

W.P. SERIES NO. 211

SOCIAL SAFETY NETS, WHO NEEDS THEM? AN ANALYSIS OF HOUSEHOLD DATA FROM ZIMBABWE.

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Social Safety Nets, Who Needs Them? An Analysis of Household Data from Zimbabwe.

Abstract.

The paper argues vulnerability, rather than poverty, should be the selection criterion used to target resources towards people likely to be most severely effected by adverse economic shocks during structural adjustment. One measure of vulnerability is a household's ability to meet expenses for health care and education. Survey data show 16% of households were vulnerable in an urban district in Zimbabwe using these criteria. Econometric analysis of the household data shows that observable indicators can predict vulnerability well. It is argued that assessments using observable indicators, rather than household income are a viable way to target social welfare benefits that offer considerable advantages over the present system in Zimbabwe.

1. Introduction.

Analysis of structural adjustment programmes in developing countries traditionally focused on the policies' success in achieving desired targets for macroeconomic variables; the balance of payments, the governments budget deficit, inflation, the real exchange rate and economic growth. More recently, after a number of publications documented the increasing poverty and deterioration in welfare accompanying structural adjustment programmes (Cornia et al 1987, 1988 is an influential example), attention has turned to their impact on the wider social objectives of government, especially poverty reduction (World Bank, 1990). Structural adjustment programmes often now include policies aimed to reduce or counter the adverse economic shocks that affect the poor and vulnerable during the process of adjustment. In general the social policies incorporated in the structural adjustment policy package aim to identify target groups and direct resources to them. The aim is thus to construct 'social safety nets' that catch the poor and vulnerable before they fall into extreme poverty or destitution.

Targeting, it is argued, is preferable to systems of universal subsidy as not only does it ensure that those in most need get most benefit but also as targeting maximizes the resources that the government has to spend on the poor. The argument is that universal provision of free services, such as health and education, or subsidy of goods that comprise a large proportion of poor people's expenditure, such as food grains or housing, benefits those that could afford to pay for such goods and services. Targeting thus can release resources for social expenditure as resources can be directed away from subsidizing people who can afford to pay for government provided social services and subsidized goods to those who cannot afford to pay for them. (Kanbur et al 1994; see World Bank, 1993, for this argument applied to health care services).

Whether targeting does in fact improve equity is by no means proven empirically (see Cornia and Stewart 1993 for evidence on the welfare effects of some targeted schemes compared to universal ones). Here we leave aside the issue of whether targeted schemes are superior to universal provision and consider a narrower issue, whether it is possible to identify the vulnerable in practise. Household survey data from Zimbabwe are used in our analysis. The data form part of the research programme "The political and social context of structural adjustment in sub-Saharan Africa " based at the Nordiska Afrikainstitutet, Uppsala, Sweden (see Gibbon 1992, 1993 and 1995a,b and c). The research in Zimbabwe assesses the impact of structural adjustment on health and health care in one urban and one rural area.

In Zimbabwe user charges for health services have recently been introduced¹, reflecting a switch to targeting

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See section 3 for precise details.

of health service provision. Although a system for exempting poor households from health service charges exists concern has been expressed by health service professionals that user charges result in reduced access of the poor to health services (eg. Renfrew, 1992). It is argued that those qualifying for exemption from charges (defined by their income level) are often unable to get the necessary documentation to prove their status and the scheme's administration and design mitigates against ensuring that the poor and vulnerable have access to health services (Lennock, 1994).

If low income households are unable to cope with the greater demand for cash payments for education and health services, a vicious cycle is likely to occur as the next generation become increasingly vulnerable to poverty, due to their inadequate education and access to health care services. Defining who needs social safety nets by the criterion of vulnerability as well as poverty should thus be of vital concern to social policy makers aiming to reduce poverty levels over time.

The paper proceeds as follows. First, the concept of vulnerability is defined and its relationship to poverty discussed. Criteria by which the vulnerable may be identified are suggested. It is argued that the power of vulnerability (over poverty) as a criterion for social welfare provision lies in the attention that it draws to risks facing the household over the various stages of its life cycle. Some households will be better positioned to overcome adverse circumstances when they occur than others. To implement a policy which aims to protect the vulnerable, policy makers have to be able to find out which households are most likely to be vulnerable either at some time in the future or at the present moment. Social welfare policy must be preventative in the sense that service provision enables people to avoid falling below a certain standard of living. After briefly describing some of the characteristics and attributes of households in a high density urban district in Zimbabwe, (surveyed by the research project cited above), an econometric model is tested to see whether household characteristics can predict the likelihood of vulnerability. It is concluded that the likelihood of vulnerability can be predicted using household data which are readily observable. Thus one way of implementing targeted welfare benefit would be to designate the target as a group sharing similar characteristics rather than attempting to identify individual households as poor or non poor. Further policy implications are summarized in the conclusion.

2. Identifying Target Groups.

Two groups, the poor and vulnerable, are the object of targeted social expenditures under structural adjustment. The poor are defined as those having an income below some socially defined minimum, usually a poverty datum line.

The vulnerable are defined as those being particularly at risk from adverse economic shocks (World Bank, 1990). An economic approach to risk defines it as the extent to which outcomes diverge from their expected values. To apply this approach to the household would mean that their exposure to risk would have to be measured by, for example, first calculating the expected value of lifetime earnings and assessing their ability to meet socially defined minimum levels of consumption and then estimating the standard deviation from the calculated expected income for different socio-economic groups. Clearly such a task is impossible in practice. The normal recourse is to use proxy variables to define vulnerability.² Vulnerability is therefore operationalized as a probabilistic concept: in any society high odds can be attached to the likelihood that certain groups in the

²

One well known publication on the social impact of structural adjustment proxies vulnerability by: all children under five years old; children living in villages subject to drought; pregnant and nursing women; the unemployed; the under-employed; unemployed youth; the old; the rural landless; the illiterate and retrenched government employees in the various country studies (Cornia, Jolly and Stewart, 1983).

population experience poverty or another form of social deprivation. Policy interventions are thus made either to smooth out large standard deviations in the expected value of absolute income (improving irrigation in drought prone agricultural regions, for example), or to temporarily ease the constraint of high costs in relation to income over the life cycle (for example by setting up feeding programmes for children under five years old) to reduce vulnerability .

Poverty and vulnerability clearly have some overlap. Figure 1 , a Venn diagram illustrates a possible relationship between the two concepts. P and V define the set of poor and vulnerable households respectively. A household can be poor and not vulnerable, shown by the unshaded part of the 'P' circle. For example, if economic policy reduces employment in an industry situated in an urban area, poor rural households unaffected by the policy are not vulnerable to this economic shock. A household can also be vulnerable but not poor, as represented by the unshaded area of the 'V' circle. If a drought prone rural agricultural area has good rainfall for a few years running, then many households will get an income above the poverty line for some of those years but they will remain vulnerable to the next drought. Alternatively a household can be poor and vulnerable as shown by the shaded area in Figure 1. For example a rural household with inadequate access to land may not get an income above the poverty line when rainfall is adequate and at the same time remains vulnerable to droughts. Over time a household can, of course, move between or out of the poverty and vulnerability sets and it is the implications of the dynamic aspects of poverty and vulnerability that the next section considers.

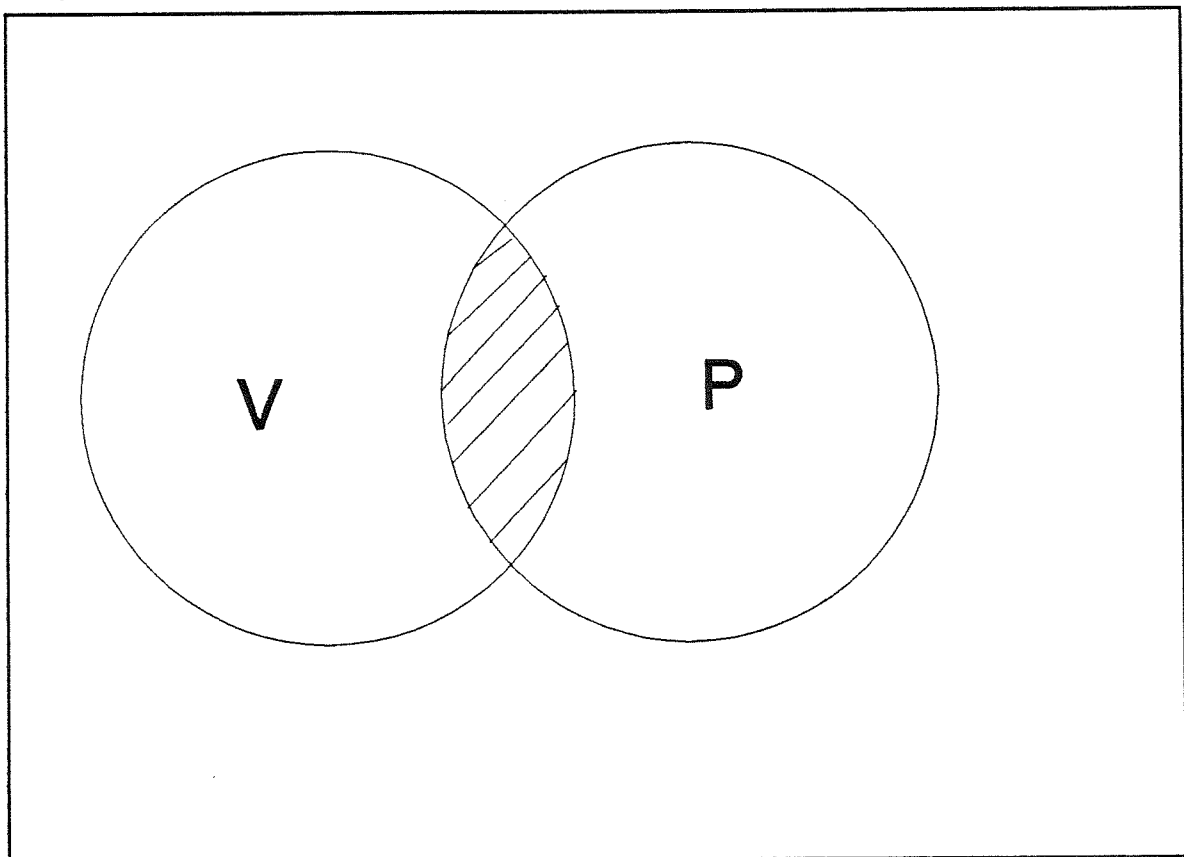


Figure 1

Vulnerability versus poverty as a focus for policy makers.

The need to focus on vulnerability rather than poverty can be justified by three considerations: the life cycle of the household or individual; measurement problems and concern for the quality of life of future generations.

Some households will move in and out of poverty over time. Such movement can be due to random, shocks such as the main wage earner becoming unemployed, or because there is greater pressure on income and resources at particular times in life.³ Households are more likely to be poor when there is a high proportion of non-wage earners to wage earners and such contingencies are likely to occur at specific time periods in a household's formation, varying according to the particular social form of familial relationships in each society.⁴ Social policy needs therefore to be designed to take the dynamic nature of household welfare into account.

Problems for policy makers of implementing means tested social policies are well known. In developing countries illiteracy and the frequency of informal, temporary and casual employment make accurately assessing whether a household qualifies for a means tested benefit an expensive, time consuming and difficult task. Furthermore, as Atkinson (1989) points out, when income is the variable used to define poverty, it gives an incomplete picture of the extent to which consumption expenditure is restricted. Households facing sudden cuts in income can react by running down assets or borrowing to maintain levels of consumption. Given capital market imperfections, the availability of credit is not a realistic option for the majority of low income households. Social welfare policy needs therefore not only to consider the *incidence* of poverty but also its *duration*.

Recently sustainability in the development process has become an important issue. The debate has centred around the environmental effects of policies enacted to promote growth and their effect on human capital formation. Research on economic development has linked a country's level of human development to its capacity for growth (UNDP, various years). One implication of this research is that household capacity to adapt to, or absorb, adverse economic shocks will affect future economic development and thus the standard of living of future generations.

Social policy that aims to reduce poverty over the longer term should therefore ensure that households can normally increase their 'investment' in human capital and at the very least maintain it in times of economic recession or other adverse circumstances. By being able to continue to educate children, adequately feed adults and children in the household and provide for their health care needs, the value of the household's human resources increases and the sustainability of development is enhanced. To this end vulnerability is a better focus for policy makers than poverty. Focusing on the risk that households face takes account of the dynamic nature of poverty thus making welfare interventions, if well formulated and successfully implemented, better fitted to raising the standard of living over the longer term.

3. Vulnerability in Chitungwiza, an Urban Area in Zimbabwe.

If policies are to use vulnerability rather than poverty as the criterion by which people receive social welfare payments or transfers in kind, it will be necessary to distinguish between vulnerable and non vulnerable households. The empirical analysis that follows investigates whether this is possible or not. The question is particularly pertinent in the context of recent Zimbabwean social policy changes.

³ In Zimbabwe (and many other countries), one such time for many households is when children are at secondary school as fees have to be paid .

⁴ See for example Mead Cain (1978) who argues that wives in rural households, given that they are normally much younger than their husbands at marriage, have a high incentive to have at least two sons to ensure that they are supported once they are widowed. Widowhood is thus the time when vulnerability is high in rural Bangladesh.

First, recent changes in Zimbabwe's health and education policy and the economic environment in which they occurred are described. Next, some characteristics of the households in the sample are described and the definition of vulnerability explained. The ability of household data, consisting of mainly observable indicators, to predict vulnerability and hence determine which households should be exempted from user charges for social services is tested in section 4.

Using observable indicators, instead of household income data, avoids many of the measurement problems cited earlier associated with assessing eligibility for means tested benefits. They are also more amenable for use by community organisations, such as school committees, parent teacher associations, community clinics etc., who wish to establish systems to exempt people from charges for social services. So they can offer a viable and equitable way to implement targeted policies.

Economic Conditions and Health and Education Policy in the Early 1990s.

Zimbabwe was hit by drought in 1991/2 which had severe economic repercussions in rural and urban areas. In 1992 real economic growth was negative (-7.7%) as inflation reached 46%. By 1993 real growth recovered to 2% (still well below the rate of growth of the population) and inflation fell to 20%. The drought coincided with the implementation of the Economic Structural Adjustment Programme (ESAP) in 1991 (Bijlmakers et al, 1994).

One element of the ESAP was to reinforce targeting of health care services. In fact, a system of user charges, accompanied by exemption criteria, had been in place since 1985. In practise they were often not implemented by clinics and hospitals in Zimbabwe. In an effort to increase cost recovery the Ministry of Health took measures to enforce the user fee system in 1991. Except in the case of a few specified diseases and medical conditions, user charges were enforced for those whose income put them above a certain level.⁵

Eligibility for exemption from health service charges was determined solely by household monthly income, irrespective of family size. It was even unclear exactly whose income was under consideration: many households have more than one breadwinner. In order to receive free medical services, a certificate had to be obtained from the local Social Welfare Office, which was also empowered to make discretionary grants to help people pay school fees or feed babies and children. Proof of earnings of the main wage earner was normally needed to get Social Welfare grants or exemption certificates which were issued for family health care. About 23% of the economically active population is employed in the formal sector in Zimbabwe,⁶ hence many people have difficulty getting proof of earnings.

So, since 1991, health policy has relied increasingly on poverty assessments, defined by income, to decide whether people are charged user fees for health services or not. The change in policy emphasis has not been problem free (Renfrew 1992, Lennock, 1994): by 1992 a common view in Zimbabwe was that the system of exemption could not ensure equal access to health services (Hanmer 1992).

Cost recovery policies were also implemented in the education sector. In January 1992 primary school fees were introduced and secondary school fees raised in urban areas (in rural areas primary schools still did not charge school fees). The fee structure reflected the income of the catchment areas. The highest fees were charged by schools in the low density urban suburbs, lower ones charged by schools in the urban high density areas and the

⁵ Z\$150 in 1991 increased to Z\$400 in 1993/4.

⁶ Calculated from *Quarterly Digest of Statistics*, (1992) and *Census 1992*.

lowest fees charged by secondary schools in rural areas. In addition to school fees parents have to pay levies, set by the individual school (and approved by government), as contributions towards the school's financial requirements. Like the charges for health care services, eligibility for exemption from school fees was determined by family income⁷ and was assessed given by the Department of Social Welfare (Kanji 1994).

In 1993 households in Zimbabwe faced harsh economic circumstances, inflation raised the price of many basic foodstuffs, employment prospects were poor and real wage levels stagnant. The effects of drought were still being felt in rural areas (user fees had to be suspended between January and June 1993 in government rural health facilities). Households in urban areas will often have had to absorb members of their extended family and sometimes looked after one or more children from the rural areas whose parents were having difficulty feeding them.

The Chitungwiza Data.

The survey consists of 327 households who were interviewed in 1993. It was carried out in Chitungwiza, an urban high density residential area, outside Harare. Chitungwiza was built before independence (1980) to provide housing for blue collar workers working in Harare. In recent years its character has changed, as households now let out rooms and space in their backyards (on which wooden shacks are built) to 'lodgers', often people from rural areas working or looking for work in Harare. Householders in Chitungwiza are now from a wider range of occupational backgrounds than in the past. Lower real wages of many white collar workers, particularly people employed in the public sector, combined with the high cost of Harare's housing, has meant that newly formed households in Chitungwiza may consist of professional and white collar workers as well as those in blue collar jobs.

Table 1 shows some characteristics of Chitungwizan households. The data are disaggregated by type of tenure, as given the difference in the standard of accommodation of lodgers and house owners or renters,⁸ averages across these categories could hide different characteristics belonging to discrete populations.

Table 1. Chitungwiza Households 1993, (n=237).

Medians	House Owners (n=81)	House Renters (n=75)	Lodgers (n=171)
Household (h.h) Size	9	7	4
No of Adults (per h.h)	3	2	2
No of Children (under 5yrs)	1	1	1
No of Children(over 5yrs)	4	3	1

Chitungwiza in Comparison to the Rest of Zimbabwe.

Social indicators for Chitungwiza compare favourably to those for the Zimbabwean provinces. Table 2 below shows that in some provinces the percentage of the population with no education varies between 40% and 50%

⁷ Parents earning under Z\$400 a month qualified for exemption.

⁸ Home renter category includes all those in a rent to buy scheme for less than ten years, capturing those whose housing costs are likely to be high in relation to their income.

compared to 20% for Chitungwiza.

Considering malnutrition, 1990 data on weight for age for infants show a proportion of two percent for Chitungwiza, compared to between nine percent and 17% for the eight Zimbabwean Provinces and five and three percent, for Bulawayo and Harare respectively. Evidence on maternal nutrition and the quality of ante natal care are reflected in birth weight data. In 1989 about two percent of births in Chitungwiza were below 2.5 kg, compared to 10-15% in other provinces, over six percent in Bulawayo and less than one percent in Harare. Regression analysis has shown that about half the variation in birth weights can be explained by the sex of the child, the number of children born to the mother and income and education of the parents while the other half is explained by the nutritional status and health of the mother (Tagwireyi and Greiner 1994). Thus the indications are that lower malnutrition rates in Chitungwiza derive at least in part from better social conditions and a higher standard of living.

Table 2. Percentage Distribution of Population 5yrs+ by Level of Education Completed.

Province/District.	None	Grade 7	Form 2	Form 4	Grad/Post Grad	Other
Chitungwiza	17.6	27.0	15.2	18.6	0.6	9.3
Urban Harare	14.8	24.5	13.7	30.5	2.7	13.7
Bulawayo	16.2	29.7	15.6	28.9	1.2	8.4
Mash. East	41.0	30.2	11.3	14.1	0.3	3.1
Masvingo	47.7	26.8	9.4	12.5	0.3	3.3
Mat. South	44.2	33.2	9.9	10.1	0.2	3.0
Manicaland	49.2	26.5	8.9	12.0	0.3	3.1

Other categories are Form 6, Diploma Primary, Diploma Secondary.
Source: Census 1992, various Provincial Profiles, CSO Harare; 1993.

Compared to many other areas in Zimbabwe people in Chitungwiza are well educated, well nourished and hence could be thought to have reasonably good employment opportunities and earning prospects. So, it can be expected to be an area where vulnerability is relatively low. Chitungwiza is thus a good case study to see if social safety nets can operate in practice. There will be variation in households ability to cope with adverse economic shocks, the area has good communications and literacy rates are high, hence people should be aware of policy changes and thus able to respond to them by applying for exemption from charges, if eligible. However, it must be born in mind that conditions in Chitungwiza are not typical of many regions in Zimbabwe, particularly in the rural areas, so results from the study cannot be generalized to all regions in Zimbabwe.

Indicators of vulnerability.

The analysis that follows does not claim to capture the full extent of vulnerability of households in Chitungwiza. The household survey excluded households with no child between 12 and 59 months. So vulnerability is only considered in some types of households in Chitungwiza. From the social welfare perspective there are thus important groups of households, for example, those consisting of elderly people with no or few adult wage

earners to support them, which are under-represented in the estimates of vulnerability in Chitungwiza presented below.

The survey data give two possible ways to ascribe vulnerability to households; inability to meet school fees and inability to meet health care expenses.

Households were considered vulnerable if one or more of their children had delayed starting school or been withdrawn from school. Such interruptions in a child's schooling usually occurred as the family was unable to pay school fees or related school expenses (school uniforms, book funds etc). However in one or two instances other reasons were given, including that the child was mentally or physically handicapped.

If household members said when a household member fell ill they had been not gone to the clinic as they could not afford it, or had paid for health care services received by borrowing or getting credit from the service provider, they were categorized as vulnerable.

Fifty three households, or 16% of the sample, were categorized as vulnerable by these criteria. Of these eight were house owners (10% of all house owners), 31 lodgers (18% of all lodgers) and 14 renting their house (19% of tenants). Table 3 shows a breakdown of the different categories. Given the relative advantages of Chitungwiza compared to other places in Zimbabwe, it is extremely worrying that 16% of sample households are vulnerable according to these criteria alone. Proportions in other less advantaged parts of the country may well be higher.

Determinants of vulnerability.

To find out whether policy makers could identify vulnerability using indicators other than income, data on household attributes available from the survey of households in Chitungwiza are discussed below.

Table 3 shows that incidence of vulnerability occur in households in each type of tenure vulnerability thus cannot be determined by tenure status alone.

Table 3. Incidence of Vulnerability in Households in Chitungwiza.

Indicator	Incidence	Sample Percentage (n=327)
Delayed or stopped school.	34	
Unable to meet medical expenses.	27	
Total	61	
Total number of households experiencing at least one of above indicators.	53	16
House Owner	8	10
House Renter	14	19
Lodger	31	18

Household Characteristics.

Household size and composition are given by data on the number of children (over and under five years old), the number of economically active adult males and females, the number of adult men and women and whether the household is female headed or not. Female headed households include both *de jure* female headed households (those with no male employed) and *de facto* ones (those where no adult male lives) (Kennedy and Peters, 1992).

Indicators of Income and Human Capital.

Employment data show how many household members work in the formal and informal sectors and how many are unemployed. The data are differentiated by sex. Unfortunately, no data are available that indicate households human capital levels (e.g. years schooling of children's parents). The employment data may pick up some of the household's human capital attributes if the different employment categories (formal sector, informal sector and subsistence) are associated with different levels of education and training.

Indicators of Physical Capital and Assets.

The variables that can indicate a household's physical capital and assets are: house ownership (defined by households either stating that they own their house or by them being part of a rent to buy scheme for more than 10 years); land usufruct; cattle ownership and debt and savings.

The status of lodger is also included as an indicator of relative asset endowment. Lodgers have no legal rights to their housing, are frequently more overcrowded and generally have less adequate and lower quality housing than homeowners. They are thus not only unable to raise money on the basis of their housing capital, (by renting out rooms as homeowners do), but also more likely to be subject to homelessness or (costly) changes of accommodation. Compared to homeowners they are less likely to own consumer durables and probably have less assets in the form of housing capital.

Table 4. Household Attributes.

Attribute	No of Households			
	Owner (N=81)	Renter (N=75)	Lodger (N=171)	Total (N=327)
Female Headed Household	9 (11%)	14(19%)	26(15%)	49(15%)
Cow Ownership	15(18%)	10(13%)	22(13%)	47(14%)
Land Usufruct	26(32%)	11(15%)	35(21%)	72(22%)
Indebtedness	22(27%)	23(31%)	51(30%)	96(29%)
Inability to save	42(52%)	36(48%)	92(54%)	170(52%)
Unemployed Males (>=1)	19(23%)	25(33%)	19(11%)	63(19%)
Unemployed Females (>=1)	44(54%)	39(52%)	79(46%)	162(49%)
Male Formal Sector (>=1)	52(64%)	42(56%)	102(60%)	196(60%)
Female Formal Sector (>=1)	9 (11%)	13(17%)	9(5%)	31(9%)
Male Informal Sector(>=1)	17(21%)	23(31%)	37(22%)	81(25%)
Female Informal Sector (>=1)	46(57%)	41(55%)	87(51%)	174(53%)

Numbers in brackets in the first three columns show the percentage of each tenure group that has the attribute. In the last column the number in brackets is the percentage of the sample that has the attribute.

4. Econometric Modelling.

A logit model was used to estimate the ability of the household attributes to predict whether a household was vulnerable or not.

The dependent variable in the model is the logarithm of the probability of vulnerability. The coefficients estimated by the model gives the exponents (to the base e) which can be converted to an odds ratio for each variable. The odds ratio shows the increase in the probability of vulnerability occurring associated with each particular variable, holding the others variables constant.

The general model tested specifies vulnerability, (V), as a function of household characteristics, (HC), household employment, (E) and household asset holding, (A).

$$V = f (HC, E, A) \tag{1}$$

The data set included a number of variables each category of independent variable. The full range of variables from which Model 1 (Table 5 below) was selected are shown in Appendix I. The procedure followed was to estimate a separate model for each of the independent variable categories (HC, E and A) and determine the best sets of independent variables for predicting probable vulnerability (Models 1.1 - 3.2, Appendix 1). Logistic likelihood ratio tests were used to test which variables could be dropped without significant loss of information.

The signs of the variables are as expected (see Appendix 1 for further details). Access to physical and financial capital decrease the probability of household vulnerability, while having large numbers of children increases it. A female headed household has a higher probability of being vulnerable. The positive relationship between the number of male and female informal sector workers and household vulnerability suggests that some of this work represents 'distress sales' of labour. The Zimbabwe research project found that the most important reasons for large numbers of informal sector workers per household were first, that spouses who used to stay at home were going to work in the informal sector and second, that relatives from rural areas joined the household to try and find work in town. One interpretation is thus that the household is selling all the labour it can to scrape together to get a living.

Table 5. Logit Models of Household Vulnerability⁹

Variable	Model 1 Chi ² (7)=35.2		Model 2 Chi ² (4)=32.26	
	Odds Ratio	t	Odds Ratio	t
Children over 5	1.40	3.45	1.48	4.21
Children under 5	1.59	1.30		
Fem H.H.	1.20	0.41		
House Owner	0.32	-1.8	0.30	-2.69
Female formal sector worker	0.22	-1.3	0.26	-1.73
Female informal sector worker	1.76	2.15		
Unemployed males.	1.53	1.96	1.49	1.99

Notes: The dependent variable is the probability of the household experiencing an incidence of vulnerability.

Chi² statistics for Model 1 and 2 are significant at above 0.0001.

Logistic Likelihood Test of Model 2 v Model 1: chi²(3)= 3.1 probability of a greater chi² = 0.37

From the procedure described above Model 1, shown in Table 5 was selected. The logistic likelihood test for Model 2 shows that the number of children under five years old, female headed household and female informal sector workers can be dropped from the model with no significant effect on the model's explanatory power. The final model therefore is:

$$PV = \beta_0 + \beta_1CHO5 - \beta_2HO - \beta_3FFE + \beta_4MU \quad (2)$$

Where:

PV is the probability of being vulnerable.

HO is house ownership.

CHO5 is the number of children over five years old.

FFE is the number of female workers in formal sector employment.

MU is the number of unemployed males .

Model 2 shows that the probability being vulnerable increases the more children over five years old and the more unemployed males the household includes (by 48% and 49% respectively). Two variables decrease the probability of vulnerability; house ownership (the probability of being vulnerable decreases by about 70%), and the number of women employed in the formal sector, (which decreases the probability of household vulnerability

⁹ The chi squared statistic presented in Table 5 tests the null hypothesis that all the coefficients in the model are zero, except the constant. The chi squared and t statistics can sometimes disagree as indeed is the case for Models 1 and 2 in Table 5. Here the chi squared statistic is significant at above the 99% level whereas the t statistics show variation in their significance level. In these instances the chi squared is regarded as having more validity (Hamilton, 1993).

by about 74%).

The interesting finding is the strong significance of female formal sector employment and its negative relationship with household vulnerability. Three possible explanations can be given.

First, women could be more prepared to spend money on school fees or health care for their children than men. If women who work in formal sector work have higher wages than those who do not and so can plan their budgets to include school fees and health care expenses, their households will be less vulnerable.

Alternatively, female formal sector employment can be an indicator of women's education. In this case the variable picks up the positive effect that women's education has on household welfare which is reflected in the priority given to the education and health of children.

A third possibility is that women's employment in the formal sector is a proxy for women's control over cash income and their bargaining position within the household. The argument in this case is that formal sector employment does not necessarily entail high wages (cleaners in government offices are employed in the formal sector), informal sector workers may earn more money. Formal sector workers do however, especially if they are not employed in jobs requiring professional qualifications, have to have good contacts with other formal sector workers to get employed. The female formal sector worker effect thus picks up the influence of women who have a strong bargaining position within the household, either because they are professionally qualified (e.g. teachers and nurses) or because they have strong and influential social networks which enhances their status within the household. The story then becomes one of differential access to income and ability to control its expenditure within households. Households where women have greater bargaining power and higher status can better maintain the schooling and medical care of their children in times of economic hardship than those where women's status is low. The effect of all the employment variables is shown in Table A.3, Appendix 1.

5. Conclusion.

Fifty three households in Chitungwiza (16% of the sample) are identified as being vulnerable, either as they could not afford to send their children to school, or pay for health care, or both. They represent just one category of the vulnerable in Chitungwiza, as the sample only includes households that had children in a particular age group and as households are vulnerable due to factors other than inadequate health care and education for their children. This implies that systems of exemption from health and education charges need to cover more people than they currently do (at least in Chitungwiza and other comparable areas) if the risk of increasing poverty and lowering the rate of human capital formation is to be avoided in Zimbabwe.

Analysis of household data show that a set of simple observable household characteristics can predict vulnerability well. Female formal sector employment and house ownership reduce the probability of household vulnerability by about 75% and 70% respectively. The number of children over five years old and the number of unemployed males increase it each by about 50%.

The ability of household characteristics to predict vulnerability could therefore provide an alternative to means testing benefits by assessing income. It would be possible, if the decision to provide free health or education was devolved to local government, to construct a transparent set of criteria which could be used to guide decision

making.¹⁰

The strong influence of women's formal sector employment on household vulnerability supports the argument that women's access to and control over income, which can be influenced by their status and bargaining position within the household, is a key determinant of whether household resources get allocated to health and education expenditures or not.

Targeting on the basis of broad based observable indicators is one way to effectively implement a social safety net. It offers considerable advantages over the present system as the criteria for exemption are more transparent than the single indicator of income. The results of this study are based on a sample which is not representative of all regions of Zimbabwe; the results are however relevant for several urban areas. Further research is necessary to find appropriate observable indicators for rural areas and to test a greater range of household variables for their ability to indicate vulnerability. If social welfare policy is going to continue to target benefits this seems an avenue well worth pursuing.

¹⁰ Indeed, in rural areas local councillors sometimes issue letters for exemption and, since this survey was conducted, nurses in Chitungwiza have been authorized to decide to waive payments in the absence of exemption certificates if they know the family to be genuinely impoverished. A systematic formalisation of this process could save a lot of time and cost for the individuals and the government administrations concerned.

Assets.

$$V = f(\text{HO}, \text{LOD}, \text{CO}, \text{LO}, \text{NS}, \text{DT})$$

HO house ownership

LOD lodger

CO cattle ownership

LO land usufruct

NS no savings and/inability to save from current income.

DT households reporting debt.

Table A.2

Variable	Model 2.1 Chi ² (6)=11.76 P> Chi ² = 0.06		Model 2.2 Chi ² (1)=3.47 P> Chi ² = 0.06	
	Odds Ratio	t	Odds Ratio	t
HO	0.45	-1.74	0.49	-1.75
LOD	0.92	-0.22		
CO	0.38	-1.47		
LO	1.41	0.74		
NS	1.95	2.10		
DT	1.33	0.83		

Logistic likelihood ratio test Chi²(5) = 8.64. P > Chi²=0.12

Employment

$$V = f(\text{MF}, \text{FF}, \text{MINF}, \text{FINF}, \text{FS}, \text{UM}, \text{UF})$$

- MF number of males in formal sector employment.
- FF number of females in formal sector employment.
- MINF number of males in informal sector employment.
- FINF number of females in informal sector employment.
- FS number of females in subsistence employment.
- UM number of unemployed males.
- UF number of unemployed females.

Table A.3

Variable	Model 3.1 Chi ² (6)=18.11 P>Chi ² =0.006		Model 3.2 Chi ² (3)=15.03 P>Chi ² =0.002	
	Odds Ratio	t	Odds Ratio	t
MF	1.32	0.88		
FF	0.33	-1.42	0.34	-1.41
MINF	1.57	1.38		
FINF	1.82	2.26	1.62	2.11
UM	1.82	3.01	1.75	2.90
UF	1.13	0.27		

Logistic Likelihood Ratio Test Chi²(3)= 6.73. P>Chi²= 0.081

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