

The Reverse Transfer of Technology from Sub-Saharan Africa: Some Lessons from a Preliminary Assessment of the Zimbabwean Case

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The brain drain is defined broadly to include the systematic high volume emigration of 'Professional, Technical and Kindred' workers. The process, which is typically occupation-selective can occur from any country to another country or group of countries. Logan (1992) has identified four main geographical patterns in this international flow of trained experts : (i) from one developed country to another developed country (as in the case of British nurses to the US during much of the 1980s); (ii) from a developed country to a Third World country (usually in the form of technical support as with Americans in Kuwait) although, whether this is actually a brain drain now is debatable; (iii) from a Third World country to another Third World country (this is typically a regional flow as from many Southern African countries to the Republic of South Africa) but macro-spatial flows are also possible as with Filipinos and other South-east Asian professionals to the Middle-eastern oil rich states); and, (iv) from a Third World country to a developed country.

The last of these flows, from the poor South to the opulent North, is sometimes referred to as the reverse transfer of technology (RTT). The term emanates from the fact that technology transfer is normally from a developed country to a Third World country in the form of hard machinery and managerial skills. In the RTT, however, technology transfer in the form of the embedded and embodied expertise of a scientist (rather than in a physical or mechanical form) is from the Third world to the developed world.

There are two shortcomings with present approaches to the RTT ; one deals with data aggregation and accessibility, the other with lines of analysis. The data problem stems from a widespread assumption that immigration records compiled in the West are comprehensive enough to provide answers to the several dimensions of the RTT. Clearly, this is not the case. For example, US immigration records might indicate that Ghanaian medical doctors constitute a small percentage of all medical doctors immigrating into the US in a particular year. However, these data cannot provide insights into the actual loss of these experts to the Ghanaian health sector, nor can they explain why the doctors decided to emigrate in the first place.

The second problem with present approaches to the RTT is the underlying assumption that it is caused exclusively, or almost so, by economic forces. While this assumption might well be correct, it is based on intuitive judgement rather than on empirical validation of a diverse array of factors. It must be recognized that source (home country) conditions are dynamic and have spatial and temporal variants ; the population of skilled experts is not monolithic ; and, most importantly, their decision-making process is likely to constitute an 'untidy' combination of social, cultural, economic and personal variables. For these reasons, it is necessary to explore whether economic forces, by themselves, constitute a satisfactory and sufficient explanation of the RTT.

Amongst other things, the present study is an attempt to redress these two shortcomings in pre-

sent RTT analysis. The study focuses on the RTT from Africa, and tries to utilize data from Zimbabwe to provide insights on the conditions at home that have a potential to force African experts to emigrate. The general problem addressed in the study may be formalized into the following four specific questions.

1. What are the general trends of the RTT from sub-Saharan Africa ?
2. Is it possible, for policy purposes, to differentiate between experts who are likely to emigrate in the near future and those who are not ?
3. If it is possible to separate these two groups of experts, what demographic and other explanatory attributes are likely to be useful in this exercise ?
4. What actual and perceived factors at the source impel experts to make the decision to emigrate and upon what actual and perceived conditions overseas do they construct their destination choices ?

All of these questions, especially the last three, are closely related. A primary objective of the study, therefore, is to verify the importance of economic motives in the decision to emigrate. However, the study is also an attempt to venture beyond economic explanations to contemplate upon, and understand the influence on non-economic factors in the decision-making of experts. In this sense, the answers to the questions formalized above, may have significant policy implications. If it is possible to distinguish between experts who are likely emigrate and those who are not, policy mechanisms could be implemented to introduce conditions that will reinforce the decision of experts who are predisposed to stay home, and to convince those who now desire to emigrate to stay and contribute to the domestic economy.

Contextual background

Academic interest in the RTT

The RTT was a major research and policy question during the 1970s when Third World countries, including those in Africa, were striving to establish the human and other infrastructural capacities for 'take-off'. During the 1980s, other immediate economic imperatives, for example, commodity price fluctuations, structural adjustment, population growth and political reform, replaced the RTT as urged development questions. In the 1990s, however, the RTT has reemerged at the center stage of development discourse. This renewed interest is evidenced by a recent spate of research output on the subject, for example, Gonzalez (1992) on the Philippines; and Chang and Deng (1992) on China. Other recent studies of the RTT cover South Korea, Hong Kong, Singapore, the Caribbean, and Eastern Europe.

The new RTT literature has broken ground on a number of issues that were not part of the earlier discourse on the subject. One of these new areas of interest is the spontaneous process of 'brain gain' now being experienced by middle income countries in Asia, and even some in Africa (especially South Africa, Botswana and Eritrea). Intuitively, it would seem that the 'brain gain' is the converse of the brain drain and that the former is a sufficient solution to the latter. This benign view of the brain gain has led to policy apathy. The general view seems to be that there is no need for government action to understand why and how indigenous experts make the decision to return home and what impacts their return has on the domestic economy. However, it is becoming clear, in Southern Africa, for example, that the 'brain gain' is not simply an answer to the brain drain. It comes with its own set of unanticipated difficulties which may need policy attention. For example, at the labor market level, there is often a mismatch between demand and the supply provided by returning experts, and at the social relations level, there is

often negative competition between returning experts and those who had stayed home (usually resentment from the latter). An equally important difficulty is that economic prosperity breeds its own unique circumstances, principal amongst which is the fact that middle income countries become potential estimations in the RTT. Thus, with opulence, the status of middle countries changes dramatically from net losers to net gainers in the RTT. This change in status necessitates that middle income countries must explore strategies to utilize the influx of indigenous and foreign experts in the most efficacious way towards their development objectives.

The recent literature on the RTT also touches on institutional mechanisms to entice Third World experts to return home. The International Office for Migration (IOM) and the UNDP's Transfer of Knowledge Through Expatriate Nationals are two cases in point. While the former seeks to return experts to their home countries on a more permanent basis (IOM, 1992), the latter sponsors the repatriation of experts through government channels, for specific time periods, on specific projects in their home countries. The advantages of the TOKTEN approach are : it is built on 'cultural affinity' (experts are sent only to their home countries), it is on a volunteer basis, and it allows experts to contribute to the development of their home countries without forcing them to make difficult choices concerning change of life style, legal residency, and citizenship (Logan, 1990). Both IOM and TOKTEN hold much promise for solving human resource scarcities in Third World economies, especially as both programs operate largely at the public sector level where national labor needs can be targeted more effectively than in the private sector.

At least two global conditions seem also to particularize the present renewal of interest in the RTT. First, there is concern in Europe over the recent massive entry of East European scientists into the region's labor market. The economic, social and political implications of this process have yet to be addressed directly as the EU solidifies its regional economic leadership while the former East Bloc countries experiment with democracy and free market enterprise.

A second global trend that has resurrected the policy significance of the RTT is its undeniable socioeconomic and cultural impact on the poorest countries of Africa and Asia. These factors, especially the large and persistent hemorrhaging of managerial and scientific skills, have always been in existence. However, they have become more pernicious towards the turn of the century. It is now clear that three decades of post-independence investments in human resource development have not borne fruit. Quite to the contrary, a case can be made that there have actually been an inverse relationship between investment in human resource development and industrial, scientific or economic progress in many parts of Africa and Asia. As these regions, especially Africa, become further marginalized in the international economic, scientific and intellectual realms, policy makers are being forced to reassess their manpower planning strategies of the 1970s and 1980s, and to seek answers to the problem rather than continue to react to immigration policies in the West. The search for solutions must incorporate long term strategies to place education at center of economic and political reform packages rather than at the periphery where it now resides. The search for solutions must also include more immediately attainable goals, for example, hiring indigenous rather than foreign experts for national development projects and targeting scholarships and study leaves for specific disciplines which complement development plans. Some of these efforts are already in some countries, but it is clear that their scope needs to be broadened to cope with the increasing complexity of the RTT.

Theoretical studies of the RTT

Theoretical analyses of the RTT have revolved largely around the suitability of neoclassical international trade, international migration and international political economy theories to enlighten the complexities of the international flow of 'brain resources'. Early theoretical studies of the subject (example Bhagwati, 1978) treat the RTT within the framework of interna-

tional labor mobility. Recent reactions are, however, more cautious about applying the optimizing criteria of labor analyses to the nebulous area of 'brain resources'. Adepoju (1991) and Achanfuo-Yeboah (1993), for example, advise caution against placing the cultural and psychological intricacies of the RTT into simple economic optimization frameworks.

Another important theoretical thrust of the RTT concerns its trade and financial implications. Several early studies of the subject have tried to construct taxation, trade, and legal frameworks within which the process can be meaningfully assessed. As Bhagwati (1978) and Pomp and Oldman (1978) have pointed out, many of these approaches are fraught with both theoretical and practical limitations. In particular, taxation or financial repatriation strategies must be capable of conceptualizing the benefits and costs of the RTT at both the source and destination. Is it clear, for example, that the benefits lost to the source country, however it may be quantified, are equal to the benefits gained by the destination country? Are the actual and opportunity costs, if any, at the source, borne by governments alone, or by a combination of private and public entities. If the latter, how can the benefits of the process be apportioned and allocated to reflect these different cost constituents?

One theoretical possibility for resolving the problem of equitable allocations of costs and benefits was proposed by Oldman and Pomp (1978). They couch the RTT under the broad aegis of international capital flows, and handle it as a special case of international taxation. Their approach makes it possible to treat the RTT simply as a matter of income transfers between countries: experts could be taxed in their countries of residence and the funds could be transferred to their home countries as an item in the balance of payments between the two countries.

Other scholars have approached the problem, similarly, as a simple arithmetic issue of capital now accounting using either historic or present discounted value (Bhagwati, 1978; Rauch, 1991). The conceptual logic behind this approach rests on the assumption that value can be imputed to the RTT as a form of capital assistance from a Third World country (the home of the expert) to a first world country (the present country of residence of the expert). The earnings of an expert, while in the latter, could be accumulated, and a predetermined portion of the present discounted sum could be included in the transactional balance of payments to the home country.

Unfortunately, these theoretical approaches to the RTT have yet to provide an adequate framework for capturing all of the complex nuances of the process. One serious conceptual difficulty is that the calculus of costs and benefits involves a number of immeasurables, and an equal number of undefined (and undefinable) units of measurement. Four examples will underscore this point. (1) Any attempt to translate the marginal productivity of labor to a universal norm is conceptually risky. Productivity at the margin is likely to be measured differently in different sociocultural settings, and the direct values (monetary and otherwise) associated with such productivity are also likely to be different. (2) Attempts at equating educational costs with discounted productivity are especially problematic because they make questionable assumptions regarding national and personal opportunity costs. They also make very worrisome assumptions about the differential marginal productivity of individuals even when they have similar inculcated skills. (3) It could be argued that when an expert emigrates, the home country bears further opportunity costs only if the individual could have been gainfully employed. If not, it seems that the relief from unemployment that the home country enjoys is a benefit rather than a cost. (4) As mentioned earlier, there is much uncertainty regarding the allocation of educational costs in the training of an expert. As a result, how benefits should be apportioned is also problematic. Educational costs may have been borne in different proportions by the individual (working to support him/herself), the individual's family at home and abroad, the country of residence through an assistantship, and the home government, through a study leave or scholarship. It is improbable that the educational costs can be determined with enough certainty to provide guidance to the amount of reparation that the home government deserves.

The theoretical and conceptual problems that surround the RTT are likely to become more intractable as the process itself becomes more complex in the future. For instance, it is not too far-fetched to assume that strategies for reparation to home governments will soon become complicated by the internet. If experts could work for and be paid by a foreign firm without ever leaving the home country, then they could easily be taxed by the home government. This would essentially render the issue of reparation of funds a moot one. Developments like these, especially in the communications industry, make it unclear at this time, whether theory will guide policy or whether policy innovations will set the groundwork for a theory that is likely to incorporate elements of international labor and international trade paradigms.

Empirical studies of the RTT

Empirical studies of the RTT may be divided into two categories : those that examine the process from a global perspective, and those that are national or regional in scale. Global studies of the RTT are rather dated. In general, they are based on interviews of Third World experts resident in developed countries, and they attempt to determine why these experts have decided not to return home (Glaser, 1973 ; Friborg, 1975).

National and regional studies of the RTT are as dated as the global ones. Many of these micro-scale studies can be traced back to the mid to late 1970s when the United Nations Conference of Trade and Development (UNCTAD) sponsored a number of brain drain projects. A significant number of these UNCTAD studies cover countries in Asia, especially India, Pakistan and the Philippines (UNCTAD, 1978a, 1978b, 1978c, 1978d ; Oh, 1977 ; Nasseem, 1978 ; Sicat, 1978 ; and Tangeman, 1989).

Few empirical studies of the RTT have been directed at Africa (Russell, 1985 ; Achanfu-Yeboah, 1993). US immigration data have been used to investigate the RTT from Africa, in general, and sub-Saharan Africa in particular, first for a period covering 1974-1984 (Logan, 1987) and then for a second period covering 1980-1989 (Logan, 1992). These studies have determined that sub-Saharan countries 'exporting' large numbers of experts to the US share certain similarities in population size, official language, colonial tradition, and history of higher education. Generalizing from the US data, the studies also conclude that a combination of factors favor the mass exodus of experts from a source country : a large population (countries like Nigeria and Kenya with large populations are also major actors in the process) ; a pro-Western political ideology (in fact, experts from Marxist countries are often classified as refugees, thereby excluding them from any accounting of the brain drain) ; and, sociopolitical and cultural links with the metropolitan countries which once colonized the source country. Other related factors found to be relevant include the international language used as an official language, and the language of higher education at the source and destination. The relative importance of these different factors has yet to be determined by empirical analysis.

The RTT from sub-Saharan Africa

Worsening economic conditions in many African countries during much of the eighties have had a number of interrelated impacts on higher education, one of them being a general retrenchment of government expenditure on secondary and tertiary education. For example, per capita public educational investment in Ghana has dropped from US \$20 in 1972, to US \$10 in 1979, to as little as US \$1 in 1988 (Asobayire, 1988). This trend has the cumulative effect

of reducing academic and professional opportunities for indigenous experts. Economic austerity has also forced governments to reduce their efforts to recruit their graduates and nationals working abroad. As a result, even those experts who may have wished to return home, are becoming resigned to overseas employment. At the same time, as career opportunities continue to shrink at home, the number of emigrating experts has also increased.

Evaluating the RTT at the destination: African experts to the US

The impacts of socioeconomic pressures on the African RTT are reflected in US immigration data of all Africans entering the US over a ten-year period. The data indicate that between 1980 and 1989, the share of Africans in the total number of immigrants to the US increased from 2.6% to 3%. Although this increase is marginal, at best, two salient points also emerge concerning the outflow of African from the continent: (i) Africa has the highest regional growth rate of immigration to the US; (ii) Africa has the largest immigrant: expert ratio of any world region (Logan, 1992). This seems to suggest that, more so than other world regions, African immigrants must be qualified experts to have a likelihood of obtaining a US visa.

Looking specifically at sub-Saharan Africa, the data for 1980-1989 indicate that 'executives and managers' account for 20% of all immigrants from the sub-region to the US. This figure compares with an average of 8% for other world regions combined. 'Third Preference' visas and 'executives and managers' together account for 25% of all sub-Saharan Africans entering the US, compared with only 9% for other world regions combined. It is not certain that the US trend is replicated in other developed areas. However, it is not too unrealistic to expect that the figures for Western Europe may be even more significant in Europe because of the strong historical, economic and cultural ties between that region and Africa (Logan, 1992).

Evaluating the RTT from the source: The Zimbabwean case

Zimbabwe presents an interesting empirical case to assess the varying source conditions that direct and motivate the key actors in the RTT. The relevance of the Zimbabwe case for other countries in the region rests on its complex colonial history, its strong ties with Europe, especially Britain, its strong present economic performance, its strong presence in the Southern African Development Community (SADC) region, and its emerging economic and political leadership role in the whole continent. Some of these are attributes which are shared by other African countries and others are attributes which place Zimbabwe in a position of example for other African countries.

Since independence in 1980, a number of mitigating strategies have been implemented to redress racial imbalances in education and other human development sectors. One of the pillars of this push is the 'indigenisation' of education. This process has involved sending black Zimbabweans overseas for higher education and giving them leadership positions in government, and in secondary and tertiary education upon their return. Under these circumstances, it is reasonable to expect that qualified Zimbabweans have every incentive to return home upon the completion of their studies, and that those who return home will stay to contribute to the domestic economy.

Not only are there national incentives for Zimbabweans to return and stay home, the country's position in SADC is second only to South Africa's, and Zimbabwe is considered to be one of the emerging economic success stories in Africa. The country is a net exporter of its basic staple, maize, and a major exporter of meat to the European Community and south east Asia. In this sense, Zimbabwe can be considered to be food self-sufficient. These healthy economic

conditions, together with political stability provide additional incentives for Zimbabwean professionals to return and stay home. It is in this context that Zimbabwe can help other African countries determine whether national economic well being is a sufficient condition to reduce the brain drain or whether the decision-making of experts involves other, more complex assortment of factors.

The objective of the Zimbabwean study, as mentioned in section one, is to determine (i) whether there are demographic and social differences between experts who express a desire to emigrate and those who do not; (ii) whether there are certain factors which direct and underlie the decision of experts to emigrate; (iii) whether there are any differences between experts who express a desire to emigrate and those who do not, on the basis of a number of factors, including work conditions at home and abroad, economic conditions at home and abroad, and perceptions about the desirability of potential destination countries.

Data and data sources

Data on the factors that underlie the decision of experts to emigrate have been obtained from a questionnaire survey conducted at the University of Zimbabwe, Harare between February and April, 1996 (the survey is actually ongoing and some respondents who did not reply on the first round have to be revisited on a second round). The target population comprises of all born or naturalized Zimbabwean academic staff. This population is about five hundred (500), so it has been decided to conduct a complete census rather than a sample survey. The response rate at the time of drafting this report is 38% (out of 497 questionnaires distributed, 163 have been returned completed). The response rate is expected to increase to the 50% mark during the second round.

The survey instrument is designed to eke out a number of questions, including the following: age and marital status, academic discipline, highest qualification, field of specialization, country in which highest qualification was obtained; language of instruction; employment status in Zimbabwe; pay scale; satisfaction with present job and job environment; satisfaction with present national economic and political environment; satisfaction with present family, cultural and social environment; possibility of emigrating; reason for emigrating, and potential destination of emigration. The results obtained so far have been collated and analyzed in rough tabular form. This elementary statistical analysis is used to assess, in a rough way, whether it is possible to differentiate between experts who have expressed a desire to emigrate and those who have expressed a desire not to emigrate. As noted earlier, if this is possible, it would have important policy implications. It would be possible to establish a profile of a potential emigre in terms of demographic, social and economic characteristics and to identify the factors which underlie the decision to emigrate. Mitigating policy instruments could then be put in place to minimize the tendency to emigrate.

Preliminary results from the Zimbabwe survey

Socio-demographic profile of respondents

Table 1 is a summary of the demographic and social characteristics of the two groups of experts: those who have expressed a desire to emigrate in the near future (1-3 years) and those who have expressed a desire not to emigrate. The two groups are similar in that they are comprised largely of males (reflecting the gender bias in the academic staff), yet, there are some distinctions in their demographic and social attributes. Those who intend to emigrate are largely in their thirties (67%), while those who do not intend to emigrate are older, sixty percent of them being forty-one years or more. At this level of the analysis, the most noticeable diffe-

Table 1. Demographic and background. Attributes of the two groups of experts

	Intend to emigrate (%) (n=62)	Do not intend to emigrate (%) (n=101)
Age		
21-30	-	9
31-40	67	31
41-50	17	38
51+	16	22
Gender		
male	83	75
female	17	25
Marital Status		
single with children	0	12
single without children	0	0
married with children	20	79
married without children	80	9
Education		
BA/BS	16	22
MA/MS	50	47
Doctorate	34	31
Service		
1 year	29	7
1-5 yrs	29	36
6-10yrs	52	36
10+ yrs	0	21
Salary		
low	33	-
medium	67	86
high	-	14

rence between the two groups is that those who intend to emigrate are largely married without children (80 %) while those who do not intend to emigrate are largely married without children (79 %). In fact, ninety-one percent (91 %) of those who intend to emigrate do not have children. It is too early to draw any inferences from these data concerning the impact of child dependents on the decision to emigrate, but there is some suggestion that this factor cannot be totally ignored when a policy framework is being prepared by any African country.

The two groups of scholars cannot be differentiated on the basis of educational qualification (Table 1) but the data indicate that those who intend to emigrate are younger in tenure and, as may be expected, have a less favorable opinion of their salary conditions than their counterparts who do not intend to emigrate. In addition, experts who do not intend to emigrate are to be found mainly in the humanities, business and social sciences (73 %) while those who intend to emigrate tend to be clustered in medicine and engineering (57 %) (Table 2).

In an attempt to create a socio-demographic profile of each group, therefore, one can suggest the following attributes as a first and rough approximation.

(1) An expert with the potential to emigrate in the near future is : 31/40 years, without children (married or single), less than ten years in service, considers his/her salary scale to be low to medium, and is likely to be in medicine or engineering, although he/she may also be in other sciences.

(2) By contrast, an expert who has expressed a desire to stay home is : forty years and older, married with children, five years and over in service (and likely to be more than ten years and over in service), considers his salary scale to be medium to high, and is likely to be in the humanities, social sciences or business.

Although these profiles represent a crude, first approximation, the approach itself has some potential for policy formulation. Even at this elementary level of analysis, the data seems to suggest that age and number of dependents are critical demographic factors in the decision to emigrate or stay home.

Table 2. Academic fields of the two groups of experts

Dont intend to emigrate	Intend to emigrate
Administration Adult Education Animal Science Agronomy Archaeology Biology Business Education Electrical Eng. English Literature Hotel/catering Linguistics Mining Eng. Political Sc/Admin Public Admin Social sciences Soil Sciences Humanities, Social Sciences and Business = 73%	Agricultural Engineering Anaesthetics Biochemistry Civil Engineering Crop Science Education Mechanical Eng. Pediatrics Pharmacy Psychology Urban/Peg. Planning Water Eng. Medicine Medicine and Engineering = 57%

Job-related conditions at the source

The decision of an expert to emigrate is almost certain to emanate from dissatisfaction with work conditions in the home country. The extent to which these factors may be economic, social, or cultural, is still unclear. The Zimbabwe case seems to suggest that a complex inter-play of all three groups of factors contribute to the final decision of an expert to emigrate.

The data on Table 3 show that all of the experts who intend to emigrate are dissatisfied with their present job. While this is not particularly surprising, it is surprising that 54 % of those who do not intend to emigrate are also dissatisfied with their present job. If job dissatisfaction is so prevalent, what job-related conditions transform job dissatisfaction to complete alienation for one group (100 % looking for a job) while the other group is more willing to be patient (86 % not looking for a job) ?

The data on Table 3 suggest that the major factors underlying a negative job assessment for both groups are : *low salaries, poor research facilities, poor work ethic of colleagues and supervisors and poor opportunities* for career advancement. For those who intend to emigrate, these are critical factors which score on the ‘strongly agree’ to ‘agree’ range on the five-point Likert scale. Those who do not intend to emigrate only ‘moderately agree’ that these factors constitute a serious drawback to their estimation of their jobs. Economics and the sociocultural environment of the workplace are important to both groups. However, for those who already intend to emigrate, the sociocultural factors have become intolerable, while for those who have decided not to emigrate, these conditions merely need attention and have not yet reached a crisis stage. This fundamental difference in the attitudes of the two groups towards their work environment should also be instructive for policy purposes.

As with the sociodemographic factors in the previous section, more comprehensive analyses are

Table 3. Job-related perceptions of the two groups of experts

	Intend to emigrate (%)	Do not intend to emigrate (%)
Satisfied with present job		
strongly agree	0	0
agree	0	14
moderately agree	0	32
disagree	43	40
strongly disagree	57	14
Factors for negative job rating (5 pt Likerts Scale)		
salary	1.0	2.3
career advancement	2.2	2.8
work pressure	2.0	2.6
poor work ethic	1.8	3.3
research facilities	1.5	2.6
Looking for a job?		
yes	100	14
no	0	86
If yes, where are you looking for a job? (5 pt Likert Scale)		
Southern Africa	2.5	3.0
Other Africa	5.0	3.0
US	2.0	5.0
Canada	2.0	5.0
Europe	2.0	4.0
Australia	5.0	5.0

required to determine the relative influence of the different factors which create job dissatisfaction, and the degree to which it contributes to initiating the desire to emigrate. For example, it is not surprising that *poor salaries* and *poor research facilities* are identified as important determining factors by both groups (even though with different emphasis). However, it is a bit more surprising that *work pressure* and the *poor work ethic of supervisors and colleagues* should be scored so highly, especially by those who wish to emigrate. These two factors are scored even more highly than ‘opportunities for career advancement’ by this group of experts.

It is interesting to note that the geographic range of a possible or ongoing job search is different for the two groups of experts, perhaps, because the factors responsible for their job dissatisfaction and the intensity of their job alienation are also different. Those who intend to emigrate tend to be pulled towards Europe (agree), US (agree) Canada (agree) and South Africa. Those who do not intend to emigrate seem to have a stronger regional pull, with their potential job search restricted to Southern Africa or other African countries (Table 3). One should not draw too much from this result, but it is possible that both groups are generalizing their Zimbabwean experience to the continental level. Those who intend to emigrate expect to find conditions in other African countries to be just as frustrating as they find them to be in Zimbabwe. As a result, they are opting to seek jobs in the West, where they expect these conditions to be more conducive to productivity. By contrast, those who do not intend to emigrate expect that conditions in other African countries are as tolerable as they find them to be in Zimbabwe. Consequently, they see no reason to venture far afield to seek jobs, if the need should arise.

The preliminary assessment of the Zimbabwean case indicates that job dissatisfaction emanates primarily from economic forces. This finding supports what has often been assumed in the literature. However, the data also suggest that economics is strongly complemented by the sociology of the work place to create worker dissatisfaction. In particular, experts tend to be frustrated and alienated by what they consider to be the poor attitudes of colleagues and supervisors towards work and productivity. These factors seem to be just as important, if not more so, than research facilities and chances for career advancement, in creating the conditions under which experts decide to emigrate.

The decision to emigrate

As noted earlier, two groups of experts have been distinguished on the basis of their expressed desire either to emigrate or not to emigrate in the near future (defined as 1-3 years). The expressed desires of both groups fall clearly at polar ends of the Likert scale : all of those who desire to emigrate 'strongly agree' or 'agree' with the statement that they are likely to emigrate; while those who do not intend to emigrate cluster at the 'disagree' to 'strongly disagree' end of the scale.

It would seem that when once the decision to emigrate has been made, experts have a distinct group of countries that they identify as potential destinations. The top twelve potential destinations of those who intend to emigrate are ranked on Table 4. It has been noted earlier that this group of experts does not show a distinct regional predilection in their job search area (Table 3). On the contrary, their choice of potential destinations shows a clear bias towards southern Africa. What this suggests is not quite clear. It would seem that experts are willing to look for a job in a country to which they may not be willing to emigrate. In essence, they are not reluctant to cast their nets widely while looking for a job, but when the actual decision to emigrate must be made, they are reluctant to move too far away from the home country.

The choice of potential destination in the emigration process is based substantially on the perception of experts regarding its economic and social conditions. The most important pull factor to a destination are expectations of the existence of high paying jobs (Table 4). Geographic proximity to the home country is also an important factor but, contrary to what one would have expected, educational opportunities for spouse and kids do not seem to exert an important pull effect. This is, perhaps, because so many of those who wish to emigrate do not have children.

While economic conditions and geographic proximity are the most important pull conditions, the push factors in Zimbabwe seem to cover a wider array of considerations (Table 5). The two groups of experts were asked to score factors that would impel them to leave Zimbabwe. Those

Table 4. Decision to emigrate

	Intend to emigrate (%) reponse	Do not intend to emigrate (%) reponse
Likely to emigrate in the next 1-3 years?		
strongly agree	34.0	0
agree	66.0	0
moderately agree	0	0
disagree	0	7.0
strongly disagree	0	93.0
Rank your top 12 potential destinations	Southern Africa (1) Mozambique (1) South Africa (3) Botswana (3) Britain (4) USA (5) Germany (6) France(7) Italy (8) Canada (9) Australia (9) Namibia (11) Mid-East (12)	
Explain your ranking (5-point Likert scale)		
High salaries	1.5	
Close to home country	2.0	
Best job opportunities	2.5	
Good overall quality of life	2.6	
Educational opportunities for spouse	3.0	
Good educational opportunities for kids	3.0	
Good research facilities	3.3	

who do not intend to emigrate do not have strong feelings on this subject (as to be expected) and ‘moderately agree’ that economic forces (high cost of living and difficulty of obtaining a high paying job) might act as push factors in Zimbabwe.

Those who intend to emigrate identify high cost of living, difficulty of obtaining a high paying job, and high taxes as the critical factors. These three factors are followed by poor political climate and poor educational opportunities for self and spouse. In the latter instance, it would seem that even though educational facilities at the destination do not necessarily constitute a pull factor, they are considered to be a push factor in Zimbabwe. What this suggests is that experts who wish to emigrate take it for granted that educational opportunities would be available at the destination, and that they would be better than, or equal to what is to be found in Zimbabwe.

Table 5. Conditions in Zimbabwe underlying. Actual/potential decision to emigrate (5 Pt Likert Scale)

	Intend to emigrate (%)	Do not intend to emigrate (%)
High cost of living	1.6	2.7
Difficult to obtain high-paying job	1.6	2.7
Poor political climate in country	2.3	3.9
Poor educational Opportunities for spouse	2.4	4.0
Poor national economy	3.0	3.3
Poor educational Opportunities for kids	5.0	3.7
Family abroad	5.0	4.6
Others		
-high taxes (7:1)		
-poor water/sanitation (1:3)		

Summary and lessons to be drawn from preliminary findings

Brain drain studies of Africa have often relied on data covering the entry of African experts into destination points in the Western developed countries. Typically, this is the only type of data available. It is becoming increasingly obvious, however, that destination point data do not provide much insights into why experts leave their home countries in the first place. The need for a study or studies to assess source conditions that act as push factors in the migration process is now almost incumbent if serious mitigation strategies are to be developed to combat the negative impacts of the RTT.

This study is an initial attempt towards this end. It uses University of Zimbabwe academic staff to ferret out why African experts decide to emigrate, their potential destinations, and the factors that attract them to their potential destinations. The experts in the study are divided into two groups : those who express a desire to emigrate in the near future and those who do not. The survey results suggest that economic considerations factor significantly in the decision-making process of experts. This confirms what has been assumed in the literature for a long time. However, the results clearly indicate that the sociology of the workplace, political climate of the home country, and educational opportunities for family members, may all be equally as important as economic factors.

From the elementary analysis conducted here of the results of the questionnaire survey, it seems that it is possible to create a profile of each group of experts. This is an important finding. It means that it could be possible for human resource planners to conduct comprehensive

labor surveys and to determine : (a) how to provide incentives so that experts who now express a desire to emigrate could be convinced to stay home ; and, (b) to ensure that those who now express a desire to stay home do not change their mind.

The Zimbabwean case seems to suggest a number of broad lessons for other African countries. (1) There must be good benefits and incentives for young faculty, especially those in the lower ranks. (2) There must be a competitive package of benefits to convince faculty in the 'hard sciences' to stay home. (3) There must be a clearly identifiable structure of merit so that faculty do not become frustrated with what they may perceive as the 'poor work ethic' of colleagues. (4) There must be a clearly identifiable structure for promotion so that faculty do not feel stultified by a perceived absence of career advancement opportunities. (5) At the geographical level, governments must ensure that salary and job benefits are competitive with those of countries in the same region. There is some indication that countries might stand a greater risk of losing experts to their neighbors rather than to countries in the developed West.

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