Long-Term Rural Demographic Trends

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ESA Working Paper No. 07-19

May 2007

Agricultural Development Economics Division

The Food and Agriculture Organization
of the United Nations

www.fao.org/es/esa

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Abstract

This paper studies rural demographic trends at the global level with an analysis of a specially prepared database of population age/gender/rurality tables from population censuses. The focus is to identify the main demographic differences in the evolution of rural and urban populations. Among the main findings of this study, we report that with the exception of Sub-Saharan Africa there is no rural feminization. Also, rural ageing is not observed at aggregate levels in rural regions of the developing world. Perhaps the main adverse demographic trend of rural populations is the high dependency ratios brought about by higher fertility rates. This paper also carries out a census-based cross-country net-migration study identifying the main characteristics of rural out-migration in Latin America, and searches for common threads in East Africa. This analysis shows important improvements of welfare indicators and asset accumulation in rural Latin America (promoting an upward convergence of poorer and richer areas of countries), partially explained by migration. We did not find common characteristics in rural out-migration in East Africa, but report that education is the key asset that enables out-migration from poorer rural communities in East Africa.

Key Words: rural feminization, ageing, dependency, rural migration.

JEL: J11, J16, R23

* The author thanks the useful comments from Karen Macours, Benjamin Davis, Kostas Stamoulis, Gero Carletto, and Alberto Zezza. Also, the efficient research assistance of Stefano Trento is kindly acknowledged. The usual disclaimer applies: all errors and omissions are the exclusive responsibility of the author.

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I.- Introduction

When it is estimated that 3 out of 4 persons in the poorest fifth of the world population (i.e. the poorest 1.2 billion persons) live in rural areas (IFAD (2001)), where agriculture is the main source of livelihood, any serious analysis of the prospect of reducing rural and overall poverty requires a clear understanding of this farming population, their characteristics and the obstacles they face.

Among development specialist several trends have been mentioned as possible threats to agricultural and rural development in developing nations. Many of these threats are endogenous, and with the right policy environment, or with an "investment push" can be solved, like low levels of public and private investments in infrastructure and human capital. Other threats however, are exogenous and therefore more worrisome. An important example of these exogenous threats refers to disadvantageous demographic developments, like ageing of population or higher female to male ratios due to war or new epidemics like AIDS, which can basically cut the supply of new labor and block the prospects of rural development. For example IFPRI (2006), warns the about the potential problems some regions may face due to an aging population. On the other hand, the concern about rural feminization has been commonplace in the rural development debate.

In this paper we attempt to provide a long-term and global view at these exogenous demographic trends. We explore the validity of the concern of adverse exogenous rural demographic developments with an analysis of a global database of population census figures. The goal of this effort is to identify inherent differences in the demographic characteristics of rural populations as compared to their urban counterparts. In this section we explore the issue of ageing, economic dependency, and feminization; both in terms of current levels and observed trends. As identified below, one of the main forces determining the future demographic characteristics of rural populations will be migration.

In the third section of this paper we carry out a cross-country net-migration study for a sample of four Latin American countries and two East African countries. Here we explore how migration is acting in rural communities, that is, how the demographic and socio-economic characteristics of the population change due to migration. In addition of searching for common trends in feminization, ageing, education, and other welfare indicators, we explore the hypothesis that migration is increasing duality at a national level separating those who do well and those who stay behind.

II.- Global Rural Demographic Trends

As countries develop, life expectancy increases, as health services and their coverage improve, and lifestyles change reducing the risk of death. At a later stage, as countries continue developing, the fertility rate drops, as family planning services become available and / or, due to cultural and economic reasons, females reduce the amount of children they have during their fertility life-span (in demographic terms 15 – 49 years). These are well established features of development in the dynamics of populations, and are generally described together in what demographers call the *demographic transition* (Lee (2003)). One manifestation of the demographic transition is a change in the age/sex population pyramid shape, from properly a pyramid shape to a cylinder shape as countries move through the four stages of demographic transition**:** as the fall in the fertility rate manifests in a lower relative size of the younger cohorts, and the reduction of mortality rates shows in a higher relative size of older cohorts.

In this section, we start from what is still a valid generalization, to focus in the trends of rural population dynamics. The goal is to identify how these trends differ between rural and urban areas. Furthermore, we want to identify demographic trends that may eventually act as a burden for rural development. For example, ageing and the lack of adult males may act as a barrier to agricultural development, particularly in poor, capital scarce countries, where man-power is still an essential input for agricultural production.

To study these topics we have constructed a global database of tables of age (5 year cohorts) / sex (male-female)/ and rurality (urban-rural) of populations. The main source of this database is the UNSTATS common database, which at the time of this report was fairly complete until 1998; the United Nations Demographic Yearbook 2003 (United Nations (2006)), which at the time of this report was not yet available in print, but was available on-line; and a dedicated search in on-line and printed sources for these tables for censuses, or urban/rural decompositions that were not available in UN sources. In the end, we created a database that contained population estimates, but we decided to use in this section only official figures from *de jure* or *de facto* censuses and sample survey population counts. Population estimates are prepared with sophisticated and time-tested demographic methods that account for changing mortality rates, fertility rates, and migration. However, these estimates are based in previous trends, and things can change a lot from what is predicted. Furthermore, we decided to keep sample survey population counts, because we can not know *a priori* if it is more reliable than a census. Certainly, a well done sample survey may be more

precise than a poorly carried out population census. Also, some countries, like Germany, for historical and political reasons do not carry out population censuses. In the end, we kept the sample surveys, and they represent 3.5% of our sample[2]. Finally, we chose to work with observations as old as those of 1980; we had older observations, but we want to describe the latest demographic trends[3].

A.- Economically Dependent Groups and Rural Dependency

More than 50% of the variability in the share of the old population (in demography, older than 64 years), and the share of children in the population (14 or younger) can be explained by differences in the level of development alone. As Table 1 A shows, more than 2 thirds of the variability in the national share of children are explained by the differences in per capita income. The correlation of the share of old population is not as high, but it is still considerable.

The demographic transition model tells us that countries, starting from high levels of mortality and fertility (first stage), first experience reductions in their mortality rates (second stage), which manifests in longer life-expectancy. Later as countries continue developing they move into the third stage when fertility rates fall and the share of children in the population falls as well. As people live longer, the share of older population starts increasing. However, the fall in the share of children is much faster than the rise in the share of the older population. This should not come as a surprise, because at earlier stages of the demographic transition younger population are a larger share of the total population, and it takes time for these cohort to reach the old-age cohorts, while the fall in fertility immediately manifests in the share of children in total population.

As we compare the differences between rural and urban populations in panels B and C of Table 1, we see that on average for the same level of income, rural populations have a higher share of children population. This is consistent with the fact that rural populations have a higher fertility rate. The share of children though, falls faster with income in rural populations. Also, we see that the share of older people is also a little bit higher in rural areas, for an equivalent level of income; but the share of old population rises slightly faster in urban areas. These results can be observed more clearly in Figure 1, where we can see that the predicted (by income) share of children is higher in rural areas, and statistically significant.

[2] A full list of countries and years included in this section can be found in Appendix I.
[3] It may be argued that a smaller time frame is required to capture the latest demographic trends; however, in Sub Saharan Africa information is very scarce, and a larger time span is necessary to capture at least two population counts.

The share of old people, on the other hand, is higher in rural areas but not statistically significant. Also, both gaps tend to close with development.

Four very important conclusions can be made just by looking at this picture:

- First, as the larger share of economically dependent population are children, and this share is larger in rural areas, it follows that rural dependency ratios are higher in rural areas (these is amply confirmed in Table 2).
- Fertility rates are higher in rural areas.
- As the larger share of economically dependent population falls with income, it follows that the economic dependency ratio also falls with income.
- Finally, there is eventually a theoretical turn-around, at a certain income level the dependency ratio starts growing with income. Using the numbers in Table 1, panel A, we can make a back of the envelope prediction that this will happen at roughly $80,000 per capita. This prediction may seem excessive, but Luxembourg for instance, at $62,000, in 2003 is not far from this threshold.

In Table 2, we show dependency ratios by global regions, and confirm some of the above predictions. First, the rural dependency ratio is higher in every global region when compared to the urban dependency ratio, and this difference is statistically significant in every region. Second, the dependency ratio is precisely higher in the least developed regions, with rural Sub Saharan Africa showing the highest average dependency ratio. In Figure 2 we plot the rural dependency ratio against per capita income, and confirm the strong negative correlation between level of development and the rural dependency ratio. However, it is important to highlight that the outliars, with higher dependency than predicted for their level of development, in Sub-Saharan Africa, Botswana, Swaziland, and Zimbabwe are among the countries that have highest HIV incidence (24.1, 33.4, and 20.1% of adult HIV incidence respectively), as estimated by UNAIDS (2006).

The fact that rural dependency ratios are higher than their urban counterparts has important welfare implications. One robust finding in poverty studies around the world is that household dependency ratios are positively correlated with poverty. For example, López and Váldes (2000) summarizing the evidence from 6 poverty studies in Latin America show that a consistent determinant of poverty in all of the studies was the dependency ratio. Similar evidence has been found in Pakistan (Malik (1996)) and Ethiopia (Bigsten et al. (2003)), just to mention two other examples from different development regions. Therefore, part of the

observed differences in the intensity of poverty between rural and urban areas can be explained by these demographic differences alone[4].

In Table 2, we also show how the dependency ratio is changing. We can say that on average it is falling on every major global region; however, there is no clear trend between the fall in rural and urban areas. It is falling faster in urban areas of Asia, but faster in rural areas of the Latin America and Caribbean region; however, none of these differences are statistically significant. Also, there is no statistically significant correlation between the fall in the rural dependency ratio and income. There is a negative correlation between the fall in the dependency ratio and per capita GDP growth, but this relationship is not strong. It is perhaps useful to look at the countries where the dependency ratio is actually growing; in our sample these countries are: Armenia, Maldives, Namibia, Nepal, Paraguay, Uganda, and Zambia. Once again, the three Sub-Saharan nations (Namibia, Uganda, and Zambia) are among those with high adult HIV prevalence (19.6, 6.7, and 17% respectively)[5]. Obviously, AIDS mortality is precisely higher in the adult, non-economically dependent cohort. In the other three, Armenia, Maldives, and Paraguay, it is very likely that migration plays a determinant role.

B. Rural Feminization

The issue of rural feminization can be of concern from two different perspectives. First, the absence of adult males can be a hindrance to agricultural development, where raw man-power is an important input in agricultural production. This risks to be a male chauvinist concern, for, as a matter of fact, in many cultures it is females that generally attend the agricultural activities of the household. However, in other communities the absence of able bodied adult males can be a serious obstacle to agricultural growth.

The other aspect of feminization is at the household level. If female-headed households are consistently over-represented among the poor, then the increase in femininity should be of concern. With respect to this last question the evidence is mixed. Buvinic and Gupta (1997) report that in a survey of 61 studies that addressed the question, 38 reported higher poverty rates for female-headed households. In a cross-country study using different household surveys, Quisumbing et al. (2001) find that in only 2 (4) out 10 surveys, female

[4] Ravallion (2005) attempts to determine the contribution of differential mortality and fertility rates between poor and non-poor to the evolution of poverty incidence in the 1990s. He finds that these differences significantly affect poverty. However, the main demographic determinant of poverty differentials may be the differences in dependency between poor and non-poor.

[5] UNAIDS (2006). Uganda, furthermore has been the victim of a civil war, see more details below.

headed households are over-represented using a 1$/day poverty line (33rd percentile poverty line). Whether female-headed households earn less farm income is also a question with mixed answers. For example, in Ethiopia it has been found that they earn significantly less (Holden et al. (2001)); while in Pakistan and Egypt there no significant differences (Anríquez and Valdés (2006) and Croppenstedt (2006)).

Even if the empirical evidence on income and poverty studies is mixed, there are sufficient theoretical reasons to be concerned about the disfavored position of female-headed households. Female headed households generally have higher dependency ratios, lower average earnings for the "bread earner", many times are forced to take lower paying jobs to accommodate to household-duties' generated time constraints; all of which contribute to higher poverty (Buvinic and Gupta (1997)). Furthermore, even if measured poverty does not indicate that female-headed households are poorer, their welfare position is still likely to be lower due to the leisure time sacrifices that they have to trade for equivalent income (Lipton and Ravallion (1995)). In conclusion, although female headed households are likely in a disfavored position, the situation varies considerably by country and developing region.

In Table 3, we present the mean femininity ratios, i.e. number of females every 100 males, by global development region, and condition of rurality, as identified from population censuses. Overall, rural femininity is high in Europe and Sub-Saharan Asia. In general, femininity ratios are higher in urban areas than in rural areas, with the exception of South Asia, Middle East and North Africa (MENA) and Sub-Saharan Africa (SSA); however, in the first two regions there are on average still more males than females in rural areas.

The femininity measure is mainly influenced by three channels. First, the rate of renewal of the population is less gendered biased, and therefore contributes to balance the femininity ratio. Although, as the national averages indirectly show, for cultural reasons, in MENA, South Asia, and China, the younger cohorts tend to have more boys than in the rest of the world[6], we still find that the renewal of the population tends to balance out the overall femininity. The second force is ageing. Older cohorts bias towards the female side, as young male mortality is much higher than young female mortality. Hence, older populations tend to display higher femininity ratios. Finally, there is migration, rural-urban and international, which is the wild card in the femininity equation. We do not have an *a priori* about the effects of migration in the gender composition of population, but we explore the issue below.

[6] This phenomenon known in the literature as the case of "the missing girls" has been amply studied in the literature. See for example Johansson and Nygren (1991); Coale and Banister (1994); and Gupta and Shuzhuo (1999). Unfortunately this phenomenon seems to worsen with income growth (Sudha and Rajan (1998))!

It is therefore useful to look at the femininity of the adult cohort (15 – 49 years), because this cohort is neither biased by ageing nor by the younger more gender balanced population. Also, the gender composition of the adult cohort may be more relevant to study from the perspective of availability of working age males. The lower panel of Table 3 shows the adult femininity ratio by global development region and condition of rurality. We focus on the rural femininity and see that the high total femininity in rural Europe was a result of ageing, as the femininity ratio of the adult population is quite balanced. On the other hand, the table also shows that the femininity ratio in rural SSA is even higher than the total rural femininity ratio. South Asia also has a higher femininity ratio, and it could become of concern if it is growing. We would like to stress that these are gross averages; behind those already high femininity ratios for SSA may lie communities that due to war or AIDS show even higher femininity ratios. In the map of adult rural femininity one can observe that the case of high rural femininity is an issue basically only in SSA (see Appendix II, Maps).

Given new threats like the HIV/AIDS pandemic and old ones like war, it is thus important to explore the changes in femininity. However, the changes themselves are not revealing; it is interesting to observe whether femininity is growing from low levels (a likely result just from population growth), or whether it is growing from already high levels of femininity. We explore this question graphically in Figure 3, where in the x-axis we measure the initial femininity, while in the y-axis we measure the change in femininity, using average yearly rates for comparability. This means that the North-East quadrant of the plot is where both femininity is high and it is growing. In panel B of the figure, that plots adult rural femininity, we can see that most of the observations in the right quadrants are from the SSA region. We inspect the observations of rural SSA, to see if rural adult femininity is still growing. We see that although adult femininity ratios are high, they are still growing in only two of ten observations (Uganda (1991-2002) and Zimbabwe (1992-1997)).[7]

After identifying high rural femininity ratios in Sub-Saharan Africa, the next obvious question is to determine whether female-headed households are over-represented among the poor in that development region. To provide a global overview, we propose a simple way to analyze the correlation between female headship and income by searching for consistent differences in the share of female-headed households and income levels. In Table 4, we tabulated the percentage of (rural) female-headed households by expenditure quintiles for 27 household surveys, most of them from the RIGA database of household surveys (Davis et al.

[7] The first country has been going through one of the worst internal displacement crisis in the continent, see further details below; and the second is one of the countries with highest adult HIV prevalence.

(2007)). To capture in a single statistic the differences between gender headship of households of different income levels, we propose the following index:

$$\text{Gender Inequality} = \sum_{i \in Q_i >> Q_{i+1}} (5 - i).$$

This gender inequality index increases only if the percentage of female headed households in the poorer quintile is statistically higher than the percentage of female headed households in the next (richer) expenditure quintile. It values differences in the poorest quintiles higher than differences in the richer quintiles, this is consistent with the value judgment that gender differences in the poor quintiles are more relevant from the policy perspective. Also, starting to add from the poorest quintile, we stop adding if the sign is reverted and if it is statistically significant, that is, we stop adding if a richer quintile has a statistically higher rate of female headed households. The index has a maximum value of 10 and a minimum of 0. Table 4 shows that countries in the SSA region and South Asia, the countries with higher adult rural femininity, are precisely the countries with higher gender inequality. In Latin America, gender inequality seems to be lower, but Ecuador is an exception with high gender inequality.

The Role of HIV/AIDS

As Sub-Saharan Africa has higher adult rural femininity ratios, it is easy to point to the AIDS pandemic as the main cause, but things are not as straightforward. Without AIDS, i.e. before it appeared, and in current epidemiological models that estimate a no AIDS scenario, adult male mortality is higher than adult female mortality, like in the rest of the world. Thus, if the HIV/AIDS pandemic is the culprit of higher rural femininity ratios, then it is enough for the disease to have increased male mortality by less than female mortality to cause an increase in femininity[8]. Unfortunately we can not give definite answers, all we can provide is scattered evidence. Mather et al. (2004), using household surveys from five high AIDS prevalence countries reports death of "prime age" adults, i.e. persons in the 15 – 59 years age cohort. These numbers are revealing, because most of these deaths are AIDS related. The authors report that in two countries, Kenya and Malawi, there were more male deaths, while in two others (Mozambique and Zambia) there were more female "prime age" deaths, and in the fifth country (Rwanda) there was essentially a gendered balanced death count. In Tanzania, female AIDS mortality was higher than male AIDS mortality in 1997

[8] It can be shown that the femininity ratio would not change if the change in mortality followed the rule: $\frac{dm_m}{dm_f} = \frac{(1-m_m)}{(1-m_f)}$, where m_m, m_f are the male and female mortality rates. Since male adult mortality is initially higher than female adult mortality this ratio is less than one.

(UNDP (2000)), while in Ethiopia in 2001 male AIDS mortality was higher than female (Reniers et al. (2006)). Perhaps the most insightful way to look at the issue of gender bias of AIDS mortality is to look at the change in Demographic and Health Surveys' reported mortality from an early (ideally pre AIDS period) and a later period when the pandemic is present. This exercise was done by World Health Organization (2003). The document reports that in Ethiopia and in Zimbabwe female mortality grew more than male mortality (both rates growing by 400 to 600%!), which suggests that AIDS induces a reduction in the rural adult femininity ratio; while in South Africa male mortality increased more than female.

South Africa is a useful country, because it has good data, and it shows that the gap between the gender mortality rates changes closes, replicating what has happened in developed countries, where initially male mortality is much higher, but later both AIDS related male mortality fall and female mortality rises. So if South Africa trends can be extrapolated, we can propose that AIDS likely caused initially an increase in femininity rates, but today and towards the future the AIDS pandemic will be the causal for a decrease in SSA femininity rates. This latter prediction is shared by the United Nations Population Division, which estimates that in the 38 affected countries in Africa, there will be an AIDS induced increase in female mortality of 39.8% while AIDS related excess deaths will increase male mortality by only 33% for the period 2000-2005. This higher female AIDS mortality differential is projected to grow and continue through 2020, the end date of the projections (United Nations (2005)).

The Role of Migration

To close this section on femininity we refer to migration. We have discussed that migration is the wild card in any prediction on what is going to happen with rural femininity. To get a global perspective on what is happening, at least with international migration, we have two avenues. One is to look at the gender of the migrant stock, which is a task that the UN Population Division has been carrying, trying to identify the size and composition of those who are foreign born, as measured either by population census, or using official citizenship records. Before discussing the results, note that both methods (particularly the second) are likely to undercount illegal migrants, and therefore undercount the gender composition of this component of the international migrants. In Table 5, we report the average femininity ratio of the international migrant stock by development region. There, we observe that, with the exception of Europe, in all developing regions most international migrants are male; that is, we can infer that the South-South migrant is predominantly male,

while in OECD countries the femininity ratio is above 100, which would suggest that most South-North Migrants migrant are female.

The other avenue to get a global perspective on the gender composition of international migrants is to look at the latest population census, which have begun asking households to identify members that have left the country. In the 2000 round of population census in Latin America this question was asked in Mexico, Ecuador, Panama, and Dominican Republic. In Table 6, we show that in the countries with a high rate of international migration, Mexico and Ecuador, international migrants are predominantly males. This is more consistent with the anecdotal evidence available in the press of OECD countries that reports that captured illegal migrants trying to enter the developed world are mostly male. We posit the hypothesis that the first wave of illegal migrants are mostly male, but when this first generation establishes, mostly female legal migrants follow; however, this is an hypothesis we are in no position to contrast here.

We explore the gender trends in domestic migration in the section of population movements further below.

C.- Rural Ageing

At what point does population ageing become a hindrance for rural development? This is a question with no easy answer. The answer depends on many factors: on whether the country has a well funded pension system, on whether older people are holding to land as insurance blocking efficient land transactions, on whether households headed by older people are consistently poorer. The answers to these questions will determine if ageing of the population could block rural development.

In the section above, we have shown that ageing is highly and positively correlated with the level of income of countries. We consider 60 years as the threshold of old population, instead of the traditional threshold of 65 years usually used in demography. We first see that the share of population older than 60 has a similarly high positive correlation with income (results comparable to those presented in Table 1). We map the share of rural old population at the global level (see Appendix II) and we discover that the rural ageing map looks extremely similar to an income map, with older cohorts representing a smaller share of total population in SSA.

To study rural ageing, we analyze the evolution of the old cohort. In Figure 4, we plot the change in the rural old cohort against per capita income, and we discover that the change in the rural cohort (an indirect measure of ageing) is also positively correlated with income.

This means that not only wealthier countries are older, but that they age faster. In Figure 5, we repeat the exercise of plotting the change in the older cohort against income for SSA. We observe that in the region this positive correlation also holds. We can conclude that ageing behaves like a non-income measure of welfare; it captures the increases in life expectancy associated with development[9].

The HIV/AIDS pandemic undoubtedly plays a role in rural ageing. As we have shown in the previous sections adult mortality rates have jumped dramatically, but this rise in a region where life expectancy was already low, instead of increasing the share of the old, the disease has most likely reduced it. This can be seen with the case of Zimbabwe, the country with the fourth highest adult AIDS prevalence (20.1% of the adult population in 2003, UNAIDS (2006)). In Figure 5, we can see that this country reduced the rate of growth of the rural old from the low HIV prevalence period of 1982-1992 to the high prevalence period of 1992-1997. Another aspect to consider is whether these increased deaths are at the aggregate levels affecting the intra-household labor supply. Mather, Donovan et al. (2004) report that in none of the five countries studied, households afflicted by death of an adult had statistically less adult labor than non-afflicted households. This result, together with the high fertility in SSA suggests that it is still too early to promote labor-saving technologies for the SSA region (Jayne et al. (2005)).

We further explore the effects of ageing at the household level, searching for a correlation between the age of household heads and wealth. In Table 7, we tabulate the mean age of rural household heads by expenditure quintile for a set of recent household surveys from the RIGA database (Davis, Winters et al. (2007)). A close inspection of the table will reveal that there is no correlation with wealth to report. In some countries older heads are more prevalent in poorer households, for example in Bulgaria, while in others older heads are wealthier, like in Chile, while in yet other countries there is no difference in the average age of the household head by expenditure quintile, for example in Guatemala. We also explore the possibility that the overall share of rural old may determine the sign of the correlation between household head age and wealth; however, we find no such relationship. For example, both in Bangladesh and in Chile, where the share of old is more than double that of Bangladesh, we find that older heads are wealthier.

We can conclude by stating that rural ageing may be a hindrance to rural development in some particular communities, but at aggregate levels the share of old population, under

[9] This is why Sen (1998) suggests that mortality may be in many cases a preferred welfare indicator.

10% in all development regions, is unlikely to be a barrier to the development of rural economies. This statement is more valid the less developed the country is.

III.- Population Movements in Latin America and East Africa

In this section we explore for common trends in population movements in Latin American and East African countries with a cross-country net-migration study. Our interest is to explore common trends that can help predict into the future how demographic composition of population in rural areas is going to change. We would like to know whether people are staying behind in the worst-off communities increasing duality within countries separating successful areas and pockets of poor. We explore these questions, for a sample of four Latin American countries: Brazil, Mexico, Ecuador and Panama and two East African countries: Kenya and Uganda; by estimating where people are moving out from and how the characteristics of the communities they leave behind change.

A.- Estimating Population Movement

To estimate population movement we follow the path of an age cohort across time, as it is counted in two different population censuses. The idea is that within a constant area, if we count people at one point in time, and then we recount people at the same exact place a period later, we can know the net result of how many people arrived or left the place. The problem is that people not only leave or arrive, but people are born or die. We eliminate the problem of new people being born by counting people of a certain age. We still have to account for mortality. In this study we follow the adult cohort 15-49 years at the first census, and compare them to the people 25-59 that are still in the same place 10 years later in the second census count. It makes sense to follow the adult cohort, because they form the bulk of the migrating population, and also for the most part have finished their education (particularly in the poorer regions), which allows us to make some inference about changes in their education levels.

Before counting people in the second census, we predict how many should be there if no one moved, accounting for mortality. It is well known that mortality varies by gender and age group (higher for males, and increasing with age), so we use different mortality rates by gender. For example, females initially in the age group 15-19 in 1990 in administrative unit *i*,

should be 25-29 ten year later, but less after some of them died, in particular we can estimate their number with:

$$\hat{F}^{i}_{25-29}(2000) = F^{i}_{15-19}(1990) \cdot (1 - m^{F}_{15-19}(1990,1995))^{5} \cdot (1 - m^{F}_{20-24}(1995-2000))^{5} \qquad (1).$$

That is, the predicted size of the cohort (under the assumption that there is no net migration) is equal to the initial size minus those who die after they suffer risk of death that corresponds to their age group for five years. After five years the cohort "graduates" and moves to the next age cohort, and suffers a different risk of death[10].

Thus if our mortality measure was exact, we can impute exactly the net in or out migration of the cohort between 1990 and 2000 as:

$$NM^{i}_{25-29}(1990,2000) = (F^{i}_{25-29}(2000) + M^{i}_{25-29}(2000)) - (\hat{F}^{i}_{25-29}(2000) + \hat{M}^{i}_{25-29}(2000)) \quad (2).$$

The measure would be positive if more people in-migrated than those out-migrated, and negative if more people left the administrative unit *i*. Finally we can calculate the migration rate adding the imputed migration over the 7 5-years cohorts that compose the adult cohort:

$$nm^{i}(1990,2000) = \frac{\sum_{j} NM^{i}_{j}(1990,2000)}{(F^{i}_{15-49}(1990) + M^{i}_{15-49}(1990))} \qquad (3).$$

The problem is that death rates are not equivalent across administrative units, which would be of no concern if the risk of death was randomly distributed with the known mean we are working with. In Latin America for example it is very likely that in poorer, more rural regions, mortality rates are higher than the national means, and that in richer urban settings the mortality rate is lower than the national rate. Although we can not control this bias, we can at least predict what its effect is: we are going to overestimate out-migration in poor areas, and over estimate in-migration in richer areas. It is also possible that the gap between male and female mortality is higher in rural areas. If this is so we would overestimate male out migration in poor areas, and equivalently we would overestimate the (positive) change in the femininity ratio in poor areas, mainly in the adult cohort.

In Africa the picture is more complex, and it is hard to know *a priori* the sign of this type of biases. On the one hand in some countries, in our sample Uganda, there are wars which change the risk of death substantially, and the risk is correlated with regions, in our case northern Uganda, not the level of rurality. Additionally, there is increased mortality caused by AIDS, however, we do not know with certainty, if this type of mortality is higher

[10] We obtained the mortality rates from life tables for Latin America as produced by CELADE (2001). In the case of Uganda and Kenya, we used Demographic and Health Surveys, in particular DHS (1996) and DHS (2001) for Uganda, and DHS (1994) and DHS (1999) for Kenya.

in urban or rural settings. The main source to study HIV-AIDS mortality, the Demographic and Health Surveys, do not differentiate between urban and rural areas.

After calculating the predicted net migration rates, we explore how they vary by income levels. We construct a welfare index, forming a principal components index of different housing characteristics that are usually asked for in a population census, like floor, ceiling, and walls construction materials; and access to water, electricity and sewage. These are in a sense stock measures of wealth, as opposed to income or expenditure usually used in household surveys which measure flow. We compare how the migration rates vary across the different wealth quartiles, and also how the population characteristics change across these wealth quartiles.

We also compare results by education quartiles and distance quartiles. Distance was calculated as a simple linear distance from the center of the administrative unit (the centroid of the polygon) to the closest city of at least 100,000 inhabitants at the time of the second census. We use the threshold in the second census, because the fact that a city is crossing the threshold says something about its migration attracting force. These three measures are different indicators of marginality. We want to explore how marginality relates to population movements. In Table 8, we report the correlation of the different indicators in the three countries under review. We see that all the signs are as expected, education and housing quality, two different types of assets, are positively correlated; this correlation is very high in all countries with the exception of Ecuador. The correlation between assets and distance is as expected negative, but these correlations are not as high.

The population census data we use comes from complete tabulations using the online REDATAM facility in the cases of Ecuador and Panama[11]. For the rest of the countries we used census samples. In the case of Mexico we use census samples (10% in 1990, and 10.6% in 2000), prepared by INEGI (Mexico's statistics office) and available at IPUMS (Minnesota Population Center (2006)). The samples for Kenya and Uganda (5% and 10% respectively) were also obtained from IPUMS, while the samples for Brazil (10%) were obtained from IBGE (the Brazilian Statistics Office). The use of census sample data imposes certain limits, these samples are weighed to produce the exact person count even in the smallest administrative unit; however, they are not necessarily accurate for other indicators of the population like age composition or housing quality for smaller municipalities which are as small as 300 persons (as is the case of some Mexican municipalities). Therefore, to ensure

[11] See http://www.eclac.cl/celade/ for links to country level REDATAM access.

representativity of samples we merged together municipalities smaller than 3,500 inhabitants by state, or districts.

The Brazilian samples presented an additional challenge, as the country changed its administrative units from roughly 4500 to 5400 municipalities in their inter-censal period 1991-2000. The scale of subdivisions and merging of administrative units, made it impractical to individually identify each geopolitical rearrangement, as was done for example with Ecuador. The task of identifying fission and fusions of municipalities was automated with a GIS analysis of the areas of intersection of municipalities using geopolitical maps of the census years, also available from the Brazilian statistical office.

B.- The Results [12]

In Table 9 we present the results of tabulating imputed net migration and population characteristics by wealth quartiles. All the following results are robust across the four Latin American countries:

1. People out-migrate more from the poorer administrative units.
2. These are also the most rural communities.
3. Femininity, as reported above is lower in the poorer, more rural communities.
4. Indigenous populations form a larger share of poorer administrative units.
5. Assets are being accumulated faster in the poorest more marginal communities: both education and housing quality indicators (we use floor quality as an example in the tables) are growing faster in the poorest communities.
6. Indigenous populations are growing faster in the better off communities.

Result 1 is rather surprising. However, it does not negate the body of evidence in the literature that shows that usually it is not the poorest *individuals* that out-migrate, but those who are slightly better off, leaving the poorest behind. Result 1 indicates that it is the poorest *communities* from where people out-migrate the most.

Result 5 is explained by three different effects. First, the asset base is lower in poorer communities, therefore equivalent changes appear as higher, percentage wise in the poorer communities. Then, as people are leaving, all these averages that are weighted implicitly over persons, will rise if those who out-migrate, are below the community means in the assets indicators. Finally, there are real improvements in education and housing quality in these

[12] In this section we focus in the net migration results by welfare quartiles. Additional tables tabulating net-migration differences by distance and education quartiles are available in Appendix III.

communities that raise the means. Anyhow, result 5 indicates that poorer communities are catching up with their better off counter parts.

The change in the relative size of indigenous population is given by:

$$\frac{\frac{I_{t+1}}{P_{t+1}} - \frac{I_t}{P_t}}{\frac{I_t}{P_t}} \qquad (4),$$

where I_t, P_t are indigenous and total population respectively. Rearranging terms, it is easy to show that the change will be positive iff $I_{t+1}/I_t > P_{t+1}/P_t$, that is if indigenous populations grow faster than the total population. Therefore, it is possible for this indicator to be positive in all quartiles, as is the case of Ecuador[13]. However, consistently the change in ethnicity is higher in wealthier communities. We interpret results 1, 4, and 6 together as indicating that native populations are leaving the poorest communities and moving into the better-off administrative units. This result is corroborated in Table 10 where we follow the characteristics of the adult cohort alone. We interpret results 1 and 5 together as indicating that population movements are helping to close the gap in Latin America between the wealthy and marginal communities.

In East Africa, there is no such common thread, and the two countries analyzed present two different stories in terms of net migration. In both countries poorer communities, in terms of housing quality, also show lower levels of human capital accumulations. Furthermore, in both countries, as opposed to Latin America, femininity is higher in the more rural settings; again a result previously reported above. In terms of population movement the countries diverge. In Kenya, it is the middle quartiles which have the highest level of out-migration, while the poorest communities show a much lower rate of out-migration. Also, welfare indicators (housing and educations) are growing much faster, precisely in the middle quartiles. Hence, we can say that, like in Latin America, migration is working towards the convergence of communities; however, in Kenya the poorest, least educated, and more distant communities are being left behind. These communities show low out-migration, and slower rate of growth of welfare indicators.

In Uganda, there is yet a different story. In-migration has been much higher in the poorest regions, displaying what we can call a return migration, to the rural and poorer areas.

[13] Unfortunately in Ecuador the question regarding spoken language, our ethnicity proxy, changed drastically between censuses, which is why probably we are overestimating the change in ethnicity in all parishes of the country. In spite of this bias, while we can not compare the evolution of ethnicity, we can still compare this biased measure *between parishes* as we are doing.

This return migration has caused the fastest improvement in welfare indicators in the poorest regions of Uganda. Here, again, migration is acting towards (a downwards) convergence of communities. However, it would be erroneous to attribute these trends to underlying socio-economic characteristics. Uganda has been under a civil war since 1986, and a serious internal displacement crisis has been growing since 1996, when the government started a "protected villages" program. Today an independent organism linked to the United Nations estimates at 1.9 million the number of internally displaced people, particularly in northern Uganda (Centre (2005)). This means that a staggering 7.5% of the population is internally displaced. That is why Uganda shows net in-migration rates in the higher quartile that are 4 times higher than any other country studied (see Table 10). Thus, most of what we are reading in our statistics as return urban to rural migration is most likely internal displacement, a phenomenon that only indirectly is explained by socio-economic differences.

In Table 10 we see that in Kenya out migrants have been mostly females, while no such clear trend is evident in Uganda. Table 10 also shows that contrary to the evidence displayed in Latin America, it is from communities with higher levels of education where people out-migrate the most. This conclusion is further confirmed by regression analysis in Table 11, where we estimate the determinants of the net-migration rate for the East African countries. Although, results should be interpreted with care, as there is likely spatial correlation in the equations not accounted for; both equations show that there is a strong negative and quadratic relation between education levels and migration. These equations say that at the higher tail of the education distribution, communities act as in-migration magnets, but at the lower tail improvements in education promote higher out-migration. All the evidence presented speaks quite clearly that education is the key asset that determines out-migration, and in the case of Kenya, it is the lack of education that is leaving behind from the migration channel the poorest communities.

IV.- Conclusions

The revision of global rural demographic trends seems to debunk some notions in the development field. With respect to feminization we find that such a demographic unbalance only exists in rural Sub- Saharan Africa[14]. A superficial analysis of gender inequality showed

[14] It is important to differentiate demographic feminization as studied here, and feminization of the labor force, or agricultural labor force. For example Katz (2003) shows that rural femininity has been falling in Latin America (as we also show for a larger sample of countries), but at the same time there has been a growing female share of rural employment particularly in the non-farm sector..

that precisely in this region inequality in terms of economic wellbeing and gender is also more acute. AIDS however, is contributing to diminish femininity, not to intensify it. We found that ageing is not really a concern for least developed countries, and actually the opposite is true. We identified as the most significant adverse demographic trend, the high dependency ratios brought about by larger children shares of populations, which act to reduce economic wellbeing in the rural developing world. Therefore, the supply of labor is not at risk even in countries that are hard hit by the AIDS pandemic. This is confirmed by the macro demographic indicators and the latest literature that studies the effects of AIDS at the household level. Finally, with respect to ageing, we showed that like mortality, is highly correlated with income levels. Therefore, ageing is not likely to be a demographic factor in the developing world, and more so in the rural developing world.

Finally, in our cross-country migration analysis we found that in Latin America, migration is acting to help an upward convergence of rural communities. We also documented important improvement in welfare and assets indicators in rural Latin America during the 1990s. Similar conclusions can not be extended to East Africa however, where we found that some communities are being left behind. We also identified education as the main asset that enables migration. Communities that are not endowed with sufficient levels of human capital are being left behind.

Tables

Table 1. Population Age Composition and Development

A.- National Shares

	Share old Population (>64)		Share Children (<15)	
	Coefficient	Standard Error	Coefficient	Standard Error
log of Real GDP per Capita	2.81	0.18	-7.33	0.38
Constant	-17.16	1.50	96.53	3.25
Mean Dep. Variable	6.70		34.14	
Std. error of regression	2.50		5.45	
Observations	190		193	
R^2	57.75		66.17	

B.- Rural Shares

	Share old Population (>64)		Share Children (<15)	
	Coefficient	Standard Error	Coefficient	Standard Error
log of Real GDP per Capita	2.91	0.22	-6.96	0.47
Constant	-17.52	1.85	95.77	4.00
Mean Dep. Variable	7.17		36.47	
Std. error of regression	3.08		6.70	
Observations	193		196	
R^2	48.73		53.53	

C.- Urban Shares

	Share old Population (>64)		Share Children (<15)	
	Coefficient	Standard Error	Coefficient	Standard Error
log of Real GDP per Capita	3.03	0.17	-6.15	0.36
Constant	-19.68	1.49	83.91	3.08
Mean Dep. Variable	6.12		31.47	
Std. error of regression	2.40		5.15	
Observations	191		194	
R^2	63.35		60.58	

Table 2. Dependency Ratios and Dependency Ratio Changes by Global Regions and Condition of Rurality

	National Dependency Ratio		Urban Dependency Ratio		Rural Dependency Ratio			Urban – Rural†
Region	**Average**	**Std. Deviation**	**Average**	**Std. Deviation**	**Average**	**Std. Deviation**	**Obs.**	
East Asia & Pacific	0.67	0.13	0.56	0.12	0.73	0.14	25	--
Europe & Central Asia	0.58	0.12	0.51	0.08	0.67	0.14	21	--
Latin America & Caribbean	0.70	0.11	0.63	0.07	0.82	0.16	36	--
Middle East & North Africa	0.87	0.14	0.77	0.13	0.99	0.15	15	--
South Asia	0.84	0.12	0.67	0.09	0.91	0.15	14	--
Sub-Saharan Africa	0.93	0.14	0.74	0.16	1.02	0.15	39	--
High income: non OECD	0.58	0.09	0.54	0.09	0.65	0.10	13	--
High income: OECD	0.52	0.06	0.49	0.06	0.57	0.06	35	--
Total	0.71	0.18	0.61	0.14	0.79	0.21	198	--

	Mean Yearly % Change National Dependency Ratio		Mean Yearly % Change Urban Dependency Ratio		Mean Yearly % Change Rural Dependency Ratio			Urban – Rural†
Region	**Average**	**Std. Deviation**	**Average**	**Std. Deviation**	**Average**	**Std. Deviation**	**Obs.**	
East Asia & Pacific	-2.01	0.73	-2.08	1.49	-1.78	0.92	9	-
Europe & Central Asia	-0.58	.	-1.22	.	0.45	.	1	-
Latin America & Caribbean	-0.88	0.58	-0.71	0.62	-1.03	0.85	17	+
Middle East & North Africa	-1.59	0.92	-1.38	1.11	-1.48	0.63	5	+
South Asia	-0.43	0.47	-0.91	0.94	-0.26	0.65	7	-
Sub-Saharan Africa	-0.48	0.71	-0.69	0.46	-0.24	0.74	8	-
High income: non OECD	-1.04	0.98	-0.92	0.88	-1.03	1.22	5	+
High income: OECD	-0.83	1.08	-0.74	1.03	-0.89	1.16	18	+
Total	-0.98	0.91	-0.98	1.02	-0.93	1.02	70	-

Source: Author's calculations from a Database of Census Sex/Age/Rurality Tables for the period 1980-2003. The Femininity Ratio refers to the number of females for every 100 males.

† +/– Identifies the sign of the difference between urban and rural mean. ++/-- Indicates that the difference is statistically significant at 90% using a t-test.

Table 3. Femininity Ratios

	National Femininity Ratio		Urban Femininity Ratio		Rural Femininity Ratio			Urban – Rural†
Region	**Average**	**Std. Deviation**	**Average**	**Std. Deviation**	**Average**	**Std. Deviation**	**Obs.**	
East Asia & Pacific	99.2	4.7	99.0	7.8	99.0	5.2	28	
Europe & Central Asia	106.2	5.6	107.5	6.2	104.5	6.3	27	++
Latin America & Caribbean	102.3	2.6	107.2	2.9	92.6	7.5	43	++
Middle East & North Africa	95.7	3.2	94.7	4.3	96.4	3.7	17	-
South Asia	94.8	2.8	87.6	5.0	96.8	3.0	14	--
Sub-Saharan Africa	104.2	4.3	99.4	7.0	106.0	5.3	45	--
High income: non OECD	99.1	6.8	100.8	7.7	95.0	6.3	14	++
High income: OECD	103.1	2.6	105.6	3.4	97.3	5.7	41	++
Total	101.8	5.2	101.9	7.8	99.0	7.5	229	++

	National Working Age (15-49) Femininity Ratio		Urban Working Age (15-49) Femininity Ratio		Rural Working Age(15-49) Femininity Ratio			Urban – Rural†
Region	**Average**	**Std. Deviation**	**Average**	**Std. Deviation**	**Average**	**Std. Deviation**	**Obs.**	
East Asia & Pacific	100.9	5.3	99.9	9.7	100.7	6.6	28	-
Europe & Central Asia	100.3	2.9	103.2	5.5	95.6	6.7	27	++
Latin America & Caribbean	103.6	3.1	109.2	4.2	91.4	9.5	42	++
Middle East & North Africa	96.4	6.5	93.4	7.4	99.3	8.7	16	--
South Asia	97.8	4.8	84.3	7.9	103.3	7.3	14	--
Sub-Saharan Africa	110.3	6.7	98.1	10.4	116.3	10.3	42	--
High income: non OECD	97.8	9.1	100.1	10.0	92.0	8.9	14	++
High income: OECD	98.2	2.3	100.7	2.8	92.2	4.6	40	++
Total	101.9	6.7	100.4	9.5	99.2	12.1	223	+

Source: Author's calculations from a Database of Census Sex/Age/Rurality Tables for the period 1980-2003. The Femininity Ratio refers to the number of females for every 100 males.

† +/– Identifies the sign of the difference between urban and rural mean. ++/-- Indicates that the difference is statistically significant at 90% using a t-test.

Table 4. Rural Gender Inequality
Female Headed Households (%) by per Capita Expenditure Quintiles

Country	*Year*	*Q1*	*Q2*	*Q3*	*Q4*	*Q5*	*Total*	*Gender Inequality Index*
Malawi	1997	48.7	33.2	22.3	16.9	10.7	26.4	10
Malawi	2004	40.8	28.0	21.5	17.1	12.6	24.0	10
Indonesia	1993	33.3	16.1	11.6	10.8	8.2	16.0	8
Nepal	1996	26.9	14.0	9.7	7.8	5.7	12.8	8
Bangladesh	2000	19.7	6.3	4.9	6.6	5.6	8.7	7
Ecuador	1995	24.5	13.6	10.0	12.9	9.7	14.1	7
Vietnam	1998	38.8	21.9	16.6	16.2	14.3	21.6	7
Albania	2005	15.1	6.5	7.3	4.0	4.3	7.4	6
Bulgaria	2001	50.0	20.1	19.0	10.9	9.8	22.0	6
Ecuador	1998	20.4	15.6	14.5	11.7	12.4	14.9	6
Ghana	1992	35.2	33.0	29.6	22.1	24.2	28.8	5
Pakistan	2001	13.0	9.2	8.2	7.4	5.8	8.7	5
Vietnam	1992	36.2	21.3	20.9	19.4	15.5	22.7	5
Bulgaria	1995	54.3	30.1	29.3	30.1	28.2	34.4	4
Madagascar	1993	20.6	15.9	18.8	16.5	15.4	17.4	4
Nigeria	2004	16.1	14.2	14.6	13.7	13.2	14.4	4
Pakistan	1991	7.0	3.4	2.8	2.8	3.3	3.9	4
Albania	2001	16.3	14.7	9.1	7.8	6.1	10.8	3
Ghana	1998	36.3	36.4	34.7	27.0	22.1	31.3	3
Panama	2003	21.0	21.1	20.3	16.7	17.3	19.3	2
Chile†	1990	13.5	13.1	14.1	14.7	13.6	13.8	0
Chile†	2003	17.9	17.3	18.9	19.8	17.7	18.3	0
Guatemala	2000	10.1	11.7	14.7	15.6	18.6	14.1	0
Indonesia	2000	15.8	14.7	16.6	18.9	18.4	16.9	0
Madagascar	2001	18.4	18.1	17.6	23.6	19.0	19.3	0
Nicaragua	2001	19.3	20.4	18.3	16.0	16.9	18.2	0
Panama	1997	12.6	13.7	18.1	19.7	20.1	16.8	0

Notes: Author's calculations using the RIGA database of Household Surveys.
† Income per capita quintiles. See text for explanation on the calculation of the gender inequality index.

Table 5. Femininity Ratio of the International Migrant Stock by Development Region

Region	Average	Std. Deviation	Obs.
East Asia & Pacific	88.5	18.6	23
Europe & Central Asia	126.5	19.9	25
Latin America & Caribbean	102.9	22.7	31
Middle East & North Africa	78.4	28.3	14
South Asia	96.2	58.6	8
Sub-Saharan Africa	92.7	18.8	46
High income: non OECD	93.5	31.9	31
High income: OECD	107.7	9.4	24
Total	99.0	27.1	202

Author's calculations using UNSTATS' "Statistics and indicators on women and men".

Table 6. Gender of International Migrants Leaving Latin American Countries

		Urban	*Rural*	*Total*
Panama 2000	Femininity	157.4	156.2	156.3
	Migrants	17,867	2,458	20,325
Ecuador 2001	Femininity	98.9	65.0	88.5
	Migrants	276,480	101,428	377,908
Dominican Republic 2002	Femininity	105.1	111.1	109.1
	Migrants	326,511	152,133	478,644
Mexico 2000	Femininity	32.8	55.7	34.0
	Migrants	1,532,198	100,854	1,633,052

Notes: Author's calculations using the REDATAM online consultation system for Panama, Ecuador, and the Dominican Republic, and official tabulations by INEGI, for Mexico.
The number of migrants are not comparable, because in the Dominican Republic the question was open ended, in Ecuador it was asked for migrants in the last ten years, while in Panama and Mexico it asked for international migrants in the last 5 years.

Table 7. Rural Household Head Age and Wealth
Mean Age of Household Head by per Capita Expenditure Quintiles

Country	*Year*	*Q1*	*Q2*	*Q3*	*Q4*	*Q5*	*Total*	*% Rural Pop. >60 and Year of Calculation*	
Albania	2001	50.3	50.6	50.2	49.6	52.3	50.6	10.6	2001
Albania	2005	54.3	52.8	52.0	50.0	51.1	52.0	10.6	2001
Bangladesh	2000	42.3	41.2	43.8	45.3	50.6	44.6	4.9	1988
Bulgaria	1995	70.3	64.4	57.8	55.8	52.0	60.1	31.2	1995
Bulgaria	2001	63.2	55.0	58.3	53.3	53.5	56.7	32.5	2003
Chile†	1990	42.8	45.3	49.1	53.6	51.5	48.4	10.8	1992
Chile†	2003	46.8	50.2	53.3	55.6	54.5	52.1	13.4	2002
Ecuador	1995	48.5	45.9	43.9	46.0	44.3	45.9	7.1	1990
Ecuador	1998	48.4	48.5	49.5	48.1	47.8	48.4	9.8	2001
Ghana	1992	47.0	44.6	43.8	44.0	46.3	45.1	6.4	1984
Ghana	1998	49.1	46.5	45.7	45.3	46.0	46.5	7.8	2000
Guatemala	2000	43.1	43.2	44.1	44.3	44.7	43.9	4.5	1989
Indonesia	1993	52.4	46.5	43.4	44.5	44.9	46.3	6.8	1990
Indonesia	2000	47.4	45.9	46.9	45.9	44.0	46.0	7.9	2000
Madagascar	1993	43.9	43.3	42.2	43.0	42.1	42.9	6.0	1975
Malawi	1997	43.0	40.2	41.0	41.6	43.4	41.8	6.1	1999
Malawi	2004	46.9	42.9	41.8	41.9	42.0	43.1	6.1	1998
Nepal	1996	43.4	42.1	44.9	44.8	48.2	44.7	5.9	1991
Nicaragua	2001	46.8	45.2	45.9	45.0	47.7	46.1	4.4	2003
Nigeria	2004	46.0	46.0	47.5	48.4	51.2	47.8	5.8	1991
Pakistan	1991	45.3	42.1	44.7	48.2	50.0	46.0	6.6	1995
Pakistan	2001	43.1	42.8	45.4	46.6	49.9	45.5	5.9	1998
Panama	1997	47.5	48.6	48.1	50.7	50.9	49.2	9.1	2000
Panama	2003	51.0	49.3	47.9	48.1	48.6	49.0	7.4	1990
Vietnam	1992	44.1	41.3	44.6	46.3	48.1	44.9	7.4	1989
Vietnam	1998	50.2	44.7	45.9	46.7	48.3	47.2	8.3	1999

Notes: Author's calculations using the RIGA database of Household Surveys.
† Income per capita quintiles.

Table 8. Correlation Matrices of Marginality Quartiles

Panama	**Housing Quality Quartiles**	**Average Education Quartiles**
Housing Quality Quartiles	1	
Average Education Quartiles	0.927	1
Distance to Main City Quartiles	-0.249	-0.334
Mexico		
Housing Quality Quartiles	1	
Average Education Quartiles	0.747	1
Distance to Main City Quartiles	-0.214	-0.266
Ecuador		
Housing Quality Quartiles	1	
Average Education Quartiles	0.527	1
Distance to Main City Quartiles	-0.454	-0.095
Brazil		
Housing Quality Quartiles	1	
Average Education Quartiles	0.833	1
Distance to Main City Quartiles	-0.328	-0.336
Kenya		
Housing Quality Quartiles	1	
Average Education Quartiles	0.828	1
Distance to Main City Quartiles	-0.494	-0.686
Uganda		
Housing Quality Quartiles	1	
Average Education Quartiles	0.708	1
Distance to Main City Quartiles	-0.382	-0.327

Table 9. Population Movement, Initial Population Characteristic, and Changes by Housing Quality Quartiles

	Ecuador 1990-2001				Mexico 1990-2000				Panama 1990-2000			
	Housing Quality Quartiles				Housing Quality Quartiles				Housing Quality Quartiles			
	1	2	3	4	1	2	3	4	1	2	3	4
Population Movement												
Mean*	-22.13	-15.91	-7.63	4.86	-12.85	-8.33	-2.78	1.77	-42.06	-21.35	-15.49	3.86
Std. Error of the Mean	1.79	1.63	1.20	1.09	0.61	0.85	0.89	0.76	0.05	0.03	0.02	0.01
Coefficient of variation	-1.22	-1.54	-2.38	3.37	-0.98	-2.10	-6.58	8.77	-0.43	-0.48	-0.51	1.20
Administrative Units	229	228	229	228	422	421	422	421	17	16	17	16
	Parishes				Municipalities				Districts			
%Rural	99.56	95.77	92.40	72.00	81.88	61.22	48.53	27.02	98.23	91.53	85.87	54.85
Initial Population Characteristics												
Mean by Housing Quality Quartiles												
Education (Years)	3.60	4.13	4.36	5.32	3.32	4.47	5.32	6.39	3.84	5.46	6.37	8.17
Femininity (Ratio)	90.11	94.37	100.90	102.14	100.42	101.04	102.91	104.55	90.20	83.23	86.82	97.40
Age	21.76	23.55	24.79	25.25	22.29	23.48	23.93	24.53	22.44	25.84	26.68	28.22
Ethnicity (%)	16.52	6.06	6.07	3.94	0.45	0.12	0.04	0.01	40.68	2.33	4.95	1.34
Change in Population Characteristics												
% Change by Housing Quality Quartiles												
Education	15.13	14.69	13.62	6.98	55.00	30.56	22.03	18.79	42.43	18.22	14.44	12.27
Femininity	1.77	3.12	2.52	1.47	2.72	2.99	2.76	1.39	-2.94	3.58	2.32	0.41
Age	13.65	12.94	13.10	12.10	8.53	10.41	10.11	10.33	12.48	9.57	8.08	7.98
Floor Quality Index	8.40	7.24	5.37	4.39	56.78	18.34	10.66	6.10	77.11	35.26	11.54	5.47
Ethnicity**	33.42	49.16	41.07	54.57	-1.81	-11.54	1.28	26.04	-33.43	30.90	30.53	62.37

* Weighted by initial population of the administrative unit.

** Weighted by indigenous population in the administrative unit.

Table 9. (cont.)

	Brazil 1991-2000				Kenya 1989-1999				Uganda 1991-2002			
	Housing Quality Quartiles				Housing Quality Quartiles				Housing Quality Quartiles			
	1	2	3	4	1	2	3	4	1	2	3	4
Population Movement												
Mean*	-13.47	-11.76	-1.80	-0.15	-2.65	-8.33	-10.27	3.19	41.31	5.87	-2.78	2.08
Std. Error of the Mean	0.01	0.00	0.01	0.00	8.93	2.10	3.44	3.82	10.85	4.00	8.91	4.41
Coefficient of variation	-1.77	-1.52	-15.46	-75.87	-11.17	-0.80	-1.06	3.79	1.70	4.32	-20.57	13.44
Administrative Units	732	732	732	731	11	10	10	10	42	40	41	40
	Municipalities				Districts				Counties			
%Rural	57.53	39.35	26.49	6.37	86.41	93.27	90.70	65.94	97.56	98.24	94.86	60.86
Initial Population Characteristics												
Mean by Housing Quality Quartiles												
Education (Years)	1.48	2.25	3.28	4.64	1.71	3.37	3.84	4.95	2.18	2.66	3.05	4.12
Femininity (Ratio)	97.77	98.51	99.95	106.25	99.71	106.18	101.82	95.63	110.08	103.83	103.20	105.00
Age	23.56	23.91	25.47	27.03	20.88	20.86	21.23	22.66	21.17	21.18	21.48	20.94
Ethnicity (%)	5.90	5.26	5.55	5.91	-	-	-	-	-	-	-	-
Change in Population Characteristics												
% Change by Housing Quality Quartiles												
Education	75.41	50.81	33.56	22.50	15.52	24.22	23.09	18.68	326.88	75.65	60.23	45.10
Femininity	-0.81	0.01	0.82	0.73	0.93	1.46	2.31	3.50	-7.02	-2.76	-3.75	-3.67
Age	10.01	10.18	10.18	8.91	3.81	-0.95	-2.28	1.26	4.93	4.26	5.69	3.77
Floor Quality Index ***	53.53	10.24	-1.31	-10.00	18.01	36.62	33.52	25.83	302.88	101.37	49.90	29.04
Ethnicity**	35.49	33.55	27.73	22.96	-	-	-	-	-	-	-	-

* Weighted by initial population of the administrative unit.
** Black and Indigenous in Brazil. Weighted by indigenous population in the administrative unit.
*** Sewage in Brazil.

Table 10. Characteristics of the Adult Cohort, and Changes by Population Movement Quartiles

	Ecuador 1990-2001				Mexico 1990-2000				Panama 1990-2000			
	Population Movement Quartiles				Population Movement Quartiles				Population Movement Quartiles			
	1	2	3	4	1	2	3	4	1	2	3	4
Initial Characteristics of the Adult Cohort (15-49)												
Mean by Population Movement Quartiles												
Education (Years)	5.30	5.60	5.61	5.91	5.01	5.17	5.79	6.82	5.07	5.40	6.83	8.55
Femininity (Ratio)	86.69	97.65	107.12	109.55	101.21	106.54	109.80	110.66	82.51	80.25	87.07	99.65
Age	28.34	28.45	28.62	28.59	28.08	28.14	28.09	28.02	28.71	29.20	30.05	30.86
Ethnicity (%)	7.46	4.78	8.33	11.25	15.16	21.29	17.93	9.68	23.33	17.42	8.01	0.85
% Change in the Characteristics of the Adult Cohort (15-49)												
% Change by Population Movement Quartiles												
% Population Change*	-42.76	-19.96	-8.18	8.98	-22.64	-13.13	-4.33	13.47	-49.14	-24.45	-12.31	4.08
Education	-4.27	-1.86	-2.40	1.33	4.27	7.01	8.76	11.34	24.60	1.81	4.11	7.23
Femininity	11.78	4.71	1.94	-2.48	7.35	4.01	2.45	1.02	-0.03	2.03	4.68	-0.38
Ethnicity**	32.16	33.25	38.11	49.61	5.61	4.95	2.30	17.33	-62.11	9.68	5.66	37.02
% Rural	98.42	92.25	88.04	81.03	70.73	61.80	51.19	34.95	98.60	92.39	83.59	56.03

* Weighted by initial population of the administrative unit.

** Weighted by indigenous population in the administrative unit.

Table 10. (cont.)

	Brazil 1991-2000				Kenya 1989-1999				Uganda 1991-2002			
	Population Movement Quartiles				Population Movement Quartiles				Population Movement Quartiles			
	1	2	3	4	1	2	3	4	1	2	3	4
Initial Characteristics of the Adult Cohort (15-49)												
Mean by Population Movement Quartiles												
Education (Years)	3.09	3.69	6.07	5.89	4.94	4.74	5.64	4.15	4.32	4.31	4.25	3.29
Femininity (Ratio)	98.95	101.23	106.95	102.20	112.04	110.95	102.40	96.64	108.49	110.33	109.99	121.29
Age	28.38	28.60	29.42	29.37	27.28	27.17	27.31	27.23	27.20	27.19	27.23	27.78
Ethnicity (%)	5.47	5.49	6.71	5.38	-	-	-	-	-	-	-	-
% Change in the Characteristics of the Adult Cohort (15-49)												
% Change by Population Movement Quartiles												
% Population Change*	-11.81	6.56	12.00	28.73	-18.73	-9.16	-1.61	15.47	-19.47	-1.70	13.90	93.20
Education	63.28	47.21	26.39	25.13	4.30	4.56	10.51	-6.03	-17.43	-15.76	-14.28	135.48
Femininity	-1.24	-1.74	-1.01	0.61	-8.64	-9.32	-0.10	5.61	-7.42	-8.91	-7.31	-12.10
Ethnicity**	33.50	33.58	27.63	27.30	-	-	-	-	-	-	-	-
% Rural	48.78	40.78	15.54	9.90	89.12	93.00	80.14	73.78	90.38	86.73	82.35	92.82

* Weighted by initial population of the administrative unit.

** Black and Indigenous in Brazil. Weighted by indigenous population in the administrative unit.

Table 11. Intercensal Net Migration Rate

	Kenya 1989 - 1999		Uganda 1991 - 2002	
Age	-0.973	1.664	9.029***	2.280
Education	-33.809***	9.656	-56.562***	13.670
Education^2	3.418***	0.989	6.694***	1.7513
Standard Deviation of Education	24.381**	11.060	-3.848	15.703
Housing Quality	-1.774	3.226	-19.706***	6.732
Share of Employment in Primary Sector	-21.453	17.738	-22.388	34.415
Rurality (%)	16.428	23.101	-93.826*	48.081
Distance to City	-0.021	0.040	-62.072*	33.505
R^2	0.261		0.542	
Obs.	41		163	

Figures

Figure 1. Economically Dependent Population and Income

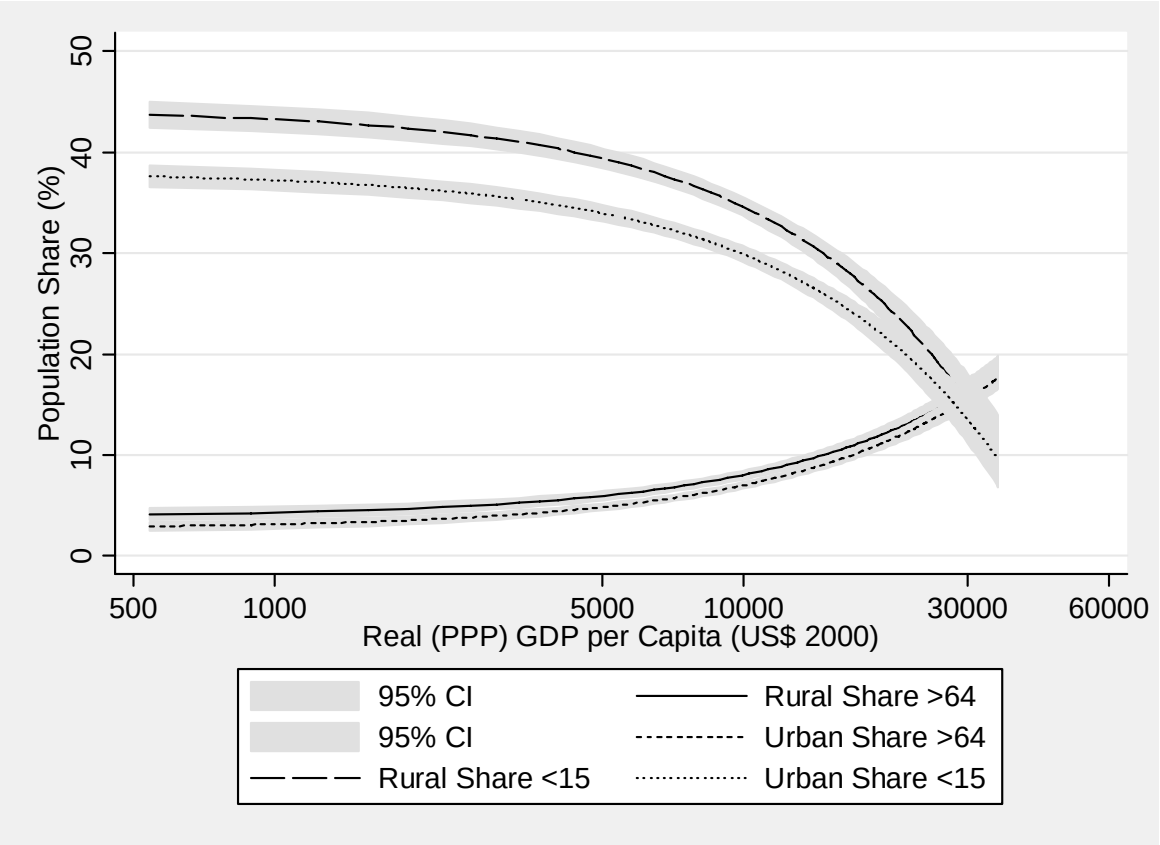


Figure 2. Rural Dependency Ratio and Income

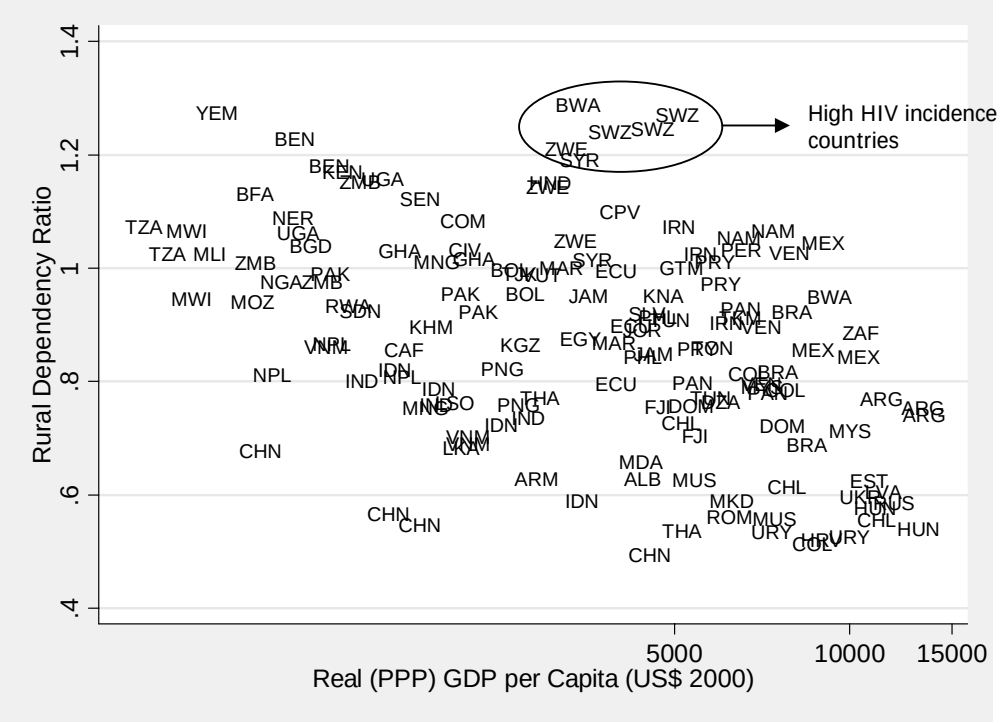
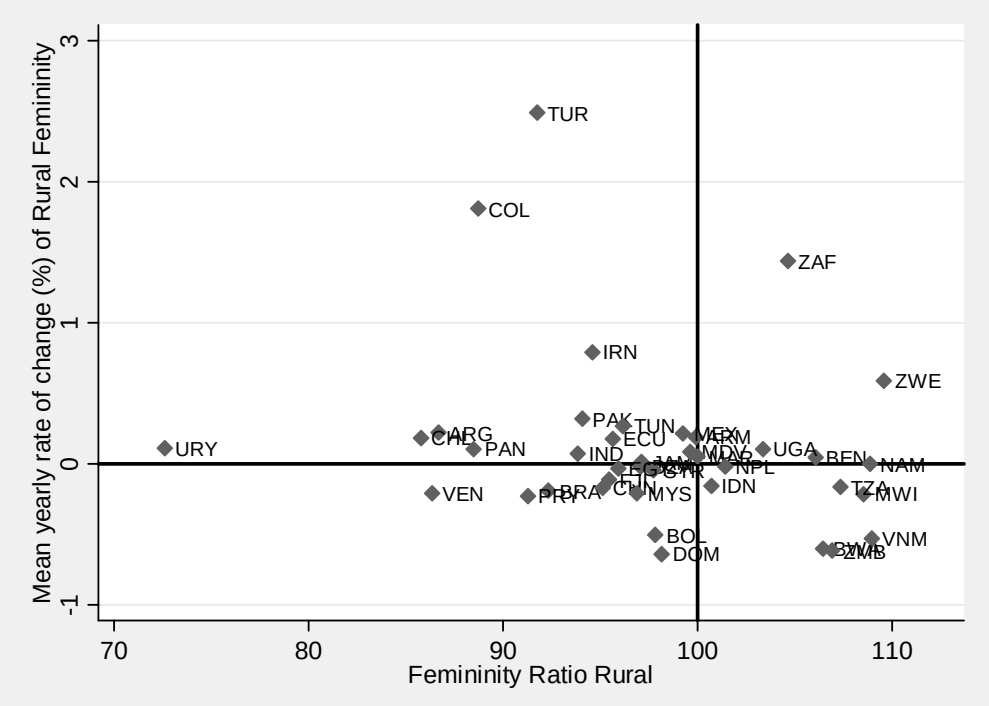


Figure 3. Changes in the Femininity Ratio by Initial Femininity

A. Rural Femininity



B. Adult Rural Femininity

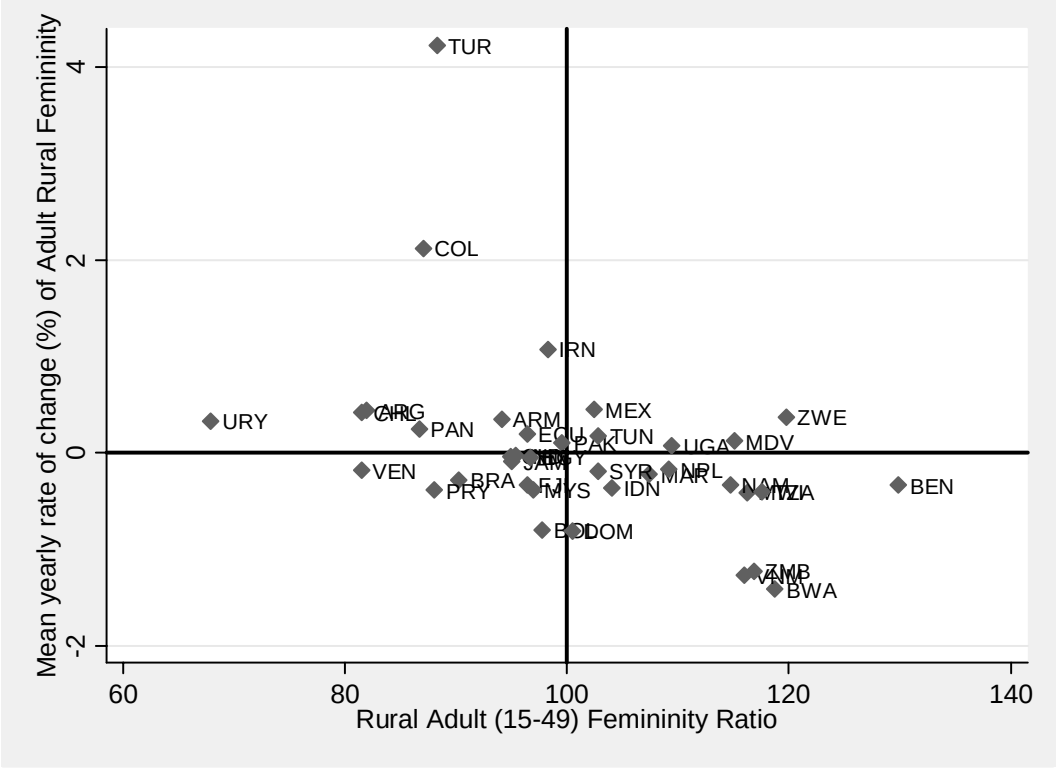


Figure 4. Rural Ageing Developing Countries

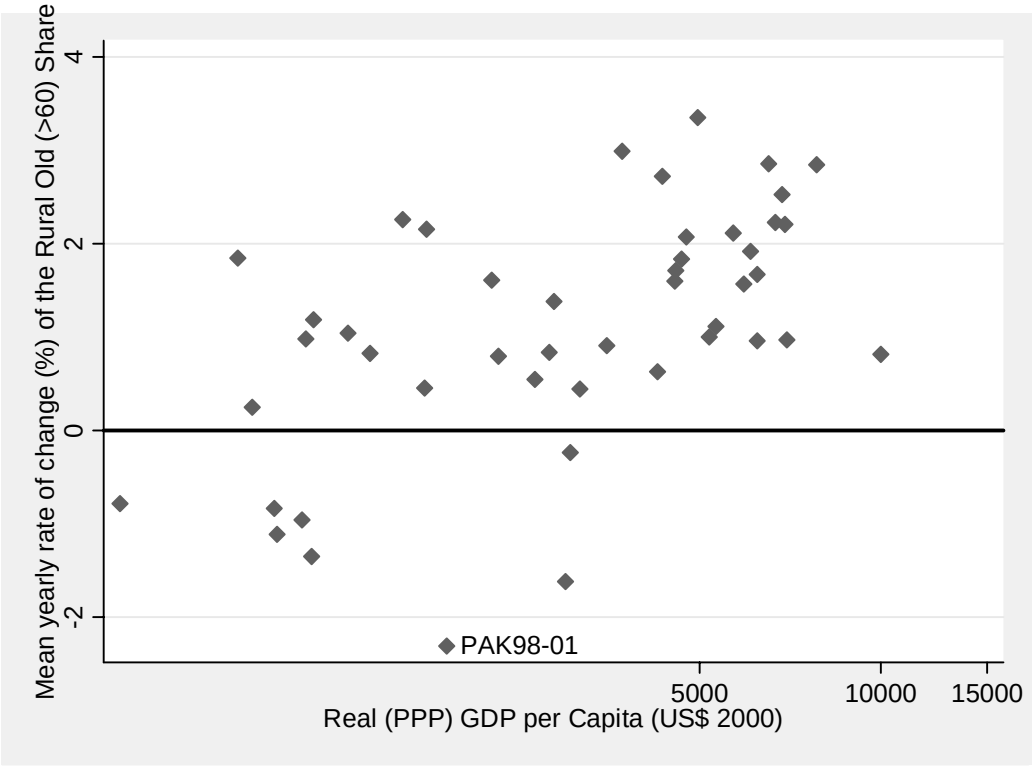
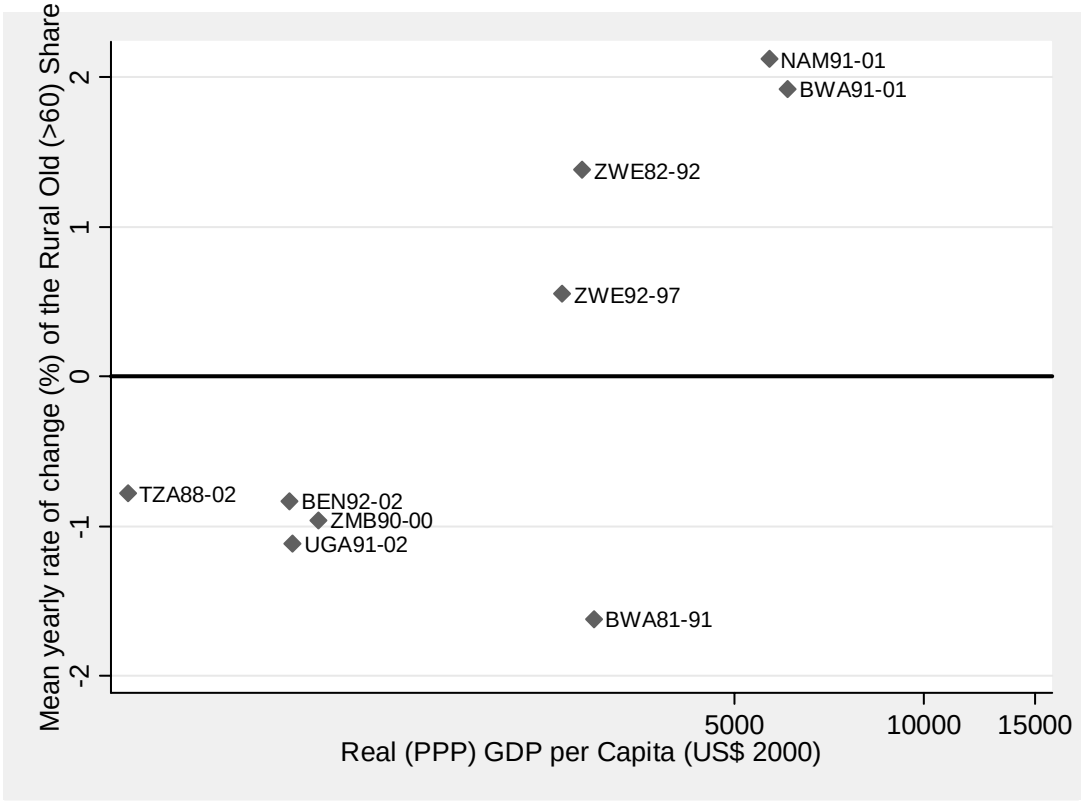


Figure 5. Rural Ageing in Sub Saharan Africa



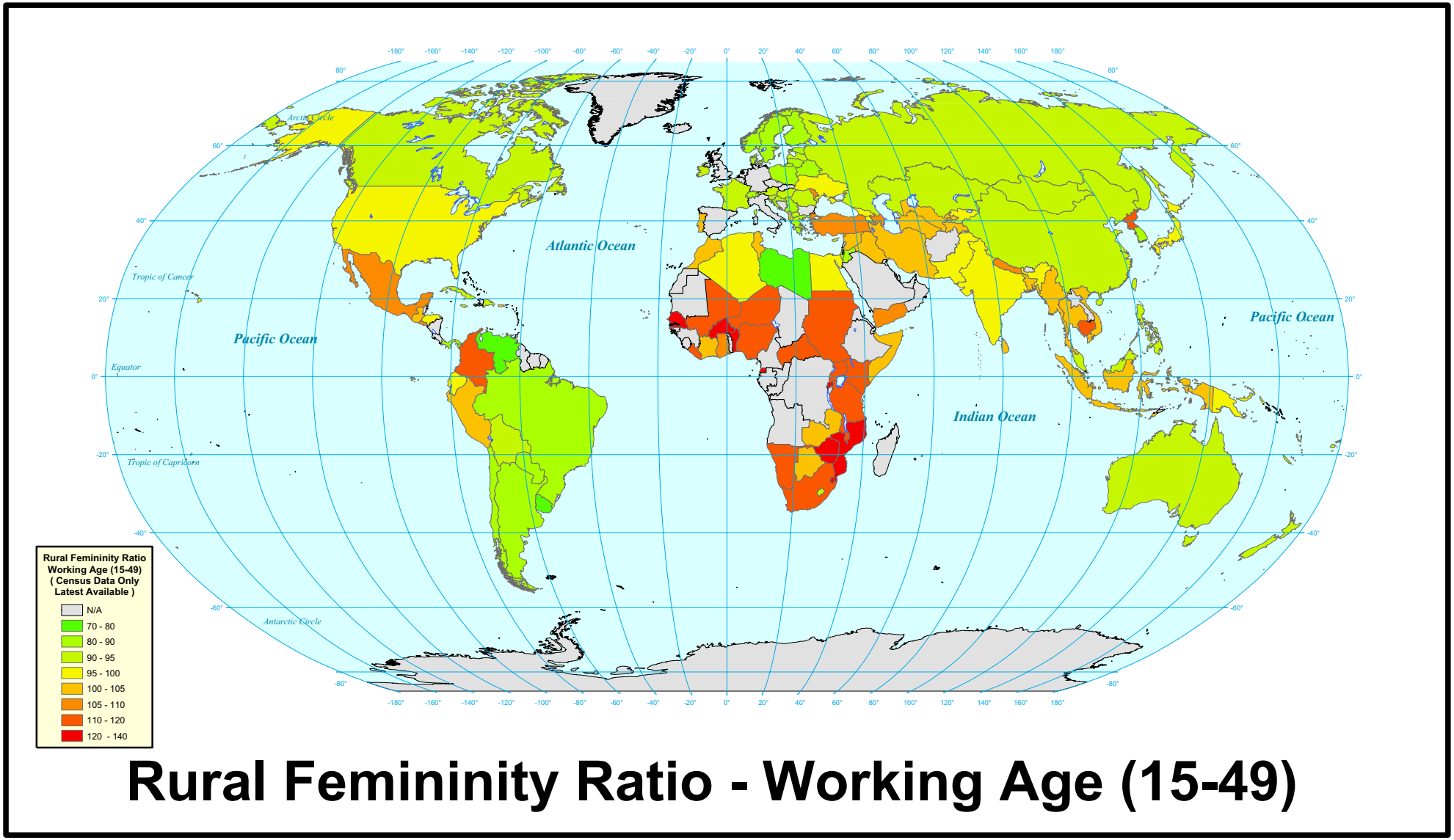
Appendix I. Countries and Censuses or Sample Surveys Included in the Global Population Database

Regions	Country	Code	Years				
East Asia & Pacific	American Samoa	ASM	1990				
	Cambodia	KHM	1998				
	China	CHN				2000	
	China [inc. Taiwan province]	CHN	1982	1987	1990		
	Fiji	FJI	1986	1996			
	Indonesia	IDN	1980	1985	1990	2000	
	Korea, Democratic People's Republic of	PRK	1993				
	Malaysia	MYS	1991	2000			
	Mongolia	MNG	2000				
	Myanmar	MMR	1983				
	Papua New Guinea	PNG	1980	2000			
	Philippines	PHL	1980	1990			
	Thailand	THA	1980	1990			
	Tonga	TON	1986				
	Vanuatu	VUT	1989				
	Viet Nam	VNM	1989	1999	1999		
Europe & Central Asia	Armenia	ARM	1989	2001			
	Azerbaijan	AZE	1989				
	Belarus	BLR	1989				
	Croatia	HRV	1991				
	Estonia	EST	1989				
	Georgia	GEO	1989				
	Hungary	HUN	1980	1990			
	Kazakhstan	KAZ	1989				
	Kyrgyzstan	KGZ	1989				
	Latvia	LVA	1989				
	Lithuania	LTU	1989				
	Poland	POL	1988				
	Republic of Moldova	MDA	1989				
	Romania	ROM	1992				
	Russian Federation	RUS	1989				
	Serbia and Montenegro	YUG	1991				
	Tajikistan	TJK	1989				
	The former Yugoslav Republic of Macedonia	MKD	1994				
	Turkey	TUR	1980	1985	1990		
	Turkmenistan	TKM	1989				
	Ukraine	UKR	1989				
	Uzbekistan	UZB	1989				
	Yugoslavia [former Socialist Federal Republ	YUG	1981				
Latin America & Caribbean	Argentina	ARG	1980	1991	2001		
	Bolivia	BOL	1992	2001			
	Brazil	BRA	1980	1991	2000		
	Chile	CHL	1982	1992	2002		
	Colombia	COL	1985	1993	2006		
	Cuba	CUB	1981				
	Dominican Republic	DOM	1993	2002			

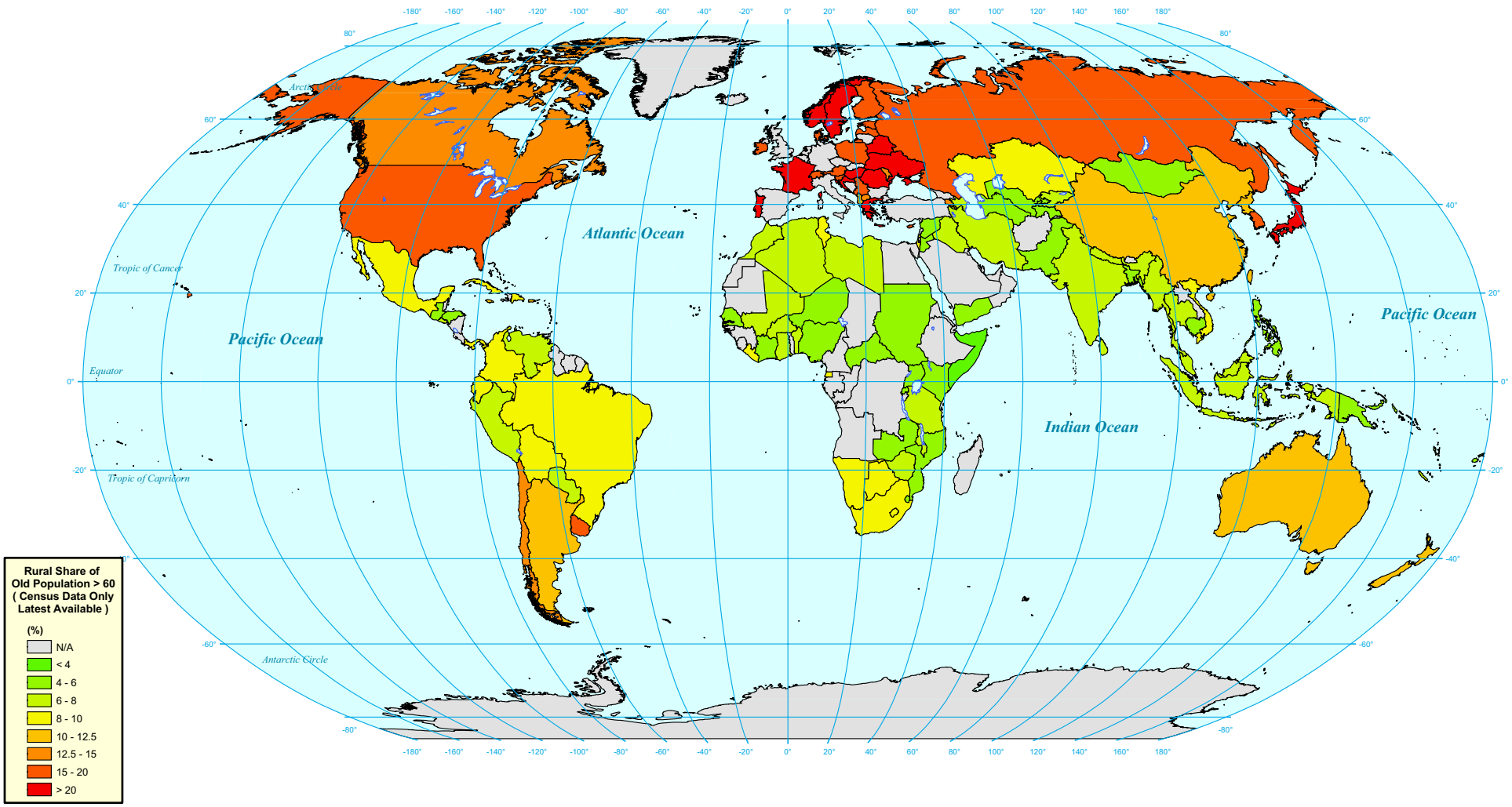
	Ecuador	ECU	1982	1990	2001		
	El Salvador	SLV	1992				
	Guatemala	GTM	1981				
	Honduras	HND	1988				
	Jamaica	JAM	1982	1991			
	Mexico	MEX	1980	1990	1995	2000	
	Panama	PAN	1980	1990	2000		
	Paraguay	PRY	1982	1992	2002		
	Peru	PER	1981				
	Saint Kitts and Nevis	KNA	1980				
	Saint Lucia	LCA	1991				
	Uruguay	URY	1985	1996			
	Venezuela	VEN	1981	1990	2001		
Middle East & North Africa	Algeria	DZA	1987	1998			
	Egypt	EGY	1986	1996			
	Iran (Islamic Republic of)	IRN	1986	1991	1996		
	Iraq	IRQ	1987				
	Jordan	JOR	1994				
	Libyan Arab Jamahiriya	LBY	1984				
	Morocco	MAR	1982	1994			
	Syrian Arab Republic	SYR	1981	1994			
	Tunisia	TUN	1984	1994			
	Yemen	YEM	1994				
South Asia	Bangladesh	BGD	1981				
	India	IND	1981	1991	2001		
	Maldives	MDV	1985	1990	1995		
	Nepal	NPL	1981	1991	2001		
	Pakistan	PAK	1981	1998	2001		
	Sri Lanka	LKA	1981				
Sub-Saharan Africa	Benin	BEN	1992	2002			
	Botswana	BWA	1981	1991	2001		
	Burkina Faso	BFA	1985				
	Cape Verde	CPV	1990				
	Central African Republic	CAF	1988				
	Comoros	COM	1980				
	Cote d'Ivoire	CIV	1988				
	Equatorial Guinea	GNQ	1983				
	Ghana	GHA	1984				
	Kenya	KEN	1989				
	Lesotho	LSO	2001				
	Liberia	LBR	1984				
	Malawi	MWI	1982	1987	1998		
	Mali	MLI	1987				
	Mauritius	MUS	1990				
	Mauritius Island	MUS	1983				
	Mozambique	MOZ	1997				
	Namibia	NAM	1991	2001			
	Niger	NER	1988				
	Nigeria	NGA	1991				
	Rwanda	RWA	2002				
	Senegal	SEN	1988				
	Somalia	SOM	2002				

	South Africa	ZAF	1980	1985	1991	1996	
	Sudan	SDN	1983				
	Swaziland	SWZ	1986				
	Uganda	UGA	1991	2002			
	United Republic of Tanzania	TZA	1988	2002			
	Zambia	ZMB	1980	1990	2000		
	Zimbabwe	ZWE	1982	1992	1997		
High income: nonOECD	Brunei Darussalam	BRN	1981	1991	2001		
	China, Hong Kong Special Administrative Re	HKG	1981	1986			
	Cyprus	CYP	1982	1992			
	Israel	ISR	1983	1995			
	New Caledonia	NCL	1989				
	Puerto Rico	PRI	1980	1990			
	Slovenia	SVN	1991				
	United States Virgin Islands	VIR	1980				
High income: OECD	Australia	AUS	1981	1986			
	Austria	AUT	1981	1991			
	Canada	CAN	1981	1986	1991		
	Denmark	DNK	1981				
	Finland	FIN	1990				
	France	FRA	1982	1990			
	Greece	GRC	1981	1991			
	Ireland	IRL	1981	1986	1996	2002	
	Japan	JPN	1980	1985	1990	1995	2000
	Korea, Republic of	KOR	1980	1985	1990	1995	
	New Zealand	NZL	1981	1986	1991	1996	
	Norway	NOR	1980	1990			
	Portugal	PRT	1981	1991			
	Sweden	SWE	1980	1990			
	Switzerland	CHE	1980	1990			
	United States	USA	1980	1990	2000		

Appendix II. Maps



Rural Femininity Ratio - Working Age (15-49)



Rural Ageing - Share of Rural Population > 60

Appendix III. Additional Net-Migration Tables

Table 12. Population Movement, Initial Population Characteristic, and Changes by Average Education Quartiles

	Ecuador 1990-2001				Mexico 1990-2000				Panama 1990-2000			
	Education Quartiles				Education Quartiles				Education Quartiles			
	1	2	3	4	1	2	3	4	1	2	3	4
Population Movement												
Mean *	-13.57	-16.18	-13.88	4.39	-12.67	-10.37	-7.15	2.17	-41.60	-25.19	-13.19	3.52
Std. Error of the Mean	1.86	1.44	1.35	1.14	0.51	0.50	0.82	0.82	0.05	0.02	0.02	0.01
Coefficient of variation	-2.07	-1.34	-1.47	3.91	-0.83	-0.99	-2.35	7.78	-0.44	-0.32	-0.58	1.44
Administrative Units	229	228	229	228	422	421	422	421	17	16	17	16
	Parishes				Municipalities				Districts			
%Rural	99.46	97.88	93.70	68.68	79.53	66.95	50.33	21.84	98.23	90.22	87.55	54.38
Initial Population Characteristics												
Mean by Housing Quality Quartiles												
Education (Years)	3.02	4.01	4.58	5.81	3.06	4.35	5.25	6.84	3.81	5.30	6.52	8.19
Femininity (Ratio)	99.60	97.39	95.06	95.44	101.38	102.24	102.15	103.14	90.22	82.16	88.11	97.08
Age	23.10	23.73	23.99	24.54	22.28	23.57	24.12	24.26	22.61	25.28	27.31	27.94
Ethnicity (%)	15.81	8.45	5.10	3.25	0.43	0.12	0.06	0.02	42.15	4.21	1.48	1.59
Change in Population Characteristics												
% Change by Housing Quality Quartiles												
Education	22.61	14.58	12.84	6.64	57.89	29.09	21.61	17.79	42.53	17.28	15.53	11.95
Femininity	2.12	1.57	2.54	2.65	2.51	3.10	2.94	1.30	-2.35	3.58	1.76	0.39
Age	12.46	13.55	13.24	12.53	7.90	11.21	10.40	9.87	12.70	9.14	8.30	7.95
Floor Quality Index	8.62	12.02	3.94	0.80	52.06	21.56	11.80	6.46	76.39	32.95	14.35	5.54
Ethnicity**	40.89	53.25	43.54	51.11	-1.94	-7.90	-2.04	11.90	-32.33	25.21	55.51	62.17

* Weighted by initial population of the administrative unit.

** Weighted by indigenous population in the administrative unit.

Table 12. (cont.)

	Brazil 1991-2000				Kenya 1989-1999				Uganda 1991-2002			
	Education Quartiles				Education Quartiles				Education Quartiles			
	1	2	3	4	1	2	3	4	1	2	3	4
Population Movement												
Mean *	-15.74	-11.44	-4.21	1.39	4.45	-9.40	-8.23	-0.34	41.31	5.87	-2.78	2.08
Std. Error of the Mean	0.00	0.01	0.00	0.00	7.77	3.38	2.28	4.94	10.85	4.00	8.91	4.41
Coefficient of variation	-1.31	-2.54	-5.19	9.60	5.80	-1.14	-0.88	-46.12	1.70	4.32	-20.57	13.44
Administrative Units	962	962	962	961	11	10	10	10	42	40	41	40
	Municipalities				Districts				Counties			
%Rural	55.81	41.59	30.24	5.88	84.47	91.64	92.34	68.05	97.47	97.62	95.79	60.61
Initial Population Characteristics												
Mean by Housing Quality Quartiles												
Education (Years)	1.30	2.18	3.16	4.91	1.53	3.22	4.02	5.12	1.87	2.66	3.15	4.32
Femininity (Ratio)	98.85	98.84	99.07	105.20	98.48	104.86	103.18	96.94	111.65	104.25	103.89	102.40
Age	23.54	24.07	25.31	26.97	20.87	21.78	20.51	22.48	20.86	21.29	21.52	21.09
Ethnicity (%)	9.94	10.55	8.96	8.52	-	-	-	-	-	-	-	-
Change in Population Characteristics												
% Change by Housing Quality Quartiles												
Education	80.46	48.73	32.80	16.71	15.29	27.44	21.53	17.29	237.29	67.48	53.48	37.78
Femininity	-0.90	-0.11	0.81	0.88	1.64	1.50	1.88	3.10	-7.88	-2.79	-2.74	-3.89
Age	9.62	10.33	10.57	8.91	3.64	1.69	-3.18	-0.30	3.91	5.45	5.76	3.54
Floor Quality Index	47.17	13.01	0.84	-8.19	14.30	42.36	35.05	22.63	289.48	125.02	52.40	21.01
Ethnicity**	40.45	31.32	23.24	23.88	-	-	-	-	-	-	-	-

* Weighted by initial population of the administrative unit.

** Black and Indigenous in Brazil. Weighted by indigenous population in the administrative unit.

*** Sewage in Brazil.

Table 13. Population Movement, Initial Population Characteristic, and Changes by Distance Quartiles

	Ecuador 1990-2001				Mexico 1990-2000				Panama 1990-2000			
	Distance Quartiles				Distance Quartiles				Distance Quartiles			
	1	2	3	4	1	2	3	4	1	2	3	4
Population Movement												
Mean *	4.77	-3.98	-13.45	-6.54	0.69	1.19	-6.78	-10.38	1.56	-6.82	-22.71	-19.81
Std. Error of the Mean	1.32	1.07	1.24	2.14	0.86	0.80	0.55	0.73	0.01	0.04	0.05	0.05
Coefficient of variation	4.27	-4.09	-1.38	-4.80	25.59	13.72	-1.67	-1.45	4.94	-2.10	-0.77	-1.16
Administrative Units	240	232	225	215	422	421	422	421	17	16	17	16
		Parishes				Municipalities				Districts		
%Rural	88.52	90.71	90.16	90.40	36.36	54.28	61.46	66.62	76.59	79.99	89.80	85.23
Initial Population Characteristics												
Mean by Housing Quality Quartiles												
Education (Years)	6.77	6.30	4.50	4.80	5.66	4.81	4.59	4.44	7.01	6.21	4.95	5.55
Femininity (Ratio)	103.45	98.10	95.76	89.47	102.85	101.65	102.81	101.60	88.27	92.78	85.85	90.93
Age	25.12	24.53	23.71	21.82	23.52	23.34	23.78	23.59	25.83	28.17	25.04	24.04
Ethnicity (%) **	7.26	4.42	5.35	16.20	0.11	0.14	0.15	0.23	2.28	6.72	15.86	26.15
Change in Population Characteristics												
% Change by Housing Quality Quartiles												
Education	10.14	7.87	13.84	11.66	27.42	31.30	32.50	35.21	12.42	15.69	23.77	36.77
Femininity	0.66	0.86	1.33	2.34	2.33	3.11	2.60	1.82	0.87	1.40	1.17	-0.24
Age	11.68	13.00	13.31	13.91	9.45	10.14	9.83	9.95	7.24	8.21	10.24	12.61
Floor Quality Index	5.38	4.60	6.74	8.91	14.97	20.33	21.13	35.47	11.83	16.70	44.14	58.75
Ethnicity**	43.14	47.45	64.55	37.08	9.18	-4.69	-7.62	-0.74	53.97	6.24	-5.54	-26.65

* Weighted by initial population of the administrative unit.

** Weighted by indigenous population in the administrative unit.

Table 13. (cont.)

	Brazil 1991-2000				Kenya 1989-1999				Uganda 1991-2002			
	Education Quartiles				Education Quartiles				Education Quartiles			
	1	2	3	4	1	2	3	4	1	2	3	4
Population Movement												
Mean *	0.69	1.19	-6.78	-10.38	0.54	-10.95	-9.20	10.92	1.77	5.45	23.94	3.41
Std. Error of the Mean	0.00	0.01	0.00	0.01	3.64	3.05	3.61	9.49	5.35	8.78	8.86	6.40
Coefficient of variation	25.59	13.72	-1.67	-1.45	22.44	-0.88	-1.24	2.75	19.36	10.31	2.37	11.88
Administrative Units	422	421	422	421	11	10	10	10	41	41	41	40
	Municipalities				Districts				Counties			
%Rural	9.45	31.03	38.45	41.98	71.03	94.05	92.36	80.41	83.63	89.32	91.37	87.84
Initial Population Characteristics												
Mean by Housing Quality Quartiles												
Education (Years)	4.62	2.99	2.70	2.21	4.72	3.76	3.37	1.72	3.68	2.81	2.83	2.64
Femininity (Ratio)	105.31	99.83	98.86	97.83	96.59	105.71	104.67	96.68	101.35	105.49	105.96	109.57
Age	26.49	25.75	25.35	23.85	21.96	20.81	21.58	21.17	21.42	21.19	21.74	20.40
Ethnicity (%)	9.00	9.31	8.31	10.05	-	-	-	-	-	-	-	-
Change in Population Characteristics												
% Change by Housing Quality Quartiles												
Education	20.84	40.11	46.92	54.74	19.43	23.13	23.44	15.12	47.92	72.39	85.01	163.70
Femininity	0.79	0.32	0.12	-0.14	3.06	1.46	1.45	2.03	-3.09	-3.86	-4.43	-5.97
Age	8.93	9.56	10.22	10.70	0.65	-2.10	1.40	2.19	6.06	5.95	7.27	-0.73
Floor Quality Index***	-6.18	7.73	14.01	27.09	23.88	36.34	37.79	15.37	48.11	88.00	61.51	297.02
Ethnicity**	25.76	20.40	25.28	39.68	-	-	-	-	-	-	-	-

* Weighted by initial population of the administrative unit.

** Black and Indigenous in Brazil. Weighted by indigenous population in the administrative unit.

*** Sewage in Brazil.

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