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Title: Crime and Happiness amongst Heads of Households in Malawi

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Abstract: This paper uses 2005 Malawian data to investigate the link between crime and happiness in Malawi. Detailed descriptive statistics reveal that crime is a gendered issue and econometric analyses show that males and females respond differently to different crime variables. In particular, for males being attacked has a negative impact on happiness and neighbourhood crime rates have a U-shaped effect on happiness with happiness at its lowest when 11.2% of respondents in a neighbourhood reported being a victim. For females only a subjective feeling of insecurity impacts negatively on happiness.

Response to Reviewers: To the editor
Dear Sir,
Thank you for forwarding the referees' detailed and very useful comments, as well as for your own suggestions. We particularly appreciate receiving feedback from 4 different reviewers.
We apologise for not having been able to reply sooner. One of us has recently moved to a new post overseas and the other has recently had a child – we've both been pretty snowed under!
We have found the comments and suggestions made by the referees extremely useful in improving the paper and we have tried to address them as fully and as thoroughly as possible and to consider all of their suggested changes. We hope therefore that, thanks to the comments and suggestion, both you and they will find the attached paper much improved on the original version.
Kind regards,
Simon and Tim

Referee 1

- Referee's points 1 and 2. We acknowledge the limitations of having to use cross-sectional rather than panel data, and have discussed this in the first paragraph in section 1 – Data and Descriptive Statistics.
- Referee's points 3, 6, 7, 8. We understand the issues related to the Probit model previously included looking at determinants of being victim of crime. The referee raised a number of useful points, which caused us to think in more detail about this model. After careful consideration, although we feel that the results are interesting, it seems that a more detailed analysis would be required in order to do it justice. In particular, as the referee suggested, it would need more justification and setting in the relevant literature. In addition, a wider range of models could be explored and these are likely to tease

out some interesting results. Given that it seems that a more detailed exposition of these issues is desirable, we have decided to remove this model from the paper and to concentrate on these issues in another paper. We hope that our paper is more focused as a result.

- Referee's point 4. It is true that not including other shocks in the regressions was an omission and we thank the referee for pointing this out. The data do contain information on recent shocks suffered by the household. We have therefore been able to include dummies indicating whether or not the household has suffered from crop loss due to flooding/drought, from sickness/accident and unemployment in the regressions. Key results have not changed, showing the robustness of the impact of crime on wellbeing.
- Referee's point 5. The impact of being attacked by different people would be an interesting topic to develop further. This topic would be embedded, at least partly, in the intra-household dynamics literature including domestic violence. We think that this would remove a part of the focus from the current paper and reserve this for future work.
- Referee's point 9. This was an omission from the paper. Regional dummies were used (but not reported) throughout the work. This has now been mentioned in an additional paragraph in section 2.1 (Methodology).
- Referee's point 10. We thank the referee for pointing this out. The new version of the paper has maintained the non-linear relationship into the last 3 columns of regressions.
- Referee's point 11. Other referees also agreed that more relevant literature needed to be cited and recommended a number of paper. Both the short literature review in the introduction and the discussion of results have now benefited from studies on: Social norms, employment and wellbeing (Stutzer and Lalive, 2004); Trust and Crime (Paxton, 2002, 2007); Crime and Fear (Moore and Shepherd, 2007); and Satisfaction and Comparison Income (Clark and Oswald, 1996).
- Thank you for pointing out the omission of the page number for the Powwthavee quote. In the final version of the paper, the discussion does not include the phrase cited. We have therefore rephrased and no page number reference is required.

Referee 2

- It is true that the average age may seem old. However, it should be noted that these ages refer to the household head, and not the average age of the population (which is much younger). We thank the referee for pointing this out, and have added an additional line in paragraph 3 under section 1 – Data and Descriptive Statistics – in order to clarify this.
- The question of how Malawian crime rate relates to other countries is a difficult one. Papers which attempt to study the issue find a lack of data, and that any available data is highly unreliable (e.g. Schonteich, 2000 – African Security Review). This is due to under-reporting, lack of official statistics keeping and possibly corruption. Unfortunately, it has not been possible to find any reliable data to make the comparison.

Referee 3

- The probit regression looking at determinants of being attacked has now been removed. Most variables from this regression were included in the main regressions focusing on subjective wellbeing. However, we recognise that there were certain omissions and thank the referee for pointing these out. Community income and a Migrant dummy have both now been added to the main regressions. Although the focus of the paper is on crime and wellbeing, we believe that the other sections are of interest both in themselves and to help compare our overall results with other papers. However, an additional section has been added on Wealth, Crime and Happiness at the suggestion of another referee to expand the focus on Crime and Happiness.
- It was very interesting to read some of Paxton's work. Unfortunately our data set do not contain any variables which would be suitable to test the extent to which the social capital measures that she looks at (institutional membership, overlapping institutions etc) impact on happiness. It is an

interesting topic to bring up however, as we do have another Malawian data set which does contain such information (attendance of village discussion, memberships of sports/social clubs, political parties or religious institutions), but, unfortunately, does not collect information on wellbeing. However, we have now referenced two Paxton papers in the second paragraph of the introduction.

- Thank you for suggesting the Stutzer and Lalive (2004) paper on employment, wellbeing and social norms. It complements well this work. We have referenced it, and have referred to it in the results discussion under Economic Activity and Life Satisfaction. We have also noted at the end of the second paragraph in the introduction that others' behavior can impact on happiness.

Referee 4

- We thank the referee for pointing out the lack of pointing out the 'value-added' – the final paragraph in the introduction now notes the 'value-added' of this research.
- The question of how Malawian crime rate relates to other countries is a difficult one. Papers which attempt to study the issue find a lack of data, and that any available data is highly unreliable (e.g. Schonteich, 2000 – African Security Review). This is due to under-reporting, lack of official statistics keeping and possibly corruption. Unfortunately, it has not been possible to find any reliable data to make the comparison.
- We have now added an additional table (see Appendix I) containing variable definitions. This should have been included.
- Thank you for spotting that Migrant and Migrated for Marriage were not in the appendix. Migrated for Marriage was used in the probit model which has been dropped from the paper. We have added Migrant to the descriptive statistics table.
- The suggestion to ask the question, 'which is the most important in explaining well-being' is a good one. We have followed your suggestion of taking the most complete model and removing the crime measure one-by-one and comparing chi-2. Although we do not want to clutter the paper with too many tables, we do believe that the results are of interest and have discussed them in the last paragraph in the discussion of the results on Crime and Life Satisfaction. We have said that the results are available from the authors on request, but have provided you with the results below, for your interest. The analysis reveals that the subjective 'feel unsafe' has the strongest explanatory power.
- Discussion of clustering/regional dummies was an omission from the paper. Regional dummies were used (but not reported) throughout the work as an alternative to clustering in order to control for systematic differences between regions. This has now been mentioned in an additional paragraph in section 2.1 (Methodology).
- Although it would be an interesting analysis to look for a quadratic between feeling unsafe and wellbeing, unfortunately this variable is only a dummy.
- Thank you for pointing out our error in the turning point calculation. The turning point in the new regressions in column 4 is 11.2%. The necessary corrections have been made.
- We have added an additional paragraph at the end of the section discussing the results of Crime and Life Satisfaction suggesting that the social stigma attached to being attacked is stronger for males than for females, and that this might be part of the explanation for the observed male-female differences.
- The question of whether or not those with more income/assets are more affected by regional crime is an interesting one to raise. This has been tested by running the pooled sample separately for the top and bottom asset quartiles. The results have been presented in a new Table 5 and reveal a number of interesting points. The major point is, as the referee correctly guessed (!), that regional crime rates are significant only for those in the top asset quartile, and not the bottom quartile. A new section – Crime, Wealth and Life Satisfaction – has been added to the results section to discuss these new findings. This has also helped to focus the paper more on the relationship between crime and wellbeing.

Referee 4 - Other Points

- The Moore and Shepherd (2007) paper was very interesting and has now been referenced. We also draw on their results in the results section on Crime and Life Satisfaction and Income, Asset Wealth and Life Satisfaction.
- 'Affect' and 'effect' have now been corrected in the introduction 1st paragraph.
- Footnote 3 in old version – This is a reasonable interpretation. This footnote has now been removed as the section is no longer part of the paper.
- Thank you for pointing out the Clark and Oswald (1996) result. We have now mentioned their results.
- We have altered the conclusion so that it does not end on a brief discussion of 'other covariates' but that the final discussion ends on crime – the focus of the paper. In addition, the importance attached to the new finding that a feeling of being unsafe has the most explanatory power has been highlighted. We hope this makes the conclusion somewhat more punchy and leaves the reader focused on the main points in the paper.

All Household Heads - Removing Crime Variables One-by-One

| Model | 1 | 2 | 3 | 4 |
|---|---|---|---|---|
| log(Per Capita Consumption) | 0.19*** | 0.19*** | 0.18*** | 0.19*** |
| | (6.73) | (6.76) | (6.27) | (6.64) |
| Ultra Poor | -0.09** | -0.09** | -0.09** | -0.09** |
| | (-2.53) | (-2.47) | (-2.45) | (-2.57) |
| Attacked in Previous 12 Months | -0.12*** | | -0.14*** | -0.15*** |
| | (-2.67) | | (-3.28) | (-3.25) |
| % in Region Reported being Attacked in last 12 Months | -2.41*** | | -2.58*** | -2.71*** |
| | (-2.59) | | (-2.74) | (-2.94) |
| Square % in Region Reported being Attacked in last 12 Months | 14.29* | | 12.28 | 14.95** |
| | (1.89) | | (1.58) | (1.97) |
| Feel Unsafe | -0.30*** | | -0.31*** | -0.31*** |
| | (-9.17) | | (-9.42) | (-9.34) |
| Female Dummy | -0.03 | -0.03 | -0.04 | -0.03 |
| | (-0.94) | (-0.92) | (-1.10) | (-0.91) |
| Age | -0.01* | -0.01 | -0.01* | -0.01 |
| | (-1.68) | (-1.64) | (-1.76) | (-1.57) |
| Age Squared | 0.00 | 0.00 | 0.00 | 0.00 |
| | (1.55) | (1.49) | (1.64) | (1.48) |
| Married Dummy | 0.06** | 0.06** | 0.06** | 0.06** |
| | (2.12) | (2.15) | (2.11) | (2.12) |
| Migrant Dummy | -0.06** | -0.06** | -0.06** | -0.06** |
| | (-2.29) | (-2.23) | (-2.26) | (-2.29) |
| Unemployed † | 0.04 | 0.04 | 0.05 | 0.04 |
| | (0.55) | (0.57) | (0.81) | (0.59) |
| Home Worker † | 0.03 | 0.03 | 0.03 | 0.04 |
| | (0.61) | (0.58) | (0.49) | (0.63) |
| Student † | 0.09 | 0.08 | 0.08 | 0.09 |
| | (0.46) | (0.42) | (0.40) | (0.47) |
| Salaried Employment † | 0.13*** | 0.13*** | 0.13*** | 0.13*** |
| | (3.93) | (3.93) | (4.09) | (3.96) |
| Self-Employment † | 0.14*** | 0.14*** | 0.15*** | 0.14*** |
| | (4.21) | (4.14) | (4.41) | (4.24) |
| Other Employment † | -0.05 | -0.05 | -0.05 | -0.05 |
| | (-1.06) | (-1.02) | (-0.96) | (-1.07) |
| Household Size | 0.02*** | 0.02*** | 0.02** | 0.02*** |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | (2.89) | (2.87) | (2.38) | (2.79) | | | | | |
| Primary Education † | 0.09*** | 0.09*** | 0.09*** | 0.09*** | | | | | |
| | (3.39) | (3.35) | (3.12) | (3.32) | | | | | |
| Secondary Education † | 0.03 | 0.03 | 0.03 | 0.03 | | | | | |
| | (0.91) | (0.86) | (0.78) | (0.87) | | | | | |
| Higher Education † | -0.18* | -0.18* | -0.17 | -0.18* | | | | | |
| | (-1.72) | (-1.70) | (-1.63) | (-1.70) | | | | | |
| Rural Dummy | 0.09* | 0.08* | 0.09* | 0.09* | | | | | |
| | (1.90) | (1.85) | (1.91) | (1.93) | | | | | |
| Asset Index | 0.07*** | 0.07*** | 0.07*** | 0.07*** | | | | | |
| | (9.26) | (9.35) | (9.22) | (9.33) | | | | | |
| Hungry Season | -0.14*** | | -0.13*** | | -0.15*** | | -0.14*** | | |
| | (-5.24) | (-4.94) | (-5.37) | (-5.25) | | | | | |
| log(Per Capita Community Consumption) | | | | | -0.20*** | | -0.22*** | -0.21*** | -0.20*** |
| | (-5.58) | (-6.16) | (-5.77) | (-5.56) | | | | | |
| Shock: Flood/Drought | -0.11*** | | -0.11*** | | -0.11*** | | -0.11*** | | |
| | (-4.22) | (-4.46) | (-4.18) | (-4.24) | | | | | |
| Shock: Unemployment | -0.08** | -0.08** | -0.08** | -0.08** | | | | | |
| | (-2.23) | (-2.28) | (-2.36) | (-2.27) | | | | | |
| Shock: Sickness/Accident | | | -0.15*** | | -0.15*** | | -0.15*** | -0.15*** | |
| | (-6.36) | (-6.42) | (-6.50) | (-6.39) | | | | | |
| Cut 1 Constant | -1.53*** | | -1.67*** | | -1.72*** | | -1.55*** | | |
| | (-3.51) | (-3.86) | (-3.96) | (-3.54) | | | | | |
| Cut 2 Constant | -0.39 | -0.53 | -0.59 | -0.40 | | | | | |
| | (-0.89) | (-1.22) | (-1.35) | (-0.92) | | | | | |
| Cut 3 Constant | 0.04 | -0.10 | -0.16 | 0.03 | | | | | |
| | (0.10) | (-0.22) | (-0.36) | (0.07) | | | | | |
| Cut 4 Constant | 1.01** | 0.87** | 0.81* | 1.00** | | | | | |
| | (2.32) | (2.02) | (1.86) | (2.29) | | | | | |
| N | 11221 | 11221 | 11221 | 11221 | | | | | |
| Pseudo r2 | 0.07 | 0.07 | 0.07 | 0.07 | | | | | |
| Chi-2 | 2030.00 | | 2030.13 | | 1944.76 | | 2027.02 | | |

# Crime and Happiness amongst Heads of Households in Malawi

**Short Abstract**
This paper uses 2005 Malawian data to investigate the link between crime and happiness in Malawi. Detailed descriptive statistics reveal that crime is a gendered issue and econometric analyses show that males and females respond differently to different crime variables. In particular, for males being attacked has a negative impact on happiness and neighbourhood crime rates have a U-shaped effect on happiness with happiness at its lowest when 11.2% of respondents in a neighbourhood reported being a victim. For females only a subjective *feeling* of insecurity impacts negatively on happiness.
**[90 words]**

**Long Abstract**
This paper uses 2005 Malawian data to investigate the link between crime and happiness in Malawi. Detailed descriptive statistics reveal that crime is a gendered issue and we use standard econometric methodology to show that males and females respond differently to different crime variables. In particular, for males being attacked has a negative impact on happiness and neighbourhood crime rates have a U-shaped effect on happiness with happiness at its lowest when 11.2% of respondents in a neighbourhood reported being a victim. For females only a subjective *feeling* of insecurity impacts negatively on happiness. Descriptive analysis shows a positive relationship between crime level and a feeling of insecurity, but the econometric results indicate that these variables capture different things. Males are more likely to be a victim of being attacked than females, and household heads more at risk than others. There is some evidence to suggest that females who reported being attacked were victims of the (probably male) household head, with females who left their home village for the purpose of marriage being particularly at risk. In addition, we find that primary education is important for the wellbeing of females but not males and that the highly educated report lower levels of life satisfaction. Respondents interviewed during the traditional "hungry season" reported significantly lower life satisfaction than those interviewed at other times. Per capita consumption and an asset index have a positive impact on happiness for both males and females and life satisfaction follows the usual U-shaped relationship in age.
**[250 words]**

**Keywords:** Crime; Happiness; Subjective Wellbeing; Quality of Life; Malawi; Africa
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*cover page

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# Crime and Happiness amongst Heads of Households in Malawi

## Introduction

This paper analyses the specific relationship between crime and life satisfaction in Malawi and whether this relationship is affected by gender. Generally, crime statistics reveal that males are more likely to be the victims and perpetrators of a crime than females (Naude, Prinsloo and Ladikos, 2006; Fisher and Wilkes 2003). Women on the other hand are more likely to be the victims of domestic violence. It is expected that there is no systematic difference between men and women with regard to the effect being a victim of crime and perceptions of crime have on wellbeing. How people feel about crime and their own safety is open to some gender difference as alluded to by van Dijk et al. (2007) who found that females and the elderly feel more unsafe than men. This paper is interested in three particular relationships and whether they differ across sex, (1) whether crime victimisation, after controlling for other things, negatively affects life satisfaction, (2) whether the risk of being a victim of crime has a non-linear relationship with life satisfaction and (3) whether perceptions of safety are at all significant in reported life satisfaction.

The use of subjective happiness/life satisfaction scores to measure wellbeing has emerged as a genuine alternative to standard measures of economic wellbeing. Whilst initial research focussed on developed countries there has been a steady increase in using subjective wellbeing in understanding more about how people perceive their lives in developing countries. The majority of economic studies found that life satisfaction scores increase at a decreasing rate with respect to income but that in countries with higher income levels there may be no correlation at all (Frey and Stutzer, 2002). Cross sectional studies indicate that a concave relationship does exist within high, middle and low income countries (e.g. Di Tella, MacCulloch and Oswald, 2001; Hinks and Gruen, 2006; Hinks and Davies, 2008). Other general findings include the unemployed being significantly less satisfied with life, the highly educated being more satisfied than others and age having a U-shaped relationship with life satisfaction. Subjective happiness is not only correlated with economic factors. Social, psychological and political factors can also contribute to how happy somebody is feeling. The impact of major life changing events such as winning the lottery, or the death of somebody who is close to you reveals how quickly (if at all) people's wellbeing scores react to these events over a number of years (Gardner and Oswald, 2007; Oswald and Powdthavee, 2007). Many studies find that a 'set point' underlies people's wellbeing and that this represents a kind of equilibrium to which people tend towards or return to following such shocks (e.g. Lucas et al., 2003). Importance of family, marriage and friends is apparent in many country-specific wellbeing studies. Hudson (2006)

and Paxton (2002, 2007) highlight the positive correlation between individual wellbeing and trust in international and national institutions such as the police force, the rule of law and government. Kingdom and Knight (2006) find that there is no significant difference in life satisfaction scores between the searching and non-searching unemployed in South Africa as well as evidence that those searching for work feel less safe in their own neighbourhood. Powdthavee (2005) analyses the specific impact crime has on wellbeing in South Africa, finding a negative correlation. Moller (2005) too finds that crime victimisation and risk of crime are negatively correlated with wellbeing but that victimisation itself seems secondary to risk of crime in terms of explaining happiness. More generally, the behaviour of others can impact on happiness. For example, Stutzer and Lalive (2004) find that unemployment has a negative impact on happiness, and that the stronger is the social belief against unemployment benefits, the more negative is the impact of unemployment.

This paper uses a unique data set to study the impact of crime on wellbeing in a developing country – an area in which, to our knowledge, there has been little research to date. It is useful to take the opportunity to carry out a large-sample analysis in a developing country in order to better understand this relationship. The following section provides some initial life satisfaction and crime statistics for Malawi using the latest cross-sectional national survey. Section 3 provides the methodology to be used to estimate the life satisfaction equations. Section 4 presents the findings with a specific focus on gender differences in crime and life satisfaction. A conclusion follows.

## 1 Data and descriptive statistics

We take advantage of a cross-sectional data set, which provides a unique (to our knowledge) opportunity to focus on crime and wellbeing within a developing context. The data are drawn from the 2004/05 Malawian Integrated Household Survey (IHS) which surveyed around 11,000 households. The survey elicits subjective wellbeing measures from household heads only, who were asked to rate their overall life satisfaction on a Likert scale of 1 (very dissatisfied) to 5 (very satisfied). Variable definitions are given in Appendix I and descriptive statistics are presented separately for male and female headed households in Appendix II. They reveal that the average subjective wellbeing levels for males is 2.465 compared with 2.287 for females. Ideally, panel data would be used in order to control for unobserved heterogeneity, however this has not been possible. Instead, we have taken every effort to minimise such effects by controlling for other necessary correlates with wellbeing.

Per capita consumption is higher in male headed households than female ones (MK25,358 against MK22,523)[1] and around 19% of female headed households are classified by the Malawian National Statistical Office as being ultra poor compared with 16% of male headed households.

At 48 years female heads tend to be older than their male counter parts who are around 40 years on average. This may appear old in a young country, however, it should be noted that household heads tend to be older than the average age of the population. Over 80% of male headed households are married compared with only 5% of female headed households. The average size of female headed households is 3.8 people compared with 4.8 for male headed households. Together the age, household size and marital differences suggest that households are headed by females following the death of the husband. A small number are de facto female heads whose husband has migrated for work.

Males are more likely to have any given level of education, and own more assets. The asset index has a mean of zero for all households (by construction) but this is 0.142 for male headed households and -0.479 for female headed households. Female headed households therefore tend to be extremely asset poor. On average female headed households live in neighbourhoods with similar crime levels to male headed households.

The IHS asked all adults to report various crime indicators. Of particular interest is information on whether individuals had been attacked during the previous year and, if so, by whom. Subjective measures relating to fear of crime were also collected.

### *1.1 Crime and gender differences*

Males and male heads of households are more likely to have been personally attacked relative to females and female heads. Table 1 shows that 2.7% of women reported having been attacked in the previous year compared with 5.3% of men. In addition, 8.3% of attacks on women are by other household members, compared with less than 1% for men. Around 4.3% of attacks on female household heads are by other household members. Thus, females are more likely to be attacked by other household members, but considerably less so when the female is the household head. This is consistent with the hypothesis that male heads and males generally are responsible for a considerable proportion of attacks against female household members.

[1] At the time of the survey, US$1≈MK130

**Table 1: Attacks on individuals**

| In the past year, were you personally attacked? | | | | |
|---|---|---|---|---|
| | **All Female Adults** | **Female Heads Only** | **All Male Adults** | **Male Heads Only** |
| Yes | 2.71% | 3.68% | 5.34% | 6.42% |
| No | 97.29% | 96.32% | 94.66% | 93.58% |
| | 100.00% | 100.00% | 100.00% | 100.00% |
| If attacked, by whom? | | | | |
| | **All Female Adults** | **Female Heads Only** | **All Male Adults** | **Male Heads Only** |
| Household member | 8.25% | 4.26% | 0.81% | 0.72% |
| Other relative | 17.53% | 17.02% | 11.20% | 12.00% |
| Neighbour | 28.09% | 30.85% | 24.02% | 20.43% |
| Stranger | 46.13% | 47.87% | 63.97% | 66.85% |
| | 100.00% | 100.00% | 100.00% | 100.00% |

As well as being a victim of crime, respondents were asked subjective measures of fear of crime. Around 85% of both heads and the total adult population reported feeling "very safe" or "fairly safe" from criminals in their own homes. A Pearson chi square test strongly rejects the null hypothesis of independence between feeling unsafe and having been attacked for both All Adults and Heads only with chi square values of 167.9822 (p=0.000) and 136.1024 (p=0.000) respectively. Respondents who felt unsafe were asked to specify the main source of the threat, with over half of respondents indicating unarmed burglars.

We next calculate the proportion of respondents in each neighbourhood who reported having been attacked. This provides us with an "attack risk" variable. The "attack risk" variable has a mean of 2.42% and range of 0% to 18.64%, that is, in the most dangerous community, nearly 19% of respondents reported having been attacked in the previous year.

We classify neighbourhoods into one of five categories based on the reported crime rates. Table 3 shows that around 44% of households live in areas in which the risk of attack is under 1% (very low risk). 28% of households live in areas in which the risk is 1-3% (low risk). Around 4% live in very high risk areas with a risk of attack of greater than 10%.

**Table 3: Percent of households living in neighbourhoods with different risks of attack**

| Risk of Attack | % Households |
|---|---|
| Under 1% | 44.15% |
| 1-3% | 27.84% |
| 3-5% | 10.99% |
| 5-10% | 12.94% |
| Above 10% | 4.08% |

### *1.2 Linking crime and happiness*

While crime data is available for each household member, only the household heads were asked to report their life satisfaction. The remainder of the paper focuses only on household heads. Over 71% of household heads who reported having been attacked during the previous year also reported being very dissatisfied or dissatisfied with their life, compared with 62% of those who had not been attacked (see Table 4). Those who did not suffer an attack were more likely to be satisfied or very satisfied (around 24%) than those who had been attacked of whom around 18% were satisfied or very satisfied. This offers initial evidence of a link between crime and happiness.

Of those who reported feeling unsafe over three quarters were either very dissatisfied or dissatisfied, compared with around 60% of those who did not feel unsafe. Those who feel unsafe are also less likely to be happy with their lives, with around 18% reporting being satisfied or very satisfied, compared with around 25% of those who did not feel unsafe.

**Table 4: Life satisfaction, attack status and fear of crime**

| | Life satisfaction by attack status | | Life satisfaction and fear of crime | |
|---|---|---|---|---|
| | Attacked | Not Attacked | Feel Unsafe | Do not Feel Unsafe |
| Dissatisfied/Very Dissatisfied | 71.56% | 62.33% | 75.22% | 60.35% |
| Neither Satisfied nor Dissatisfied | 10.09% | 13.71% | 6.99% | 14.68% |
| Satisfied/Very Satisfied | 18.35% | 23.95% | 17.79% | 24.97% |
| | 100.00% | 99.99% | 100.00% | 100.00% |

**Figure 1** illustrates the link between life satisfaction and the risk of being attacked in the neighbourhood. The proportion of people who report being dissatisfied or very dissatisfied increases as the attack rate increases. Similarly, the proportion who report being very satisfied, satisfied or neither satisfied no dissatisfied is falling in crime.

**Figure 1: Life satisfaction by neighbourhood risk of attack**

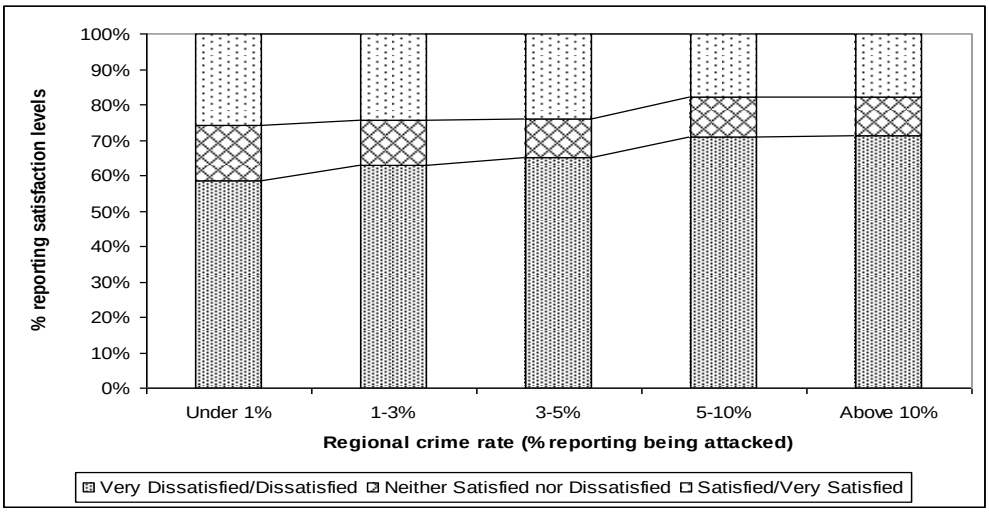
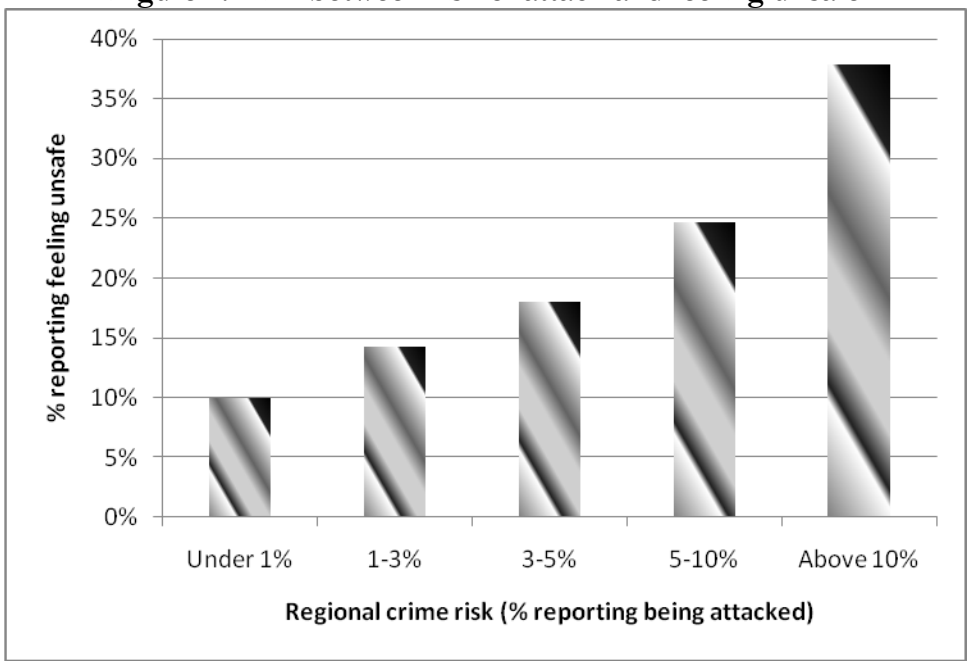



Figure 2 shows the link between the crime rate and feeling unsafe. The proportion of people reporting feeling unsafe increases as the crime level in the neighbourhood increases. In addition, there is a positive and significant correlation of 0.0985 (p=0.01) between risk of attack and feeling unsafe. On average, those who reported feeling unsafe did so with reason.

**Figure 2: Link between risk of attack and feeling unsafe**



The non-technical analysis indicates that there are strong links between crime and feelings of insecurity and happiness. Those who have been attacked tend to report lower levels of life satisfaction and life satisfaction is negatively associated with the neighbourhood crime rates. In addition, there is evidence to suggest that simply feeling in danger is associated with lower levels of life satisfaction. On average, those who reported feeling unsafe tend to live in more dangerous neighbourhoods.

## 2 Econometric analysis

### *2.1 Methodology*

The previous section showed a clear link between crime and fear of crime, and life satisfaction. This section models the impact of crime on household head life satisfaction using an ordered probit model, as is standard in the subjective well being literature. Self-reported satisfaction is regressed onto a number of variables including crime which takes either an objective form (based on likelihood of crime by area or whether a victim of crime) or subjective form ('feeling' of being a victim of crime), consumption per capita in each household and a vector of personalcharacteristics (e.g. age and education). In addition, the data provide information on other recent shocks suffered by the household. Given the cross-sectional nature of the data and the fact that we aim to isolate the impact of a crime shock, it is important to control for these[2]. The data allow us to include information on three shocks suffered by the household: Having suffered from crop destruction through flooding or drought; having suffered from having a member being made unemployed from a salary-paying job and having had someone suffer from a serious sickness or accident.

Regional dummies are used (but not reported) in order to control for systematic differences between regions. This is particularly important when we consider regional crime levels. An alternative would have been to control for clustering at the regional level.

This model does not consider endogeneity issues meaning estimated coefficients are correlates rather than determinants[3]. However for the case of crime and life satisfaction, Powdthavee (2005) discusses the issue of causality and notes that both economic theory and various psychological studies indicate that psychological distress results from victimisation rather than the other way round. We thus interpret significant coefficients on having been attacked during the previous year as crime impacting on individuals' happiness.

[2] We would like to thank an anonymous referee for pointing this out.
[3] For a discussion of the endogeneity issues see Deiner and Seligman (2004), Deiner et al. (2002), and Frey and Stutzer (2002).

The issue is not so clear cut for fear of crime. It could be, for example, that individuals who fear crime more tend to be unhappier. However, the inverse could also be the case. Although our descriptive statistics indicate a clear link between fear of crime and risk of crime, we prefer to remain cautious in the interpretation of coefficients on the subjective fear of crime variable. We therefore favour discussing significant coefficients on subjective fear of crime as associations rather than as causal. Nonetheless, we believe the models including these variables offer some interesting insights into the link between crime and wellbeing.

In addition to crime variables, we include other covariates traditionally found in subjective wellbeing analyses. In particular, we include household characteristics including log of per capita income, a dummy indicating whether a household is below the national ultra poor poverty line and an asset index calculated using principle components analysis. Individual characteristics including age and its square; education level; marital status; and employment are also included. Regional dummies are also included but not shown.

We enter the different measures of crime separately, and estimate 3 models for the whole sample and for male and female headed households separately in order to understand any systematic differences between these two groups. Results are found in Table 4.

## 2.2 Results

*Crime and Life Satisfaction*

The pooled sample results confirm the link between crime and happiness found in the analysis of the descriptive statistics. Model 1 indicates that having been attacked in the previous 12 months causes reported life satisfaction to decrease, ceteris paribus. This result holds when regional crime level is included which itself significantly reduces life satisfaction. The square of regional crime is also included in Models 2 and 3 and we find evidence that household heads in higher crime areas do not suffer additional losses in life satisfaction. Powdthavee (2005) finds that in South Africa the well being gap between crime victims and non-crime victims may actually be smaller in high crime districts. These results suggest that once regional crime reaches 11.2%, people adjust to this, and it ceases to make them less happy. However, when the sample is split by gender of head of household these results are only observed for male headed households.

We observe a major difference between male and female headed households with respect to crime. Objective measures of crime are consistently negative but insignificant for females. By contrast, the subjective measure of crime 'feel unsafe' included in Model 3 is negative and highly significant for female headed households as well as for male headed households. There is thus a strong negative association for females between *feeling* unsafe and life satisfaction, but not between actually being unsafe and life satisfaction. This is a significant result despite the fact that around 3.7% of female heads reported having been attacked in the previous year compared with 6.4% of men. Moore and Shepherd (2007) found that, in the UK, females reported more fear of personal harm than males, but less fear of personal loss.

It could be the case that having been a victim contributes negatively towards happiness in two ways: firstly simply having been attacked has a negative impact. Secondly, there may be a social stigma attached to being a victim. If this is stronger for males, then the models are likely to reveal a far stronger impact for males than for females for whom there is little social stigma.

It is interesting to ask which of the crime variables has the strongest explanatory power. Removing each of the crime variables from the full model one-by-one and comparing chi-2 is revealing. The chi-2 remain high for all models and is 2,027 when we remove a dummy indicating whether or not a respondent was attacked in the previous 12 months and 2,030 when we remove the regional crime variable, compared with 2,030 for the full model. When we remove the subjective 'feel unsafe' variable however, the chi-2 falls to 1,945. It suggests that this is the crime variable with the strongest explanatory power[4]. Results are not presented here for brevity but are available from the authors on request.

*Human Capital and Life Satisfaction*

Age is negative and its square positive indicating the well known U-shaped life satisfaction-age relationship. Primary education has a positive impact on happiness compared with the baseline of no education. Interestingly, females with an education level above secondary are actually less happy than others after controlling for income. This is a new finding in the African well being literature and is unusual in the well being literature generally. However, Clark and Oswald (1996) find a similar relationship between education and British job satisfaction equations. Graham and Hoover (2006) find that on average well educated Africans report higher life satisfaction scores, whilst Hinks and Gruen (2007) and Powdthavee (2005) find that higher educated South Africans, ceteris paribus,

[4] We would like to thank an anonymous referee for suggesting this type of analysis.

report higher life satisfaction levels. Highly educated Malawians may have too high expectations that are unlikely to be attained which affect life satisfaction negatively. Why highly educated Malawians are different to other Africans in this regard is not at all clear though. Alternatively, basic education in literacy and numeracy are likely to significantly contribute to quality of life, giving people improved access to a wider range of consumption goods, medicine and (communication) technologies. Issues of endogeneity arise here though since level of education cannot only influence well being but also earnings and household income levels[5]. When dividing the sample by gender of household head, it is found that primary education has a positive impact on life satisfaction for females, but not for males. In addition, higher education is negative and significant for females, but not significant for males. This may be an indication of job market discrimination with males being able to take advantage of their higher education, but females not. Given the positive externalities better education can have, particularly in poor countries, this is an area of research that requires further investigation but is beyond the scope of this paper.

*Income, Asset Wealth and Life Satisfaction*

Coefficients on our control covariates are in line with other studies. In particular, the log of per capita consumption is found to be positive and significant across all model specifications and across female and male head of households. For the UK, Moore and Shepherd report a positive relationship between income and fear of personal loss but a negative relationship between income and fear of personal harm. Other things equal, increased consumption levels increase happiness. Households which are below the national ultra-poor poverty line, calculated by the Malawian National Statistical Office tend to report lower life satisfaction. The asset index is consistently positive and significant indicating that greater wealth (and therefore perhaps living conditions) is associated with increased life satisfaction.

*Economic Activity and Life Satisfaction*

Self employment and salaried employment are consistently positive and significant. Those with these employments tend to be happier than the baseline farmer, other things being equal. Being unemployed (as opposed to being a farmer) is associated with lower life satisfaction amongst females but not amongst males, whilst males benefit from salaried and self-employment, but females do not. Here again, a labour market explanation is likely, with males securing better salaried work and

[5] The highly educated worker could well be the principle earner in the household but has to sacrifice more of this income to other household members that could negatively affect happiness.

running businesses that bring them more satisfaction than their female counterparts[6]. Stutzer and Lalive (2004) find that unemployment in Switzerland is inversely related to life satisfaction. In addition, they use a measure of social belief in the acceptability of being unemployed to find that the stronger is the social belief in the district, the more the negative impact is of being unemployed.

*Seasonal, Geography, Other Shocks and Life Satisfaction*

The hungry season dummy is a control variable which is equal to one for households which were interviewed during December, January or February. This is the time of year when food stocks from the previous year's harvest tend to run out. Food is often scarce for a few months during this period until the new harvest. The variable is significantly negative for pooled, male and female headed households indicating that short term factors, although predictable, can impact on reported life satisfaction. It is therefore important to include this as a control variable.

The rural dummy is positive and significant indicating that, other things equal, those living in rural areas report higher life satisfaction than their urban counterparts. The relationship between well being and urban areas is one that has received relatively scant research in the literature. Hudson (2006) finds that UK village dwellers are more satisfied with life than others. Explanations of this finding are varied. It could be argued that in developed countries town dwellers perceive public services to be poor because of the number of people using them. Lewis (1954) was the first economist to argue that urban life was more stressful than rural life. Urban wage premiums were, amongst other things, a result of the 'psychological cost of transferring from the easy going life of the subsistence sector to the more regimented environment of the capitalist sector' (ibid, pp.150). Issues of population density have as yet not been addressed in mainstream economic literature but are an area of research that needs inquiry. In Malawi rural dwellers may be happier than others simply because they have no alternative point of reference. Meanwhile urban dwellers may have migrated from rural villages so do have an alternative view: While the grass may always be greener, this is conditional on having migrated in the first place. Three shocks are also included in the models; the results indicate that having suffered from crop loss through flooding or drought; having had a member lose a salaried job; or having had a member suffer from serious illness of injury all unsurprisingly contribute negatively to the wellbeing of the respondent.

[6] In Malawi, self-employed females tend to run small home-based businesses such as beer brewing, with many males running larger trading firms.

*Crime, Wealth and Life Satisfaction*[7]

In order to whether there is any difference in the impact of crime on different wealth groups, we split households up by asset wealth quartiles, and run the wellbeing models for the top and bottom quartiles. These are reported in Table 5.

The results are revealing. The regional crime rate variables remain significant only for households in the top asset wealth quartile. Wealthier households suffer from increased regional crime but, as with the full sample, this exhibits a quadratic relationship with the impact of increased crime beginning to decline once it reaches around 7.4%. The regional crime rate has no impact on poorer households.

This difference could be explained by the fact that wealthier households have more to lose from higher crime and are more likely to be a victim than poorer households.

Other results follow similar patterns, with increased income having a positive impact and feeling unsafe having a negative impact for both groups. Interestingly, the hungry season has a negative impact for both groups suggesting that wealthier households are affected either directly or indirectly.

## 3. Conclusions

This paper has used detailed descriptive statistics and standard subjective wellbeing econometric methodology to investigate the link between crime and life satisfaction. Results indicate that the link is gendered with males and females responding to different crime variables. Regarding other covariates, we find that primary education has a positive impact on happiness for females but not males and that highly educated females may encounter discrimination in the labour market since this group are significantly less satisfied with life. Both consumption and an asset index are positively associated with happiness for males and females. Age follows the usual U-shape found by other authors.

Our results confirm that there is a negative relationship between crime and happiness with having been attacked in the previous year impacting negatively on life satisfaction. In addition, our results show that it is not only having been victimised which causes a decline in happiness. Rather, happiness is also declining in both the neighbourhood crime level and a simple *feeling* of being unsafe.

[7] We would like to thank an anonymous referee for suggesting this analysis.

The more respondents in a given neighbourhood who reported being attacked, the lower is life satisfaction. However, the relationship is not linear. Happiness declines until around 11.2% of the neighbourhood reported having been attacked, after which happiness begins to return to a 'set point' as indicated by theory.

The *feeling* of being unsafe is negatively associated with life satisfaction. In addition, removing crime variables one-by-one suggests that this is actually the crime indicator with the strongest explanatory power.

Key gender differences include the finding that both objective measures of crime and the subjective feeling unsafe variable impact negatively for males. For females only feeling unsafe effects life satisfaction with all objective crime variables being insignificant. Although the descriptive statistics reveal that there is a link between feeling unsafe and the neighbourhood crime level, this regression result indicates that the variables are not capturing the same thing.

# Table 4. Impact of Crime on Wellbeing

| Model | 1 | | | 2 | | | 3 | | |
|---|---|---|---|---|---|---|---|---|---|
| | All Household Heads | Female Household Heads | Male Household Heads | All Household Heads | Female Household Heads | Male Household Heads | All Household Heads | Female Household Heads | Male Household Heads |
| log(Per Capita Consumption) | 0.18*** | 0.13** | 0.19*** | 0.18*** | 0.13** | 0.19*** | 0.19*** | 0.14** | 0.20*** |
| | (6.28) | (2.13) | (5.79) | (6.15) | (2.09) | (5.70) | (6.73) | (2.25) | (6.25) |
| Ultra Poor | -0.08** | -0.13* | -0.07* | -0.09** | -0.13* | -0.08* | -0.09** | -0.13* | -0.08** |
| | (-2.38) | (-1.73) | (-1.80) | (-2.50) | (-1.76) | (-1.95) | (-2.53) | (-1.78) | (-1.97) |
| Attacked in Previous 12 Months | -0.18*** | -0.14 | -0.18*** | | | | -0.12*** | -0.12 | -0.11** |
| | (-4.12) | (-1.14) | (-3.88) | | | | (-2.67) | (-0.94) | (-2.20) |
| % in Region Reported being Attacked in last 12 Months | | | | -2.95*** | -0.91 | -3.66*** | -2.41*** | -0.84 | -2.98*** |
| | | | | (-3.15) | (-0.47) | (-3.40) | (-2.59) | (-0.43) | (-2.80) |
| Square % in Region Reported being Attacked in last 12 Months | | | | 13.02* | 2.81 | 15.73* | 14.29* | 5.54 | 16.59* |
| | | | | (1.67) | (0.17) | (1.75) | (1.89) | (0.35) | (1.92) |
| Feel Unsafe | | | | | | | -0.30*** | -0.25*** | -0.33*** |
| | | | | | | | (-9.17) | (-3.58) | (-8.70) |
| Female Dummy | -0.04 | | | -0.04 | | | -0.03 | | |
| | (-1.11) | | | (-1.07) | | | (-0.94) | | |
| Age | -0.01* | -0.01 | -0.00 | -0.01 | -0.01 | -0.00 | -0.01* | -0.01 | -0.00 |
| | (-1.71) | (-1.09) | (-0.82) | (-1.63) | (-1.05) | (-0.75) | (-1.68) | (-1.11) | (-0.74) |
| Age Squared | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | (1.57) | (1.31) | (0.55) | (1.55) | (1.28) | (0.53) | (1.55) | (1.34) | (0.47) |
| Married Dummy | 0.06** | 0.14 | 0.06* | 0.06** | 0.15 | 0.06* | 0.06** | 0.15 | 0.06* |
| | (2.13) | (1.47) | (1.89) | (2.10) | (1.54) | (1.79) | (2.12) | (1.50) | (1.81) |
| Migrant Dummy | -0.06** | -0.04 | -0.05* | -0.06** | -0.04 | -0.06* | -0.06** | -0.04 | -0.06** |
| | (-2.20) | (-0.70) | (-1.91) | (-2.26) | (-0.73) | (-1.95) | (-2.29) | (-0.69) | (-2.00) |
| Unemployed † | 0.05 | -0.25* | 0.12* | 0.06 | -0.26* | 0.13* | 0.04 | -0.27* | 0.10 |
| | (0.84) | (-1.75) | (1.72) | (0.85) | (-1.75) | (1.74) | (0.55) | (-1.85) | (1.45) |
| Home Worker † | 0.03 | 0.08 | -0.11 | 0.03 | 0.08 | -0.11 | 0.03 | 0.09 | -0.10 |
| | (0.46) | (1.08) | (-1.23) | (0.51) | (1.08) | (-1.21) | (0.61) | (1.15) | (-1.12) |
| Student † | 0.07 | 1.03 | 0.01 | 0.08 | 1.04 | 0.02 | 0.09 | 1.08 | 0.03 |
| | (0.35) | (1.52) | (0.03) | (0.42) | (1.52) | (0.13) | (0.46) | (1.54) | (0.15) |
| Salaried Employment † | 0.13*** | 0.09 | 0.14*** | 0.14*** | 0.09 | 0.14*** | 0.13*** | 0.08 | 0.13*** |
| | (4.10) | (0.86) | (3.89) | (4.13) | (0.85) | (3.93) | (3.93) | (0.79) | (3.72) |
| Self-Employment † | 0.14*** | 0.03 | 0.15*** | 0.15*** | 0.03 | 0.16*** | 0.14*** | 0.03 | 0.15*** |
| | (4.32) | (0.39) | (4.20) | (4.46) | (0.40) | (4.34) | (4.21) | (0.36) | (4.07) |
| Other Employment † | -0.04 | -0.05 | -0.06 | -0.05 | -0.05 | -0.06 | -0.05 | -0.04 | -0.07 |
| | (-0.90) | (-0.51) | (-1.01) | (-0.97) | (-0.51) | (-1.10) | (-1.06) | (-0.46) | (-1.25) |
| Household Size | 0.02** | -0.00 | 0.02** | 0.01** | -0.00 | 0.02** | 0.02*** | 0.00 | 0.02*** |
| | (2.33) | (-0.19) | (2.43) | (2.24) | (-0.18) | (2.32) | (2.89) | (0.01) | (2.94) |
| Primary Education † | 0.08*** | 0.16*** | 0.04 | 0.08*** | 0.16*** | 0.04 | 0.09*** | 0.17*** | 0.05 |
| | (3.07) | (3.11) | (1.16) | (3.03) | (3.12) | (1.09) | (3.39) | (3.21) | (1.48) |
| Secondary Education † | 0.03 | 0.06 | -0.01 | 0.03 | 0.06 | -0.01 | 0.03 | 0.06 | -0.01 |
| | (0.73) | (0.69) | (-0.33) | (0.73) | (0.67) | (-0.35) | (0.91) | (0.71) | (-0.14) |
| Higher Education † | -0.17 | -0.61* | -0.13 | -0.17 | -0.62* | -0.14 | -0.18* | -0.62* | -0.15 |
| | (-1.59) | (-1.83) | (-1.18) | (-1.60) | (-1.85) | (-1.21) | (-1.72) | (-1.84) | (-1.30) |
| Rural Dunmmy | 0.08* | 0.17 | 0.04 | 0.09* | 0.17 | 0.05 | 0.09* | 0.16 | 0.04 |
| | (1.79) | (1.58) | (0.71) | (1.94) | (1.60) | (0.90) | (1.90) | (1.57) | (0.86) |
| Asset Index | 0.07*** | 0.09*** | 0.06*** | 0.07*** | 0.09*** | 0.06*** | 0.07*** | 0.09*** | 0.06*** |
| | (9.34) | (5.09) | (7.90) | (9.30) | (5.07) | (7.86) | (9.26) | (5.06) | (7.84) |
| Hungry Season | -0.14*** | -0.12** | -0.15*** | -0.15*** | -0.12** | -0.16*** | -0.14*** | -0.12** | -0.16*** |
| | (-4.99) | (-2.03) | (-4.72) | (-5.38) | (-2.04) | (-5.20) | (-5.24) | (-2.10) | (-5.01) |
| log(Per Capita Community Consumption) | -0.23*** | -0.05 | -0.27*** | -0.21*** | -0.04 | -0.25*** | -0.20*** | -0.03 | -0.24*** |
| | (-6.50) | (-0.70) | (-6.84) | (-5.75) | (-0.54) | (-6.06) | (-5.58) | (-0.33) | (-6.01) |
| Shock: Flood/Drought | -0.11*** | -0.12** | -0.11*** | -0.11*** | -0.12** | -0.10*** | -0.11*** | -0.12** | -0.10*** |
| | (-4.46) | (-2.18) | (-3.91) | (-4.21) | (-2.16) | (-3.60) | (-4.22) | (-2.22) | (-3.58) |
| Shock: Unemployment | -0.08** | 0.10 | -0.11*** | -0.08** | 0.11 | -0.10*** | -0.08** | 0.13 | -0.10*** |
| | (-2.44) | (0.98) | (-2.97) | (-2.41) | (1.00) | (-2.91) | (-2.23) | (1.19) | (-2.82) |
| Shock: Sickness/Accident | -0.15*** | -0.14*** | -0.16*** | -0.15*** | -0.14*** | -0.15*** | -0.15*** | -0.14*** | -0.15*** |
| | (-6.58) | (-2.83) | (-5.93) | (-6.53) | (-2.88) | (-5.84) | (-6.36) | (-2.79) | (-5.70) |
| Cut 1 Constant | -1.92*** | -0.31 | -2.38*** | -1.74*** | -0.22 | -2.16*** | -1.53*** | 0.02 | -1.96*** |
| | (-4.45) | (-0.34) | (-4.85) | (-4.00) | (-0.23) | (-4.36) | (-3.51) | (0.02) | (-3.96) |
| Cut 2 Constant | -0.79* | 0.84 | -1.24** | -0.61 | 0.93 | -1.02** | -0.39 | 1.17 | -0.81 |
| | (-1.82) | (0.91) | (-2.53) | (-1.39) | (0.99) | (-2.06) | (-0.89) | (1.25) | (-1.64) |
| Cut 3 Constant | -0.36 | 1.30 | -0.82* | -0.18 | 1.40 | -0.59 | 0.04 | 1.64* | -0.38 |
| | (-0.83) | (1.41) | (-1.67) | (-0.40) | (1.49) | (-1.20) | (0.10) | (1.75) | (-0.78) |
| Cut 4 Constant | 0.60 | 2.19** | 0.17 | 0.79* | 2.28** | 0.40 | 1.01** | 2.53*** | 0.61 |
| | (1.41) | (2.37) | (0.35) | (1.81) | (2.44) | (0.81) | (2.32) | (2.70) | (1.23) |
| N | 11221 | 2570 | 8651 | 11221 | 2570 | 8651 | 11221 | 2570 | 8651 |
| Pseudo r2 | 0.0675 | 0.0721 | 0.0691 | 0.0675 | 0.0720 | 0.0694 | 0.0708 | 0.0741 | 0.0731 |
| Chi-2 | 1946.20 | 525.52 | 1496.63 | 1942.57 | 527.04 | 1498.99 | 2030.00 | 545.98 | 1567.30 |

Notes: † "Farmer" is omitted occupation dummy and "no education" is omitted education level. T-values in parentheses below coefficients. *, **, and*** indicate significance at the 10%, 5% and 1% levels respectively. Standard errors are corrected for potential heteroskedasticity using White (1980). Regional dummies included but not shown.

## Table 5. Impact of Crime on Wellbeing by Wealth

| | All Household Heads | |
|---|---|---|
| | Top Asset Quartile | Bottom Asset Quartile |
| log(Per Capita Consumption) | 0.13** | 0.22*** |
| | (2.47) | (3.47) |
| Ultra Poor | -0.13 | -0.07 |
| | (-1.32) | (-1.00) |
| Attacked in Previous 12 Months | -0.14 | -0.05 |
| | (-1.52) | (-0.53) |
| % in Region Reported being Attacked in last 12 Months | -5.20*** | 2.37 |
| | (-2.81) | (1.29) |
| Square % in Region Reported being Attacked in last 12 Months | 35.02** | -18.19 |
| | (2.53) | (-1.32) |
| Feel Unsafe | -0.28*** | -0.40*** |
| | (-4.21) | (-5.88) |
| Female Dummy | 0.07 | -0.11 |
| | (0.91) | (-1.62) |
| Age | 0.01 | -0.02** |
| | (1.04) | (-2.26) |
| Age Squared | -0.00 | 0.00* |
| | (-0.77) | (1.87) |
| Married Dummy | 0.12** | 0.10* |
| | (2.03) | (1.72) |
| Migrant Dummy | -0.06 | -0.01 |
| | (-1.30) | (-0.20) |
| Unemployed † | -0.04 | 0.13 |
| | (-0.34) | (1.12) |
| Home Worker † | -0.09 | 0.07 |
| | (-0.62) | (0.81) |
| Student † | -0.15 | 0.15 |
| | (-0.46) | (0.40) |
| Salaried Employment † | 0.04 | 0.07 |
| | (0.73) | (0.82) |
| Self-Employment † | 0.10 | -0.05 |
| | (1.60) | (-0.58) |
| Other Employment † | -0.20** | -0.18** |
| | (-2.01) | (-2.06) |
| Household Size | -0.01 | 0.03** |
| | (-0.64) | (2.22) |
| Primary Education † | 0.08 | 0.01 |
| | (0.96) | (0.20) |
| Secondary Education † | 0.01 | -0.01 |
| | (0.17) | (-0.09) |
| Higher Education † | -0.07 | |
| | (-0.56) | |
| Rural Dunmmy | 0.00 | -0.39*** |
| | (0.02) | (-3.10) |
| Asset Index | 0.04*** | 0.01 |
| | (3.09) | (0.18) |
| Hungry Season | -0.16*** | -0.20*** |
| | (-2.97) | (-3.22) |
| log(Per Capita Community Consumption) | -0.07 | -0.33*** |
| | (-1.16) | (-3.96) |
| Shock: Flood/Drought | -0.22*** | 0.04 |
| | (-4.32) | (0.77) |
| Shock: Unemployment | -0.12* | -0.15** |
| | (-1.86) | (-2.22) |
| Shock: Sickness/Accident | 0.02 | -0.25*** |
| | (0.46) | (-5.16) |
| Cut 1 Constant | -0.49 | -3.29*** |
| | (-0.62) | (-3.57) |
| Cut 2 Constant | 0.48 | -1.96** |
| | (0.61) | (-2.13) |
| Cut 3 Constant | 0.99 | -1.57* |
| | (1.26) | (-1.70) |
| Cut 4 Constant | 2.04*** | -0.70 |
| | (2.61) | (-0.76) |
| N | 2806 | 2810 |
| Pseudo r2 | 0.0670 | 0.0797 |
| Chi-2 | 564.83 | 527.61 |

Notes: † "Farmer" is omitted occupation dummy and "no education" is omitted education level. T-values in parentheses below coefficients. *, **, and*** indicate significance at the 10%, 5% and 1% levels respectively. Standard errors are corrected for potential heteroskedasticity using White (1980). Regional dummies included but not shown.

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## Appendix I: Variable Definitions

| | Variable Definition |
|---|---|
| Wellbeing | On a scale of 1 to 5 with 1 being least satisfied with life and 5 being most satisfied |
| Per Capita Consumption | Per capita total household consumption levels. This is logged. |
| Ultra Poor Dummy | A dummy indicating whether the household is classified as ultra-poor by the Malawian National Statistics Office |
| Attacked | A dummy indicating whether or not the respondent had been physically attacked over the previous year. |
| % in Region Reported being Attacked in last 12 Months | This indicates the percentage of respondents in the region that reported having been attacked over the previous year. This is thus a regional crime variable. |
| Feel Unsafe | A dummy indicating whether or not the respondent indicated that they felt unsafe from crime. |
| Female Head | A dummy indicating a female head of household. |
| Age | The age of the respondent. |
| Married | A dummy indicating whether or not the respondent is married. |
| Unemployed | An occumpational dummy inicating that the respondent is currently unemployed. |
| Home Worker | An occumpational dummy inicating that the respondent is currently a home worker. |
| Student | An occumpational dummy inicating that the respondent is currently a student. |
| Salaried Employment | An occumpational dummy inicating that the respondent is currently in salaried employment. |
| Self Employed | An occumpational dummy inicating that the respondent is currently self-employed. |
| Other Job | An occumpational dummy inicating that the respondent is currently employed in a job other than those indicated. |
| Household Size | The number of household members |
| Primary Education | A dummy indicating that the respondent's highest level of education is primary. |
| Secondary Education | A dummy indicating that the respondent's highest level of education is secondary. |
| Higher Education | A dummy indicating that the respondent's highest level of education is tertiary. |
| Migrant | A dummy indicating that the respondent was born outside of his/her current district of residence. |
| Rural Area | A dummy indicating that the household resides in a rural area. |
| Asset Index | An asset index composed using Principle Components Analysis. |
| Hunger Season | A dummy indicating that the respondent was interviewed during the 'hungry season'. |

## Appendix II: Descriptive Statistics

| | All Households | | | | | Female Headed Households | | | | | Male Headed Households | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Obs | Mean | Std. Dev. | Min | Max | Obs | Mean | Std. Dev. | Min | Max | Obs | Mean | Std. Dev. | Min | Max |
| **Wellbeing** | 11272 | 2.424 | 1.197 | 1 | 5 | 2582 | 2.287 | 1.161 | 1 | 5 | 8690 | 2.465 | 1.205 | 1 | 5 |
| **Per Capita Consumption** | 11280 | 24709 | 27685 | 1425 | 765641 | 2583 | 22523 | 23141 | 2710 | 458193 | 8697 | 25358 | 28867 | 1425 | 765641 |
| **Ultra Poor Dummy** | 11280 | 0.167 | | 0 | 1 | 2583 | 0.191 | | 0 | 1 | 8697 | 0.160 | | 0 | 1 |
| **Attacked** | 11280 | 0.058 | | 0 | 1 | 2583 | 0.037 | | 0 | 1 | 8697 | 0.064 | | 0 | 1 |
| **Pr(Attacked)** | 11280 | 0.023 | 0.031 | 0 | 0.186 | 2583 | 0.023 | 0.031 | 0 | 0.186 | 8697 | 0.024 | 0.031 | 0 | 0.186 |
| **Feel Unsafe** | 11280 | 0.151 | | 0 | 1 | 2583 | 0.151 | | 0 | 1 | 8697 | 0.151 | | 0 | 1 |
| **Female Head** | 11280 | 0.229 | | 0 | 1 | | | | | | | | | | |
| **Age** | 11272 | 42.459 | 16.354 | 14 | 99 | 2582 | 48.403 | 17.851 | 14 | 99 | 8690 | 40.693 | 15.449 | 14 | 99 |
| **Married** | 11280 | 0.638 | | 0 | 1 | 2583 | 0.051 | | 0 | 1 | 8697 | 0.813 | | 0 | 1 |
| **Unemployed** | 11280 | 0.025 | | 0 | 1 | 2583 | 0.019 | | 0 | 1 | 8697 | 0.027 | | 0 | 1 |
| **Home Worker** | 11280 | 0.034 | | 0 | 1 | 2583 | 0.103 | | 0 | 1 | 8697 | 0.014 | | 0 | 1 |
| **Student** | 11280 | 0.004 | | 0 | 1 | 2583 | 0.002 | | 0 | 1 | 8697 | 0.004 | | 0 | 1 |
| **Salaried Employment** | 11280 | 0.170 | | 0 | 1 | 2583 | 0.066 | | 0 | 1 | 8697 | 0.201 | | 0 | 1 |
| **Self Employed** | 11280 | 0.140 | | 0 | 1 | 2583 | 0.105 | | 0 | 1 | 8697 | 0.151 | | 0 | 1 |
| **Other Job** | 11280 | 0.057 | | 0 | 1 | 2583 | 0.061 | | 0 | 1 | 8697 | 0.056 | | 0 | 1 |
| **Household Size** | 11280 | 4.547 | 2.336 | 1 | 27 | 2583 | 3.810 | 2.125 | 1 | 15 | 8697 | 4.766 | 2.351 | 1 | 27 |
| **Primary Education** | 11280 | 0.426 | | 0 | 1 | 2583 | 0.358 | | 0 | 1 | 8697 | 0.446 | | 0 | 1 |
| **Secondary Education** | 11280 | 0.286 | | 0 | 1 | 2583 | 0.124 | | 0 | 1 | 8697 | 0.334 | | 0 | 1 |
| **Higher Education** | 11280 | 0.016 | | 0 | 1 | 2583 | 0.007 | | 0 | 1 | 8697 | 0.019 | | 0 | 1 |
| **Migrant** | 11280 | 0.290 | | 0 | 1 | 2583 | 0.220 | | 0 | 1 | 8697 | 0.310 | | 0 | 1 |
| **Rural Area** | 11280 | 0.872 | | 0 | 1 | 2583 | 0.914 | | 0 | 1 | 8697 | 0.860 | | 0 | 1 |
| **Asset Index** | 11237 | 0.000 | 2.263 | -2.606 | 12.707 | 2572 | -0.479 | 1.941 | -2.535 | 11.526 | 8665 | 0.142 | 2.332 | -2.606 | 12.707 |
| **Hungry Season** | 11280 | 0.184 | | 0 | 1 | 2583 | 0.184 | | 0 | 1 | 8697 | 0.185 | | 0 | 1 |