The fertility-employment relationship has been established globally, initially as inverse but evolving into a variable, complex relationship dependent on female identity, government policy and social norms. In the empirical component of the paper, it is shown that fertility and employment are inversely correlated in black, urban South Africa in the short-run. This relationship is highly significant, with a strong explanatory impact. In line with international norms, the relationship decreases in both explanatory impact and significance over time.

Introduction

Although South Africa has made the transition to a democratic, middle-income country in the past twenty years, poverty and unemployment remain critical problems for most South Africans. The country has a chronically high unemployment rate, measured officially at 25.3% (Statistics South Africa, 2010).

Unemployment corresponds closely with poverty, and young black women form the most vulnerable group by these two measures (Bhorat et al, 2001:65). Table 1 illustrates recent South African unemployment figures, while Table 2 illustrates youth unemployment (aged 20-24-years-old). The NEA category comprises respondents who had not within the previous month taken steps to search for a job, excluding discouraged work seekers (part of the broadly unemployed). In both tables, African women have the lowest level of employment, particularly owing to very high rates of economic inactivity comparative to all other groups. South Africa's history led to distortions of attitudes, social norms and economic indicators such as education and social capital for these women; however relatively little work has been done on more contemporary aspects of the unemployment problem.

	All women	African women	All men	African men
Employed	31.76	28.82	44.57	40.3
Unemployed (strict)	52.48	11.88	38.78	13.92
Unemployed (broad)	57.41	17.74	42.79	18.79
Not economically active (NEA)	10.83	53.44	12.64	40.92

Table 1: Population employment statistics (percentages)

Source: Quarterly Labour Force Survey, 2009

	All women	African women	All men	African men

Employed	20.38	16.33	30.82	26.54
Unemployed (strict)	23.06	24.01	24.82	25.87
Unemployed (broad)	32.06	34.13	32.94	35.15
Not economically active (NEA)	47.55	49.55	36.24	38.3

Table 2: Youth (20-24) employment statistics (percentages)

Source: Quarterly Labour Force Survey, 2009

In other parts of the world, fertility and its relation to employment has come under increased scrutiny over the past forty years, as increasing numbers of economists and policymakers have recognised a strong and variable relationship between the two. Initially, an inverse fertility-employment correlation was found, explained by increasing work opportunities and thus rising wages for women, which increased the opportunity costs of child-bearing (Butz and Ward, 1979:318-319). However, this relationship has since shifted to a positive correlation in some countries, illustrating its responsiveness to changes in social norms, structural constraints and government policies, e.g. as childcare facilities and expected norms of working mothers increase, female labour force participation (LFP) and fertility may reinforce each other (Brewster and Rindfuss, 2000:280-281).

The increase in work done on fertility-employment has revealed much about this relationship. In particular, it has been shown that the relationship depends on a certain level of economic development or industrialisation, which in turn increases the incompatibility of motherhood and labour for women (Safilios-Rothschild, 1977:361-362). This leads to a trade-off between work and motherhood. However, this trade-off is heavily dependent on women's personal identities – influenced by social norms, education and opportunities – and work quality – whether or not work is seen as an adequately fulfilling substitute for children (Safilios-Rothschild, 1977:359).

In the South African context, little work has been done on the fertility-employment relationship. What is known about the factors influencing this relationship, such as level of

development, education, social norms and history, can suggest certain conclusions. Demographers agree that South Africa has experienced most of its fertility transition, however it is suggested that social norms are still highly constraining for women in terms of identity and responsibility (Caldwell and Caldwell, 1993). This implies a strongly inverse fertility-employment relationship.

In this paper, a retrospective dataset will be analysed using a probit model to determine whether fertility does influence employment probability, and in which direction. The model is based on a microeconomic labour model, in which women are likely to supply their labour to the market if the full wage exceeds the reservation wage (minimum wage required to induce a woman to supply her labour to the market). Giving birth to children increases the reservation wage by decreasing amounts as time elapsed since birth increases. The results are as expected – the variable of giving birth in a specific year significantly increases probability of unemployment at the end of that year, and also in the middle of the following year. However, the effect becomes insignificant fairly quickly, i.e. by the end of the following year, suggesting that many women either find work highly and quickly substitutable for children, or women have a great deal of mother substitutes supporting them, or they are forced to work to support themselves and the children (lacking other means of support). The South African context suggests that the third reason would be most important, but the second reason is also possible.

The paper presents a new contribution to the debate around unemployment and solutions in the South African context, by examining social factors of a vulnerable group that may affect their economic status. It considers existing theory around the fertility-employment relationship as well as containing an empirical component relating specifically to young, black urban South African women, and the effect of their fertility on their employment statuses over time.

In the literature review following, the fertility-employment relationship is outlined for developed nations, before considering the differences in developing countries and then a specifically South African context. The dataset is then described and illustrated in terms of key

factors influencing fertility and employment, and then the methodology for empirical analysis is described. A probit model will be used, with the binary dependent variable equal to one if the respondent is unemployed, assessed against a range of common unemployment indicators such as education. One of these explanatory variables is the fertility variable. In the empirical results section, the results will be discussed from various regressions. Although fertility has an expected negative effect on employment, this becomes insignificant a year after the child's birth, which is a little quicker than expected from the literature. Finally, the conclusion summarises and discusses the previous sections.

Literature review

Economic frameworks

The first real economic discussion of fertility was by Malthus in his 1798 Essay on the Principle of Population. He stressed a positive income-fertility relationship that would lead to overpopulation in a simplistic framework (Borjas, 1996:95). Malthus is usually criticised for excluding technology and prices from his analysis, which explains why reality has sharply diverged from this model (Borjas, 1996:95).

The relationship between fertility and employment emerged as an important factor in neoclassical economics in developed countries after World War II. Initially neoclassicism treated fertility as exogenous, influenced positively by business cycles and thus income. However, the post-war period saw a breakdown in this traditional fertility-income relationship that could not be explained using traditional models. Fertility declined continuously as income and employment was increasing through the 1960s (Butz and Ward, 1979:318).

In this context, Becker created the first microeconomic model of fertility. In this model, fertility entered as a decision variable to be analysed in a microeconomic, utility-maximising framework like any other, and the decision (to give birth) was influenced by tastes, incomes and prices

(Becker, 1976:173). Supply was determined by ability to have children, and approximated by potential supply. In the post-war period, rapid decreases in child mortality and increases in contraceptive knowledge and use led to a convergence of potential to actual supply of children (Becker, 1976:178-179). This, too, stimulated the emergence of an inverse fertility-employment relationship, as the previous situation had veiled the actual demand for children.

Continuing this line of work, Butz and Ward created a more specific fertility-employment model, the Chicago-Columbia model. Their major insight was in the distinction between male and female employment effects on the household. An increase in male wage would increase household income, whereas an increase in female wage would increase household income (income effect) and the price of children (substitution effect), as female wage represents the opportunity cost of children (Butz and Ward, 1979:318-319). Children are seen as a normal good, thus the income effect increases demand for children with a wage increase; however the substitution effect induces a movement away from children towards work owing to the higher price of children. This analysis obviously includes the judgment that men do not significantly contribute time to childrearing activity. The fertility shift in the United States of America was explained through a massive feminisation of the labour force in the WWII period, which led to a substitution effect dominating the income effect at the individual household level. The sheer magnitude of changes in female labour force participation then carried this individual effect through in the aggregate, as women now constituted a large enough proportion of income earners to cause a breakdown in the strictly positive fertility-income relationship (Butz and Ward, 1979:321).

These models were in some ways simplistic; however they led to some crucial conclusions. Firstly, there was general recognition of a strong, inverse fertility-employment relationship in developed countries. Secondly, this relationship could be analysed in a traditional microeconomic model, as agents were responding rationally to incentives. Thirdly, this association implied far-reaching indirect development through increasing female labour force participation.

Empirical development

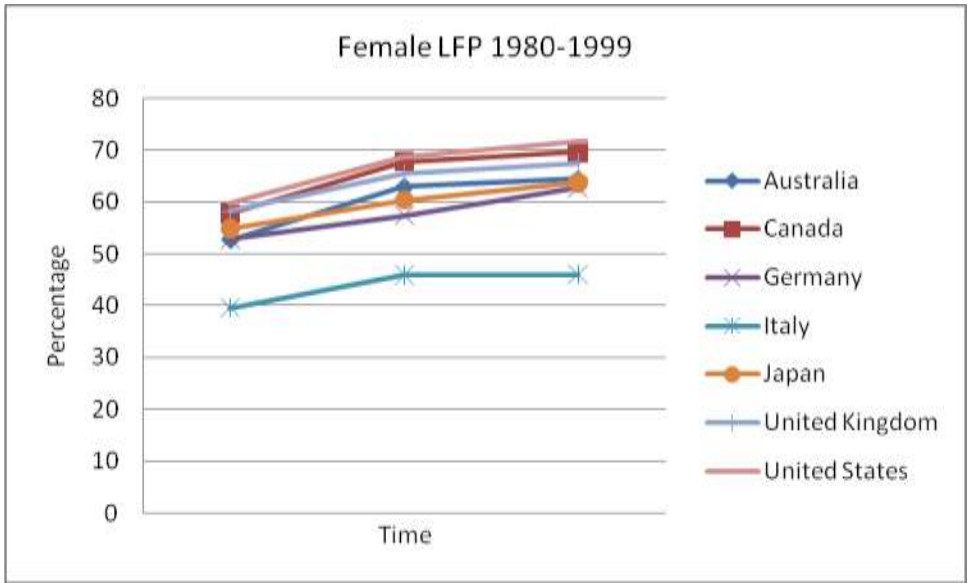

Figure 1: Female LFP over time

Source: Borjas, 'Labor Economics'

In the following years, female LFP has increased at different rates in most developed countries (Borjas, 1996:50). This is primarily driven by increases in female wages above the reservation wage, most of the change deriving from an increasing 'pull' of women into the labour force rather than increased hours worked by those already in the labour force (Borjas, 1996:53). Cultural norms, institutional structures and socio-economic disruptions are also important factors driving increased female LFP (Borjas, 1996:52). The negative correlation between female wages and fertility was proved in a variety of studies, and became generally accepted (Borjas, 1996:99). Safilios-Rothschild (1977:355) attributes the inverse relationship to three factors: employment representing emancipation of married women, employment and motherhood acting as substitutes for each other, and the heavy workload of childrearing leading to smaller families. This correlation is strongly affected by the age of the child, with a large increase in LFP by mothers as soon as the child reaches one year old, with increases following for each year (Bowen and Finegan, 1969:102).

Some consensus has been reached by economists on the general determinants of fertility. Easterlin and Crimmins (1985:8) published a macroeconomic model of fertility, declaring that the "principle long-term source of fertility decline is family size limitation within marriage". They found that female education was the most important determinant of fertility (increases in education leading to decreases in fertility), with female LFP in an industrialised (non-agricultural, as agricultural work is considered traditional, thus not incompatible with childrearing) context the second most important (Easterlin and Crimmins, 1985:90). Urbanisation also decreases fertility, as children are relatively more costly in an urban setting, because they cannot contribute much productive labour to the household and more substitutes for children are available (Easterlin and Crimmins, 1985:23). Female work experience before marriage and age at marriage also tend to decrease fertility as they increase, possibly because women are more aware of substitutes for children (Standing, 1983). Occupation also influences fertility, with increasing distance from home and skills levels decreasing fertility (Standing, 1983).

The above are all individual-level determinants, but structural factors also influence fertility. Labour market discrimination against women increases fertility by reducing alternatives for women and frustrating their status aspirations (Standing, 1983). High unemployment rates tend to depress fertility, because increased fertility carries an inter-temporal loss of income with it (Brewster and Rindfuss, 2000). Labour market institutions facilitating entry and exit from the market increase fertility as women are able to return to work more easily afterwards (Brewster and Rindfuss, 2000). In general, the state's philosophy on family has a strong influence on fertility, as it influences labour legislation, childcare facilities and interacts with social norms (Brewster and Rindfuss, 2000:287). For example, as industrialisation increases, a state legislating paid maternity leave is likely to have higher fertility rates than one with no legislation around workplace discrimination at all.

A common theme of female identity underlies some of the major determinants of fertility, although obviously difficult (if not impossible) to measure as a variable. Fertility is strongly influenced by education, work experience, industrialisation levels, and female LFP – all factors implying legitimate alternative identity choices for women. Although the reasons behind high fertility levels are often rational, these led to a link between female identity and motherhood, i.e. in many societies women were or are viewed as useful because of their abilities to bear and raise a number of children (Hess, 1988:23). This is rational from the perspective of a society with little room for female labour in the formal labour market – childbearing and rearing is then the most productive use of a women's time.

As labour demand and wages for women increase, the alternative worker identity becomes legitimated for women also, because working (i.e. supplying labour to the formal labour market) becomes a productive use of time. The woman's identity then becomes a choice variable rather than predetermined parameter, and work and children begin to act as direct substitutes for each other. In economic terminology, access to economic opportunity tends to increase the returns to declining fertility, resulting in substitution of labour for children (Hess, 1988:125). This substitution acts to decrease fertility in a long-term, sustainable manner, hence the long-run causality from female LFP to fertility as discussed by Cramer (1980:185).

Safilios-Rothschild (1977:359) extends this analysis by commenting that work satisfaction rather than simple work commitment increases the substitution effect, implying that quality rather than quantity of employment mediates the strength of the inverse fertility-employment relationship. Thus women are likely to see work as an alternative identity to motherhood if the work they are doing is psychologically, emotionally and intellectually satisfying, and not all forms of employment will be seen as equally substitutable for children.

The fertility-employment relationship, once established, was then methodologically developed. Critics pointed out that the strong fertility-employment correlation did not prove causation, and empirical work proved inconclusive in this regard (Standing, 1983:517). Some stated that

both were endogenous variables, and should be analysed as such. Direction of causation remains inconclusive; however there is now some acceptance that short-run causality runs from fertility to employment, and long-run causality in the opposite direction (Cramer, 1980:185). This implies that young children have significant effects on employment decisions of a mother, but employment opportunity will more strongly affect the lifetime choice of a woman to give birth. This is in line with development theory promoting economic opportunity for women, which has indirect effects on poverty by decreasing fertility.

Common methodological problems when analysing fertility and employment include measurement of the two variables, multicollinearity, model misspecification and the static nature of most models (Cramer, 1980:168). Most researchers agree that a dynamic model is required when dealing with fertility, which varies over time, and that models improve with the addition of social and institutional (not purely economic) factors (Brewster and Rindfuss, 2000:285).

Recently, empirical work has illustrated an emerging positive sign in the fertility-employment relationship for certain developed countries. This change is driven by social norms, structural constraints and government policies (Brewster and Rindfuss, 2000:280-281). Again, this relates to the idea of fertility-employment as a variable and not a constant (Safilios-Rothschild, 1977:355). This relationship is driven at the individual level, again, by identity. If the post-war labour force feminisation offered women a choice between identity as a worker or a mother, then the recent sign change implies a further choice for women between identity as a worker, a mother or a mother-worker (Brewster and Rindfuss, 2000:275). In other words, some societies appear to have accepted the legitimacy of both roles for women and therefore role incompatibility has decreased. Where norms, structures and policies allow for work and family as well as equally distributed family responsibility (between mother and father), a positive fertility-employment relationship has emerged (Brewster and Rindfuss, 2000:284). This would imply a modification to the Butz and Ward model: husband's time would also be an input into childrearing.

Developing countries

Although the vast majority of fertility-employment work has taken place in developed countries, developing countries are of increasing interest in this field. Initial work often took place in rural areas, where role incompatibility between mother and worker was found to be low (Schockaert, 2005:151). Traditionally, women often contribute labour in agricultural or domestic capacities, which allow children to be near. In this framework, increased fertility may be an advantage as children can assist the mother with her work, hence the role compatibility (Ware, 1977:28). Stycos and Weller (1967:211) suggest that a certain threshold of economic development is required before the inverse relationship asserts itself. Economic development tends to increase wages as the nature of work changes, which initially increases male wages but then pulls women into the labour market as discussed above, thus increasing female LFP and the opportunity cost of children (Borjas, 1996:54).

As stated, this relationship has repercussions in developmental economics for policies targeting women. Early development was often concerned with economic dependence of women as well as high fertility rates in underdeveloped areas. The fertility-employment relation implies that these two issues are linked increasingly closely after industrialisation (Collver and Langlois, 1962:367). Thus, policies aimed at increasing female LFP may have a long-term effect on fertility, similarly to the effect of increasing education (a significant determinant of fertility).

Schockaert (2005:161-162) finds the relationship between fertility and employment to be highly unstable in developing as compared to developed countries using Latin American studies; she attributes this to fragmented labour markets in developing countries, where informal labour markets are very prevalent and development is still in progress.

This echoes the idea of a contingent (rather than necessary) fertility-employment relationship, as has been seen from its gradual emergence and change in sign, dependent on implicit

income-substitution effects of changes in wages on women. Until income is fairly high, the substitution effect should overwhelm the income effect, thus a rise in wages causes a substitution of work for children, and the negative relation. However, this analysis is dependent on work and motherhood being substitutes for each other – increased wages then cause women to substitute work and consumption for childbearing, and the substitution effect would dominate to the extent that these are considered close substitutes for children (Safilios-Rothschild, 1977:359). If this is not true, women would work solely to earn income and purchase leisure, goods and children. A negative relationship may exist, but it would be weaker, leading to the neoclassical backward-bending labour supply curve (Bernheim and Whinston, 2008:190). The income effect may well overwhelm the substitution effect at much lower income levels.

Crucially, in industrialised developing countries, urban work is often not seen as a substitute for motherhood. Significant gendered wage differentials continue to exist in both developed and developing countries (Borjas, 1996:358). This is primarily explained in terms of discrimination and the tendency for women to work in interrupted spells, which decreases their human capital and leads to uncertainty on the part of firms (Borjas, 1996:386). Gender inequality contributes to discrimination against women in schools and the workplace – thus women are less educated (thus would take low or semi-skilled work) and denied access to higher quality employment. Although work satisfaction is distinct from skilled work, satisfaction is closely linked to the quality and personal choice of work – both these factors are negatively impacted by gender inequality. Further, cultural norms are often inhibiting factors in the identity shift. These exist in both developing and developed countries, as has been shown through analysis of Mediterranean countries with strong traditional norms around family and the care burden falling solely on the mother (Brewster and Rindfuss, 2000:285). Culture may dictate women's identity, especially as synonymous with motherhood (Potts and Marks, 2001:205). This could affect substitution directly and indirectly: women may refuse to see work as a substitute for motherhood, and employers may refuse to see work as a legitimate identity for women, thus increasing gender discrimination in the workplace.

However, substitution may occur despite this lack of identity shift for two reasons. Firstly, the models outlined above assume a household budget constraint and, usually, a nuclear family structure. If a woman is single and chooses to have a child or has a child alone or loses her partner, a substitution effect would be necessary until her income is high enough to purchase children. These women would need to achieve income high enough for a child while also insuring against the uncertainty of future earnings upon returning to the labour market after giving birth (Standing, 1983:529). Depending on her education and other factors influencing employment, the income effect may dominate very quickly.

Secondly, and related to the first point, if the household is very poor, substitution may dominate for survivalist reasons, i.e. the woman's income is necessary for household survival. Schockaert (2005:150) discusses the second effect in Latin America, where structural adjustment crises have prompted increased female LFP especially in the lower social classes. This LFP arises from necessity rather than choice, and she emphasises that it does not amount to an overall improvement in the status or lives of women. A positive fertility-employment relationship may eventually emerge for survivalist reasons rather than structural support, in direct contrast to the situation in developed countries (Schockaert, 2005:165).

South African context

South Africa is an unusual country in many respects. It is a middle-income country with very high levels of inequality stratified by race, gender and class (Bhorat et al, 2001:1). The country has a high and entrenched unemployment rate that has remained stagnant for over twenty years now (Bhorat et al, 2001:10). Little direct work has been done on the fertility-employment relationship in South Africa, although it has been noted that increasing female LFP is associated with decreasing fertility in the country (Casale and Posel, 2002:172). Bhorat et al (2001:87) find no correlation between labour supply and fertility, although noting that young children increase a woman's probability of unemployment. The several respects in which South Africa should be

analysed for the relationship are family structure, employment structure, culture and history and female identity.

Apartheid left an insidious legacy on South Africa in general and black women in particular, leading to a highly gendered poverty structure (Hassim, 2006:126). The migrant labour system and structure of urban employment actively destabilised the black nuclear family by separating married men and women. Post-apartheid, HIV/AIDS has widened this gap, leading to increasing proportions of female-headed households and single parent structures (Hassim, 2006:116). Black women are most likely to be female heads of households (Casale and Posel, 2002:177). The Butz and Ward/Becker conception of a household representing mother, father and children is highly inappropriate in South Africa, where households usually comprise many dependents and not necessarily any married couple. Earlier work on South African fertility emphasised that high black fertility levels were something of a necessity culturally, but made possible by low levels of male responsibility for children and high female dependence on children for financial support in old age (Caldwell and Caldwell, 1993:252). Black South Africans were excluded from the apartheid-era welfare system under the assumption that extended families would carry the support burden (Hassim, 2006:111).

Apartheid also discriminated against women (Pampallis, 1991:205). This is officially acknowledged by definition of all women as previously disadvantaged individuals, and seen in the continued existence of a gendered earnings differential (Bhorat et al, 2001:93). South African structures and social policies strongly echoed the Mediterranean model with a normative view of the nuclear family in which men head the household and are primary income-earners, and women are secondary (Hassim, 2006:113). Although the country comprises a plurality of different cultures, these are overwhelmingly and strongly patriarchal.

This structural gender inequality obviously acts to decrease female LFP, or increase barriers to female LFP; however, the norms underpinning this often act to increase fertility directly, reinforcing the effects. Many black cultures in particular still define female identity by

childbearing. It has been suggested that sterility is the worst possible fate for a woman, rendering her invisible (Upton, 2001:349). Education is seen as key to transforming this relationship by suggesting alternative identities for women and equipping them with the skills required to assert these identities, i.e. a worker identity (Potts and Marks, 2001:198).

The end of apartheid did lead to a large increase in female LFP, a trend continuing into the new millennium (Casele and Posel, 2002:156). This is consistent with the discriminatory issues under apartheid negatively impacting female LFP and employment. Casale and Posel (2002:157) note that the increase in female LFP has been primarily in the ranks of the unemployed or self-employed in the informal sector – both undesirable, highly vulnerable labour options. This suggests that women are being pushed rather than pulled into the South African labour market, as household income is shrinking owing to fewer women marrying their partners and higher unemployment rates amongst men (Casale and Posel, 2002:179).

The fertility transition has taken place across all races in South Africa; beginning in the 1960s and accelerating in the 1980s (Caldwell and Caldwell, 1993:231). The transition occurred for white women first, then Indian and Coloured women, and finally black women. Caldwell and Caldwell (1993:226) point out that black South Africa went through the transition earlier than in any other sub-Saharan African country; this is consistent with comparatively higher urbanisation, per capita income and education levels (all fertility depressors) in South Africa. South Africa also had the highest female LFP of all sub-Saharan countries (Potts and Marks, 2001). Schoen (1978:478) theorised that fertility decline is partly a result of desired social advancement – apartheid removed this incentive by rigidly relegating the black population to the lowest social class, thus inhibiting fertility decline. This lack of social mobility is emphasised by Bhorat et al (2001:5). This implies a greater and quicker fertility decline after the end of apartheid, although further studies highlight the importance of the family planning program under apartheid – with the expansion of spending on health post-apartheid, this program would suffer and may cause an initial increase before the long-run decline in black fertility levels in South Africa (Caldwell and Caldwell, 1993:258).

Theoretical framework

The fragmentation in black South African nuclear families makes the Becker and Butz and Ward frameworks inappropriate for analysis of the fertility-employment relationship. In addition, these frameworks are more useful for analysing employment as a determinant of fertility than the reverse. However, in line with the short-run causality suggested by Cramer, this paper will be analysing fertility as a determinant of employment.

An individual-level framework is required for South African women. Thus the labour framework of reservation wages will be used, in which labour supply is a function of the difference between the full and the reservation wage. The full wage is defined as the opportunity cost of non-employment, which is equal to current wages and discounted forgone future earnings (i.e. forgone wage increases owing to work experience). The reservation wage is the lowest possible wage that would induce the individual to offer her labour in the market. Fertility would increase the reservation wage and thus decrease labour supply (Borjas, 1996:51).

Data and descriptive statistics

The Labour Market Entry Survey data will be used. This retrospective survey was undertaken over 2009 by the African Microeconomic Research Unit (AMERU). It collected detailed information regarding employment for young, black urban South Africans, and included questions on the number of children born to respondents, years of birth of children, and current as well as retrospective activity/employment status. Of the 4 010 respondents, 2 219 are female and 1 116 (50.3%) of these women have one or more children. Only the women are considered in this paper. The regressions were run using a sample of 2 181 women (including 1 091 mothers) aged 20 – 24 years old.

The data did not allow for a full analysis of causality between employment and fertility, thus only the short-run correlation is analysed, in line with generally accepted short-run direction of causality. Table 3 describes the most important variables for women with children as percentages of total women. The most striking aspect of this table is the high proportion of mothers in the sample at 50.02%. This is surprising considering the youth and education levels (which can be taken as a proxy for contraceptive knowledge) of these women. However, it may indicate entrenched problems of unequal power relations in sexual relations in South Africa, implying that women either truly or feel they do not have choice in sexual matters (Potts and Marks, 2001:199). Caldwell and Caldwell (1993:254) have also found that young women may have children simply as a means of "focusing their lives" when out of school or unemployed, implying, again, that female identity is strongly linked to fertility and motherhood.

The table shows that fertility is associated with lower education levels of both respondents and their parents, where education of parents may act as a proxy for other social capital factors affecting later fertility (or employment) of the respondent (e.g. a parent with a higher level of education may encourage access to books, which may increase aspirations apart from motherhood). All three location variables contain approximately equal numbers of mothers and non-mothers, but a higher proportion of mothers live in households with no income earners.

	Total	**Education: Matric certificate**	**Education: No Matric certificate**	**Parents education: Matric or higher**	**Living with father of children**
Female total	2 181	1 399	782	641	202
Female total as percentage	100	64.15	35.86	29.39	9.26
Mothers as percentage	50.02	42.75	63.04	40.41	100
Non-mothers as percentage	49.98	57.25	36.96	59.59	0

	Location: Gauteng	Location: KZN	Location: Limpopo	Earners per household: Zero	Earners per household: One
Female total	979	566	636	424	1 184
Female total as percentage	44.89	25.95	29.16	19.44	54.29
Mothers as percentage	50.56	50.18	49.06	55.43	50.42
Non-mothers as percentage	49.44	49.82	50.94	44.56	49.58

Table 3: Basic data description

Table 4 illustrates summary statistics for meaningful variables, where Parents' education is a scaled variable ranging from no schooling (1) to a doctorate (9), with the mean approximately equal to some high school (3). The second column depicts statistics for the total number of children per women.

	All children	Age	Income earners	Parents' education
Mean	1.184	21.897	1.178	2.972
Median	1	22	1	3
Std deviation	0.461	1.406	0.932	1.226
N	1 091	2 181	2 181	2 181
Min	1	20	0	1
Max	4	24	9	9

Table 4: Summary statistics for all women

Graphing the variables of interest provides even more information, such as in Figure 2, which immediately illustrates the association between education and fertility. It is clear from the graphs that mothers have significantly lower levels of education than non-mothers. Because of the importance of the education variable, education levels in absolute terms are illustrated in Figure 3. It is shown that the majority of the sample is relatively well-educated, i.e. has matriculated.

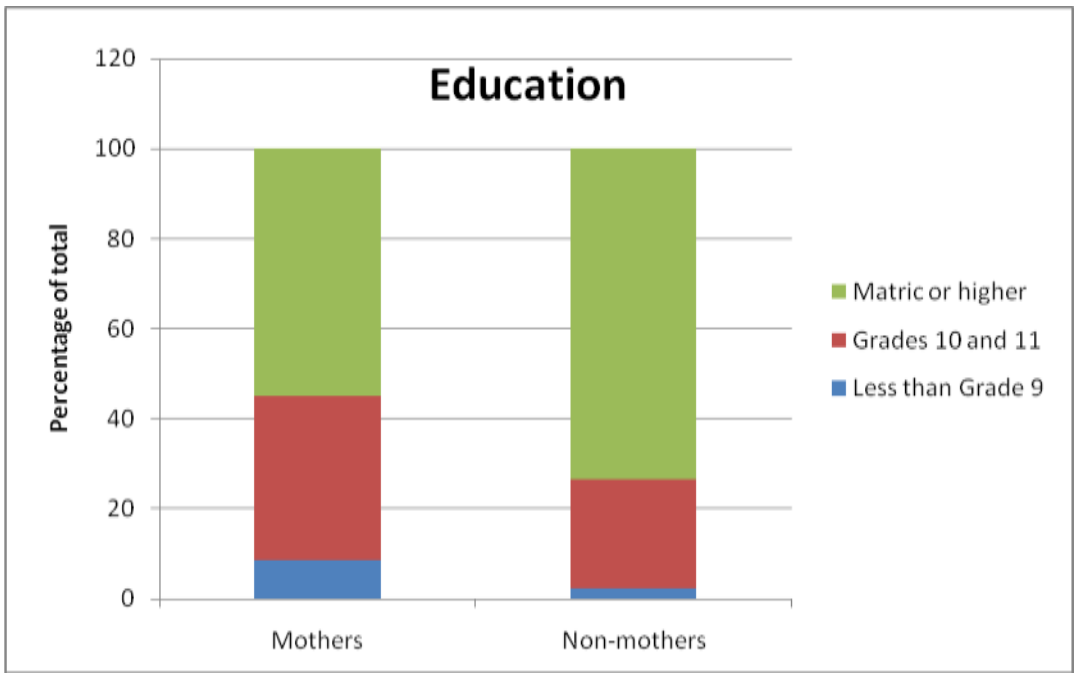

Figure 2: Education levels of mothers versus non-mothers

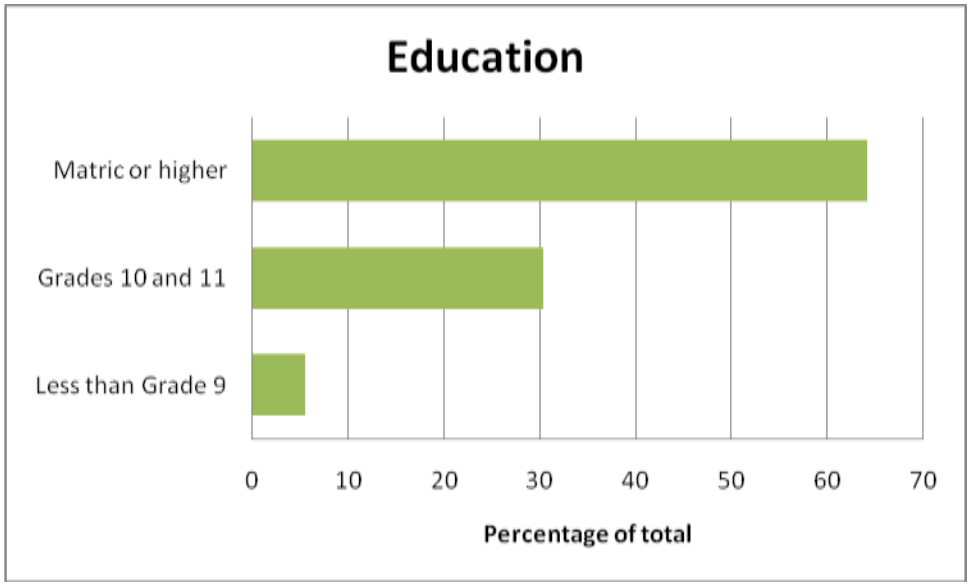

Figure 3: Education levels of all women

Figures 4 and 5 illustrate that fertility is not significantly related to either location or ethnicity. The relative insignificance of culture is somewhat surprising, considering that a large number of cultures are captured within the sample, and yet none show any particular trend relative to the

others, i.e. all cultures are similar in this (fertility) respect. From the total sample, the majority of women are located in Gauteng and are either Sepedi or Zulu.

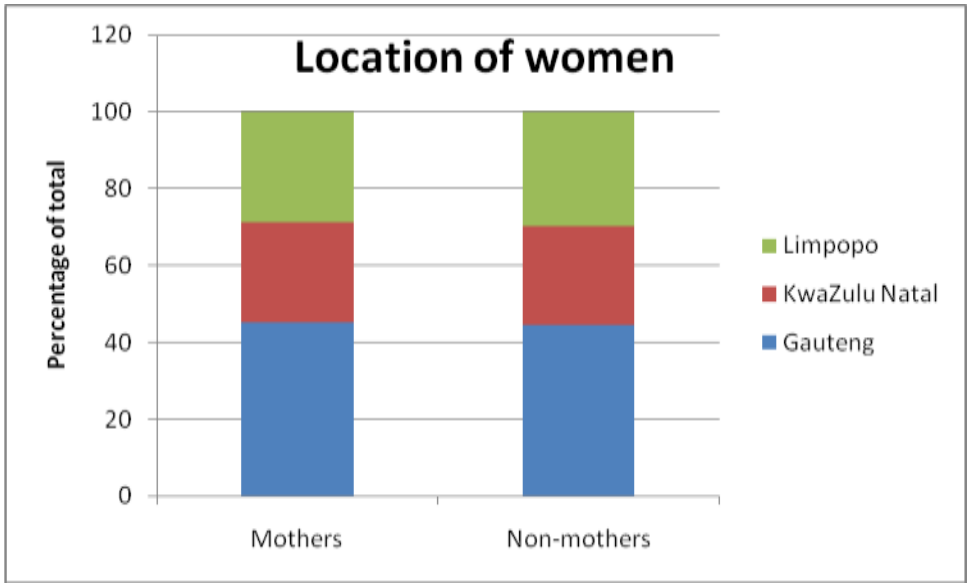

Figure 4: Location (province) of mothers versus non-mothers

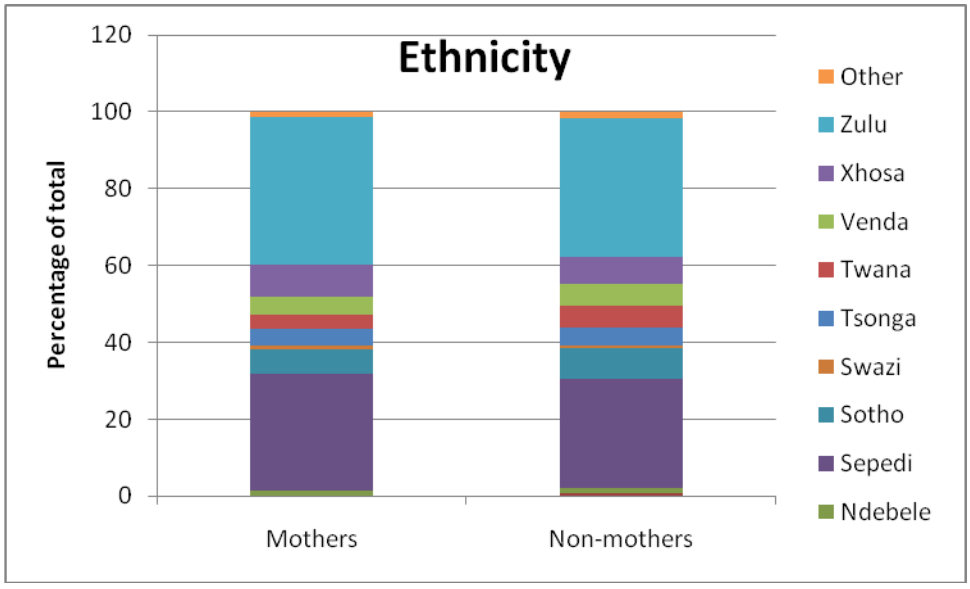

Figure 5: Ethnicity of mothers versus non-mothers

Figure 6 illustrates the number of people currently earning income per household. There is some difference in this variable for mothers as compared with non-mothers – it can be seen

that the households of mothers have a proportionately lower number of income earners. This supports the expected inverse fertility-employment relationship, because a household with more children should be supplying less labour. Other people in the household could be acting as mother substitutes and therefore not earning income, or the mother herself could not be earning income because she is caring for her child (individual respondents are included in the number of income earners per household).

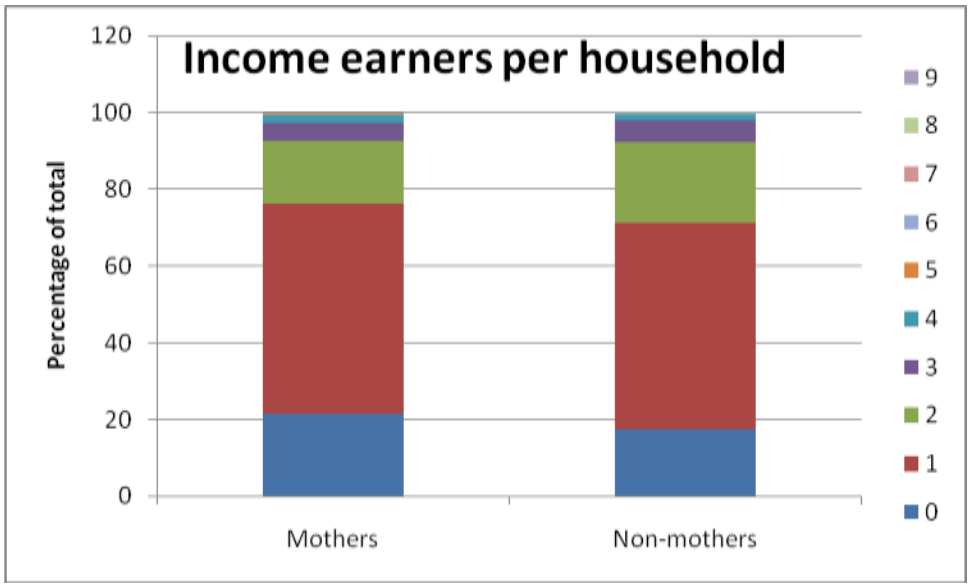

Figure 6: Number of current income earners per household

The current activities (at the time of the survey, 2009) of all respondents are illustrated in Figure 7. Although there is not enough analysis to lead to firm conclusions, it is interesting to note that a much higher proportion of non-mothers are engaged in further study than are mothers. A lower proportion of non-mothers are searching unemployed, but, as the corollary, a lower proportion of non-mothers are wage employed also. Overall, this graph indicates simply that a higher proportion of mothers are part of the labour market compared to non-mothers. However this is probably owing to the correlation between age and fertility, as seen in Figure 8.

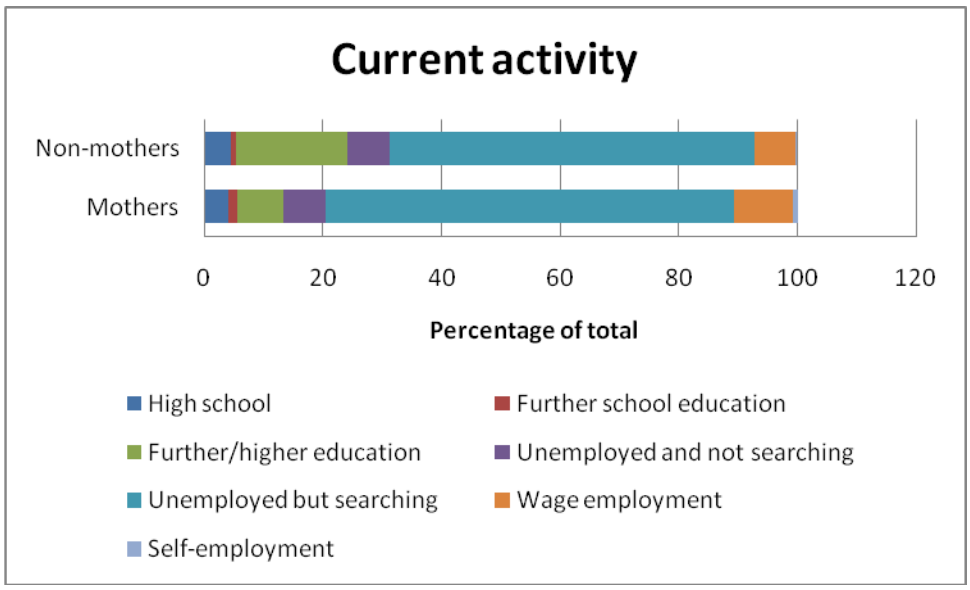

Figure 7: Current activity of mothers versus non-mothers

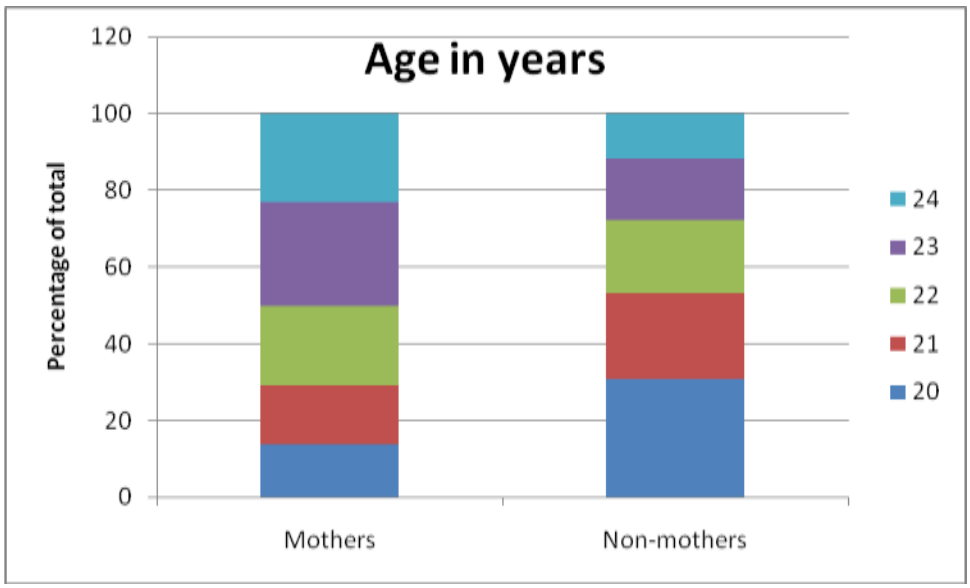

Figure 8: Age of women in years

Although macro-social variables are not included in the data and hence, the regressions, they do play an important role in influencing employment and fertility. Figure 9 thus illustrates the broad activities at the three time periods used for regressions later in the paper, i.e. December 2007, June 2008 and December 2008, calculated using the Labour Market Entry Survey data. A

clear trend in decreasing education and increasing unemployment is visible, with unemployment spiking particularly in December 2008; however, this is probably linked to the age group of the sample, with more of the sample entering the labour market as time passes

Statistics South Africa recorded a decrease in the unemployment rate from 23.1% in the second quarter of 2008 to 21.9% in the fourth quarter of 2008, which does not correspond to this sample, at first sight. However, this decrease in unemployment was primarily owing to increasing male employment (Statistics SA, 2009:vi) in the construction industry (Statistics SA, 2009vii). Also, Limpopo recorded an increase in unemployment, and Gauteng recorded a very small increase in employment, which may explain the discrepancy in the sample compared to national figures (Statistics SA, 2009:vii).

Interestingly, the second round of data collection in 2010 illustrates the women's own opinions on a fertility-employment relationship. 49.18% of mothers indicated that they believe having children makes finding employment more difficult, compared to 50.68% of non-mothers. This further implies an existing fertility-employment relationship as seen in Figures 10, 11 and 12.

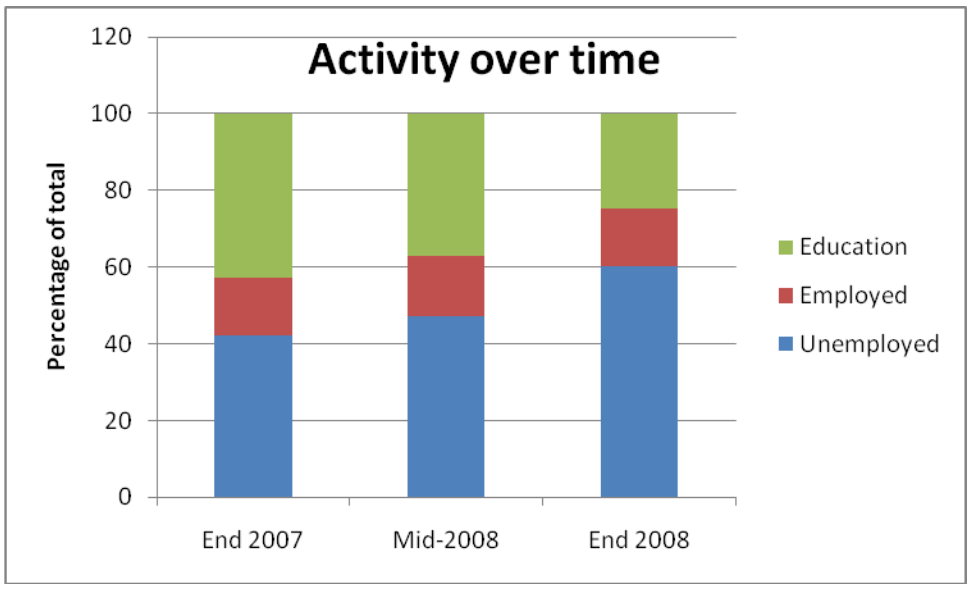

Figure 9: Activities at specific time periods

Figures 10, 11 and 12 illustrate proportionate changes in activities for women who gave birth to a child during 2007 as compared to women who did not, over time. Unemployment increases over time for both groups, but at different rates, i.e. there is a tendency for unemployment to converge between women who gave birth during 2007 and other women. It is very obvious, however, that a much higher proportion of the former group was unemployed initially (at December 2007), and there remains a discrepancy in proportionate activity levels even at the end of 2008. These graphs illustrate a definite inverse fertility-employment correlation, with decreasing significance as time since the birth increases.

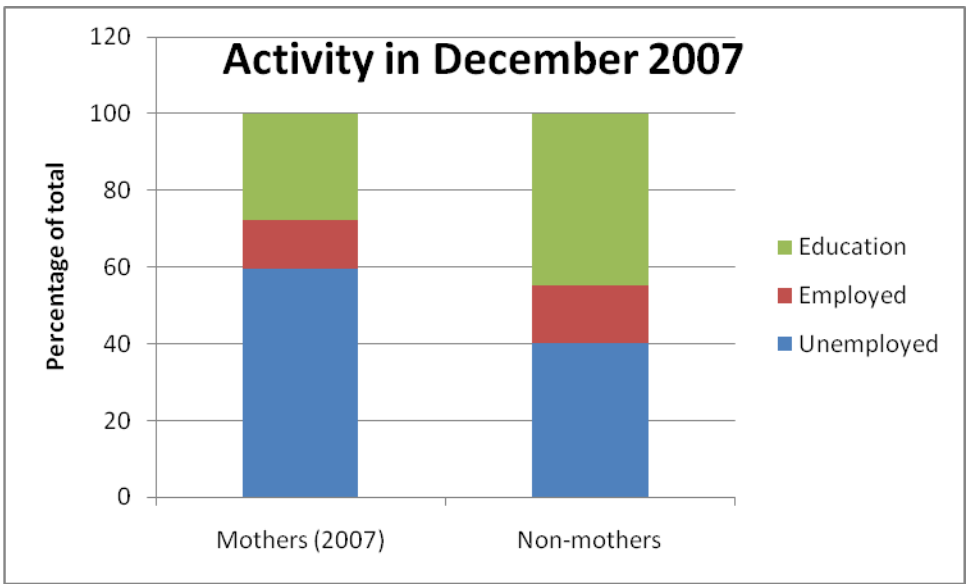

Figure 10: Activity at end 2007 for women who had children during 2007 versus other women

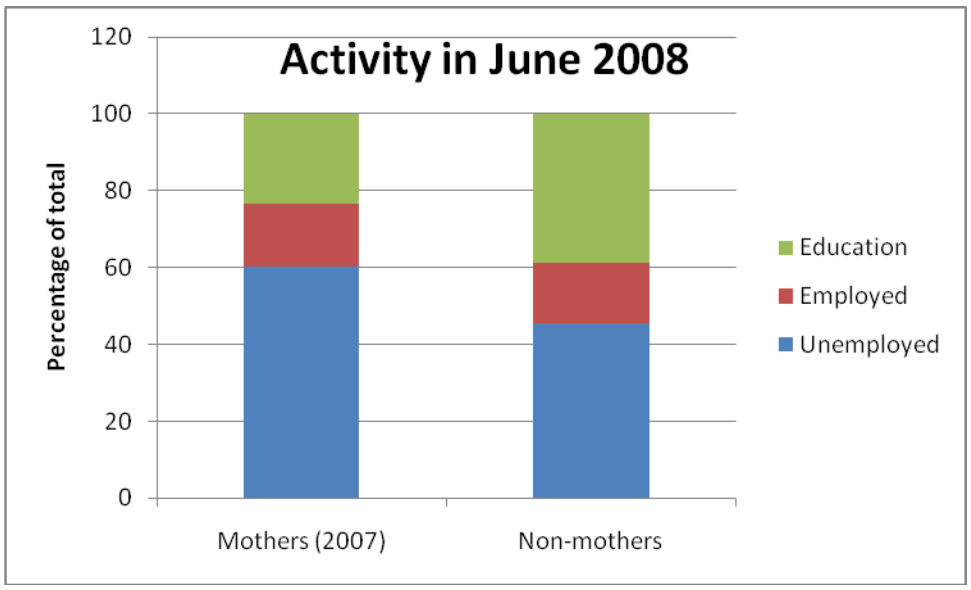

Figure 11: Activity at mid-2008 for women who had children during 2007 versus other women

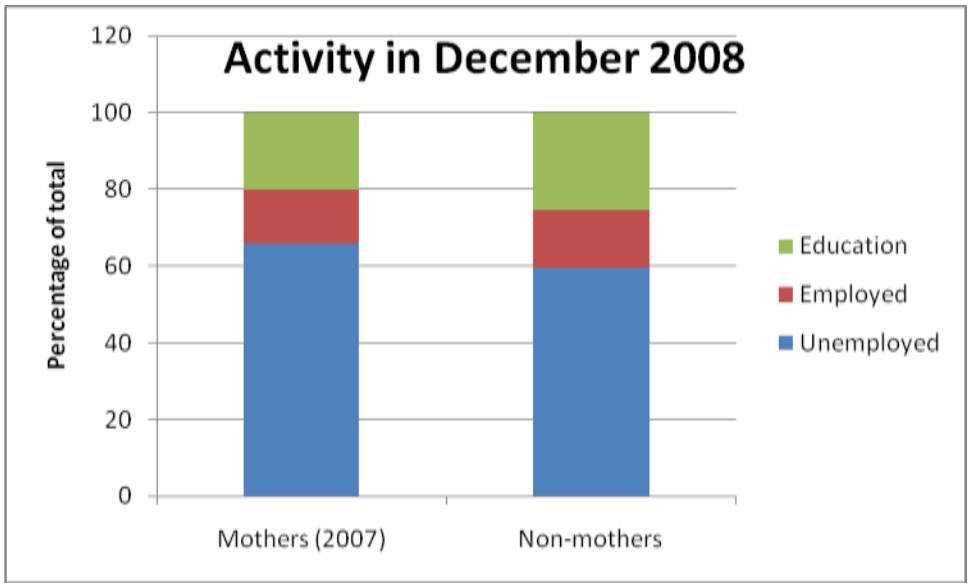

Figure 12: Activity at end 2008 for women who had children during 2007 versus other women

Methodology

This paper uses a probit model to assess whether fertility affects employment for young black women and if so, in which direction. Probability of unemployment in a specific year is regressed against generally accepted explanatory variables including education, number of income

earners per household, location, social grants received by the household, and then fertility, and the results are analysed. The specification is outlined below.

$$Pr(Y = 1|X) = \phi(\alpha + X'\beta + \varepsilon)$$

Where *Y* is unemployment at a specific time period, taking a probability dependent on a vector of explanatory variables, $X'\beta$. X_1 is the dummy for Grades 10 and 11, X_2 the dummy for Matric and higher, X_3 the dummy for Gauteng, X_4 the dummy for KwaZulu-Natal, X_5 the number of income earners per household, X_6 a dummy representing social grants received by the household and X_7 a dummy taking the value of 1 if the respondent is a mother living with the father of her child(ren). X_8 is the fertility variable, a dummy equal to 1 if the respondent had a child during 2007. α is the constant and ε the residual.

Education is represented by three dummy variables corresponding to Grade 9 and below, Grades 10 and 11, and finally a Matric certificate, following Lam, Leibbrandt and Mlatsheni (2008:16). Grade 9 and below was the omitted category. Education should be the most influential variable on unemployment probability and is expected to be strongly negative.

The survey took place in Gauteng, KwaZulu-Natal and Limpopo, and dummies are included for these locations, with Limpopo province as the omitted category. All three provinces are urbanised, however Gauteng and KwaZulu-Natal are significantly more urbanised than Limpopo. This could increase or decrease unemployment probability comparative to Limpopo – unemployment may be more likely if competition for work is very high (especially as the sample represents a particularly vulnerable group), or less likely if employment opportunities are more plentiful owing to greater development.

Number of income earners has a dual effect on unemployment probability – as employment is often facilitated by social networks, it should decrease unemployment probability directly. It

may also decrease probability indirectly, as an increase in number of income earners also increases the possibility of mother substitutes in the household, relieving the care burden on new mothers and freeing up more time for employed work (Safilios-Rothschild, 1977:360).

A dummy variable was also included for any social grants, excluding child support grants (which are considered endogenous), received by the household in which the respondent lived. The grant variable should be positively related to unemployment probability. Neoclassical labour theory suggests that grants increase probability of unemployment by increasing income (Bernheim and Whinston, 2008:188). Pensions formed the largest proportion (approximately 65%) of non-child support grants – in South Africa, work suggests that these grants allow individuals to increase search periods to match themselves to jobs more accurately, which would also increase unemployment probability (Posel et al, 2006:852).

Although only a small proportion of mothers indicated that they were living with the fathers of their children, a dummy variable was included for this. The expectation is that mothers living with partners have a lower burden of caring for children, which should decrease their probability of unemployment, similar to the number of income earners variable. These fathers have indicated some form of bond with their children; hence they are more likely to share costs of the children with the mothers. They provide a second income to the mother and child, which could increase probability of unemployment if mothers supply labour out of necessity rather than choice.

As outlined above, an inverse relationship between fertility and employment is expected. A dummy variable was included for children born in a specific year, which should increase unemployment probability with decreasing significance as time elapses between birth and current activity.

Y is the variable that will be changed in different regressions, in order to assess the changes in the effect of fertility on unemployment probability as time elapses after the birth. In the first

regression, the fertility variable was excluded to assess the impact of all other variables on probability of unemployment at the end of 2007. Next, probability of unemployment at the end of 2007 was regressed against the explanatory variables, including the dummy for children born during 2007. The same explanatory variables were then used to explain probability of unemployment in mid-2008, and finally at the end of 2008.

Empirical results

Table 5: Probit regression estimates

Independent variables	Pr(Unemployed end 2007), no fertility	Marginal effects, no fertility	Pr(Unemployed end 2007)	Marginal effects, end 2007
Location: Gauteng	0.239***	0.0933***	0.241***	0.0941***
	(0.0707)	(0.0275)	(0.0711)	(0.0277)
Location: KwaZulu-Natal	0.284***	0.112***	0.286***	0.113***
	(0.0787)	(0.0311)	(0.0791)	(0.0312)
Income earners p/hh	-0.104***	-0.0406***	-0.106***	-0.0416***
	(0.0333)	(0.0130)	(0.0336)	(0.0131)
Parents' education	-0.0831***	-0.0325***	-0.0837***	-0.0327***
	(0.0245)	(0.00956)	(0.0245)	(0.00959)
Education: Grades 10 and 11	-0.676***	-0.251***	-0.655***	-0.244***
	(0.139)	(0.0478)	(0.140)	(0.0487)
Education: Matric	-0.833***	-0.322***	-0.792***	-0.307***
	(0.135)	(0.0497)	(0.137)	(0.0508)
Social grants	-0.0689	-0.0268	-0.0587	-0.0229
	(0.0674)	(0.0262)	(0.0679)	(0.0264)
Live with partner	0.284***	0.113***	0.248**	0.0982**
	(0.0998)	(0.0396)	(0.102)	(0.0404)
Children born 2007			0.417***	0.165***
			(0.0921)	(0.0362)
Constant	0.711***		0.635***	
	(0.156)		(0.158)	

Observations	1 994	1 994	1 994	1 994
Pseudo-R^2	0.0417	0.0417	0.0494	0.0494

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Independent variables	Pr(Unemployed mid-2008)	Marginal effects, mid-2008	Pr(Unemployed end 2008)	Marginal effects, end 2008
Location: Gauteng	0.201***	0.0798***	0.160**	0.0613**
	(0.0689)	(0.0273)	(0.0679)	(0.0259)
Location: KwaZulu-Natal	0.211***	0.0841***	0.0969	0.0370
	(0.0776)	(0.0308)	(0.0766)	(0.0291)
Income earners p/hh	-0.0986***	-0.0393***	-0.0988***	-0.0380***
	(0.0321)	(0.0128)	(0.0304)	(0.0117)
Parents' education	-0.0865***	-0.0344***	-0.107***	-0.0412***
	(0.0238)	(0.00947)	(0.0239)	(0.00920)
Education: Grades 10 and 11	-0.702***	-0.269***	-0.539***	-0.210***
	(0.145)	(0.0520)	(0.148)	(0.0572)
Education: Matric	-0.860***	-0.332***	-0.653***	-0.241***
	(0.141)	(0.0511)	(0.145)	(0.0498)
Social grants	-0.0276	-0.0110	-0.00932	-0.00359
	(0.0665)	(0.0264)	(0.0661)	(0.0255)
Live with partner	0.381***	0.151***	0.0934	0.0355
	(0.103)	(0.0398)	(0.101)	(0.0380)
Children born 2007	0.320***	0.127***	0.151*	0.0570*
	(0.0903)	(0.0353)	(0.0910)	(0.0337)
Constant	0.854***		1.163***	
	(0.162)		(0.165)	
Observations	2 036	2 036	2 078	2 078
Pseudo-R^2	0.0476	0.0476	0.0294	0.0294

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Overall, the results are as expected in terms of coefficient signs and significance. Increasing fertility significantly increases unemployment probability, signalling the anticipated inverse fertility-employment relationship at least in the short-run amongst young black urban women in South Africa.

After one year, the correlation between unemployment probability (at the end of 2008) and fertility (during 2007) is greatly lessened and is significant only at the ten percent level, as seen in the fourth regression. This is in line with literature suggesting that most of the impact of fertility on employment occurs in the first year after birth for the short-run relationship (as opposed to the long-run impact of employment on fertility).

After each regression, the next column illustrates marginal effects evaluated at the sample means. Standard deviations are robust to correct for any heteroscedascity in the individual retrospective data. In the first regression, unemployment probability is assessed by factors excluding a fertility dummy variable. These are all significant at the one percent level, excluding social grants. The education variables have the greatest impact on unemployment probability as seen in the marginal effects regression for no fertility. Thus a Grade 10 or 11 level education decreases unemployment probability by about 25% relative to a Grade 9 level education, while a Matric level education decreases unemployment probability by about 33% relatively. Location is the next most important factor, with unemployment more probable in both Gauteng and KwaZulu-Natal relative to Limpopo. This indicates that competition for jobs at the sample level is higher in bigger, more industrialised cities.

The dummy variable for the respondent living with the father of her child has a positive coefficient, increasing unemployment probability by just over 11%, a fairly high explanatory impact. As fertility is omitted from this regression, some of its impact may be captured through this variable, in which case its explanatory impact would decrease after adding the fertility

variable in the third column. An increasing number of current earners per household decreases probability of unemployment, which implies the importance of networks in finding employment, i.e. that finding employment is more likely if some close friends or family are employed and can assist in finding work. A VIF test indicates no multicollinearity between the earners per household and partner variables. One possible explanation for these results is that living with a partner decreases the need or desire to find employment, as the partner may provide financial support. However, as the number of income earners per household increase, finding employment may become easier (for social network reasons) regardless of financial support, and so more women may move into employment.

Social grants did not increase unemployment probability, contrary to expectations, however the variable was not significant and had a very low impact (one percent). The fifth regression, in the Appendix, includes the endogenous child grants as part of the grants variable, and is highly significant with the expected (positive) coefficient sign. Of the 1 156 respondents receiving grants, approximately 70% were only receiving child grants, thus eliminating child grants in the main regressions probably led to the insignificant coefficient. Finally the education level of parents decreases probability of unemployment, but has the least impact of all explanatory variables.

The second regression adds a dummy variable for children born during 2007, with the same dependent and other independent variables. The first and most important result of this is that the regression improves, i.e. pseudo r-squared increases and log pseudolikelihood decreases (in absolute value), while all coefficients (except social grants) remain significant at the one or five percent level. This means that taking fertility into account helps to explain unemployment at an individual labour supply level. The impact of the other explanatory variables remains approximately the same, although the variable for living with a partner has decreased explanatory impact, as expected. Women who gave birth to one or more children during 2007 increased their unemployment probability by 16.5%, a higher impact than any explanatory variables barring education. This variable is robust at the one percent level of significance.

The sixth regression, in the Appendix, illustrates that the inverse fertility-employment relationship exists even if the fertility variable is restricted to a dummy variable equal to one if the respondent's first child was born in 2007 (thus excluding all children born in 2007 who were not their mother's first children). However, the variable is less significant (significant only at the ten percent level), probably because of the decreased number of children counted as part of the fertility variable under these new conditions.

All explanatory variables except children born during 2007 should have approximately similar impacts on unemployment probability across time, because they are exogenous explanations for unemployment at any time period. Therefore, changing the dependent variable to a later time period illustrates the effect of time on the fertility-employment relationship only. The prior expectation is that time will decrease the explanatory impact and significance of fertility in relation to unemployment probability (i.e. fertility will increase unemployment probability by a lower percentage, at a lower level of significance).

In the first column of the second table, the dependent variable is changed from probability of unemployment at the end of 2007 to probability of unemployment in the middle of 2008, i.e. six months later. The fertility variable remains for children born in 2007. The results are exactly as expected. All other variables (except social grants) remain significant at the one or five percent level; the fertility variable remains significant at the one percent level, but has a decreased impact on unemployment probability from 16.5% to 12.7%, as expected. Pseudo r-squared also decreases (although it is still higher than in the first regression, which excluded fertility altogether).

The fourth regression, with a dependent variable of unemployment probability at the end of 2008 and all other variables the same, is problematic. Only the household income earners, education of respondent and respondent's parents remain significant at the one or five percent level. The Gauteng location and fertility variables are also significant. However, this breakdown

in significance probably reflects larger macroeconomic conditions that affected unemployment probability to a greater extent than the factors analysed in the model, i.e. unemployment probability was affected much more by changes in labour demand than changes in labour supply at this time, thus the model is inappropriately specified. Nonetheless, the inverse fertility-employment relationship is still present, although significant only at the ten percent level and with a lower explanatory impact than previously, at just under six percent. This is in line with expectations regarding the relationship over time.

The results for the final regression may also be influenced by the sampling methodology of the dataset. The respondents were more likely to be unemployed at the time of data collection (during 2009), owing to the nature of the survey. Therefore, as the time period analysed approaches 2009, unemployment probability is likely to increase for reasons unrelated to the variables utilised within the model. This is another possible explanation for the unsatisfactory results of the final regression.

As a check, the same model was specified with children born during 2008 instead of during 2007, with the dependent variable remaining unemployment at the end of 2008. The regression estimates are included in the Appendix as the seventh regression; however, with this change in the fertility variable, fertility again becomes significant at the one percent level. All other variables remain significant or insignificant as in the previous regression. This simply illustrates that the fertility-employment relationship is fairly robust in the short-run, so that decreasing the time elapsed between childbirth and the dependent variable strengthens the relationship between fertility and employment.

Conclusion

Unemployment is arguably the most serious economic issue facing South Africa today. In order to deal with this issue, its determinants and related factors should be explored, especially where these differ between different groups of people. The country remains highly stratified,

and as is clear from inequality measures, these stratified groups have very different levels of access to labour markets and other resources.

Fertility is one subject that interacts with unemployment, yet has not been analysed much in this context in South Africa. However, literature on the fertility-employment relationship suggests a range of possibilities for the existing relationship as well as policies that may shift this over time. It is therefore only logical to introduce this relationship into the South African framework.

In this paper, the literature was reviewed to determine common characteristics and trends in the relationship. This was then applied to the South African context before the empirical component modelled the effect of short-term fertility on short-term unemployment probability. These regressions apply to a specifically young, black, urban cohort of women. The results are in line with other international studies of developing countries, in which fertility is inversely related to employment. However, the effect becomes insignificant after approximately one year, although unemployment remains proportionately higher for mothers than non-mothers. The speed of return to the labour market is also in line with research in developing countries that highlights female LFP after birth out of necessity rather than choice. This is also consistent with South African research indicating that vulnerability of women is increasing in the domestic labour market.

The empirical results confirm the hypothesis that fertility is inversely correlated with employment amongst young, black urban South African women. In fact, fertility has a highly significant and apparently strong effect on unemployment probability. This is in line with international research, suggesting that urban South Africa has attained the necessary level of economic development for a fertility-employment relationship. However, norms and government policies do not yet appear to mediate this incompatibility between motherhood and work, therefore the relationship is inverse. The literature implies that female identities are

still strongly linked to motherhood in South Africa, in accordance with the data used in this paper, which showed a high proportion of mothers relative to age and education.

These results imply that the fertility-employment relationship is not yet fully developed in South Africa, thus government action may affect this relationship in the future. It also implies that the South African context is comparable to international research, because the results were as expected from a review of international research.

Overall, the findings indicate that fertility is linked to employment in South Africa, that the two appear to be inversely related, and that the short-term relationship breaks down fairly quickly. In response to the original research question, the answer is yes, that having a child negatively impacts the employment prospects of young, black urban South African women, as expected originally.

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Appendix

Table 6: Probit regression estimates

Independent variables	Pr(Unemployed end 2007), child grants	Marginal effects, child grants	Pr(Unemployed end 2007), first child only	Marginal effects, first child only
Location: Gauteng	0.258***	0.101***	0.243***	0.0951***
	(0.0711)	(0.0277)	(0.0709)	(0.0276)
Location: KwaZulu-Natal	0.315***	0.124***	0.286***	0.113***
	(0.0791)	(0.0312)	(0.0789)	(0.0311)
Income earners p/hh	-0.102***	-0.0398***	-0.105***	-0.0412***
	(0.0333)	(0.0130)	(0.0334)	(0.0130)
Parents' education	-0.0719***	-0.0281***	-0.0825***	-0.0323***
	(0.0246)	(0.00961)	(0.0245)	(0.00957)
Education: Grades 10 and 11	-0.665***	-0.247***	-0.676***	-0.251***
	(0.140)	(0.0485)	(0.140)	(0.0481)
Education: Matric	-0.810***	-0.313***	-0.832***	-0.322***
	(0.137)	(0.0506)	(0.136)	(0.0500)
Social grants			-0.0680	-0.0265
			(0.0675)	(0.0262)
All grants	0.168***	0.0655***		
	(0.0600)	(0.0233)		
Live with partner	0.212**	0.0839**	0.269***	0.107***
	(0.101)	(0.0402)	(0.100)	(0.0398)
Children born 2007	0.250***	0.0985***		
	(0.0695)	(0.0275)		
First child born 2007			0.154*	0.0608*
			(0.0876)	(0.0348)
Constant	0.479***		0.689***	
	(0.162)		(0.157)	
Observations	1 994	1 994	1 994	1 994

Pseudo-R^2	0.0508	0.0508	0.0429	0.0429

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Independent variables	Pr(Unemployed end 2008), fertility during 2008	Marginal effects, fertility during 2008
Location: Gauteng	0.151**	0.0581**
	(0.0681)	(0.0260)
Location: KwaZulu-Natal	0.101	0.0386
	(0.0767)	(0.0291)
Income earners p/hh	-0.0952***	-0.0366***
	(0.0304)	(0.0117)
Parents' education	-0.105***	-0.0405***
	(0.0241)	(0.00926)
Education: Grades 10 and 11	-0.556***	-0.216***
	(0.149)	(0.0573)
Education: Matric	-0.667***	-0.245***
	(0.145)	(0.0496)
Social grants	-0.00206	-0.000792
	(0.0661)	(0.0254)
All grants		
Live with partner	0.0221	0.00849
	(0.103)	(0.0393)
Children born 2008	0.432***	0.156***
	(0.0935)	(0.0309)
Constant	1.143***	
	(0.165)	
Observations	2 078	2 078
Pseudo-R^2	0.0362	0.0362

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1