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THE MACROECONOMIC DETERMINANTS OF HOUSEHOLD WELFARE IN SADC: A QUANTILE REGRESSION APPROACH

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Abstract

The study focuses on household welfare in the context of Southern Africa Development Community (SADC) against the background that few studies have addressed this issue despite its importance in policy making. Past studies have failed to explain the impact of remittances on household welfare throughout the different distributions. The study aimed to: (1) establish the key determinants of household welfare and explain how they behave across different quantiles (2) discuss the substitutability between remittances and FDI as drivers of household welfare. The study employs panel data (1975-2014), conditional quantile regression and panel least squares approach. Findings support altruistic motives in explaining workers' and recipients' behavior at first while the portfolio approach dominates their behavior at higher levels of the distribution. The study confirms the trade openness led welfare hypothesis and the remittance led welfare hypothesis. The flow of remittances and FDI are substitutes when considered as sources of improved welfare. The paper provides policy implications for improving household welfare.

Keywords: Household welfare, SADC, Remittances, FDI, Quantile regression.

JEL Classification: C32, D12, F41, F63, I31

1. Introduction and Background

The level of wealth and poverty situation for a country can be determined at both household and country level. Households would then become important units in the development puzzle. Poverty reduction policies are also influenced by understanding the link between migration flows and development. There has been renewed interest on the need to improve the level of economic welfare. One way of achieving this is through improving household welfare. Families are concerned with improvements in their way of life. This is the rea-

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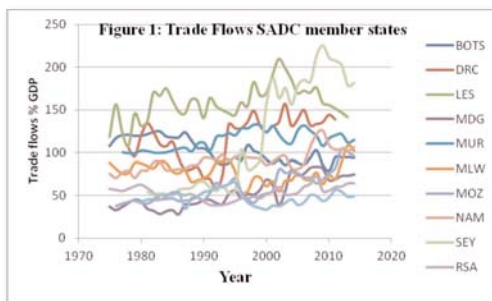
son why those who experience unfortunate situations in their country of origin resort to finding better life elsewhere. Family members usually leave their country of origin to look for better life somewhere. Migration happens as people move within the same region, to other regions within the same continent and to a different continent. It is common among all countries despite the level of development. Those staying outside their home countries normally send money to help improve the welfare of those who remained behind. Such flows of money often end up being used mainly for consumption purposes. It is also possible for part of these receipts to be used for investment and other development purposes. The money used on consumption becomes an immediate source of improving welfare. Remittances have been on the rise as more people have been moving across nations. The United Nations News Centre (2013), shows that at least two hundred and thirty million people stay outside their country of origin worldwide. Furthermore the report by World Bank (2015) record shows that international migrants were at least two hundred and forty seven million in 2013 and two hundred and fifty million in 2015. Developed countries have received remittances which were three times more than what they received as development assistance. Remittances can be both productive and counter-productive in nature. On the positive side they increase the disposable income for a household. This allows for an increase in savings for investment purpose and increased household expenditure. This makes remittances to be important in the growth equation as they improve welfare directly through consumption and indirectly through increased investment expenditure.

Studies on the impact of remittances on welfare in Sub-Saharan Africa (SSA) are scarce despite the increased flows in the different regions. There are few studies that have focused on different aspects related to welfare and they show that poverty is reduced by rising incomes and growth (Christiaensen et al, 2002), more flows can be raised through cost reduction and securitizing remittances (Ratha et al, 2008), migrants from Africa remit twice more on average than those from the rest of world, remittances flows differ by factors like marriage, gender and income level (Bollard et al, 2010, Mugumisi, 2014), remittances improve human capital and productivity (Ssozi and Asongu, 2016), remittances have no significant impact on investment (Ndikumana and Blankson, 2015), remittances have positive effect on private investment, industrialization and development (Okudua, 2015, Nweke and Nyewusira, 2015, Efobi et al, 2016) and remittances have insignificant effect on consumption volatility (Jidoud, 2015). All these studies have not directly addressed the impact of remittances on household welfare and how their impact would change in different quantiles. They mainly focus on the determinants of welfare and results provide the contribution of mean values of each variable. There is a possibility of non-linear relationship between key the determinants and welfare measures. A policy maker would not only want to understand the impact of mean values of a variable. They would also need information on what happens when the levels of consumption change from low to higher quantiles. Again, literature does not explain whether or not remittances act as substitutes or complements to foreign direct investment (FDI) as potential sources of funds to improve welfare. This study addresses these issues as a point of departure from what is already known in literature. This information guide policy makers on the impact of FDI and remittances flows on welfare. Thus the present study addresses these issues by focusing on household welfare in the context of Southern Africa Development Community (SADC). Welfare can be improved by other money flows like FDI which is affected by the level of openness of the country. All economies are open and differences exist on the degree of openness and the level of FDI flows into each country on aggregate. It is possible for households in open economies to have high chances of experiencing improved welfare than those in closed economies. The contribution of trade openness to welfare still needs to be looked into as it affects migration policies. Discussions on these views are still ongoing with no generalized findings. This is despite the significant role played by both FDI and remittance flows in influencing the level of welfare at macroeconomic level. The key questions in this study are as follows: what are the key determinants of household welfare and how do they behave as household welfare levels move among different quantiles? Are remittances and FDI working as complements and/or substitutes on their effect on household welfare? The study supports altruistic motives as explaining workers' and recipients' behavior at first while the portfolio approach dominates their behavior at higher levels of the distribution. Results also confirm the trade openness led welfare hypothesis and the remittance led welfare hypothesis. The flow of

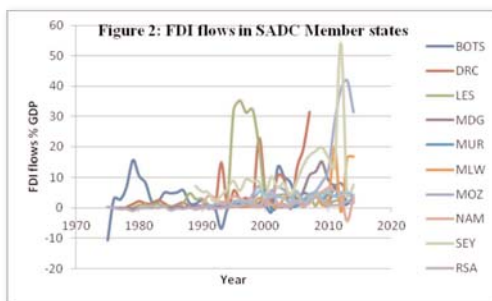
remittances and FDI are substitutes when considered as sources of improved welfare. The rest of the study is organized as follows: section 2 gives an overview of remittances, FDI flows and openness within SADC, section 3 reviews literature, section 4 explains the methodology employed, section 5 discusses the main findings and section 6 provides conclusion and policy implications.

2. An overview of Southern Africa Development Community (SADC)

The United Nations' sustainable development goals include ending poverty in all its forms, by 2030, for all people throughout the world. Poverty can be measured by people who survive on less than US\$1.25 per day. The expectation is that people have equal access to basic services, control property, natural and financial resources. Countries, in this regard, are expected to come up with policy frameworks at national, regional and international level. They are expected to attract resources, both internally and externally, that promote sustainable growth. They are expected to come up with policies that guarantee improved levels of consumption by reducing the amount of waste. The UN intends to improve welfare levels in all countries including regional blocs like SADC. SADC has 15 member states²⁷ which can be classified into three groups: middle income (RSA, NAM, BOTS, MUR, SWD), low income (MDG, MLW, TNZ, MOZ), fragile (ZIM, LES, DRC) and oil exporting (ANG). The regional bloc has come up with the Regional Indicative Strategic Development Plan (RISDP) which among other things promotes eradication of poverty, enhance trade, economic liberalization and sustainable growth (SADC, 2011). Trade flows, measured as imports plus exports as a percentage of GDP, within selected members have been mainly between 50% and 100% for the period 1975 to 2014. There have been outliers like Seychelles (SEY) and Lesotho (LES) with trade flows above 150% of GDP after the year 2000 but these have been converging towards the 100% mark experienced in other member states (Figure 1).

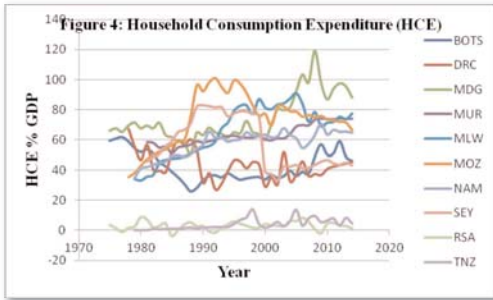
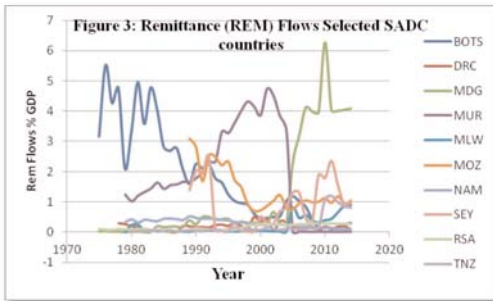


Foreign Direct Investment (FDI) inflows, within the SADC member states, have been below 10% of GDP during the review period. Countries like Lesotho (LES), Democratic Republic of Congo (DRC) and Mauritius (MUR) exceeded this level after 1990. This shows that they were able to attract more funds from outside their borders. But beyond the year 2010 the levels of FDI fell towards the levels being experienced by the rest of the countries in the region (Figure 2).



Remittance flows, Figure 3, within SADC are generally below 6% of GDP. Most of the member states have flows below 1% during the entire period. BOTS has flows of more than 4% before 1985 and they have since fallen below the 1% mark which shows that most of the citizens are staying within their country of origin. However after 2010 the levels of remittances have improved slightly above 1% which is high when compared to average flows in SSA (World Bank, 2016).

27) Angola (ANG), Botswana (BOTS), Lesotho (LES), Democratic Republic of Congo (DRC), Madagascar (MDG), Malawi (MLW), Mauritius (MUR), Mozambique (MOZ), Namibia (NAM), Swaziland (SWD), Seychelles (SEY), South Africa (RSA), Tanzania (TNZ), Zambia (ZAM), Zimbabwe (ZIM)



Household consumption final expenditure (HCE) as a percentage of GDP has been between 25% and 80%. Figure 4 shows that market value of all goods and services purchased by households remain at the same level for each country. The highest levels were experienced in Madagascar, Malawi, Mozambique and Namibia after the 1990s. This shows that households were using most of their income to improve welfare as opposed to investment expenditure. In countries like Botswana, DRC and Seychelles HCE was around 40% of GDP. This shows that households were committing most of their receipts for other uses other than consumption. Countries with lower and higher levels of remittances were associated with lower and higher levels of HCE respectively. This same pattern is also found between HCE and trade flows. This suggests a positive association between these trade flows, remittances and HCE. The lower level of FDI suggests a negative effect on HCE. These preliminary assertions are later confirmed with results in section 5.

3. Literature Review

3.1: Theoretical Review

The contribution of FDI towards welfare can be direct or indirect. Direct effect includes creation of jobs which happens when the inflow of FDI assists in the establishment of new companies. The creation of jobs continuously contributes to growth and hence alleviates poverty in host countries. Backward and forward linkages can be created as foreign affiliates generate vertical spillover effects through sourcing materials locally. Foreign firms contribute towards horizontal spillovers as they use technology and create competition in the local market. The indirect effects of FDI comes through its influence on GDP which results in improved standard of living and productivity (Gouhou and Soumaré, 2010; Fauzel et al, 2015; Kurtishi-Kastrati, 2013).

Winters (2000) explain the link between trade liberalization and welfare as follows: the level of poverty can be explained by changes in prices, government income and expenditure, changes in the levels of risk, developments in factor markets and changes in economic growth. The effects of trade liberalization on growth are adversely affected by poor trade policies, prohibitive transaction costs and lack of factor mobility. Trade liberalization can have direct effects on wellbeing by improving income and hence consumption levels and improving food development. Trade liberalization can have an indirect effect on welfare by working through improvements in capital accumulation and technological progress. These changes have an effect on employment levels and hence welfare (Rahman, 2014; de Arce et al, 2014; Edwards and Stern, 2006).

The impact of remittances on welfare is understood using two approaches. The portfolio approach is self interest controlled capital transfer which changes the structure of migrant's savings. This approach comes into being as investment opportunities and saving differentiation arise. The second approach is the altruistic approach which comes into being because the remitter sees the benefits that accrue to recipients as they get financial flows. The remitter sends money without demand from the recipient. This happens as the remitter feels that they have an obligation to assist other family members back home. The impact of remittances on the economy is not sensitive to the approach employed. However, economic activity rises where portfolio investment dominates the altruistic motives since households, through the later approach, would use the inflows as they see fit (International Monetary Fund, 2005; Kiiru, 2010; Ratha, 2013).

3.2: Empirical Review

3.2.1: Remittances and Household Welfare

Studies have been done to examine the impact of worker remittances on household welfare. Evidence has produced varying results as follows: Studies (Awan et al, 2015; Abbas et al, 2014) show that, in the case of Pakistan, remittances enhance household welfare. This is evidenced by increased expenditure on consumption, health, education and other essentials of life. The level of savings by households increases as they have more income. Similarly, Borci and Gavoci (2015) showed that households that receive remittances experience high welfare levels than those that did not receive them. Recipients of remittances have been seen to have better life style and increased opportunities. Again, De and Ratha (2012) were of the view that remittance income was mainly received by households at the lower quantiles. Consistent with previous studies (Nwaru et al, 2011, Thapa and Acharya, 2017) their study provides evidence that remittances have a positive effect on welfare which is shown by increased expenditure on consumption, health and education as compared to non remittance receiving households. This shows that remittances guarantee continuous welfare gains over the long term. This is supported by previous studies (Gubert et al, 2010, Beyene, 2012) which showed that remittances reduce poverty by between 5% and 11% and that they are more beneficial to households in lower quantiles. In the same vein, evidence (Anghel et al, 2015, Quarthey, 2006) shows that remittances have an effect of reducing the level of household poverty. They minimize the adverse impact of economic shocks that have an effect of lowering household welfare. These findings are consistent with those by Akanle and Adesina (2017) which show that remittances and welfare have a robust relationship. Households receiving remittances show robust expenditure patterns on other essentials apart from consumption. Furthermore, Assaminew et al (2010) explored the impact of remittances on livelihoods and poverty levels. Their study shows that changes in remittances led to changes in poverty. They suggest a positive impact of remittances on welfare through reduction in poverty incidences. Equally, Andersson (2014) examined the impact of remittances on household welfare. Findings show that remittances have a significant and positive effect on welfare as measured by household subjective economic well-being. Their study further shows that remittances have a positive influence on consumer assets and no effect on productive assets.

Sayeed et al (2014) investigated the impact of remittances on savings, gross domestic product and household final consumption. Results show that remittances have a positive effect on welfare. Household receiving remittances spent more on food than non recipients. They also increase expenditure on non food items like education and recreation while expenditure on medical care was found to be low (Soraya, 2007). Gyimah-Brempong and Asiedu (2009) bring a distinction between the effects of international and domestic remittances. They show that the effect of the former is higher than that of the later in reducing poverty. Similarly, studies (Kiiru, 2010, Biyase, 2012) show that remittances result in a fall in poverty level. This is shown in the economy by having a lower poverty rate where remittances are taken into consideration than when they are not taken into account. Duval and Wolff (2013) examined the effects of remittances on living standards for households, proxied by per capita consumption expenditure. Findings, using quantile regression, show that the remittances significantly improved welfare. Those households who had low levels of consumption received more benefits from using remittances. Donkoh et al (2014) show that richer households reduce expenditure on food more than their poor counterparts. Conversely, the study further shows that an increase in consumption expenditure results in a fall in household welfare.

FDI and Household Welfare

It is generally accepted that as developing economies remain open capital flows developed nations increase. These flows provide avenues for improved capital positions and more improvements in welfare. Wells Jr (1986) argue that foreign direct investment (FDI) in many cases benefits host countries while in few cases it harms them. The later is visible in the form of low growth rates and low economic welfare. According to Kurtishi-Kustrati (2013) the benefits of FDI in host nations differ according to the level of education and health of citizens, technological advancement, level of trade openness, level of competition and the level of regu-

lation. Such factors are normally weak in developing as opposed to developed nations which explains the differences in findings. Studies have been in both developed and developing economies. A study was done to test the impact of FDI on poverty. The study finds that in the case of India FDI flows result in fall in household welfare which is different than the situation in other economies. On the contrary the study shows that FDI outflows improve welfare levels (Agarwal and Atri, 2015). In another study, the direct and indirect impact of FDI on welfare was investigated using data from mining sector. The study found that FDI have both positive and negative effect on welfare. On a social level FDI was found to increase the risk of food shortages as few people were engaged in agriculture, households were dislodged from their lands as it was used for other non agricultural activities. On the positive side FDI flows improved government revenue, modernization, worker incomes and foreign currency flows. These would have an effect of improving overall welfare in the economy (Nyankweli, 2012). Im and McLaren (2015) investigated the effects of FDI on poverty and income distribution. Evidence, from this study, shows that FDI fails to make significant contribution in reducing inequality and poverty levels. The study suggests that FDI has an insignificant positive effect on poverty reduction. Fauzel et al (2015) investigated the connection between FDI and poverty reduction. Findings, using a dynamic vector error correction model, suggest that FDI is useful in reducing poverty in short and long run. The study further supports a unidirectional causality moving from FDI to poverty reduction.

Trade Openness and Household Welfare

Trade liberalization has been seen in recent years as a potential driver of increased household welfare. It has been regarded as being pro-growth and pro-poor. Countries are making efforts to harness the benefits emanating from trade liberalization. Studies have been done by various authors producing varying results. Mabugu and Chitiga (2007) examined the short and long run impact of trade liberalization on welfare. Findings show that trade liberalization has negative impact on welfare and poverty reduction. The specific effects on trade liberalization would differ among different sectors. For example the study shows that removal of tariffs benefit the mining sector which exports more and harms the textile sector due to high initial tariffs. The benefits of liberalization at household level are dependent on race with African and Colored households experiencing improved welfare more than others. Another study was done in the context of Nigeria to investigate the response of household welfare to different shocks on import taxes. The study finds mixed welfare implications as a result of partial or full liberalization in the short term. Findings show that a negative shock to import taxes make imported goods attractive. As import taxes fall the economy experiences a fall in employment in agricultural and industrial sectors which results in a fall in welfare. The study shows that sectors experiencing a fall production will face a fall in labor demand which adversely affects welfare. However, the study suggests that both urban and rural households may receive welfare gains due to improved real incomes but this may not be sustainable in the short term (Okodua and Alege, 2014). This is supported by Cockburn et al (2010) who shows that trade liberalization improves welfare for rural households. This is despite the fall in their incomes as they get benefits from price savings on goods from initially protected agricultural sectors. A study was done by Le (2014) to examine the impact of trade liberalization on welfare. The study used microeconomic analysis based on data obtained from rural households. Findings show that welfare improved in areas where there were high institutional reforms and trade openness. Welfare improvements were registered as a result of improved access to land and lower charges. Similarly, Omolo (2012) found that trade reforms had a positive effect on household welfare since their incomes and consumption levels increased. The impact of trade liberalization was enhanced by presence of foreign direct investment in the model. On the contrary the study shows that welfare for urban households was higher than that for their rural counter-parts. This is consistent with results by Cockburn et al (2006) which showed that trade liberalization has little impact on welfare and poverty. The study also shows that industrial sectors benefit more than agricultural sectors and on the other hand urban households benefit more than rural households. However, Talukder and Chile (2014) show that agricultural trade liberalization brings positive effects on welfare. The effect of liberalization on welfare is weakened by poor institutional factors and socio-economic factors. This study shows the importance of reforms that are complementary to trade liberalization. A study was

done by Rahman (2014) to assess the effect of trade liberalization on welfare. Using computer general equilibrium analysis the study shows that abolition of tariffs increases exports but output falls in mineral and social services sectors. The levels of consumption were found to improve in all sectors with exception of service and financial sectors. The study is consistent with previous by suggesting that trade liberalization improves welfare (Cisse and Fofana, 2013).

However, according to Menendez et al (2009) the impact trade liberalization on welfare depends on the measures of the later that have been employed. The study shows that liberalization increases poverty and inequality in urban centers while rural folks experience a fall in these measures of welfare. On the contrary Natsios (2005) suggests that trade liberalization does not improve welfare in the short run. It may reduce poverty in the long term by improving the rate of growth of the economy. The study further shows that trade liberalization create both winners and losers. Trade liberalization only benefits countries in the long term. Evidence show that it should be supported by structural reforms and policy changes meant to counter its negative effects in the short term (de Acade et al 2014).

4. Data and Methodology

The study uses unbalanced panel data, for the period 1975-2014, sourced from World Bank (2016). Data employed is for twelve countries based on data availability and economic stability. The study employs welfare as a dependent variable being defined as household consumption expenditure (hce) (Duval and Wolff, 2013, Moratti and Natali, 2012). Previous studies (Deaton and Zaidi, 2002, Deaton and Grosh, 2000) show that consumption is a better measure of welfare as it reflects long term income and it is not easily affected by short term changes in the economy. Welfare is measured as the market value of all goods and services purchased by households over GDP. Trade liberalization (to) defined as total import plus exports as a percentage of GDP (Omolo, 2012). Remittances (rem) are made up of personal transfers and compensation of employees. They are composed of current transfers received by resident households from outside the country in form of cash or kind. Foreign direct investment (fdi) represents the net inflows of investment to acquire a lasting management interest in a firm operating in an economy other than that of the investor. It is measured as new investment inflows minus disinvestment in the reporting economy from foreign investors divided by GDP. Physical capital (gfcf) is measured as purchases and improvements in land, plant, machinery, equipment and construction of roads, railways, residential and commercial properties. The other control variables are growth in GDP (gdpg) measured as annual percentage growth rate of GDP at market prices based on local currency and human capital (ter) measured as total enrollment as a percentage of the population of age group who are eligible for tertiary education after successfully completing secondary education. The interaction term fdi*rem is used to capture the potential non-linearity explaining the effect of foreign direct investment with respect to remittance flows and vice versa.

The generalized relationship is given as:

$$hce = f(\text{rem}, \text{gdpg}, \text{fdi}, \text{gfcf}, \text{ter}, \text{to}, \text{fdi}*\text{rem})$$

Koenker and Basset (1978) introduced quantile regression as an extension of the classical linear regression model. They used it to estimate conditional quantile functions in which quantiles of the conditional distribution of the response variables are shown as functions of the observed covariates (Koenker and Hallock, 2001). This study uses a similar approach to delineate the effects of determinants of household welfare in different quantiles as opposed to analyzing the effects of mean values for the same variables. This approach analyzes the behavior of different variables in both lower and upper quantiles. Estimations are done at nine quantiles (0.10, 0.20, 0.30, 0.40, 0.50, 0.60, 0.70, 0.80, and 0.90).

Let (y_i, x_i) , $i = 1, \dots, n$, be a sample from a population where x_i is a $K \times 1$ vector of independent variables. The conditional quantile regression model, assuming that θ_{th} quantile of the conditional distribution of y_i is linear in x_i , can be stated as

$$y_i = (x_{it} \beta_{\theta} + z_{\theta i}),$$

and

$$Quant_{\theta} (y_i \mid x_i) = \inf\{y : F_i(y \mid x) \geq \theta\} = x_i' \beta_{\theta}$$

and

$$Quant_{\theta} (z_{\theta i} \mid x_i) = 0$$

where $Quant_{\theta} (y_i \mid x_i)$ is the θ th conditional quantile of y_i , conditional on the vector of regressors x_i , β_{θ} is the unknown vector of parameters to be estimated for different values of θ between zero and one and z_{θ} is the error term which has a continuously differentiable, $F_{z_{\theta}}(y \mid x)$, and a density function $f_{z_{\theta}}(y \mid x)$ and $F_i(y \mid x)$ represents the conditional distribution function. In tracing the entire distribution of y conditional on x , we vary the values of θ from zero to one. The study employs the design matrix bootstrap method to obtain estimates of the standard errors for coefficients in quantile regression. The method is useful in cases where the sample is small and it is valid under many forms of heterogeneity. Considering the discussions above the study specifies a panel data model, adopted from Koc and Sahin (2016), as follows:

$$Quant_{\theta} (y_{it} \mid x_{it}) = \beta_0 + x_{it} \beta_{\theta} + z_{\theta it}$$

where $Quant_{\theta} (y_{it} \mid x_{it})$ is the θ th conditional quantile of y_{it} , the dependent variable capturing household welfare, conditional on the vector of regressors x_{it} as represented by the determinants of welfare across countries as defined earlier and the error term is given by $z_{\theta it}$.

The study also endeavored to determine the substitutability or complementarity of foreign direct investment and remittances as determinants of welfare. This has been captured using an interaction between the two variables using the fixed effects model. The study employed the fixed effects model as directed by Hausman (1978) tests. It is given as a linear regression model where the intercept terms vary over individual units (Verbeek, 2004). The model employed is given as:

$$y_{it} = \beta x_{it} + e_{it} \tag{2}$$

Where the error term is composed of two components μ_i and ε_{it} in which explanatory variables are assumed to be independent of all ε_{it} . The β elements are indexed as β_1 to β_n being coefficients of the explanatory variables. It can be written in the following form

$$y_{it} = \mu_i + x_{it}\beta + e_{it}, \quad e_{it} \sim IID(0, \sigma_{\varepsilon}^2)$$

5. Results and Discussion

Summary statistics (Table 1) show that the level trade openness was highest (mean value of 91.66%) and levels of net inflows of investment were lowest (mean value of 3.80%). The level of growth of economies is still worrisome with the highest being 23.6% and a minimum of negative 12.67% being realized. The highest variability was experienced in trade openness which can be explained by differences in trade policies across member states while the rate of GDP growth was stable. All variables exhibited normal distribution and they are positively skewed.

Table 1: Descriptive Statistics

	HCE	FDI	REM	TO	GFCF	TER	GDPG
Mean	65.18858	3.800827	10.16020	91.66176	26.65862	5.421280	4.076808
Median	63.10248	1.890932	0.457981	89.75125	24.55677	3.570740	3.732755
Maximum	190.5625	41.80964	106.4773	209.8912	76.69449	39.72569	23.59770
Minimum	-1.423167	-10.77480	0.000434	27.69546	8.078257	0.304580	-12.67379
Std. Dev.	36.82913	6.586465	24.01485	39.32602	12.93861	7.008885	5.147828
Skewness	0.689518	3.355372	2.594554	0.436735	1.473588	2.988707	0.657906
Kurtosis	4.128623	16.47183	8.596506	2.606260	5.932348	12.79067	5.973323
Jarque-Bera Probability	28.18284 0.000001	2010.403 0.000000	516.9485 0.000000	8.147088 0.017017	153.4001 0.000000	1167.832 0.000000	93.82664 0.000000
Sum	13885.17	809.5760	2164.123	19523.95	5678.287	1154.733	868.3602
Sum Sq. Dev.	287553.6	9196.883	122263.2	327865.6	35490.40	10414.39	5618.028
Observations	213	213	213	213	213	213	213

The method by Levin, Lin and Chu (2002) was employed to test for unit root. It tests the hypothesis that each time series has a unit root against the alternative that the series is stationary. This is done to test for stationarity and avoid having spurious results. All the variables were stationary at levels except for variable for remittances (as indicated with *). The results (Table 2) show that the null hypothesis is rejected at 1% level for all variables except for welfare and human capital.

Table 2: Panel Unit Root Test

Variable	p-value
Hce	0.0340
Rem	0.0000*
Gdpg	0.0000
Fdi	0.0000
To	0.0000
Ter	0.0400
Gfcf	0.0027

Source: Authors compilation from e-views

The study tested for the presence of multicollinearity among the variables. Results (Table 3) show both positive and negative relationships among variables. Results suggest a negative relationship between human capital development and the measure for welfare employed. Remittances and foreign direct investment have a negative association which may indicate the substitutability between the two variables. There is no multicollinearity among variables because coefficients are less than 0.80, hence there are no modeling problems using this data set.

Table 3: Correlation Analysis

	hce	fdi	rem	to	Gfcf	ter	Gdpg
Hce	1						
Fdi	0.0525	1					
Rem	0.6518	-0.0019	1				
To	0.5084	0.1676	0.6425	1			
Gfcf	0.3432	0.3889	0.5344	0.6487	1		
Ter	-0.1593	-0.0400	-0.2014	0.1256	-0.0625	1	
Gdpg	0.0197	0.0188	0.0552	0.2614	0.2597	-0.0888	1

Results Using Fixed Effects Model

Estimations using panel data were made using both fixed and random effects models. The choice for the best model was done using Hausman's test (Table 4). The aim was to determine the substitutability or complementary between foreign direct investment and remittances on welfare. Results showed that the fixed effects model was appropriate since the p-value using Hausman test was significant.

Table 4: Hausman Test

Correlated Random Effects - Hausman Test			
Equation: Untitled			
Test cross-section random effects			
Test Summary	Chi-Sq. Statistic	Chi-Sq. d.f.	Prob.
Cross-section random	31.801805	7	0.0000

Panel data analysis provides results based on the fixed effects model (Table 5). Evidence shows that household welfare is explained by the level of remittances, trade openness and foreign direct investment. Specifically, the study shows that a one percent increase in the level of remittances results in a 5.22% increase in welfare. This suggests that the more workers remit monies to their home countries the higher the chances of improvement in welfare for recipients. The levels of remittances were highest in Lesotho reaching levels of between fifty and hundred percent while the rest of the members received less than ten percent of GDP. These findings provide evidence on disparities in welfare levels for residents in different member states. These results are consistent with the a priori expectation as well as a number of available studies. The findings are consistent with previous studies (Awan et al, 2015, Thapa and Acharya, 2017, Borci and Gavoci, 2015, Anghel et al, 2015) which show that recipients of remittances experience improved welfare which can be reflected by high expenditure in education, health and consumption. This may suggest that non-consumption recipient households experience a fall in welfare. In the context of SADC member states improved remittances are useful in reducing poverty among households. This is also underpinned by the motivation to remit among those working abroad and policies directed at promoting the same.

The study shows that household welfare is improved as the economy remains open. A change in the level of openness by one unit results in an increase in welfare by 0.15 units. This suggests that improvements in trade within SADC have the potential to reduce poverty as residents have more choices on products and services. The more the economy is opened up then the higher the growth rates which effectively increase welfare. When an economy opens up the flow of imports and exports improves which have a direct effect on consumption and income patterns for households. This is supported by lower prices due to low import costs. In the case of SADC the level of trade openness shows an upward trend under the review period. Member states experience levels of between 50 and 150% of GDP. Findings are consistent with previous studies (Okodua and Alege, 2014, Omolo 2012, Cisse and Fofana, 2013, Rahman, 2014) which show the trade openness increases real incomes and hence improved consumption levels for all households. However, the study fails to explain effects of trade liberalization under different institutional arrangements that may prevail among member states. The study does not account for different policy and structural reforms necessary to enhance contribution of trade openness on welfare. For example de Arce et al (2014) argues that trade liberalization has negative effects in the short term and positive effect in long term and this is not accounted for in this study.

Evidence suggests that the flow of foreign direct investment (FDI) has an adverse effect on welfare. In the context of SADC the inflows of FDI are less than ten percent in all member states and in some cases countries experienced negative flows. Findings suggest that one unit increase in FDI results in a fall in welfare by

0.42 units. The contribution of FDI to an economy differs across countries and the economic environment. According to Kurtishi-Kastrati (2013) this can be explained by differences in levels of education, health, technological advancement, regulatory frameworks and the level of openness. In the case of SADC, according to this study, the impact of economic growth, education and physical capital on welfare is insignificant. They are failing to complement FDI flows which may be the reason for the later to have an adverse effect. This view gains support from Kurtishi-Kustrati (2013) who show the importance of these factors in supporting FDI's impact on welfare. They also show that FDI has a negative effect on household welfare. On the contrary some previous studies (Agarwal and Atri, 2015, Nyankweli, 2012) show that FDI flows improve welfare. This is possible as government revenues improve as a result of improved worker incomes and improved currency flows but this is not consistent with results from SADC member states.

The study shows that foreign direct investment and remittance flows act as substitutes in explaining the level of household welfare. This is explained by the significant and negative coefficient for the interaction term used in the model. Both variables have an additional marginal and negative effect on welfare. For example the average level of remittances was 10.16% during the period. At this level, holding other factors constant, an increase in FDI by one percent would result in a fall in household welfare by 2.591%. Again, holding other things constant, an increase in remittance levels by one percent result in an increase in welfare by 0.2912%. The marginal effect of FDI on welfare outweighs that of remittances and this has an impact on the type of policies affecting the two variables within the SADC member states.

Table 5: Estimates based on Fixed Effects Model

Dependent Variable: HCE				
Method: Panel Least Squares				
Date: 05/27/17 Time: 14:21				
Sample (adjusted): 1975 2014				
Periods included: 40				
Cross-sections included: 10				
Total panel (unbalanced) observations: 208				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	48.84409	6.606095	7.393792	0.0000
D(REM)	0.521597	0.229057	2.277150	0.0239
FDI	-0.416832	0.213111	-1.955938	0.0519
GDPG	0.098450	0.217088	0.453505	0.6507
GFCF	0.190944	0.123141	1.550615	0.1226
TER	-0.128141	0.268749	-0.476804	0.6340
FDIREM	-0.213652	0.084838	-2.518359	0.0126
TO	0.150990	0.067680	2.230951	0.0268
Effects Specification				
Cross-section fixed (dummy variables)				
R-squared	0.872502	Mean dependent var	65.48407	
Adjusted R-squared	0.861821	S.D. dependent var	37.02334	
S.E. of regression	13.76247	Akaike info criterion	8.159965	
Sum squared resid	36176.49	Schwarz criterion	8.432745	
Log likelihood	-831.6364	Hannan-Quinn criter.	8.270263	
F-statistic	81.69111	Durbin-Watson stat	0.354918	
Prob(F-statistic)	0.000000			

$$28) \Delta hce = -0.0417 - 0.214 * (10.16) = -2.591\%$$

$$29) \Delta hce = 0.522 + 0.214 * (3.80) = 0.2912$$

Results Using Quantile Regression Analysis

Quantile regression was employed to examine the behavior of the key determinants, identified using the fixed effects model, as household consumption levels move among different quantiles. Findings in Table 6 and Figure 1 show that the effect of remittances on household welfare is positive and significant up to the 70th quantile. Remittances have a negative and insignificant effect from the 80th quantile upwards. The result changes the conclusion reached using the fixed effects model. This result suggests that at higher quantiles remittance flows are diverted from consumption to other uses like taking advantage of investment opportunities. Findings from quantile regression suggest that FDI has significant and positive effect between 50th and 60th quantile. This result is different from the conclusion reached using fixed effects model that FDI has a negative effect on welfare. Results suggest that moderate FDI flows are beneficial to households. This may be possible as the structure of FDI flows change during the short to medium term (Fauzel et al, 2015). The behavior of FDI can be explained by Nyankweli (2012) as being caused by changes in the way resources are employed in the economy in productive and non productive activities. Findings using fixed effects show that the level of human capital has no effect on welfare. However, Table 6 and Figure 1 show evidence of non-linear behavior of human capital across the quantiles. Human capital has a positive effect on welfare between the 20th and 40th quantile and a negative effect at higher quantiles. Results suggest that as the level of human capital improves, households spent more on consumption up to the 50th quantile. Beyond this level the expenditure patterns of households changes as they focus on other forms of expenditure like investments. Thus household consumption expenditure cannot be improved by changing the levels of human capital at higher quantiles. Similar results are obtained, using fixed effects model and quantile regression, on the effect of trade liberalization on welfare. The coefficient of trade liberalization increases in size at higher quantiles. Thus the more economies improve the trade volumes then the more households benefit from wider choices.

Table 6: Quantile Regression Estimates

	FE	10 th Quant	20 th Quant	30 th Quant	40 th Quant	50 th Quant	60 th Quant	70 th Quant	80 th Quant	90 th Quant
REM	0.522 (0.024)	1.134 (0.000)	1.050 (0.000)	1.004 (0.000)	0.953 (0.000)	0.831 (0.000)	0.720 (0.000)	0.615 (0.000)	-0.083 (0.782)	-0.419 (0.106)
FDI	-0.417 (0.051)	- 0.0258 (0.598)	-0.074 (0.827)	-0.034 (0.935)	0.258 (0.666)	0.691 (0.049)	0.664 (0.075)	0.774 (0.143)	-0.222 (0.880)	-1.247 (0.160)
GDPG	0.098 (0.651)	0.173 (0.820)	-0.045 (0.939)	-0.173 (0.802)	-0.177 (0.817)	-0.676 (0.362)	-0.626 (0.456)	-0.116 (0.924)	-0.153 (0.890)	0.294 (0.605)
GFCF	0.191 (0.123)	-0.039 (0.824)	-0.085 (0.614)	-0.152 (0.471)	-0.213 (0.389)	-0.146 (0.593)	-0.490 (0.157)	-0.355 (0.462)	0.792 (0.452)	0.643 (0.474)
TER	-0.128 (0.634)	-0.638 (0.355)	0.731 (0.002)	0.792 (0.001)	0.712 (0.010)	0.493 (0.948)	-0.077 (0.824)	-0.459 (0.280)	-1.391 (0.019)	-2.095 (0.000)
TO	0.151 (0.027)	0.266 (0.000)	0.340 (0.000)	0.394 (0.000)	0.445 (0.000)	0.498 (0.000)	0.740 (0.000)	0.804 (0.000)	0.960 (0.016)	1.282 (0.000)
F-Test Time Dummies	2.17**	2.08**	4.06***	6.14***	3.81***	10.9***	2.04**	2.88**	3.02**	5.29***

***significant at 1%, **significant at 5%, p-values in (.)

6. Conclusions and Policy Implications

The study examines the key drivers of household welfare using macro-level data. Specifically, it establishes the key determinants of household welfare for selected SADC member states for the period 1975-2014. Conditional quantile regression was employed to examine the changing distribution of household welfare across countries over time. More so, the study employed panel least squares approach to establish the substitutability between foreign direct investment and remittances as sources of household welfare. The paper provides evidence that remittances and trade openness have a positive effect on household welfare. By contrast, the rates of growth of GDP, physical and human capital have no effect on welfare. The study shows that FDI and remittances act as substitutes when evaluated as potential sources of household welfare which comes with important policy implications.

Empirical results from this study also show that the impact of remittances on welfare is positive at lower quantiles. The effect turns out to be negative thereafter suggesting that households move receipts to other alternative uses like investment. Surprisingly FDI has a positive effect on welfare in the middle of the distribution. Thus low to moderate FDI flows are useful in improving welfare levels. These results are not consistent with those found using fixed effects and this shows the benefit of quantile regression in supporting policy generation. Consistent with fixed effects model, results using quantile regression show that the effect of trade openness on welfare improves as countries move from low to high distributions.

The study supports the altruistic motives which explain workers' behavior at first and the portfolio approach that dominates behavior at higher levels of the distribution. The study is in support of the trade openness led welfare hypothesis and the remittance led welfare hypothesis. These findings have important implications on strategies for improving household welfare in SADC member states. The study favors policies that are directed at improving remittances and reducing disparities among member states. This can be in the form of reducing the cost of sending money home by workers and developing investment opportunities in their home countries. Such an initiative can be supported by improvement in other factors like quality of institutions and strengthening property rights. Policies favoring a differentiated approach to influence the effect of remittances on welfare are desirable. Reduction of trade barriers improves the flow of products in local markets. This can be done by eliminating unreasonable transaction costs and improving factor movements across member states. This increases choices available for consumers which increase welfare through different levels of the distribution. Policies aimed at improving human and physical capital enhance the contribution of FDI towards welfare gains for households. The substitutability between FDI and remittance flows suggests that policies aimed at improving the flow of remittances may help in weakening the negative impact of FDI on welfare.

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Appendix:

Figure 1: Quantile Regression

