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ABSTRACT

Manufacturing Employment and Women's Agency: Evidence from Lesotho 2004-2014

This paper examines the impact of manufacturing employment on women's health and decision-making power within households in Lesotho. Under the US African Growth and Opportunity Act of 2000, the employment of women in ready-made garment (RMG) factories in new industrial zones greatly increased. Subsequent shocks to international demand for textile products created by the phase-out of the Multi-Fiber Agreement and the 2008 Financial Crisis temporarily reduced well-paid RMG work opportunities. Women residing closer to the industrial zones were particularly affected. These changes are exploited for identification of causal impacts. Employment in the RMG sector is found to substantially increase women's say in decisions about the allocation of household resources and own health.

JEL Classification: J13, J12, P0, P13

Keywords: Lesotho, manufacturing, trade, Africa Growth and Opportunities Act (AGOA), Demographic and Health Surveys, IPUMS census, World Bank Enterprise Surveys, Multiple Indicator Cluster Surveys (MICS), female labour supply, contraceptives, fertility, autonomy

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1 Introduction

This paper provides new evidence of the impact of women's employment in export-oriented textile manufacturing under the US African Growth and Opportunities Act (AGOA) on decision-making in poor households. Ready-made garment (RMG) exports grew rapidly in Lesotho after the signing of AGOA in May 2000 (Dowlah (2016)). Until this time, export of Lesotho's textiles had been circumscribed by the 1970s Multi-Fiber Agreement (MFA) (Goto (1989)). Under the first AGOA agreement, duty-free status on imports to the US from beneficiary countries was guaranteed until at least September 2008. This preferential trading agreement simultaneously created strong incentives for large-scale foreign direct investment in garment manufacturing facilities, and for national governments to invest in the new infrastructure necessary to host industrial zones (IZs). By 2012, Lesotho had become the largest Sub-Saharan African (SSA) exporter of garments to the US (Central Bank of Lesotho (2011)). The RMG industry is labour-intensive. Unskilled workers can be rapidly trained. For many women in Lesotho, RMG employment provided their first opportunity to earn money outside of agriculture.

The paper contributes to the sparse literature identifying causal impacts of manufacturing work on the agency of women in poor countries. The combined shocks to textile demand from the US during the 2008-09 Global Financial Crisis (GFC), and the gradual phase-out of the MFA together resulted in a large, temporary, decline in RMG employment in Lesotho. Because of the lack of other well-paid employment for women, these shocks to RMG demand provide an opportunity to examine the impact of a high-wage, formalised work environment on women's say in resource allocation in households and measures of women's health. A pseudo-panel spanning 2004-2014 is constructed to identify causal impacts of RMG employment on these outcomes. Women who reside closer to potential RMG employment are more likely to work in the sector. Exogenous variation in RMG employment propensities from the combination of distance between a woman's residence and the nearest IZ and these demand shocks is exploited for inference.

The RMG sector began in the early 1980s with investments from South Africa. These investments were facilitated by the Lesotho National Development Cooperation. Investors could circumvent sanctions on South Africa which otherwise prevented selling to the US and European markets (UNCTAD (2002), Steele (2002), Gibbon (2003)). By 2004, the RMG sector had become the main non-agricultural employer in Lesotho, engaged more

formal-sector workers than the government, and was the source of a majority of export revenue (Lall (2006), International Finance Corporation (2010)). Under AGOA, foreign direct investment in Lesotho increased substantially (Central Bank of Lesotho (2004), Central Bank of Lesotho (2005)). The sector is dominated by Taiwanese and South African-owned factories producing for the US market (Balchin and Calabrese (2019), World Trade Organization (2017)). As of 2017, about 82% of workers were women. In 2017, the RMG sector employed about 46 500 workers in Lesotho, down from a peak of 54 000 in early 2003 (Lesotho Ministry of Trade and Industry (2017)).

RMG production is concentrated primarily in the suburbs of Maseru, the national capital, and Thetsane, Mafeteng, Leribe and Mohale's Hoek. The Maseru zone remains the largest employer, likely because transportation costs for finished goods are lowest from this location. The proximity of the Maseru suburbs to the railhead leading to the South African sea port of Durban also lowers lag time between orders and deliveries.

Wages and working conditions in the RMG sector are strongly regulated in Lesotho. A child labour ban is enforced by the government. RMG sector workers are also generally unionized, and may have access to on-site childcare and healthcare (Gibbon (2003)). Factories operating in the IZs pay much higher wages both relative to local alternatives and relative to those paid in other RMG host countries including Vietnam and Bangladesh. In 2007, the average monthly earnings of an employee in the RMG sector was $US 103, and the minimum monthly earnings for a general textile worker in Lesotho was $US 93 (RMG Bangladesh (2016)). In 2007, annual GDP per capita was far lower: 846 current US$, a monthly equivalent of 71 US$ (World Bank (2022b)). Still, production costs were internationally competitive in the early 2000s. Eifert, Gelb, and Ramachandran (2005) calculated the labour costs per shirt produced in Lesotho in 2004 as 0.19 current US dollars, far under the 0.65 for South Africa and 0.29 for export processing zones in China. The minimum monthly earnings for a textile worker had risen to $US 138 by August 2018 (Al Mahfuz (2018)).

Evidence from other contexts suggests that government-sponsored industrial zones are not always successful at raising living standards. The number of such zones rose from 75 to 3500 in the world between 1975 and 2006. In general, these zones do not appear to develop the backward linkages which would help stimulate other forms of non-agricultural employment (see, for example, Warr (1989), Milberg and Amengual (2006)).

Cling, Razafindrakoto, and Roubaud (2016) show for Madagascar that wages were similar in textile-oriented export processing zones to other formal employment. Picarelli (2016) finds that only households in the top 10% of the earnings distribution increased expenditures as a result of the arrival of export processing zones in Nicaragua. In a comparative study of such zones in China, Nicaragua, Honduras and South Africa, McCallum (2011) finds those in Nicaragua to offer particularly poor wages and working conditions. As in many countries, the RMG firms operating in Lesotho benefit from tax advantages and from large government investments in water, electricity and transportation infrastructure.

There is little causal evidence relating women's employment in manufacturing to their decision-making power in households. Heath and Mobarak (2015) find that children obtain more schooling when opportunities for RMG employment increase in Bangladesh. Women marry later and delay childbearing. These findings are consistent with earlier descriptive studies for South Asia. Amin (2006) finds similar results in a comparative case study of Bangladesh, Vietnam and Egypt. White, Djamba, and Nguyen Anh (2001) attribute the fertility decline in Vietnam since the 1980s partly to industrialisation policies pursued under the *Doi Moi* programme of reforms.

The remainder of the paper proceeds as follows. Section 2 introduces the data to be employed and presents summary statistics. In Section 3, causal impacts of RMG employment are estimated using the pseudo-panel. Section 4 concludes.

2 Data and summary statistics

The Demographic and Health Surveys (DHS) present an opportunity to examine the impact of manufacturing employment on aspects of women's wellbeing which are not measured in firm-level surveys. These data comprise information about labour supply, anthropometric outcomes, fertility and household decision-making, collected from women aged 15-49. Although wage and working condition information is not included, the rich set of questions posed facilitates an investigation of how the arrival of manufacturing opportunities affected women's agency. DHS data have been employed to examine the correlation between a woman's decision-making power in her household and reproductive health in several contexts (see, for example OlaOlorun and Hindin (2014), Ghose, Feng, Tang, Yaya, He, Udenigwe, Ghosh, and Feng (2017)). Responses to questions about the

acceptability of violence from spouses have been used to examine the relationship between household wealth and violence in six SSA countries (Bamiwuye and Odimegwu (2014)).

There are now three DHS surveys spanning the large negative shock to demand for the textile exports of Lesotho (ORC Macro (2004), ICF International (2009) and ICF International (2014)). The first of these surveys was undertaken in the last quarter of 2004, the second in the last quarter of 2009 and January 2010, and the third in the fourth quarter of 2014. There are 7095 women included in the 2004 survey, 7624 in the 2009 DHS, and 6621 in the 2014 survey. The DHS sample frames are based on the 1996 and 2006 censuses. The Lesotho DHS surveys also include analogous modules for husbands and partners. Unfortunately, slightly different questions about children's school attendance were posed in the 2004 and 2009-14 surveys. Nevertheless, the impacts of RMG sector employment on household decision-making and women's health can be identified using these repeated cross-sections.

There are features of Lesotho's economy which suggest that the impacts of RMG employment on household resource allocation might be particularly great. Since the 1950s, a large fraction of men were employed in South African mines. They migrated away from their families for extended periods (see, for example, Gordon (1981), Crush and Dodson (2010)). Prior to AGOA, many households depended on remittances from these mine workers. The share of GDP from manufacturing rose from less than 10% in 1990 to nearly 25% by the year of the first available DHS survey, 2004. This is shown in Figure 1. This sector comprises food products and beverages, textiles, clothing, footwear and leather, and other manufacturing. The orientation of textile production towards the US market is unique amongst Lesotho's industries. Much of the non-textile exports of the country go to South Africa.

Coincident with the GFC and phase-out of the MFA, the contribution of manufacturing to GDP fell steeply during 2008-10. Even by 2014, this share was still below the 2004 level, about 12%. The 2009 and 2014 DHS surveys took place during this period. Despite the importance of the manufacturing sector, real GDP per capita at purchasing power parity did not fall with the negative shocks after 2008. This is shown in Figure 2. The post-2008 RMG shock did not affect all sectors.

The greatest increases in RMG employment during 1996-2004 occurred in Maseru and neighbouring districts with good road access to the railhead to South Africa. These

are districts containing post-AGOA IZs: Leribe, Mafeteng and Mohale's Hoek. This is shown in the map of Figure 3. Maseru district, which also contains the Thetsane IZ, is represented in the deepest red colour. In the mountainous and remote districts most distant from Maseru, RMG employment essentially did not increase after AGOA. No IZs were constructed in these districts. The geographic distribution of IZs suggests that new job opportunities for women under AGOA, and the effects of the post-2008 shock, would be geographically heterogeneous.

Census and firm-level data attest to the changes in employment possibilities associated with IZ arrival. The 1996 and 2006 IPUMS of Minnesota Population Center (2010) show that manufacturing employment increased substantially for women in urban areas where IZs had been placed. Data from the World Bank Enterprise Surveys for the Maseru district of Lesotho, undertaken in 2009 and 2016, show that RMG firms differ greatly from others in the nature of their jobs. These firms are much larger, undertake more worker training and spend more on health care of employees than do those in other sectors. These stylised facts are discussed in more detail in Data Appendix A.

The IPUMS and DHS data suggest a positive selection of women into RMG and manufacturing work in Lesotho. IPUMS summary statistics for women engaged in manufacturing and other sectors are presented in Panel A of Table 1, and those using the pooled DHS samples in Panel B. In the DHS data, women are coded as engaged in RMG work if they report that their occupation is: weaver, knitter, tailor, dressmaker, hatter, sewer, embroiderer, spinner or related workers. To be classified as an RMG worker, respondents must also report that they work either "for cash" or "for cash or kind", and that they do not work primarily for a family member. There were 39 respondents who reported their occupation as seamstress but were unpaid or obtained in-kind only pay, and 94 who engaged in unpaid seamstress work for family. These women were not coded as RMG workers.

The DHS surveys permit some distinction to be drawn between RMG workers who are factory employees and those who are self-employed. The self-employed likely comprise women who do not sew for IZs and potentially, some "dailies". Dailies seek casual RMG work at the gates of factories, and are otherwise unemployed. Because of the potential for dailies to self-classify as either self- or wage-employed, both women who report being employees and those reporting that they are self-employed are included in the definition of

RMG worker used in analyses. Differences between these RMG worker types are discussed in more detail in Data Appendix A.

In RMG and manufacturing sectors of other countries a majority of workers are young and unmarried. This is not the case in Lesotho (Panels A and B, columns (1)-(2) of Table 1). Manufacturing workers are slightly less likely to be married in the IPUMS data, although about 60% of both RMG and other workers are married or in partnerships in the DHS data (column (2)).

These data show that women in manufacturing and RMG work are significantly better-educated than those in other employment (column (3)). About 87% of RMG workers have completed primary school, versus 74% in other occupations. Women in RMG and manufacturing work also tend to live in urban locations and in smaller households (columns (4) and (5), Panels A and B). They are much more likely to have migrated to their current district of residence within the past ten years (Panel A, column (6)), but are not more likely to be *de jure* residents of the current household (Panel B, column (6)).

The DHS pseudo-panel shows the impact of the shock to US demand for RMG products during 2004-2014. Employment means are presented in Table 2, for IZ districts (Panel A) and for non-IZ districts (Panel B), separately by urban-rural location and for the periods before and after the crisis in RMG demand. The fraction of urban women currently employed was about 0.55-0.57 in IZ districts in both periods (column (1)), but the fraction of urban women engaged in RMG work fell substantially, by about 0.23 (Panel A, column (2)). In both years, non-IZ districts had much lower employment rates of urban respondents, about 0.43-0.48 (Panel B, column (1)). Urban RMG employment also fell in non-IZ districts between 2004 and 2009-14, but from a much lower level (column (2), Panel B). Agricultural employment of urban women was negligible in both periods, and across both IZ and non-IZ districts (Panels A and B, column (3)). Employment of urban women in unskilled services increased substantially coincident with the crisis in RMG demand (Panels A and B, column (4)).

The data for rural residents suggest similar employment trends to those for urban. These means are shown in columns (5)-(8) of Table 2. Although fewer rural residents had been engaged in RMG work in 2004, the decline in such employment is noticeable both in districts containing IZs and in hose without (Panels A and B, column (6)). Agricultural employment declined (column (7)), and unskilled service sector employment increased

during the crisis in RMG demand (column (8)).

Did urban women return to the countryside in response to the layoffs in the RMG sector after 2008? The historical record attests to substantial rural-urban migration, but suggests unidirectional flows (see, for example, Wilkinson (1983), Cobbe (2012) and Leduka (2012)). The one common question posed about migration in the DHS surveys does not suggest that *de jure* residence in a dwelling was significantly different in 2004 versus later years. In both periods, the fraction of non-*de jure* residents was minimal, at about 3-5%. These data suggest that reverse migration in response to RMG layoffs is likely relatively rare.

Increased control over income is likely important to a woman's ability to make decisions about her health and about the allocation of incomes to different items for household consumption. A large empirical literature suggests that women and men have different resource allocation priorities along many dimensions (Lundberg, Pollack, and Wales (1997), Fortin and Lacroix (1997)). Many models of the household also allow for heterogenous preferences amongst adults (McElroy and Horney (1981), Browning, Bourgignon, Chiappori, and Lêchene (1994), Chiappori, Fortin, and Lacroix (2002), Chiappori (1988)). Since the direct costs of unwanted pregnancies and poor health are primarily borne by women, greater own incomes may have a stronger effect than rising household incomes, or a woman's assets on her health decisions.

RMG work is associated with increased decision-making power of women in their households. This is shown in Table 3. In columns (1)-(5), the fraction of women having at least some say in each of four household resource allocation decisions is shown for women who do and do not work in the RMG sector. The five questions pertain to: Doctor visits (column (1)), visits to other households (column (2)), large purchases (column (3)), everyday purchases (column (4)), and what to cook (column (5)). For all outcomes save "large purchases", women engaged in RMG work report considerably more say in these decisions. Well-paid, reliable RMG work in formal workplaces may have very different impacts on decision-making power and health than the major alternatives, subsistence agriculture and informal services (Paxson and Mammon (2000)). In the absence of wage, household consumption or time use data, subjective responses may provide a measure of the impact of RMG employment on women's ability to direct household resources to her priorities.

There are substantial differences between women engaged in RMG work and others in their fertility and health behaviours. Theory suggests several channels through which fertility might fall. The opportunity costs of home production, in which children are intensive, rise as the labour market opportunities of women increase (Becker (1965)). The RMG-employed are much less likely to have born a child in the preceding two or five years (columns (6) and (7) of Table 3). Consistent with this, RMG-employed women are also much more likely than others to currently use effective contraception, defined by DHS staff as using IUD, condom, pill, foam or jelly (column (8)).

Aggregate data is also suggestive of a large decline in fertility coincident with the arrival of IZs. The total fertility rate, or the number of children a woman can be expected to bear in her lifetime, fell from 3.8 to 3.1 during 2000-2008 (World Bank (2018)). The findings suggest a potential demographic dividend in Lesotho from recovery in the RMG sector after 2014. A relatively quick rise in per capita incomes may occur because fertility declines rapidly, so decreasing the ratio of dependents to workers (Bloom, Canning, and Sevilla (2003)). A later consequence as these smaller cohorts age may be greater capital accumulation and improved productivity in other sectors (Mason and Kinugasa (2008)).

The means of column (8) are consistent with documented efforts of RMG employers in Lesotho to prevent both HIV transmission and to provide basic reproductive healthcare to employees (see, for example Maraisane (2016)). Women working in RMG factories may have obtained reproductive health services and HIV prevention information at their workplaces. Accessibility of contraceptives remains circumscribed in much of Sub-Saharan Africa. Creanga, Gillespie, Karklins, and Tsui (2011) show that, across the countries of the continent, modern contraceptives are used by less than half of women who wish not to become pregnant, and by far less women in the first household income quintile than in the fifth.

Body weight and height is measured for half of DHS respondents in each round. From these two measures the Body Mass Index (BMI) can be calculated. The fraction of women having a BMI below the underweight cutoff of 18.5 or less is about 0.07 for those engaged in RMG work, but about 0.14 for those outside (column (9)). This large difference in the incidence of underweight suggests that women engaged in RMG work might have access to improved nutrition.

Both violence from partners and gender-based violence are major problems in Lesotho.

Extractive motives for spousal violence might increase because women have greater earnings. Eswaran and Malhotra (2011) show that the incidence of violence in India depends partly on the autonomy of the wife, and that this conditional association is positive. Similarly, Heath (2014) finds a positive conditional correlation between employment and violence in Dhaka, Bangladesh. In a 2003 randomised survey of women 18-35 in Lesotho, 25% reported that they had been forced for sex (Brown, Bloem, and Thurman (2006)). Information on actual spousal violence is not collected in the Lesotho DHS surveys.

In the DHS, women are asked to report the acceptability of a partner beating his wife in five different hypothetical situations. The responses suggest that a woman's decision-making power in her relationship might be substantially improved by RMG work. Responses are compared across RMG- and non-RMG-employed women in Table 4. The five situations considered in DHS interviews are: Goes out without permission (column (1)), argues with her partner (column (2)), refuses sex (column (3)), burns the food (column (4)) and neglects the children (column (5)). For all hypothetical situations, women are significantly less likely to report that they find beating acceptable if employed in the RMG sector.

3 Estimation

Both endogeneity and mismeasurement concerns suggest an instrumental variables strategy. Even if employment levels in the RMG sector are largely determined by factors beyond the control of potential employees or the government, time-varying unobservables likely confound inference from OLS estimates. Levels of RMG employment may be correlated with pre-existing factors which determined the placement of IZs around the country, and with person-specific unobservables. Women's decisions to apply for RMG employment are likely conditioned by their current home situations and also by anticipated reactions of partners to their working in this sector. There may also also be multiplier effects from the spending of RMG wages either close to IZ locations or in one's neighbourhood of residence. For these reasons, estimation accounting for the potential endogeneity of RMG sector employment is necessary for identification of causal impacts.

Estimation accounts for the potential endogeneity of RMG sector employment by exploiting GIS information on household and IZ locations and the negative post-2008

shock to demand for textiles produced in Lesotho. Women residing closer to IZs had greater RMG employment propensities prior to the GFC and elimination of the MFA. For these women, the net benefits of RMG employment, measured as earnings net of transportation costs, would be relatively high. Demand shocks had more negative impacts on RMG employment propensities of women resident closer to IZs. This distance is likely to be accurately measured.

Attenuation bias due to misclassification of occupations may also be a concern in OLS estimation. DHS respondents are asked to describe both the type of employer and what they produce in some detail. The ability of interviewers and interviewees to communicate about employment may be important to the quality of the resulting occupational codes. The recoding of written responses into standard ISCO-88 two-digit codes involves coder discretion. Instrumentation for RMG employment may also help reduce any bias from measurement error.

3.1 Firststage regressions

For individual i in location c at time t, the RMG employment propensity can be predicted using the following firststage regression:

$$\begin{aligned} RMG_{ict} &= \beta_0 + \beta_1 LNKM_{ict} * AFTER_{ict} + \beta_2 LNKM_{ict} \\ &\quad + \beta_3 AFTER_t + \beta_4 AGE_{ict} + \beta_5 PRIMED_{ict} + \beta_6 TOTKID_{ict} \\ &\quad + \beta_7 MIGRANT_{ict} + \beta_8 URBAN_{ict} + \lambda Y2014_t + \cdots + \mu_c + \epsilon_{ict} \end{aligned}$$

Estimation exploits the shock to demand for textiles induced by the end of the MFA, and the subsequent GFC. The variable AFTER takes the value one if the survey interview is 2009 or 2014, and zero otherwise. The continuous variable LNKM is the natural log of the distance between respondent i's home and the nearest IZ. Locations of residences are reported by the DHS to within two kilometres in urban and five kilometres in rural areas. Because of travel time and cost, those residing further from IZs will be less likely to work in the RMG sector. The interaction between this distance term and the variable $AFTER$ forms the instrumental variable. The marginal respondents in IV estimation are women residing a given distance from the nearest IZ, whose probabilities of doing RMG

work change from the 2004 to post-2008 period. A dummy for 2014 is also included, as are dummies for month of interview, urban-rural and district fixed effects (μ_c).

Socio-economic controls in the full specification are: Age, dummies for the completion of primary education and marital status, children born as of five years ago and *de jure* residence of dwelling ($MIGRANT$). Dummies for household electricity, piped water and improved sanitation provisions are also included.

Primary sampling unit (PSU)-level controls included in the preferred specifications comprise: Land slope (rise over run), the DHS night lights composite index and annual and rainfall (in centimetres) in 2000.

The exclusion restriction will only be valid if general economic impacts of the post-2008 shocks are not correlated with the instrument. The GFC had negative impacts on remittances of workers from South Africa, diamond exports, and domestic manufacturing (Central Bank of Lesotho (2010)). Revenue from the Southern African Customs Union (SACU) decreased markedly (African Development Bank (2012)). Several popular press articles document the effects of this economic downturn on spending patterns (see, for example, Lesotho Times (2009), Lesotho Times (2010)). This change in the general economic environment may have influenced the behaviour and perceptions of DHS respondents. However, the general impacts of the GFC are plausibly uncorrelated with the costliness of travelling to an IZ from home, as proxied by the distance measure. General impacts of the post-2008 shocks are arguably captured in the "AFTER" variable.

Also important to the validity of the instrument is the idea that RMG jobs in IZs remained similar in pay and working conditions before and after the demand shocks. Because of AGOA rules, strong government regulations and union presence, firms could not easily absorb these shocks by altering job descriptions (Industrial Union (2012), Keletso (2015)). The nature of firm output could also not be quickly modified for sales to alternative markets. The types of garments being produced were largely determined by contracts signed before the demand crisis with companies such as Nien Hsing, supplying the US brands including The Gap, Reebok, Levi's and Walmart (see, for example, NH Jeans (2009)).

The data suggest that the post-2008 shock did not generally have different impacts on respondents closer to IZs than on those further away. The conditional association between the instrumental variable and other socioeconomic outcomes of respondents and

their children is examined in Data Appendix A. To summarise, these analyses support the conjecture that the instrumental variable only affects women's outcomes through RMG employment propensities. Household survey data from 2000 also suggests that population characteristics in future IZs were not observably different prior to the construction of factory shells. Male employment propensities, as captured in DHS men's modules, also do not appear to be endogenous to the instrument.

The instrument is a strong predictor of the endogenous variable, RMG employment propensities. The results are presented in Panel A of Table 5. Women residing closer to IZ locations have greater propensities to be engaged in RMG employment, as shown by the negative and statistically significant coefficient of the variable $LNKM$. The interaction term between distance to the nearest IZ and AFTER strongly predicts RMG employment of DHS respondents in the pseudo-panel. This holds in specifications which control for a woman's socioeconomic characteristics, and also for PSU-specific infrastructure, geography and climate variables. The addition of these controls has little impact on the size or significance of the instrumental variable. In the preferred specification, the F-statistic of the instrumental variable is about 30.

The main specification can be described as follows:

$$\begin{aligned} OUTCOME_{ict} &= \beta_0 + \beta_1 \widehat{RMG_{ict}} + \beta_2 AFTER_t + \beta_3 LNKM_{ict} \\ &\quad + \beta_4 AGE_{ict} + \beta_5 PRIMED_{ict} + \beta_6 TOTKID_{ict} + \beta_7 MIGRANT_{ict} \\ &\quad + \beta_8 URBAN_{ict} + \cdots + \mu_c + \lambda Y2014_t + \epsilon_{ict} \end{aligned}$$

The outcomes examined comprise both objective and subjective measures. The objective outcomes comprise: The probability that a women is using effective contraception at the time of interview, births in the previous two and five years, respectively and the probability of having a BMI below 18.5, the underweight cutoff. The first set of subjective outcomes examined relate to a woman's perceived say in the making of four household decisions. These decisions refer to: Her own health, everyday household purchases, large household purchases and visits to other households. Her beliefs about the acceptability of spousal violence in the following five circumstances are then examined: Goes out without permission, argues with her spouse, refuses sex, burns the food and neglects the children. These subjective outcomes are suggestive of the prevailing culture of gender relations

between partners.

3.2 Decision-making power and women's health

RMG work has strong positive causal impacts on a woman's self-reported say in her own health decisions, and other decisions about resource allocation within households. These results are presented in the upper panels of Table 6. Here estimation is limited to women residing with a partner or spouse. The OLS and IV specifications suggest both non-pooling of household resources and the increase in decision-making power that women obtain from RMG work. Coefficients are generally larger in IV than in OLS specifications, but both suggest positive impacts. The inclusion of control variables hardly alters the signs or significance of the coefficients. RMG employment appears to have positive and statistically significant causal impacts on a woman's say in decisions about her own health, visits to friends and family, large household purchases and everyday household purchases. The results suggest that household consumption and savings patterns are changed by the presence of this high-paying sector.

The IV estimates generally suggest larger impacts than do the OLS. One potential explanation for this is that the variable "RMG" includes some textile workers not employed in IZs, and excludes some women employed in these zones whose occupations are not captured in this variable. The DHS data do not include industry classifications or information on the size of employer. This means that measurement error in the RMG variable may be causing attenuation bias in OLS coefficients. Since RMG workers might be expected to be more empowered than other workers, positive selectivity into RMG employment is less likely to explain differences in coefficient sizes. If, however, women with more education can choose between government and RMG jobs, those observed in RMG work might not be positively selected *ceteris paribus*.

Consistent with RMG employment raising the opportunity cost of children, both the basic OLS and IV specifications suggest significant impacts on fertility decisions of women. These findings are presented in the lower panels of Table 6. Births in the previous two years and the previous five years are causally reduced by RMG employment. RMG employment increases the probability that a woman is using effective contraception by about 0.32. The lack of sensitivity of the IV specifications to the inclusion of a full set of socio-economic controls and time-varying PSU level controls is reassuring.

RMG work is not, however, found to have a significant impact on the probability that a woman has a low BMI. For this outcome, sample size is reduced by half, because only this fraction of respondents were weighed and measured. In the preferred specification of column (6), the F-statistic on the firststage is 16. This suggests that the lack of observed causal impact in this smaller sample is not due to weakness of the instrument in the firststage regression. Although RMG workers are less likely to be underweight than others, this difference is not caused by employment in the sector. Those who obtain RMG employment are potentially healthier than those who do not.

The findings are consistent with evidence from other contexts that high-paying employment for women alters resource allocation decisions in households. Beegle, Frankenberg, and Thomas (2001) find a strong correlation between socioeconomic measures of a woman's decision-making power and decisions taken about childbirth. In the Indonesian context, Beegle *et al.* show that assets of a woman at the time of marriage and her education level relative to her husbands' are strongly correlated with the location of a child's birth and with the type of health care accessed prior to delivery. Anderson and Eswaran (2009) show theoretically why working for money outside the husband's farm should have an even larger impact on female autonomy than does a woman's assets. They find evidence for this using data from Bangladesh. Basu (2006) shows theoretically that the power balance in a household may depend endogenously on resource allocation decisions already taken, in a context in which the initial power balance between husband and the wife is important.

These findings might be important for improving women's reproductive health in SSA, where women continue to have relatively little control over their fertility (see, for example, Stephenson, Baschieri, Clements, Hennink, and Madise (2007) , Khan, Mishra, Arnold, and Abderrahim (2007), Mccurdy, Schnatz, Weinbaum, and Zhu (2014)). Across the DHS surveys for SSA countries, contraceptive use rates amongst women who report that they do not wish to bear a child are generally less than 20%. More educated women appear to be better able to control their fertility (see, for example Shapiro and Tambashe (1994) for Kinshasa Zaire, Ainsworth, Beegle, and Nyamete (1996) who show a strong conditional correlation for fourteen African countries). The combination of high-paying RMG work and workplace health campaigns and clinics may be important channels through which contraceptive use is increased.

The history of the RMG sector in Lesotho suggests that trade agreements may induce female labour force participation to follow a different pattern with economic growth than has been the case in non-communist countries. In now-advanced countries, previous increases in the earnings power of men, and changes in the composition of labour demand first tended to draw women out of the labour force. For countries with middle-income status, female participation levels have historically been lower than those in poorer or richer contexts (Goldin (1994)). A demographic dividend of lower fertility might be quickly reaped when export-oriented manufacturing so substantially and quickly raises the potential earnings or women.

3.3 Attitudes to violence between partners

The DHS data provide other evidence that RMG work importantly increases women's decision-making power in their households. Women employed in the RMG sector are much less likely to report that beating by a partner is justified in the five circumstances considered in the DHS surveys, *ceteris paribus*. The results are shown in columns (1)-(6) of Table 7. Both OLS and IV specifications suggest that the relationship between RMG employment and acceptance of violence is negative. In the preferred IV specification of column (6), RMG employment is found to reduce the reported acceptability of spousal violence in the situations of going out without informing a spouse, arguing with a spouse, refusing sex and burning food. Only for the outcome "neglects children" is no statistically significant impact of RMG employment found.

4 Conclusions

This paper examines the impact of a new manufacturing sector which emerged under AGOA on the decision-making power of women in their households. After 2000, the RMG sector became one of the largest and best-paying employers of women in Lesotho. The post-2008 shock to the employment of workers in this sector is exploited to identify the impact of this work on women's say in household decisions, health, fertility and attitudes to violence from partners. Proximity to RMG factories and the negative shock to demand for Lesotho-produced textiles caused by the end of the MFA and the Financial Crisis are combined for inference. RMG work appears to change the opportunity cost of time spent

raising children and to significantly increase women's say in household resource allocation.

Women employed in RMG work change their health behaviours. They increase contraceptive use and decrease fertility. The reduction in fertility resulting from RMG employment is also potentially suggestive of the lack of use for children's labour outside of agriculture. In much of SSA, fertility rates remain very high and job creation has failed to keep pace with increases in educational attainment (Caldwell and Caldwell (2002)). A reduction in numbers of children born may facilitate greater investments in the human capital of each child.

Well-paid opportunities for women may impact cultural norms about the roles of partners. Women report less tolerance of potential violence from partners as a result of working in RMGs. The finding is consistent with Aizer (2010) who documents how a rise in relative wages of women in California reduced hospital admissions for injuries attributable to male partners. The nature of partnership formation may change as a result of women having greater potential earnings. The improvements in decision-making power resulting from RMG employment may reduce the probability that children grow up in violent households.

The natural experiment provided by AGOA and the Lesotho government's creation of IZs will likely have further impacts on living standards which cannot be observed in the DHS. Panel data with detailed information about terms of contracts, job transitions and household consumption and income would facilitate research into the long-run impact on the population of hosting this sector. The creation of new firms through backwards and forwards linkages with RMG factories could also be explored with firm-level data. These types of analyses could help quantify some of the multiplier effects of a unique, large and ongoing policy intervention in one of the world's poorest countries.

Data Appendix A

A1 Combined World Bank Enterprise Surveys 2009-16

In both 2009 and 2016, the World Bank undertook Enterprise Surveys in the Maseru district of Lesotho (World Bank (2022a)). RMG sector firms can be distinguished as those reporting that the sector of operation is "garments" or "textiles". About 18% of firms surveyed in the combined sample are RMG. Other firms surveyed are mainly in different manufacturing industries or retail (30%). Managers of firms were asked to respond to a series of questions about the capitalisation, employment structure, sales and regulatory environments facing their firm. Responses of managers to questions about employees of firms are compared across RMG and other sectors in Table 8.

Amongst the firms surveyed, RMG firms have many more full-time employees (column (1)), are much more likely to engage in pre-employment health checks (column (2)), are much more likely to have trained their full-time employees in the previous year (column (3)), and are much more likely to distribute free condoms and have anonymous HIV testing (columns (4) and (5)). The managers of these firms also report that high absenteeism due to illness, family reasons and HIV is a problem for the firm (columns (6)-(8)). RMG firm managers are also more likely to report that they produce HIV prevention messages. Their firms spend more per full-time employee on HIV prevention. However, for these two outcomes, differences in means are not statistically different at the 5% level (columns (9) and (10)).

A2 1996 and 2006 IPUMS census data samples

The 1996 and 2006 census samples from the IPUMS of Minnesota Population Center (2010) provide information about RMG employment prior to the founding of the IZs under AGOA, and about how their construction impacted labour markets. Although only occupation information is collected in 1996, and only basic industry information in 2006, the association between IZ presence and the nature of men and women's employment can be examined. The sample is restricted to census respondents aged 15-49. Employment and sector of industry information can be related to the eventual presence of IZs. This is done in Table 9. Prior to the introduction of the IZs in five urban areas of Lesotho, there was little to distinguish these locations from other urban locations in the country.

Women's employment did evolve differently in urban areas of IZ districts than in other districts of Lesotho. This is shown in column (1) of Table 9. Whereas in 1996, there was no difference in employment across these two district types (Panel B), employment grew by about 0.03 more in urban areas of IZ districts during 1996-2006 (Panel B, Panel C). This is consistent with higher-paying IZ jobs drawing urban women from home production into market work. There was also some RMG employment of urban women in 1996, before the advent of the IZs. This is shown in column (2) of Panel A of Table 9. Jobs as spinners, weavers, knitters, dyers, tailors, dressmakers and related workers are coded as RMG work. By this definition, about 8% of urban women in future IZ districts were employed in RMG-type work, including as seamstresses. The 2006 IPUMS data show that more than one fifth of urban women were engaged in manufacturing in IZ districts. This level is twice that of non-IZ districts.

The IZs of Lesotho had much greater impacts on urban women's employment than on men's. In 1996, men's employment levels did not differ across future IZ and non-IZ urban areas (Panel A, column (3)). This was also the case in 2006 (Panel B, column (3)). Less than 1% of urban men were engaged in the RMG sector in 1996 (Panel A, column (4)). In 2006, the fraction of urban men engaged in any type of manufacturing was about 0.09 in IZ districts, and only about 0.03 in non-IZ districts (Panel B, column (4)).

The placement of IZs close to urban areas meant that these factories affected employment in rural areas comparatively less. RMG employment of rural women in future IZ districts was less than 2% in 1996 (column (6)). Almost no rural men were engaged in RMG work (column (8)). By 2006, about 4% of rural women were engaged in manufacturing employment in IZ districts, but less than 2% of rural men.

A3 Pre-AGOA socioeconomic comparisons

Survey data provides inference about the pre-AGOA labour market situation in Lesotho. The Multiple Indicator Cluster Survey (MICS) 2000 contains district codes which allow the future locations of IZ factories to be compared to those which did not eventually host the RMG sector. The results of simple OLS regressions explaining socioeconomic outcomes as a function of a dummy for future IZ location and controls are presented in Table 10.

The specifications show that socioeconomic characteristics of urban women resident in future IZ districts were not observably different in 2000 from those which would not host IZs. Regressions explain socio-economic outcomes as a functions of a dummy for the future presence of an IZ in the district and the age of a woman. The coefficient on the IZ dummy in a regression explaining the total number of children born by a woman aged 15-49 is not statistically significant at the 10% level (column (1)). Numbers of a woman's children who have died is similar identical across future IZ and non-IZ locations (column (2)). The fraction of respondents without secondary schooling, who had ever heard of AIDS and who were working at the time of the MICS were also very similar across future IZ and non-IZ districts in 2000, *ceteris paribus*.

A4 The instrumental variable and socio-economic outcomes of women, households and children under 60 months

A major concern for identification is that the combined GFC and MFA shock had greater impacts on households not engaged in RMG work but living relatively close to IZs. One way to assess this possibility is to examine how socioeconomic outcomes of respondents and their children vary with the instrument. The conditional association between this instrument and these outcomes should not be strong if the exclusion restriction holds. The specification of column (3) of Table 5 can be used to assess these correlations.

The data do not suggest that the instrument is strongly conditionally correlated with socioeconomic outcomes of women or their households. This is shown in Panel A of Table 11. Neither the probability that a woman is engaged in work outside of the family (column (1)) nor in non-family agriculture (column (2)) is strongly conditionally associated with the instrument, *ceteris paribus*. The conditional association between the instrument and the probability that the household is in the bottom 40% of the DHS wealth index is also not statistically significant at the 10% level (column (3)). This index comprises major household assets and access to utilities, and may be considered a reasonably proxy of the living standards of household members.

Girls do not generally gain in stature after about age fifteen. For this reason, the instrumental variable should not be conditionally correlated with this anthropometric outcome. This appears to be the case (Panel A, column (4)).

The lengths and weights of children aged less than 60 months were measured by specially-trained DHS staff. Stunting is defined, using the definition of the World Health Organization, as having height-for-age of two standard deviations or more below the median for a child's age and sex. This is considered the best measure of the nutrition and disease environment facing a child in their lifetime (see, for example, de Onis and Branca (2016)). About 32% of children are stunted in the combined sample. Wasting and underweight are similarly defined with respect to the standardised child growth charts. Wasting refers to particularly low weight for height and underweight to low weight-for-age. About 3% of the sample is wasted, and about 17% underweight.

The anthropometric outcomes of children do not appear to be strongly associated with the instrument. Results for these outcomes are shown in columns (1)-(3) of Panel B. Despite the high levels of nutritional deprivation in these data, the post-2008 shock does not appear to have more effect at locations closer or more distant from an IZ.

There does appear to be a slightly stronger association between the instrument and the probability that a child has been immunized against measles. A child is coded as immunized if DHS staff observe this on the vaccination card or the mother reports this to the interviewer. Levels of polio, BCG and DPT immunization remained in the 90-95% range throughout the period. In contrast, only about 72% of children in this age range were immunized against measles in this combined sample. This fraction did not increase during 2004-14. The regression result presented in column (4) of Panel B does suggest a slight conditional correlation, statistically significant at the 10% level, between the probability of having this vaccination and the instrument. Children residing further from IZ locations may have been slightly less likely to obtain a measles vaccination after the post-2008 shocks.

Another potential concern for interpretation of IV results is that of asymmetric impacts of job gain or losses on decision-making power, say due to endowment effects: Losing a job might affect outcomes differently than obtaining one. The data do not permit direct testing of this possibility. However, because identification is not derived from following individuals through a period of RMG job loss, any concern that IV specifications reflect endowment effects should be mitigated.

The available data do not readily permit analysis of pre-trends in the period after IZ introduction, but before the post-2008 shock. Only one DHS survey took place prior to

the GFC shock and MFA expiry. Similarly, the data do not permit analysis of the predictive power of the distance measure before and after the construction of IZs. The 2006 IPUMS sample includes sub-district (constituency) geographic divisions, but the 1996 data permit only district and rural-urban divisions to be distinguished. For this reason, the IPUMS data cannot readily be used to assess the relationship between the instrument and socio-economic outcomes.

A5 DHS Men's survey

The DHS men's survey can be used to examine the plausibility of an identifying assumption that RMG employment does not affect men's employment. The interaction term between distance to the nearest IZ and the AFTER dummy should predict only RMG employment propensities of women and not the labour supply of their partners. The results suggest that the identification strategy implemented in the first stage, the interaction term between distance to the nearest IZ and AFTER, is not strongly conditionally associated with men's employment. These results are shown in Table 12. Men do not appear to change their work behaviour in response to shocks to employment in the RMG sector.

The men's data also do not suggest that the shock from the MFA and GFC had the same effects on manufacturing activities in which men tended to be concentrated. The probability that a partner works in manufacturing is not conditionally correlated with the instrument in any multivariate specifications. These results are shown in Panel A of Table 13. In Panel B, the lack of conditional association between the instrument and a man's engagement in agricultural or unskilled labour is shown.

A6 Differences amongst RMG workers

The characteristics of RMG workers who report themselves to be self-employed differ substantially from those who are employees. A comparison of means of the socio-economic characteristics of these workers is presented in Table 14. At the mean, the self-employed are more than four years older (column (1)), and much more likely to be married (column (2)). Although they are equally likely as the wage-employed to have completed primary school (column (3)), they are more likely live in rural areas (column (4)), live in larger households (column (5)), and have more children (column (6)).

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Table 1: Socio-economic characteristics of women in manufacturing and other sectors, Lesotho

	Age	**Married**	**Completed primary**	**Rural**	**Hhld size**	**Geographic mobility**[a]
	(1)	(2)	(3)	(4)	(5)	(6)
PANEL A: IPUMS 2006						
						Migrated last 10 yrs
Manufacturing						
	29.9329	0.5259	0.8666	0.3183	6.0034	0.5534
	(0.118)	(0.008)	(0.005)	(0.008)	(0.040)	(0.008)
No.obs.	3845	3845	3845	3845	3845	3845
Other employment						
	31.9351	0.4887	0.7415	0.6533	6.5520	0.3737
	(0.088)	(0.005)	(0.004)	(0.005)	(0.024)	(0.005)
No.obs.	11106	11106	11106	11106	11106	11106
Difference						
	-2.0888***	0.0338***	0.1295***	-0.3403***	-0.5574***	0.1841***
	(0.166)	(0.009)	(0.008)	(0.009)	(0.048)	(0.009)
No.obs.	14873	14873	14873	14873	14873	14873
PANEL B: DHS 2004-2014						
						Not *de jure* hhld resident
RMG						
	30.9101	0.5812	0.8632	0.3587	4.3167	0.0276
	(0.248)	(0.016)	(0.011)	(0.016)	(0.086)	(0.005)
No.obs.	956	956	956	956	956	956
Other employment						
	31.6496	0.6020	0.7387	0.6118	5.3698	0.0408
	(0.103)	(0.006)	(0.005)	(0.006)	(0.031)	(0.002)
No.obs.	7596	7596	7596	7596	7596	7596
Difference						
	-0.3662	-0.0218	0.1299***	-0.2912***	-1.2432***	-0.0122*
	(0.291)	(0.016)	(0.014)	(0.016)	(0.088)	(0.006)
No.obs.	8414	8414	8414	8414	8414	8414

Notes: IPUMS 0.1% census samples of April 1996 and 2006 and DHS 2004, 2009 and 2014. Women aged 15-49 are included. Standard errors are in parentheses. [a] Migration in the IPUMS refers to leaving a district. The DHS surveys pose few questions about migration. Common to all DHS surveys is the question regarding *de jure* residency of the interviewed household.

Table 2: Employment means for women in Lesotho 2004-2014

	Urban				Rural			
	Employed	**Works in RMG**	**Works in agri-**	**Works in unskilled services**	**Employed**	**Works in RMG**	**Works in agri-**	**Works in unskilled services**
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
PANEL A: IZ districts								
2004								
	0.5650	0.2981	0.0156	0.0211	0.3331	0.0533	0.1769	0.0161
	(0.014)	(0.013)	(0.003)	(0.004)	(0.008)	(0.004)	(0.007)	(0.002)
2009 and 2014								
	0.5526	0.0731	0.0205	0.1514	0.2970	0.0190	0.0936	0.0843
	(0.009)	(0.005)	(0.003)	(0.007)	(0.006)	(0.002)	(0.004)	(0.004)
Difference								
	-0.0123	-0.2250***	0.0049	0.1303***	-0.0361***	-0.0343***	-0.0833***	0.0682***
	(0.017)	(0.011)	(0.005)	(0.011)	(0.010)	(0.004)	(0.007)	(0.005)
No.obs.	4102	4102	4102	4102	8751	8751	8751	8751
PANEL B: No IZ districts								
2004								
	0.4268	0.0691	0.0556	0.0293	0.3325	0.0377	0.2133	0.0306
	(0.018)	(0.009)	(0.008)	(0.006)	(0.009)	(0.004)	(0.008)	(0.003)
2009 and 2014								
	0.4781	0.0399	0.0156	0.1351	0.3054	0.0130	0.1341	0.0707
	(0.013)	(0.005)	(0.003)	(0.009)	(0.006)	(0.001)	(0.004)	(0.003)
Difference								
	0.0513*	-0.0292**	-0.0400***	0.1058***	-0.0271**	-0.0247***	-0.0792***	0.0401***
	(0.029)	(0.012)	(0.008)	(0.019)	(0.011)	(0.003)	(0.008)	(0.005)
No.obs.	2316	2316	2316	2316	8342	8342	8342	8342
PANEL C: Difference-in-Difference (PANEL A-PANEL B)								
	-0.0636	-0.1958***	0.0449***	0.0246	-0.0090	-0.0096*	-0.0041	0.0281***
	(0.042)	(0.026)	(0.012)	(0.027)	(0.015)	(0.005)	(0.011)	(0.007)
No.obs.	6418	6418	6418	6418	17093	17093	17093	17093

Notes: DHS surveys 2004, 2009 and 2014. Industrial Zones are here defined as Maseru (Thetsane), Leribe, Mafeteng and Mohale's Hoek. Standard errors are in parentheses.

Table 3: Household say and health means by RMG employment, Lesotho 2004-2014

Woman has at least some say in decisions about ...						**Births last 2 years**	**births last 5 years**	**Uses effective contra-ception**	**BMI $\leq$ 18.5**
	Doctor visits	**Visits other hhlds**	**Large purchases**	**Everyday purchases**[a]	**What to cook**[b]				
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
RMG employment									
	0.7747	0.7570	0.7255	0.9021	0.9636	0.2063	0.4942	0.5141	0.0684
	(0.018)	(0.018)	(0.019)	(0.014)	(0.011)	(0.015)	(0.023)	(0.016)	(0.012)
Not employed in RMG sector									
	0.7308	0.6475	0.6961	0.8435	0.8755	0.2871	0.6403	0.3639	0.1351
	(0.004)	(0.004)	(0.004)	(0.004)	(0.005)	(0.003)	(0.005)	(0.003)	(0.003)
Difference									
RMG	0.0439***	0.1095***	0.0294*	0.0586***	0.0881***	-0.0809***	-0.1461***	0.1503***	-0.0667***
	(0.017)	(0.018)	(0.017)	(0.015)	(0.017)	(0.014)	(0.023)	(0.014)	(0.014)
No.obs.	13285	13286	13286	9223	4357	23511	23511	23511	11967

Notes: DHS 2004-2014. Respondents aged 15-49 included. Industrial Zones are located in Maseru (Thetsane), Leribe, Mafeteng and Mohale's Hoek. [a]This question was not posed in 2014. [b] This question was posed only in 2004. Questions about say in decisionmaking were posed only to women currently married or in partnerships. BMI data, comprising height and weight, is collected only for half of respondents in each round.

Table 4: RMG employment and attitudes to violence from partners, Lesotho 2004-2014

Do you believe it is acceptable for a partner to beat his wife when she . . . ?					
	Goes out w/out permission	**Argues w partner**	**Refuses sex**	**Burns food**	**Neglects kids**
	(1)	(2)	(3)	(4)	(5)
RMG employment					
	0.1255	0.2177	0.0854	0.0591	0.2292
	(0.011)	(0.013)	(0.009)	(0.008)	(0.014)
Not employed in RMG					
	0.1727	0.3071	0.1500	0.0887	0.2831
	(0.003)	(0.003)	(0.002)	(0.002)	(0.003)
Difference					
RMG	-0.0472***	-0.0894***	-0.0647***	-0.0295***	-0.0539***
	(0.011)	(0.013)	(0.010)	(0.008)	(0.013)
No.obs.	23511	23511	23511	23511	23511

Notes: DHS surveys 2004, 2009 and 2014. Respondents aged 15-49 are included. Industrial Zones are located in Maseru (Thetsane), Leribe, Mafeteng and Mohale's Hoek. Standard errors are robust.

Table 5: Firststage regressions explaining the probability of RMG sector employment in Lesotho 2004-2014

	(1)	(2)	(3)
(ln(km) to IZ)*(AFTER GFC, MFA)	0.0430***	0.0432***	0.0438***
	(0.008)	(0.008)	(0.008)
ln(km) to IZ	-0.0426***	-0.0413***	-0.0505***
	(0.008)	(0.008)	(0.008)
AFTER	-0.2083***	-0.2112***	-0.2125***
	(0.033)	(0.033)	(0.032)
2014	-0.0108*	-0.0135**	-0.0081
	(0.006)	(0.006)	(0.006)
constant	0.2809***	0.1905***	0.2398***
	(0.045)	(0.045)	(0.047)
F-stat	13.402	12.892	11.935
No. obs.	23511	23511	23511
Additional controls:			
age, primed, ch 5 yrs ago	no	yes	yes
hhld infra[a], migration, PSU controls[+]	no	no	yes
F-stat instrument	34.11	33.89	29.14

Notes: DHS 2004, 2009 and 2014. Respondents are women aged 15-49, inclusive. All regressions control for marital status, month of interview, district and urban-rural dummies. Standard errors are clustered at the PSU level. [a] Household infrastructure comprises: electricity, piped water and improved sanitation. [+] PSU controls comprise: Annual rainfall in 2000 land slope (rise over run) and the DHS nightlights composite. Estimation is by OLS.

Table 6: The causal effect of RMG employment on household decision-making and health outcomes

	OLS	IV	OLS	IV	OLS	IV
	(1)	(2)	(3)	(4)	(5)	(6)
Any say in own health decisions						
RMG	0.0884***	0.4543	0.0732***	0.4432	0.0690***	0.4895**
	(0.020)	(0.339)	(0.019)	(0.331)	(0.019)	(0.222)
F-stat	71.004	70.596	77.408	77.937	72.454	72.698
No. obs.	13285	13285	13285	13285	13285	13285
Any say in visits to friends and family						
RMG	0.0699***	0.6698*	0.0560***	0.6438*	0.0470**	0.5793***
	(0.022)	(0.381)	(0.021)	(0.374)	(0.021)	(0.223)
F-stat	21.334	17.469	40.749	38.163	36.948	34.801
No. obs.	13286	13286	13286	13286	13286	13286
Any say in large household purchases						
RMG	0.0783***	0.9144**	0.0673***	0.9044**	0.0692***	0.6358***
	(0.021)	(0.423)	(0.021)	(0.421)	(0.021)	(0.229)
F-stat	91.633	72.303	85.884	69.867	81.195	68.810
No. obs.	13286	13286	13286	13286	13286	13286
Any say in everyday household purchases[a]						
RMG	0.0561***	1.3066**	0.0524***	1.2359***	0.0530***	0.8816***
	(0.019)	(0.522)	(0.019)	(0.480)	(0.019)	(0.248)
F-stat	18.547	10.877	22.031	13.600	20.825	15.273
No. obs.	9223	9223	9223	9223	9223	9223
Births in previous 2 years						
RMG	-0.0387*	-0.2263	-0.0121	-0.2545*	-0.0091	-0.2598*
	(0.023)	(0.156)	(0.023)	(0.152)	(0.023)	(0.151)
F-stat	75.062	203.245	85.149	171.978	73.824	111.697
No. obs.	23511	23511	23511	23511	23511	23511
Births in previous 5 years						
RMG	-0.0591*	-0.8323***	-0.0283	-0.8490***	-0.0232	-0.8612***
	(0.032)	(0.311)	(0.032)	(0.302)	(0.032)	(0.292)
F-stat	117.834	330.255	121.626	238.696	112.566	167.659
No. obs.	23511	23511	23511	23511	23511	23511
Effective contraceptive use[b]						
RMG	0.1391***	0.3914**	0.1298***	0.3836**	0.1249***	0.3224*
	(0.019)	(0.178)	(0.019)	(0.175)	(0.019)	(0.188)
F-stat	67.565	188.923	71.328	173.358	66.401	129.961
No. obs.	23511	23511	23511	23511	23511	23511
Low BMI ($\leq$ 18.5)						
RMG	-0.0404***	0.0075	-0.0224	0.0206	-0.0237	0.0725
	(0.015)	(0.186)	(0.015)	(0.187)	(0.015)	(0.183)
F-stat	28.198	33.126	30.799	36.776	24.281	25.293
No. obs.	11967	11967	11967	11967	11967	11967
Additional controls:						
age, primary ed., ch.5 yrs ago	no	no	yes	yes	yes	yes
h infra[a], migration, [+] PSU controls	no	no	no	no	yes	yes

Notes: Data are from the 2004, 2009 and 2014 DHS surveys.[a] This question was not posed in 2014. [b]IUD, condom pill,foam/jelly. All estimation controls for month of interview, district and urban-rural dummies.. Only married women and those in partnerships are included for the following outcomes: say in own health decisions, say in visits to friends and family, say in large household purchases and say in everyday household purchases. Standard errors are clustered at the primary sampling unit (PSU). Sample weights are included. [a] Household infrastructure comprises: electricity, piped water and improved sanitation. [+] PSU controls comprise: Annual rainfall in 2000 land slope (rise over run) and the DHS nightlights composite.

Table 7: The causal effect of RMG employment on views of the acceptability of beating by a partner

	OLS	IV	OLS	IV	OLS	IV
	(1)	(2)	(3)	(4)	(5)	(6)
Goes out without telling spouse						
RMG	-0.0438***	-0.3643**	-0.0199*	-0.3988**	-0.0100	-0.5977***
	(0.012)	(0.180)	(0.012)	(0.168)	(0.011)	(0.161)
F-stat	35.799	32.869	57.069	54.861	52.508	51.313
N	23511	23511	23511	23511	23511	23511
Argues with spouse						
RMG	-0.0590***	-0.1984	-0.0201	-0.2620	-0.0093	-0.3524**
	(0.015)	(0.225)	(0.016)	(0.205)	(0.016)	(0.159)
F-stat	30.629	26.448	71.671	67.192	64.921	62.179
N	23511	23511	23511	23511	23511	23511
Refuses sex						
RMG	-0.0463***	-0.3151*	-0.0294**	-0.3356**	-0.0221**	-0.4435***
	(0.012)	(0.170)	(0.011)	(0.161)	(0.011)	(0.137)
F-stat	36.886	38.125	51.388	50.602	47.571	43.818
N	23511	23511	23511	23511	23511	23511
Burns food						
RMG	-0.0209**	-0.2669**	-0.0085	-0.2827**	-0.0049	-0.3002***
	(0.010)	(0.131)	(0.009)	(0.127)	(0.009)	(0.098)
F-stat	22.837	21.881	33.553	30.831	31.011	27.873
N	23511	23511	23511	23511	23511	23511
Neglects children						
RMG	-0.0515***	0.0432	-0.0206	-0.0097	-0.0170	-0.2027
	(0.016)	(0.252)	(0.016)	(0.228)	(0.015)	(0.161)
F-stat	26.838	25.658	54.004	53.206	50.474	46.082
No. obs.	23511	23511	23511	23511	23511	23511
Additional controls:						
age, primed. completion, children	no	no	yes	yes	yes	yes
hhld infra[a], migration, PSU controls[+]	no	no	no	no	yes	yes

Notes: DHS surveys 2004,2009 and 2014. All respondents aged 15-49 residing in households with partners are included. All estimates include district and urban-rural dummies, and dummies for month of interview. [a] Household infrastructure comprises: electricity, piped water and improved sanitation. [+] PSU controls comprise: Annual rainfall in 2000 land slope (rise over run) and the DHS nightlights composite.

Table 8: Employment in RMG versus other firms in Maseru district, Lesotho

	Fulltime emp	**Pre-empl health chk**	**Training last FY?**	**Free Condoms**	**Anon. HIV Testing**	**High absenteeism due to ...**			**HIV Prev. Messages**	**HIV expend FTE (Maloti)**
						sickness?	**family?**	**AIDS?**		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
RMG										
	1882.208	0.415	0.585	0.679	0.491	0.396	0.400	0.354	0.566	9.762
	(1203.33)	(0.07)	(0.07)	(0.06)	(0.07)	(0.07)	(0.07)	(0.07)	(0.07)	(3.28)
No.obs.	53	53	53	53	53	53	50	48	53	53
Non-RMG Enterprises										
	48.754	0.262	0.429	0.459	0.269	0.248	0.212	0.155	0.447	192.446
	(8.27)	(0.03)	(0.03)	(0.03)	(0.03)	(0.03)	(0.03)	(0.02)	(0.03)	(67.12)
No.obs.	248	248	245	244	242	242	240	233	246	243
Difference										
	1833.454***	0.153**	0.156**	0.222***	0.220***	0.148**	0.188***	0.200***	0.119	-182.684
	(553.14)	(0.07)	(0.08)	(0.07)	(0.07)	(0.07)	(0.07)	(0.06)	(0.08)	(143.93)
No.obs.	301	301	298	295	297	295	290	281	299	296

Notes: Combined World Bank Enterprise Surveys 2009 and 2016 for Lesotho. Maloti are the local currency, deflated by the Consumer Price Index to 2010 values.

Table 9: Census means for urban and rural populations of Lesotho in 1996 and 2006

	Urban				Rural			
	Women		Men		Women		Men	
	Work	Industry[a]	Work	Industry	Work	Industry	Work	Industry
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
PANEL A: 1996								
		RMG		**RMG**		**RMG**		**RMG**
Future IZ district								
	0.4021	0.0796	0.5541	0.0130	0.1994	0.0156	0.4813	0.0047
	(0.006)	(0.003)	(0.006)	(0.001)	(0.003)	(0.001)	(0.003)	(0.000)
Non-IZ district								
	0.4030	0.0441	0.5757	0.0050	0.2213	0.0133	0.5199	0.0032
	(0.010)	(0.004)	(0.012)	(0.002)	(0.003)	(0.001)	(0.004)	(0.000)
Difference								
	-0.0009	0.0355***	-0.0216	0.0079***	-0.0219***	0.0023*	-0.0387***	0.0015**
	(0.012)	(0.006)	(0.013)	(0.003)	(0.004)	(0.001)	(0.005)	(0.001)
No.obs.	10089	10089	8108	8108	38060	38060	36436	36436
PANEL B: 2006								
		Manuf-acturing		**Manuf-acturing**		**Manuf-acturing**		**Manuf-acturing**
IZ district								
	0.4677	0.2156	0.5616	0.0877	0.2299	0.0403	0.4926	0.0162
	(0.005)	(0.004)	(0.005)	(0.003)	(0.003)	(0.001)	(0.003)	(0.001)
Non-IZ districts								
	0.4413	0.0941	0.5636	0.0303	0.2768	0.0291	0.5545	0.0131
	(0.009)	(0.005)	(0.009)	(0.003)	(0.004)	(0.001)	(0.004)	(0.001)
Difference								
	0.0264***	0.1215***	-0.0020	0.0574***	-0.0469***	0.0112***	-0.0620***	0.0031**
	(0.010)	(0.008)	(0.011)	(0.006)	(0.005)	(0.002)	(0.006)	(0.001)
No.obs.	13946	13946	11369	11369	34008	34008	34965	34965
PANEL C: Difference-in-Difference (PANEL A-PANEL B)								
	0.0273*		0.0196		-0.0250***		-0.0233***	
	(0.015)		(0.017)		(0.006)		(0.008)	
No.obs.	24035	24035	19477	19477	72068	72068	71401	71401

Notes: IPUMS 0.1% census samples of April 1996 and 2006. Respondents aged 15-49 are included. (Future) Industrial Zones are here defined as Maseru (Thetsane), Leribe, Mafeteng and Mohale's Hoek. [a] In 1996 information about occupations is included and the RMG sector can be identified. In 2006, only industry codes are included. Standard errors are in parentheses.

Table 10: A Comparison of future factory locations with other locations in Lesotho

	Total children	Children who died	No secondary schooling	Heard of AIDS	Currently works
	(1)	(2)	(3)	(4)	(5)
IZ after AGOA	-0.6011	0.1635	0.0007	-4.2120	0.0276
	(0.408)	(0.106)	(0.092)	(3.575)	(0.078)
age	-0.0705***	-0.0139**	-0.0253***	-0.3781	0.0063
	(0.014)	(0.006)	(0.004)	(0.248)	(0.004)
rural	0.0000	0.0000	0.0000	0.0000	0.0000
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
R^2	0.034	0.015	0.050	0.026	0.038
No. obs.	1056	1056	1056	1056	1056

Notes: MICS 2000 Survey, women's questionnaire. Respondents are urban women aged 15-49. OLS estimates. All regressions control for district of Lesotho.

Table 11: The instrumental variable and socioeconomic outcomes

	(1)	(2)	(3)	(4)
PANEL A: Women				
	Non-family work	**Paid agri work**	**Poorest 40% hhld wealth dibn**	**Height (cm)**
(ln(km) to IZ)*(AFTER GFC, MFA)	-0.0016	-0.0053	0.0080	0.0976
	(0.008)	(0.004)	(0.007)	(0.147)
ln(km) to IZ	-0.0245***	0.0114***	0.0423***	-0.0487
	(0.009)	(0.004)	(0.009)	(0.153)
AFTER	-0.0353	-0.0096	0.0200	-0.6065
	(0.031)	(0.010)	(0.022)	(0.563)
2014	0.0042	-0.0226***	0.0663***	0.2462
	(0.013)	(0.006)	(0.014)	(0.225)
constant	0.0092	-0.0464**	0.5649***	153.8051***
	(0.045)	(0.021)	(0.041)	(0.792)
R^2	0.159	0.073	0.521	0.021
No. obs.	23511	23511	23511	11923
Means of dep. var				
	0.3340	0.0683	0.3285	157.0126
	(0.003)	(0.002)	(0.003)	(0.059)
PANEL B: Children under 60 months				
	stunted	**wasted**	**under-weight**	**measles immuniz.**
(ln(km) to IZ)*(AFTER GFC, MFA)	-0.0026	-0.0048	-0.0205	-0.0172*
	(0.017)	(0.005)	(0.014)	(0.010)
ln(km) to IZ	0.0036	0.0141***	0.0266*	0.0040
	(0.018)	(0.005)	(0.015)	(0.012)
AFTER	-0.0361	0.0049	0.0472	0.0204
	(0.066)	(0.017)	(0.050)	(0.036)
2014	-0.0125	0.0002	-0.0040	0.0619***
	(0.023)	(0.008)	(0.019)	(0.014)
constant	0.4817***	0.0316	0.1152	0.3374***
	(0.102)	(0.026)	(0.085)	(0.068)
R^2	0.034	0.013	0.035	0.038
No. obs.	4281	4281	4281	9817
Means of dep. var				
	0.3160	0.0328	0.1665	0.7194
	(0.007)	(0.003)	(0.006)	(0.005)

Notes: DHS 2004, 2009 and 2014 surveys. Respondents are aged 15-49 and their children under 60 months. OLS estimates. All regressions control for an identical set of covariates as in the firststage regression presented in column (3) of Table 5. Numbers of observations differ for child anthropometry and measles outcomes because only half of eligible children were measured and weighed. Stunting, wasting and underweight are -2SD or less below the median measure, as defined by the age- and sex-specific child growth charts of the World Health Organization.

Table 12: The probability of a partner's employment for money in Lesotho 2004-2014

	(1)	(2)	(3)
(ln(km) to IZ)*(AFTER GFC, MFA)	-0.0083	-0.0089	-0.0049
	(0.012)	(0.012)	(0.024)
ln(km) IZ	0.0057	0.0058	0.0060
	(0.013)	(0.013)	(0.034)
AFTER	0.3446***	0.3421***	0.3307***
	(0.044)	(0.043)	(0.089)
age	0.0080***	0.0072***	-0.0032*
	(0.001)	(0.001)	(0.002)
primed	-0.0328**	-0.0368***	0.0461
	(0.013)	(0.013)	(0.032)
2014	-0.0363*	-0.0311	-0.0511
	(0.020)	(0.019)	(0.035)
married or common law		0.1451***	0.0000
		(0.015)	(0.000)
total children ever born		-0.0197***	0.0183**
		(0.004)	(0.008)
constant	0.1293*	0.1224*	0.4672***
	(0.066)	(0.067)	(0.172)
F-stat	36.640	40.772	9.772
No. obs.	8310	8310	1691
Additional controls			
hhold wealth quantile, PSU^{+}	no	no	yes

Notes: DHS 2004, 2009 and 2014 Men's Surveys. Standard errors are clustered at the PSU level. $^{+}$ PSU controls comprise: Annual rainfall in 2000 land slope (rise over run) and the DHS nightlights composite. District and rural-urban dummies are included.

Table 13: The probability of a partner's sector-specific employment for money in Lesotho 2004-2014

	(1)	(2)	(3)
Panel A: Skilled manual employment (manufacturing)			
(ln(km) to IZ)*(AFTER GFC, MFA)	0.0028	0.0025	0.0264
	(0.008)	(0.008)	(0.024)
ln(km) IZ	-0.0149*	-0.0153*	-0.0487*
	(0.008)	(0.008)	(0.026)
AFTER	-0.0324	-0.0331	-0.2022**
	(0.033)	(0.032)	(0.092)
age	0.0045***	0.0032***	0.0012
	(0.000)	(0.001)	(0.001)
primed	0.0128	0.0123	-0.0012
	(0.009)	(0.009)	(0.030)
2014	-0.0063	-0.0028	0.0323
	(0.013)	(0.013)	(0.029)
married or common law		0.0879***	0.0000
		(0.013)	(0.000)
total children ever born		-0.0049	-0.0027
		(0.003)	(0.007)
constant	0.0845**	0.0979**	0.4427***
	(0.042)	(0.043)	(0.144)
F-stat	11.657	12.636	2.792
No. obs.	8314	8314	1692
Panel B: Agriculture and unskilled labour			
(ln(km) to IZ)*(AFTER GFC, MFA)	0.0132	0.0132	-0.0093
	(0.012)	(0.012)	(0.025)
ln(km) IZ	0.0277**	0.0281**	0.0497
	(0.011)	(0.011)	(0.031)
AFTER	0.1438***	0.1430***	0.1453
	(0.040)	(0.040)	(0.093)
age	0.0006	0.0014**	-0.0040**
	(0.000)	(0.001)	(0.002)
primed	-0.1316***	-0.1333***	-0.0490
	(0.013)	(0.013)	(0.035)
2014	-0.0732***	-0.0738***	-0.0862**
	(0.019)	(0.019)	(0.040)
married or common law		-0.0057	0.0000
		(0.016)	(0.000)
total children ever born		-0.0060	0.0109
		(0.004)	(0.008)
constant	0.0825	0.0655	0.2311
	(0.054)	(0.055)	(0.169)
F-stat	24.465	22.727	6.255
No. obs.	8314	8314	1692
Additional controls			
hhold wealth quantile, PSU^{+}	no	no	yes

Notes: DHS 2004, 2009 and 2014 Men's Surveys. Standard errors are clustered at the PSU level. $^{+}$ PSU controls comprise: Annual rainfall in 2000 land slope (rise over run) and the DHS nightlights composite. District and rural-urban dummies are included.

Table 14: Socio-economic characteristics of the self-employed and employees in RMG work in Lesotho

	Age	**Married**	**Completed primary**	**Rural**	**Hhld size**	**Total children**
	(1)	(2)	(3)	(4)	(5)	(6)
Employees						
	29.5708	0.5394	0.8663	0.2663	3.9801	1.6361
	(0.281)	(0.020)	(0.014)	(0.018)	(0.112)	(0.059)
No.obs.	606	606	606	606	606	606
Self-employed						
	34.2078	0.6830	0.8529	0.5645	5.0586	2.3089
	(0.467)	(0.026)	(0.020)	(0.028)	(0.121)	(0.099)
No.obs.	322	322	322	322	322	322
Difference						
	-4.6370***	-0.1436***	0.0133	-0.2982***	-1.0785***	-0.6727***
	(0.539)	(0.036)	(0.025)	(0.034)	(0.192)	(0.113)
No.obs.	928	928	928	928	928	928

Notes: DHS 2004, 2009 and 2014. Respondents are women aged 15-49. Sample weights are included.

Figure 1: Manufacturing output as a percentage of GDP

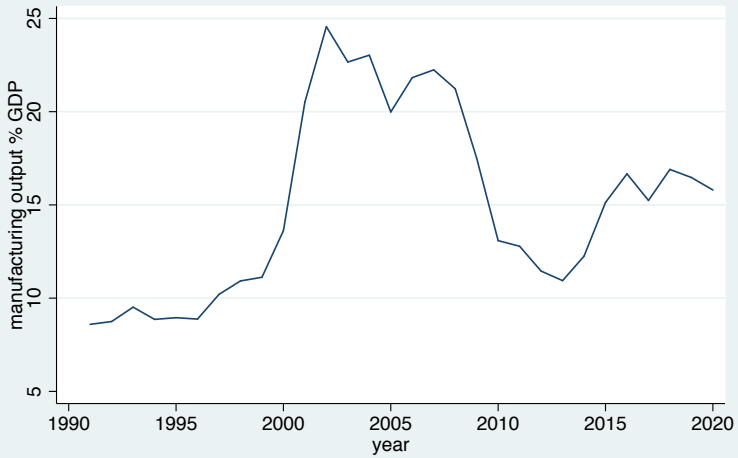


Figure 2: Real GDP per capita at purchasing power parity

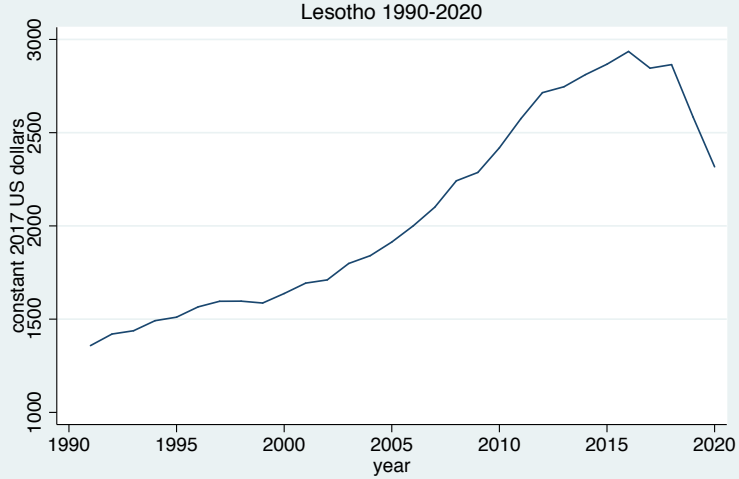
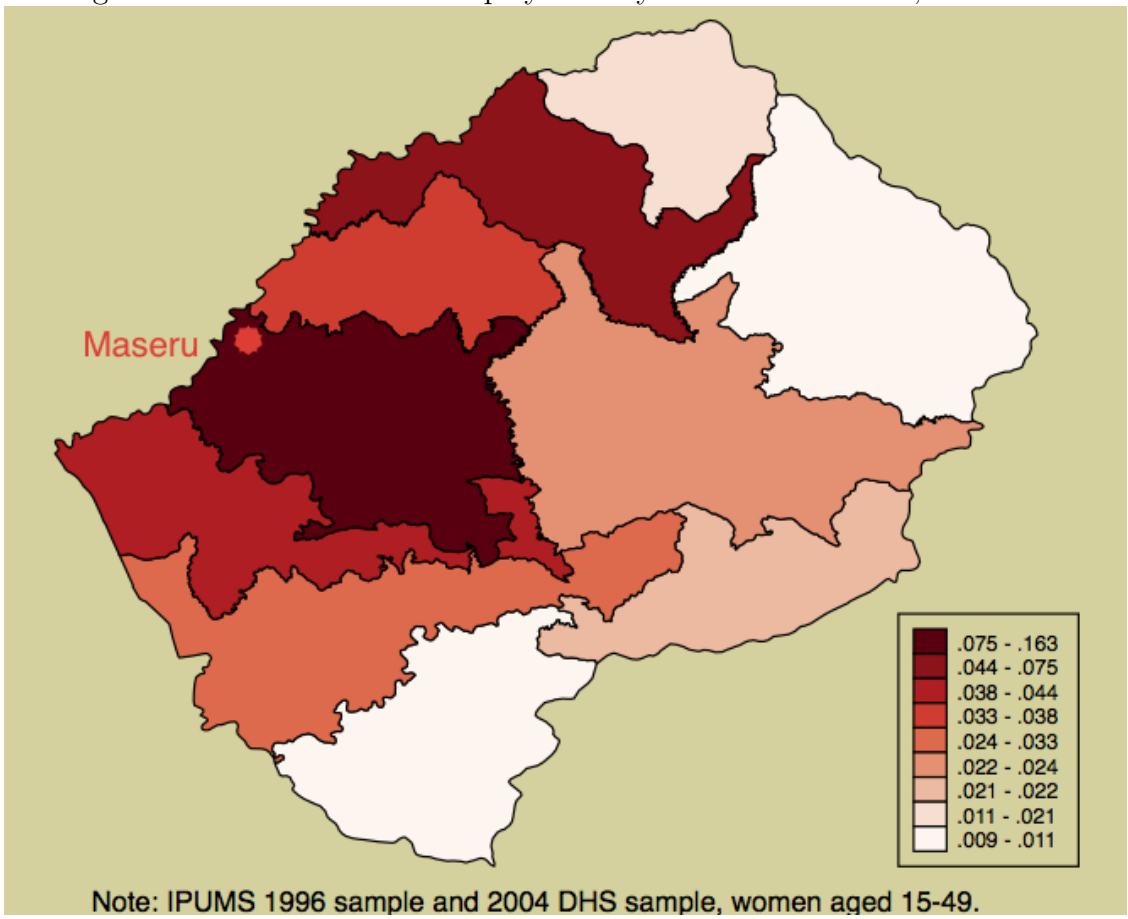


Figure 3: Increase in RMG employment by district of Lesotho, 1996-2004



List of data sets employed in analyses

IPUMS 1996 and 2006 census samples of Lesotho.

DHS 2004, 2009 and 2014 women's and men's surveys. DHS GIS information.

World Bank Enterprise Surveys of Maseru Lesotho, 2009 and 2016.

Lesotho MICS 2000.