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The Identification and Measurement of Factors in the Adjustment of New South Wales Farmers to Non-Farm Occupations

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To date, there have been a paucity of studies in Australia which have studied the adjustment of farmers to non-farm situations. A number of relevant overseas studies have been far from complete in that they have failed to identify adequately both the factors contributing to the success or failure of the adjustment process and the type of farmer who is most likely to be most adaptable to the change. This paper attempts to shed some light in this area by identifying significant factors in the adjustment process. It then attempts to discover the type of migrant who is most likely to be adaptable to the re-adjustment process by investigating the relationship between the characteristics of the former farmers and their farm situation prior to migration and their post-migration adjustment experience.

1 Introduction

A significant issue in the study of the migration of labour from agriculture is the success that former farmers have had in adjusting to a non-farm environment. Except for the study by Bell and Nalson [3], there has been little or no study of the issues in Australia. Overseas studies have shown that farm migrants have not always improved their relative position, particularly in regard to the level of earnings, when they have moved away from their farms [11, p. 203 and 8, pp. 64–65]. In fact, migration may simply result in the transference of migrants' social and economic problems from one sector to another [1, p. 140]. There is also evidence to suggest that some migrants, who fail to adjust satisfactorily in a town or city environment, return to agricultural occupations [11, p. 191].

In studying the reasons for the degree of success attending rural migrants' adjustment to non-farm situations, overseas research workers have been inhibited by the complexity of the problem and the difficulty of quantifying it, since it involves a number of economic, social and psychological factors. The most common approach has been to show how the rural migrant is faring in comparison with urban migrants or urban non-migrants using three broad categories of measures namely (1) occupation and related measures of social status, (2) social participation indexes, and (3) measures of values, attitudes, goals and aspirations [4, pp. 210-19]. As rural migrants generally have low levels of skill and experience for urban occupations, they need time to learn

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about their new status and the roles that go with them. They could be expected to compare unfavourably with their urban counterparts, at least initially [16, p. 126]. Consequently, such comparisons are likely to have limited value in explaining the ability of rural migrants to adjust to their new environment.

In this paper an alternative approach to the study of adjustment is presented, namely factor analysis. This method is used to ascertain the factors that are significant in the off-farm adjustment process. An investigation is then made of the types of migrants who are most likely to succeed or fail in the off-farm adjustment process by relating the characteristics of the migrants and their farm situation prior to migration to their post-migration adjustment experience. To these ends, a range of measures of off-farm adjustment were postulated representing employment experience, personal adjustment to the new environment, living standards and a comparative assessment of the wellbeing of each individual before and after migration. Factor analysis was used to group together the like measures into weighted clusters or factors. Significant factors associated with adjustment were identified by this process and their relative importance indicated for each individual. The factors were then combined to form an index of adjustment. The characteristics of the migrant and his farm situation prior to migration are related to this index in order to establish the extent to which such characteristics governed the success or failure of individuals in adapting to their new environment.

2 Source of Data

The data used in the present paper were obtained from personal interviews of 100 former farmers of 16 local government areas in Western New South Wales. These farmers had sold their properties during the 1968–72 rural recession (which stemmed largely from low wool prices and drought conditions) and had shifted to new localities and into new occupations. The areas selected for study were not chosen at random, but were selected because they were reputed to be characterized by relatively high rates of migration from farms¹. An attempt was made to trace and interview all those who left and took up non-farm employment. Most of the interviews were conducted during 1973.

3 The Definition and Measurement of Adjustment

In the present study it was assumed that adjustment was a function of the migrant's capacity to adapt to the life-style of his new community. It was also assumed that success in adjustment was determined, in part, by whether the well-being of an individual after migration had improved, or deteriorated, since the time in which he was engaged in farming activities. Accordingly, measures of adjustment were selected in order to take account of both the migrants' non-farm situations as well as the comparison of the quality of the new environment in relation to the old.

It was postulated that among the main factors measuring a migrant's adjustment to the life-style of his new community would be his employment experience since migration, his personal adaptation to the new environment, and his standard of living. These three aspects of post-migration adjustment were defined in more detail by developing a total of 14 measures to represent employment experience, personal adjustment and living standards (see Table 1).

¹ Further details of the process of data collection and survey results are outlined in (15).

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Table 1: A Description of the Variables Used to Define and Measure Post-Migration Adjustment

NT	Scores Assigned			Communication		
Nature of the Variables	0	1	2	Comments		
Employment Experience—						
Job type	Unskilled	Semi- skilled	Skilled			
Unemployment	Yes	No		Refers to whether the respondent had experienced involuntary unemployment after migration.		
Job turnover rate	High	Low				
Occupational mobility	Downward	No change	Upward	Defined as the direction of movement between unskilled, semi-skilled or skilled jobs after migration.		
Post-migration training		No	Yes	Refers to whether the migrant had engaged in re-training or on-the-job-training since migration.		
Job income	Less than \$4,000(a)	\$4,000 to \$7,999	\$8,000 and above			
Personal Adjustment—		<u> </u>				
Group membership	0	1	and over	Defined as the number of community groups in which the respondent was actively involved after migration.		
Attitude to adjustment	Generally negative	Mixed feelings	Generally positive			
Change in group member- ship	Less than	0	Greater than	Refers to the net gain in active group memberships after migration.		
Health	Poor	Good				
Living Standards—						
Employment status of wife		Not working				
Family income	Less than \$4,000	\$4,000 to \$7,999	\$8,000 and above	Defined as income obtained by the migrant and his wife from all sources including earnings and income received from invested assets.		
Rooms per person	Less than	1.5 to 2.9	and above	This variable was used to measure the quality of the migrant's new housing.		
Absence of poverty	No	Yes		Refers to whether the migrant family was receiving an income exceeding 120 per cent of the poverty line applicable to its size and composition (c).		
Comparison of Well-Being Before and After Mi- gration—						
House design and con- struction	Worse	Same	Better			
Household conveniences	Worse	Same	Better			
Medical facilities	Worse	Same	Better			
Community activities	Worse	Same	Better			
Social and recreational facilities	Worse	Same	Better			
School and educational facilities	Worse	Same	Better			
Level of income	Worse	Same	Better			
Income regularity	Worse	Same	Better			
Working hours	Worse	Same	Better			
Emotional security	Worse	Same	Better			
Family leisure Satisfaction in job	Worse Worse	Same Same	Better Better			
Satisfaction in job	AA 0126	Same	Detter			

⁽a) All money values are expressed in Australian dollars.

⁽b) Migrants whose wives were employed after migration were allocated a score of 0 as most of the migrants' wives who took up non-farm employment did so for reasons of economic necessity.

⁽c) The poverty lines used were that of the Australian Government's Commission of Inquiry into Poverty [2, p. 24].

Scores of 0, 1 or 2 on each measure were assigned to each individual according to what was considered his relative failure or success in adapting to the nonfarm environment. For example, with respect to the variable job type, migrants who had obtained unskilled jobs were regarded as having made a relatively poor adjustment and were assigned a score of 0 on this measure. On the other hand, individuals who obtained semi-skilled or skilled jobs were regarded as having made a more favourable adjustment and were assigned a score of 1 or 2 respectively.

The second set of criteria involved the comparative assessment of the well-being of each individual before and after migration. They consisted of a set of 12 measures which are shown in the last section of Table 1. Each respondent was asked to give a subjective assessment as to whether he felt worse, indifferent or better with respect to each measure when comparing his present situation to his farm situation prior to migration. A score of 0, 1 or 2 was assigned to each measure according to whether the individual felt worse, indifferent or better.

4 The Identification of Factors in Adjustment

In order to identify the significant factors, or associations between like measures and their relative importance in the adjustment process, a factor analysis was conducted on the 26 measures of adjustment outlined above². The factors were extracted by the principal factor method using Pearsonian correlation coefficients³. Factors having latent roots greater than one were extracted (see Table 2)⁴. The table shows that the 10 factors extracted explained 69.3 per cent of the total common factor variance. These ten factors were then rotated in order to produce a more meaningful set of factors. An orthogonal method of rotation was assumed using the varimax method of solution⁵.

² There are still unresolved issues in regard to the use of factor analysis (see Child [6, pp. 8–18, 43–49] and Duncan [7, pp. 37–46]). However, on the grounds that factor analysis specifies both the weights to be assigned to each factor according to its contribution to the total variance as well as the relationship existing between the factors, it was thought that for the purposes of the present study, this technique of analysis was superior to alternative methods of clustering such as elementary linkage analysis developed by McQuitty [14].

³ A difficulty arose in the present study due to the fact that the distribution of the scores was not symmetrical. This is because factor determination is based on the assumption that the correlations are derived from scores bearing linear relationships. Because of this problem an attempt was made to reduce or eliminate skewness by substituting tetrachoric correlation coefficients for Pearsonian correlation coefficients in the initial correlation matrix. An alternative method of eliminating skewness was also employed. This consisted of converting the raw scores into normalized scores by a procedure known as T Scaling, before preparing the initial correlation matrix (see McNemar [13, pp. 214–15] and Garrett and Woodworth [9, pp. 314–18, 455]). It was found that the use of these methods did not result in any appreciable differences in the nature of the principal factors obtained or in the ordering of the factors themselves.

⁴ This criterion is commonly referred to as the varimax criterion, a criterion developed by Kaiser [12, pp. 187–200]. However, alternative methods of factor extraction have been developed by other writers. Perhaps the most common of the alternative methods is the Scree test developed by Cattell [5, pp. 206–7]. When the Scree test was applied in the present study 13 factors were extracted as compared with 10 factors using the varimax criterion. However, no change was observed in the nature of the principal factors extracted or in the ordering of the factors as a consequence of the use of the Scree test.

⁵ Some writers have advocated the use of oblique methods of rotation on the basis that this would allow for correlation between human characteristics [6, p. 60]. In the present study it was found that there was very little change in the basic factor structure when an oblique method of rotation was used.

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Table 2: Latent Roots Associated with the Principal Factor Method of Factor Extraction

Factor		Latent Root	Proportion of Variance Explained	Cumulative Percentage	
I III IV V VII VIII XII XI XII XIII XIII XIII XIII XIII		3.078 2.728 2.106 1.817 1.720 1.609 1.404 1.310 1.193 1.057 0.985 0.881 0.736 0.712 0.668	per cent 11.8 10.5 8.1 7.0 6.6 6.2 5.4 5.0 4.6 4.1 3.8 3.4 2.8 2.7 2.6	11.8 22.3 30.4 37.4 44.0 50.2 55.6 60.7 65.2 69.3 73.1 76.5 79.3 82.1 84.6	
XXVI		 0.041	0.2	100.0	
Tota	ıl	 26.000	100.0		

The factor solution obtained is shown in Table 3. Significant factor loadings are underlined. The Burt and Banks formula was used to adjust the significance level for the Pearsonian product-moment correlation coefficients (see [6, pp. 45, 97])⁶. The Table also lists under each Roman numeral, an interpretation of each of the 10 factors obtained. The interpretation of the factors was based on the respective sizes of the variable loadings on each factor. In some cases the interpretation was relatively straight forward, such as for factor II where the variables/measures contributing significantly to the factor were all concerned with the availability and use of social facilities, and were positively reinforcing. In other cases it was difficult, if not impossible. For example, factor X had three variable/measures making significant contributions to it. In a positive sense and in order of importance, these were good personal health, poorer medical facilities and a better level of income in the non-farm occupation. The title "Quality of health" captures the essence only of the first and ignores the contribution of the second and third to this factor. Thus it may be a poor title for what the factor is actually measuring, if indeed it is indicating anything real.

⁶ The Burt and Banks formula assumes that the acceptable value for a loading judged significant should increase from the first factor to higher factors (due to the gradual intrusion of unique variance into later factors). According to this formula the standard error (\hat{r}) of a loading is equivalent to $r\binom{n}{n+1}-f$, where r= the standard error of a correlation, n= number of variables in the analysis and r= the factor number. With 100 observations and 26 variables $\hat{r}=0.257$ for factor I and $\hat{r}=0.318$ for factor X at the one per cent level of significance.

Despite such difficulties, however, the technique eliminates redundancy amongst the variables by indicating which measures of adjustment belong together. For example the measures listed in Table 1 which are markedly correlated or interrelated have been grouped together through factor analysis to form a smaller number of measures or factors as shown in Table 3. The factors can also be weighted as in Table 2, according to their contribution in explaining the total variance in the overall measure of adjustment. This not only provides an indication of their relative importance in the adjustment process, but also allows a total weighted score to be calculated for each individual based on the relative significance of each factor.

5 The Nature of the Factors Obtained

The results obtained in Table 3 suggest that there is no outstanding dominance of a single, or a few factors. This is consistent with the perceived "success" of off-farm adjustment being multi-faced and involving a complex mix of economic and social factors.

In essence, there were at least ten factors (depending on the criteria used to extract factors) of which level of income was the most significant in the adjustment of farmers to non-farm situations. In other words a respondent receiving a relatively high income is likely to adjust more favourably than a respondent receiving relatively low income. The factor, income level, was represented by the variables family income and job income, both of which were highly significant. Income variables which involved a subjective comparison of the respondent's income level before and after leaving farming were not found to be significant. This suggests that the absolute level of income received after leaving farming is of more importance than the self-assessment by the individual as to whether he feels he is better off or not. This may reflect the importance of having sufficient income in the new environment to meet the expenses of food, clothing, education, housing and leisure activities without undue hardship and at a level comparable to that enjoyed by other members of the community. Some weight is also given to the variable, job type, which would be expected to be related to the level of income being received.

A second factor of importance was that of community facilities. This factor included variables such as social and recreational facilities, community activities (such as local shows, country fairs or greyhound and horse racing), school and educational facilities and medical facilities. One possible interpretation of this factor is that a respondent is more likely to make a better adjustment in his new environment if he feels these resources are more accessible or of better quality in the new environment than the old. It is also possible that the weight assigned to variables such as social and recreational facilities and community activities may reflect the value of them as a means of social contact with friends, neighbours and other acquaintances in the community. This could mean that for some respondents, the loss of old social contacts through migration to a new area may result in feelings of isolation, loneliness and alienation leading to dissatisfaction with adjustment. The latter view must be regarded with caution however, in view of the lack of factual evidence included in the factor analysis. However external evidence such as observations and impressions gained while conducting interviews would tend to support this point of view.

Table 3: Adjustment Factors Obtained Using a Varimax-Rotated Factor Solution(a)

	×	Quality Quality of health	0.036
	VIII	Job Qu type of he	0.668 0.219 0.008 0.538 0.140 0.170 0.034 0.034 0.032 0.032 0.032 0.033 0.034 0.047 0.033 0.034 0.047 0.033 0.035 0.036 0.037 0.037 0.037 0.037 0.037 0.037 0.037 0.037 0.037 0.037 0.037 0.037
	VII	Group partici- pation	0.008 0.003 0.003 0.003 0.017 0.117 0.113 0.103 0.003
Factors	I	Employ- ment stability	0.100 0.417 0.069 0.087 0.087 0.062 0.093 0.040 0.0189 0.032 0.008 0.008 0.008 0.008 0.008 0.008 0.008 0.008 0.008 0.008 0.009 0.008
Fac	>	Working hours	-0.231 -0.047 -0.097 -0.105 -0.137 -0.034 -0.096 -0.085 -0.085 -0.085 -0.090 -0.0000 -0.000 -0.000 -0.000 -0.000 -0.000 -0.000 -0.000 -0.000 -0.0000 -0.000 -0.000 -0.000 -0.000 -0.000 -0.000 -0.000 -0.000 -0.0000 -0.000
<u> </u>	IV	Security of income	0.103 0.103 0.047 0.047 0.0147 0.0157 0.0038 0.0124 0.0124 0.124 0.124 0.124 0.126 0.092 0.092 0.009 0.00
	111	Work satis- faction	0.010 0.082 0.083 0.083 0.036 0.059 0.0107 0.0107 0.038 0.038 0.038 0.038 0.038 0.038 0.038 0.038
	П	Com- munity resources	-0.003 -0.022 0.024 0.049 0.065 0.065 0.035 0.014 0.014 0.024 0.035
	I	Income	0.086 0.086 0.086 0.057 0.057 0.058 0.058 0.013 0.013 0.089 0.089 0.089 0.089 0.089 0.089 0.089 0.089 0.089 0.089 0.089
	$Variable^{(b)}$		Job type Unemployment Job turnover rate Occupational mobility Post-migration training Job income Group membership Attitude to adjustment Group comparison Health Wife not working Family income Rooms per person Absence of poverty House design and construction Household conveniences Medical facilities Community activities School and recreational facilities Improvement in income Income regularity Improved working hours Emotional security Family leisure

(a) Principal axis factor matrix after orthogonal rotation.
(b) Loadings which are significant at the 1 per cent level have been underlined.

Comparative work satisfaction was also a significant factor in adjustment. This appeared to be closely related to a positive attitude towards adjustment. The factor was also positively related to whether the wife was not working, which in turn, is a probable reflection of the socio-economic status of the migrant's job. For example, most respondents whose wives worked tended to have unskilled and relatively low paid work which could be expected to possess low work satisfaction. The variables describing community activities, rooms per person and emotional security were also significant. While emotional security would appear to be related to job satisfaction, the interpretation of the relationship of the first two variables to comparative job satisfaction including the negative sign on the variable rooms per person, is not at all clear.

The fourth factor, called security of income, reflected the significance of the variables, absence of poverty and income regularity. In one sense these two variables would not appear to be directly related, as absence of poverty refers to a level of income which exceeds a defined minimum level, whereas regularity of income refers to fluctuations in the income being received. However poverty amongst new migrants, as reflected by a low income relative to family size may be a direct result of unemployment, high job turnover, and lack of assets (such as investments which supplement family income), as well as low job income. These variables, except for the latter, do reflect uncertainty in the source of income, although in each solution, the variables unemployment and job turnover are not significant. A study of cases where inadequate incomes were being received showed that all such families had a low level of assets. It was thought that this would result in income being less secure especially for low income families. The variable, rooms per person, was also significant. It is likely that respondents would be able to afford more spacious and higher quality housing, as measured by rooms per person, if their incomes were more secure.

A fifth factor found significant was dominated by improved working hours and leisure time which themselves are highly complementary. The loading on emotional security was also significant which could possibly reflect a relationship between freedom from apprehension and anxiety with improved working hours.

The less important factors included employment stability (as measured by the variables unemployment and job turnover), group participation (as measured by group membership since leaving the land), job type, the quality of housing and health.

6 The Role of Migrant Characteristics in Explaining Adjustment

In order that the relationship between the economic and social characteristics of migrants prior to migration and their post-migration experience could be investigated, an index of adjustment success was constructed for each respondent. The individual factor scores were weighted by their latent root (or the percentage of total variance explained by each factor), and the weighted factor scores summed to get a total adjustment score for each individual. This meant that factors such as income level, community facilities and comparative work satisfaction received greater weighting than the less significant

⁷ In the present study the least squares regression method was used to estimate factor scores, on account of its desirable mathematical properties (see Harris [10, pp. 363-79]).

factors. This method of indexing not only includes each factor found significant in adjustment but it also weights each factor according to its derived importance in the adjustment process.

A further adjustment was made to the index in order to remove the variation in scores attributable to the length of the time period which had elapsed between the date the respondent had left farming and the time of his interview. This was achieved by regressing the length of time over which the migrants had left farming with the index of adjustment success. As this relationship was positive, the adjusted scores were derived for each individual by subtracting the beta coefficient obtained, multiplied by the time period over which the respondent had left farming, from the original scores obtained. In more specific terms:

$$\hat{Y} = Y - 0.3717 t$$
,
where:
 $\hat{Y} = \text{the adjusted score}$
 $Y = \text{the original score}$

t = the period lapsed between the time the respondent left farming and the time of his interview.

Once the index of post-migration adjustment had been calculated, an attempt was made to determine the extent to which variations in the index of adjustment could be explained by other characteristics of the migrant. The hypothesis was advanced that there would be a positive relationship between post-migration adjustment and variables such as part-time work experience while farming, non-farm work experience gained prior to entering farming, farm size as measured by assets, personal equity, level of education, possession of additional training, group participation while farming, and time taken to make the decision to leave farming. Conversely it was thought that the following variables would probably display a negative relationship to postmigration adjustment: the length of time the property had been owned, the length of time the respondent had been farming, age at the time of migration, farming history (whether the migrant was a first or second generation farmer), and rooms per person in the farm residence as a measure of farm living standards. Other variables considered were the number of dependents, attitudes to farming, and the region where the farm was located. No advance judgement was made as to whether these variables would be either positively or negatively related to adjustment.

The results of the analysis are shown in Table 4. The table shows that approximately 29 per cent of the variation in the index of post-migration adjustment was explained by the social and economic characteristics of the migrant and his family prior to migration.

It is seen from Table 4 that there was a negative relationship between the age of the migrant at the time of migration and success in adjustment. This suggests that younger people were able to adjust more favourably than older ones. It is also likely that young people's ties with their old way of life are weaker than those of more elderly people.

⁸ The relationship obtained between the length of time (t) over which the migrants had left farming and the index of adjustment success (Y) was Y = 775.45 + 0.3717t $R^2 = 0.027$ (1.66)

As such, there was a positive relationship between the adjustment index scores and the time period over which the respondents had left farming, but the relationship was not significant at the 5 per cent level.

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Table 4: Predictive Factors of Post-Migration Adjustment

Independent Variables	Partial Regression Coefficients	t Ratios
Constant Age at time of migration Church association before migration Number of dependents Non-farm work experience before commencing farming Time taken to make the decision to leave farming Non-farm work experience obtained from off-farm employment Region in which farm was located R ² Number of observations	820.492 -1.465 24.695 -6.490 18.490 10.353 18.840 12.511 .287 100	-3.84† 3.10† 2.85† 2.21† 2.10* 1.99* 1.60

^{*} Significant at the 5 per cent level using a 2 tailed t test.

Migrants who had an active association with a local church prior to migration adjusted singificantly better than those people who had no such contact. It is likely that the possession of a spiritual dimension to life coupled with contact with other church members aided assimilation and reduced social isolation in the new community.

A significant relationship was found between success in adjustment and family size (as measured by the number of dependents). Migrants who had relatively small families were found to have adjusted more favourably than those who had large families.

Non-farm work experience before commencing farming and non-farm work experience gained from off-farm employment were both positively and significantly related to success in adjustment.

The length of time taken to make the decision to leave farming was significantly related to success in adjustment. Respondents who had taken a longer period of time to make their decision were likely to adjust more readily than those who made a forced decision to leave or those who made their decision over a relatively short period of time. It is likely that those in the former category gave greater consideration to problems and difficulties that were likely to arise and hence gave some consideration to the way in which they might be overcome.

There was evidence of a relationship between the region in which the farm was located and success in adjustment, although this relationship was not significant at the 5 per cent level. In this context, respondents who were farming in the Tablelands region of New South Wales were likely to adjust more successfully than those located further west in the state. It is possible that this finding may result from the proximity of farms in the Tablelands region to large towns and cities which not only offer more employment opportunities, but allow the migrant to live close enough to his old farming area in order to maintain some of the links he had there.

 $[\]dagger$ Significant at the 1 per cent level using a 2 tailed t test.

No relationship was found between post-migration adjustment and educational level, farming history, farm size, the assets available after the sale of the property, or the period of time spent in farming. These results were unexpected. For example it was believed that migrants having a low net worth after the sale of their properties would be at a considerable disadvantage in the process of adjustment. But the results failed to support this view. It was also expected that a high level of education would help considerably in the adjustment process. However the results support the view that experience gained in areas of non-farm employment prior to entering farming, and also while engaged in part-time farming, was likely to be of greater value in the process of adjustment, than a high initial level of education.

7 Conclusion

Through the use of factor analysis, the present study revealed that there was no outstanding dominance of a single or a few factors. Nevertheless the main factors which featured in off-farm adjustment were income level and community facilities in the new locality, comparative work satisfaction, security of income and improved working hours. The less important factors included employment stability, community participation, job type, quality of housing and condition of health.

A further finding was that 29 per cent of the variation in an index of post-migration adjustment success, based on the factors identified by the factor analysis, was explained by the social and economic characteristics of individuals prior to migration. In other words, factors such as age at time of migration, church association before migration, number of dependents, non-farm work experience gained before commencing farming or while involved in farming activities and time taken to make the decision to leave farming were all related to the success or failure in the adjustment process. Possibly a larger percentage of the variance could be explained if predictive variables of a more intangible nature were considered such as differences in the personality, initiative and self image of migrants. Other considerations such as the migrant's ability to make new friends and the value he places on the loss of independence since leaving the land could also be significant.

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