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In the period between the Franco-Prussian and the 1914-18 wars, population redistribution in France was characterized by the rural-to-urban shift widely observed in modern economies. Urban growth due to net migration ranged from a high of over 1 million to a low of 520 thousand during the eight intercensal guinguennia between 1872 and 1911. The net contribution of rural outmigration varied from a high of 820 thousand to a low of 417 thousand. The balance between net inmigration to urban areas and out-migration from rural areas is explained by foreign sources which in only two periods were negative, indicating net out-migration from France. Since the international contribution was relatively minor, much of the urban growth through net migration may be regarded as internal. 1

While such internal shifts have become typical of economic development in the past and are presently occurring in the non-industrialized world, they take on additional significance for France, a country of slow population growth. France was exceptional for her low reproduction rate, which turned down before and remained less than those of other industrial economies. Thus, the internal shifts of population may be of relatively greater economic significance in supplying labor than would be experienced in countries of high natural increase. An additional feature of French migration of interest to economists and statisticians is the presence of long swings or Kuznets cycles of fifteen or twenty years duration. These are particularly evident in the series of urban net migration which exhibits peaks in 1876-81 and 1896-1901, troughs in 1886-91 and 1901-06.

Rather than a comprehensive examination of this migration pattern, the objective of this paper is much more limited. We seek to examine the hypothesis that area differences in net migration within an intercensal period reflect to a large measure differences in economic opportunity; i.e., areas of high net in-migration will show higher indicators of economic opportunity than areas of relatively low net in-migration, and vice versa.

The economic variables used to measure levels of economic opportunity are income per worker and a proxy for labor supply. The 87 <u>départe</u> <u>ments</u> and their rural and urban subdivisions constitute the geographic units for the observations on the dependent and independent variables. The hypothesis is examined primarily in terms of Kendall's rank correlation for three intervals --1876-81, 1886-91, and 1901-06. Quinquennial census data provide the basis for the migration estimates and for some of the economic variables examined. II

Net migration levels are published or can be derived as residuals for each intercensal period. That is, for any given area the balance of births and deaths between censuses would lead you to expect a particular population at the next census if we were to consider natural increase alone. Should the actual population at the next census show a higher population than would be expected from natural increase, then net inmigration is inferred as the difference or residual between expected and actual population. Of course, for net out-migration, the expected population coming solely from natural increase factors would be more than the population actually enumerated. These net migration residuals are the net balances of opposing gross flows over an interval. By themselves, such residuals indicate nothing of either source or destination of migration.

To facilitate comparison, the net migrations have been converted to rates per thousand of population at the beginning of the five-year intercensal period. The rates cover not only the 87 départements but also their rural and urban sectors. In each departement these sectors are defined by the character of the principle place (chef lieu) of each of the more than 35,000 communes. When the chef lieu has 2,000 or more inhabitants the commune is "urban", with fewer inhabitants, "rural". Accordingly we can utilize three different sets with 87 items for the migration data within each département. Each set of migration rates have been ranked with the first being assigned as follows: to the highest plusvalue (in-migration) for urban sectors and for entire departements; to the highest minus-value (out-migration) for the rural sectors.

Since the departement net migration is available as total, urban and rural rates, it is desirable to have parallel <u>departement</u> income categories -- total, non-agricultural and agricultural income per worker. The non-agricultural incomes do not match exactly urban and rural sectors of <u>departements</u>. For example, income from fishing, which is a part of agricultural income, may result from activities of urban population along the coast. Nevertheless, this income delineation is the closest approximation to the incomes of urban and rural populations it is possible to make under the circumstances.

Income data provided by Delefortrie and Morice serve as the basis for estimation of the relative income positions of the <u>departements</u> and their rural and urban compenents.<sup>2</sup> The detailed inquiries of agriculture and manufacturing (<u>Enquêtes</u> of 1861-65) were used for the 1864 estimates; the economic census, for 1954 data. Generally judicious use of these sources by Delefortrie and Morice provides incomes estimates by <u>departement</u> for agriculture from the product side and for non-agricultural activity from the income side.

Since our study lies within this period, the Delefortrie-Morice volume provides no crosssections for direct comparison. However the relationships between the data for 1864 and 1954 and the statistical methodology do provide a basis for approximating income positions for intervening year. First, the analysis runs in term of rank orders of <u>departement</u> incomes and <u>not</u> the magnitudes. Hence emphasis is placed on relative income positions, on ordinal not cardinal considerations.

Second, the analysis of ranks is within income types. The income discussion does not compare different types of income -- e.g., agricultural vs. non-agricultural -- where the approach of Delefortrie and Morice is subject to particular criticism. And in the discussion of total income which combines agricultural and non-agricultural incomes, the <u>departement</u> income structure tends to be dominated by either agricultural or non-agricultural activity.

Third, the rank orders within <u>département</u> income categories exhibit remarkable stability between 1864 and 1954. Between the two dates, the rank orders of total, agricultural and nonagricultural incomes per worker were positively correlated at the .001 level of significance.

Given this stability in <u>departement</u> income positions of 1864 and 1954, we have made crude estimates of income positions within the period, assuming (1) that the income positions of the <u>departements</u> in 1864 and 1954 are a reasonable approximation to their secular positions, and (2) that the changes were distributed evenly over time. This allows a first approximation of the intervening relative income positions of the departements.

The per capita income data have been converted into income relatives, indicating the position of one area with respect to the national average. <sup>3</sup> Relatives were computed for 1864 and 1954 and interpolations made for 1879, 1889 and 1904. For each <u>departement</u> this was done for total income per member of the <u>departement</u> labor force, non-agricultural income per member of the non-agricultural labor force, and agricultural income per member of the agricultural labor force. At each interval, the <u>departements</u> were ranked for each income category; the highest income relative being assigned the first rank. <sup>4</sup>

With labor supply conditions as an independent variable, our hypothesis suggests that a more rapid growth from natural increase in one area compared to others might in time be expected to make employment conditions in that area less favorable, resulting in a higher net outmigration rate. Other areas experiencing relatively slow natural growth of population might be expected to be net in-migration areas, other things remaining unchanged.<sup>5</sup>

Changes in labor supply conditions do not exert equal pressures toward migration on all elements of a population. Empirical studies of other countries and scattered observations for France suggest the 20-29 year age group to be the most vulnerable to migratory influences, and hence we seek a measure which suggests pressure on this group. <sup>6</sup> Direct measures of labor supply by age are not available. Consequently the rate of change due to natural increase of the population aged 20-29 years for each of the departements serves as a proxy variable. <sup>7</sup>

The expected rate of increase of a particular age group tells by how much the population in the age group would be expected to change over a given period, in the absence of subsequent migration, as the cohort<sup>8</sup> initially in that group moves out and is replaced by its successor cohort. For the period under study the censuses are quinquennial; a more generalized statement of this variable is as follows:

Exp. 
$$\triangle$$
 pop. (20-29)<sub>t1-t2</sub> =

$$\frac{(15-19)_{t_1} - (25-29)_{t_1}}{(20-29)_{t_1}},$$

where  $t_1$  and  $t_2$  are consecutive censuses. In the discussion to follow, this has been expressed in terms of a rate per 1000 inhabitants aged 20-29 years at  $t_1$  in each <u>departement</u>. This rate has been calculated for each <u>departement</u> and ranked in descending order of expected rate of increase.

## III

The associations between net migration and income are given in Table 1 which shows the rank correlation of total income per member of the <u>département</u> labor force with total, urban, and rural net migration rates. Likewise, agricultural and non-agricultural income relatives have each been correlated with each of the three net migration rates.<sup>9</sup>

Table 1 can be variously interpreted, as suggested by the following questions: (1) For any particular interval, what was the "strength" of the link between the three net migration types and a given income variable? (2) Which of the three income variables, if any, provides the "best" explanation of the ranking of the various migration rates? (3) Is there any trend in the correlations between the incomes and the migration rates? Consider first the panels of Table 1 horizontally; secondly the columns of all the panels; finally changes over time within each panel.

Total income per worker is positively and significantly correlated (.01 level) with the net migration rates of the total and rural populations. The correlation is substantially higher with the net migration rates of total population -- all above the .001 level. There is no significant correlation between <u>departe-</u> <u>ment</u> levels of total income per worker and the rates of net migration in urban areas, except for one interval.

Agricultural income per worker as related to migration rates follows the same pattern for total income. The relationship is positive and statistically significant, generally at the .01 level, with the migration rates of total and rural populations. As one would expect, no significant correlation is apparent between agricultural income and the behavior of urban net migration rates.

Non-agricultural income per worker is positively and significantly correlated to the .001 level with the net migration rates of <u>département</u> total populations at each of the three intercensal periods. No clear relationship is apparent between non-agricultural incomes and either rural or urban net migration rates. Non-agricultural income correlates positively and significantly (.05 level) at two intervals with rural net migration and at one interval with urban net migration.

## TABLE 1

RANK CORRELATION OF DEPARTEMENT INCOME RELATIVES WITH RATES OF NET MIGRATION: 1876-81, 1886-91, 1901-06

Income Type:		Rates of Net Migration of:					
Total income per member of the		Period	Total Population	Urban Population	Rural Population		
total labor force	1879 1889 1904	1876-81 1886-91 1901-06	+.304a +.367a +.405a	038 +.192 <sup>b</sup> +.027	+.193b +.193b +.389a		
Agricultural income per member of agricultural labor force	1879 1889 1904	1876-81 1886-91 1901-06	+.309a +.333a +.334a	037 +.121 041	+.155 <sup>C</sup> +.187b +.343 <sup>a</sup>		
Non-Agricultural income per member of non-agricul- tural labor force	1879 1889 1904	1876-81 1886-91 1901-06	+.321 <sup>a</sup> +.406 <sup>a</sup> +.327 <sup>a</sup>	+.064 +.199b 002	+.004 +.150c +.222b		

[Kendall's Tau]

Sources for basic data:

Statistique Général de la France, <u>Résultats</u> <u>statistiques du dénombrement de 1881</u>, Table 9, pp. 82-85. <u>Résultats statistiques</u> <u>du dénombrement de 1891</u>, Part 1, Table 6, pp. 394-99. <u>Résultats statistique</u> <u>recensement général de la population de 1906</u>, Vol. 1, Part 1, Table 4, pp. 96-99.

Nicole Delefortrie and Janine Morice, Les revenus départementaux en 1864 et en 1954, pp. 217-19, 270-72.

Note: Highest rank according to highest algebraic order. Significant to: a.001 level; <sup>b</sup>.01 level; <sup>c</sup>.05 level.

Considering the columns of Table 1, total population rates of net migration correlate somewhat higher with total and non-agricultural incomes, although all are significant at the .001 level for each of the three income variables.For the three intervals, the highest coefficients appear twice in the non-agricultural income panel (1876-81 and 1886-91) and once in the total income panel. Urban net migration rate behavior is illuminated very little by any of the income variables examined. At only two of the nine correlations is there a significant association (.01 level), and these are for the same intercensal period (1886-91). For this interval urban net migration correlates significantly with both non-agricultural and total income per worker.

Rural net migration rates are somewhat more closely correlated to total income than to agricultural incomes; in either case only loosely associated with non-agricultural incomes.

A trend in the correlations suggests an increasing degree of positive association between some migration rates and income categories -- if three observations in each case can be regarded as meaningful. The correlations of net migration rates of total population rise over time with both total income and agricultural income, but not with non-agricultural income. The rural net migration rate correlations exhibit a tendency to increase over time with all three income variables. No similar tendency is evident between urban net migration rates and the income relatives.

A more general interpretive statement requires reference to the extent of correlation within each of the types of variables. For the dependent variables, the net migration rates of both rural and urban areas correlate significantly and positively with the rank order of the rates of the <u>departement</u> total populations. The highest correlations were between the net migration rates of the total and rural populations; and lower although still significant correlations between the total and urban net migration rates. <sup>10</sup> These correlations largely reflect the extent to which rural net migration dominated the migration pattern of the total population of most of the <u>departements</u>.

With regard to the designated independent variables, total income is more closely related to agricultural than to non-agricultural income. Agricultural income as an influence on the total income pattern becomes less pronounced, and the role of non-agricultural income becomes more important as France becomes more industrialized.<sup>11</sup>

This interdependence among the migration variables and among the income variables increases the difficulty of assessing the relative strengths of the income factors as explanatory variables. With this reservation in mind, however, the simple correlations between the income and migration variables suggest the following generalizations:

 <u>Départements</u> with relatively high net inmigration rates were also areas with relatively high incomes per worker (total, non-agricultural and/or agricultural). The reverse would tend to be the case for net out-migration areas. For the rural sector, high rural net out-migration was linked to relatively low total and agricultural incomes.

- 2.Urban net migration rate differentials do not generally appear to be associated with the income relatives. While higher correlation is evidenced with non-agricultural income relatives, the coefficients are not generally significant. If an income factor is operating in explaining urban migration differentials, a more appropriate variable may be found in a disaggregate of non-agricultural income.
- 3. The upward tendency noted in some of the coefficients, as the period under study progressed, suggests the relationship between the migration differentials and the economic variables became stronger. This might imply that net migration became more responsive to direct market forces or, perhaps, a reduction in the real costs of transfer.

Turning now to Table 2 where net migration is associated with the labor supply variable, we compare the actual net migration structure during selected quinquennia with the likely "pressure" on the supply side for the same period which would be felt in the absence of any net migration of 20-29 year olds. It will be recalled from the discussion of methodology that the net migration rate at the <u>end</u> of the intercensal period is compared to the expected rate of increase of this group at the <u>beginning</u> of the intercensal period.

TABLE 2RANK CORRELATION OF DÉPARTEMENT EXPECTED RATES OFINCREASE OF POPULATION 20-29 YEARS WITH RATES OFNET MIGRATION, BY TYPE OF POPULATION 1876-81,1886-91, 1901-06

Intercensal Period	Kendall's Tau when Correlation is with Net Migration Rate for:				
	Total Popu-	Urban Popu-	Rural Popu-		
1876-81	315a	+.006	206 <sup>D</sup>		
1886-91	383a	219 <sup>b</sup>	217 <sup>b</sup>		
1901-06	555a	182C	468a		

Sources for basic data:

Statistique Général de la France, <u>Résultats</u> <u>généraux du dénombrement de 1876</u>, Table 12, pp. 112-18, 136-42. <u>Résultats statistiques</u> <u>du dénombrement de 1881</u>, Table 9, pp. 82-85. <u>Résultats statistiques du dénombrement de</u> <u>1886</u>, Tables 23, and 27, pp. 156-59, 168-69. <u>Résultats statistiques du dénombrement de</u> <u>1891</u>, Part 1, Table 6, pp. 394-99. <u>Résultats statistiques de recensement</u> <u>général de la population de 1901</u>, Vol. IV, Table 7, pp. 382-85, 402-05. <u>Résultats statistiques de récensement</u> <u>général de la population de 1906</u>, Vol. I, Note: Significant to: a.001 level; b.01 level; C.05 level. Ranking in each case beginning with highest plus-rate in first rank. For a given intercensal period, t1-t2, the migration estimates are from the census at t2; the labor proxy estimates from the census at t1. With quinquennial censuses, the expected rate of population increase aged 20-29 years is stated as follows:

$$\frac{(15-19)_{t_1} - (25-29)_{t_1}}{(20-29)_{t_1}},$$

where  $t_1$  and  $t_2$  are consecutive censuses.

These correlations suggest the following relationships:

1. The correlation is higher with total than with either the rural or net migration ranks. However, all correlations except one (1876-81 for urban rates of net migration) are significant to at least the .05 level.

2. With regard to the migration rates of total and rural population, the rising coefficient suggests an increasingly strong link between <u>département</u> labor supply conditions in the most migratory ages and migration rates.

If one were to hazard a more general interpretation at this point, the table would suggest that the relatively high expected rate of increase of the 20-29 age group is associated with relatively high rates of net out-migration from those <u>departements</u>. A similar, though less marked relationship obtains for rates of net out-migration from rural areas. Of course, these correlations pertain only to three of the eight quinquennia in the 1872-1911 period. Also, the expected change in the population is not obtainable for rural and urban components. The analysis would profit from more detailed information on the nature of the labor force changes by sector and by age; but the available data do not make this possible. Nevertheless, the evidence presented here suggests a strong association between differentials in net migration rates and expected rates of change of the more migratory ages.

Having shown some significant relationships between migration rates and income on the one hand and the expected rates of change of the more migratory ages on the other, it remains to be seen how migration rate differentials are related to both of these variables considered simultaneously. First, at each income level are the net out-migration rates typically higher for <u>departements</u> with relatively high rates of expected increase of the 20-29 year age group, and vice versa? Second, for each age-specific labor supply interval do the <u>departements</u> with lower incomes generally tend to be those with higher net out-migration rates, and vice-versa?

In considering these questions, however, there is an issue of whether the income and labor supply variables exert independent influences because the rates of expected increase of population ages 20-29 years and annual income per worker are themselves negatively and significantly correlated. <sup>12</sup> Further, one might argue that there is really no need to consider labor supply, since it is already reflected in income. This may be the case, but the income estimate is for the whole labor force not just the younger population on which our labor supply variable centers. Income is a general rather than a specific index of economic opportunity.

TABLE 3

MULTIPLE RANK CORRELATION OF MIGRATION, INCOME, AND LABOR SUPPLY VARIABLES: 1876-81, 1886-91, 1901-06

Intercensal	Partial Tau	Tau	Partial Tau	Tau
Period	BC-A	BC	AC-B	AC
	(1)	(2)	(3)	(4)
1876-81	+.228	+.304*	448	315*
1886-91	+.258	+.367*	600	383*
1901-06	+.140	+.405*	860	555*

Source: Computed from basic data cited in Tables 1 and 2.

Notes: A = Rate of expected increase of population aged 20-29 years.

B = Annual income per worker.

- C = Rate of net migration.
- \* = Significant to .001 level. According to Kendall, no test of significance is possible for Partial Tau.

Also of interest are the remaining simple correlations (AB) for 1876-81 to 1901-06 which are respectively: -.278\*, -.246\* and -.368\*.

The interrelations between these three variables are shown in Table 3, where the rank order of the net migration rates is correlated (1) with income per worker when the labor supply variable is held constant (col. 1), and (2) with labor supply when income is constant (col. 3). 13

Comparisons of columns 1 and 2, 3 and 4, 1 and 3 suggests the following conclusions:

> 1. When labor supply is held constant, the partial tau between income and net migration is less than the simple tau between the two.

2. When income is held constant, the partial tau between labor supply and net migration is greater than the simple tau between the two.

Hence, of the two independent variables, the labor supply variable appears to exert relatively more influence on the rank order of net migration rates. This is shown too by the co-efficients of column 3 being higher than those of column 1 at each interval. However, this indication may reflect only the inadequacy of the income estimates and the fact that they do not necessarily reflect the incomes in the more migratory age groups.

At this level of generality, urban net migration does not appear to be associated with either income and only slightly with the labor supply variable. This may follow from the nature of the income estimates. Hence, further examination of this relation would involve some disaggregation of the income and labor supply variables and should include examination of economic activity particularly attractive to potential migrants -- e.g., net capital formation, construction activity and the like. Preliminary investigation indicates the importance of the rate of change of the non-agricultural labor force. 14

In a limited exploration of this type, the additional avenues for investigation far outnumber the few variables examined. Adjustment for the foreign component is necessary, if the net migration pattern is to reflect forces and responses internal to France. More reliable income and product accounts should be constructed. This paper has not explained why the link between net migration and several economic variables exhibits a closer association later in the period under consideration. Was the market mechanism communicating relative advantage (and disadvantage) more efficiently? Were there substantial improvements in the cost of transfer, thus lowering the real cost of migration? Nor has this study considered either the extent to which the parcelling of land holdings or the differences in agricultural mechanization may have influenced migration. All these issues can be investigated at the departement level with the information presently available mainly from official sources and will have to be considered in any extension of this exploratory study. Fortunately for the analytical economic historian, France provides an excellent laboratory for historical-statistical investigation of the development process.

## FOOTNOTES

\*This study was supported financially by the Population Council and intellectually by Hope T. Eldridge, Everett Lee, and, especially, Richard A. Easterlin among others. The author gratefully acknowledges this assistance, but he alone is responsible for remaining errors.

<sup>1</sup>Some areas, Paris and Marseilles for example, were focal points of net migration from abroad. But since this study concerns the general rural-urban pattern of economic differentials influencing migration, these exceptions are ignored in the present paper. For a detailed discussion see this writer's "Internal Migration and Economic Opportunity: France, 1872-1911"(unpublished doctoral dissertation), Department of Economics, University of Pennsylvania, 1964.

<sup>2</sup>Nicole Delefortrie and Janine Morice, <u>Les Revenus départementaux en 1864 et en 1954</u> (Paris: Colin, 1959).

<sup>3</sup>Suppose, for example, that in 1864 annual income per member of the labor force is 750 thousand francs in <u>departement</u> X, while it is 600 thousand for all France. An index for <u>departement</u> X would be 125, indicating income 25% above the French average which is assigned a value of 100.

<sup>4</sup>Corsica was removed from all of the ranking because of its distance from the French economy. The departements in Alsace-Loraine ceded to Germany in this period were also excluded.

<sup>5</sup>Louis Chevalier has asserted that between 1880 and 1910 excessive levels of population brought about rural-urban migration. See "Localisation industrielle et peuplement", <u>Population</u>, 1 (1946), p. 28. But nowhere has this view been rigorously examined.

<sup>6</sup>The one generalization about migration differentials which can be considered definitely established, although even this one cannot be stated precisely, is the following: "there is an excess of adolescents and young adults among migrants, particularly migrants from rural areas to towns, compared with the non-migrating or the general population." See Dorothy S. Thomas, <u>Research</u> <u>Memorandum on Migration Differentials</u> (New York: Social Science Research Council, Bulletin 43, 1938), p. 11. Dudley Kirk, <u>Europe's Population in the Interwar Years</u> (League of Nations 1946), pp. 157-60. G.H. Daniel, "Labour Migration and Age-Composition," <u>The Sociological Review</u>, XXXI, 3 (July, 1939), pp. 287-304. A.K. Cairncross, <u>Home and Foreign Investment</u>, 1870-1913, (London: Cambridge, 1953), p. 219. J. Saville, <u>Rural De-Population in England and Wales</u>, 1851-1951 (London: Routledge & Kegan Paul, 1957), pp. 108-25. Dorothy S. Thomas, "Economic and Social Aspects of Internal Migrations: An Exploratory Study of Selected Communities," in <u>Economic Essays in Honor of Wesley Clair Mitchell</u>, (New York: Columbia, 1935), p.462. Hope T. Eldridge, <u>Population Redistribution and Economic Growth</u>: <u>United States</u>, <u>1870-1950</u>, Vol. III <u>Demographic Analyses</u>, (Philadelphia: American Philosophical Society, 1965), Part I, Chap. 6. Louis Chevalier, <u>La Formation de la population parisienne au XIX<sup>e</sup></u> siècle (Paris: Presses Universitaires de France 1950), pp. 263-68. Georges Mauco, <u>Les Migration</u> ouvrières en France au debut du XIX<sup>e</sup> siècle (Paris: Lesot, 1932), pp. 47, 51. Marcel Croze, "Un Instrument d'étude des migrations interieures: les migrations d'electeurs," <u>Population</u>, 11 (1956), pp. 242-43.

 $^{70}$ ther possible variables -- the rate of natural increase of total population of the current quinquennium and of twenty years earlier -- were examined and rejected in preference to the expected rate of increase of the population aged 20-29 years, which proved better both on theoretical and empirical grounds.

<sup>8</sup>Deaths among the new cohort during the period are ignored. Considering survival ratios, this does not seem unreasonable for the 20-29 year age group. The forward census survival ratios of the 20-29 male and female cohorts combined were .9274 for 1876-81 and .9668 for 1901-06. Using the 1901-06 interval as an example, this ratio is defined as:

Male and female residents aged 20-29, France, 1906 Male and female residents aged 15-24, France, 1901

<sup>9</sup>It must be emphasized that non-agricultural income is not necessarily urban income. Mining, for example, may occur largely in rural communes of some <u>departements</u>.

<sup>10</sup>For 87 <u>departements</u>, Kendall's tau for the migration variables are as follows:

	Intercensal period			
Rank orders correlated	1876-81	1886-91	1901-06	
Total v. urban net migration rates	+.308	+.419	+.344	
Total v. rural net migration rates	+.366	+.457	+.639	

All coefficients are significant to the .001 level. The rankings of urban and rural net migration rates are not sufficiently correlated.

<sup>11</sup>The values for Kendall's tau for the rank order of the <u>departements</u> by (1) total income per worker and non-agricultural income per worker and (2) total income per worker and agricultural income per worker are as follows:

Income per worker	1864	1879	1889	1904	1954
Total v. non-agrucultural	+.278	+.323	+.362	+.463	+.599
Total v. agricultural	+.778	+.764	+.741	+.703	+.561

All coefficents are significant at the .001 level.

 $^{12}$ The values for Kendall's tau are -.278, -.246, and -.368 for 1876-81, 1886-91, and 1901-06 respectively.

<sup>13</sup>See the method discussed in Maurice G. Kendall, <u>Rank Correlation Methods</u>, (3rd ed. rev.; London, Griffin, 1962), Chapter 8.

<sup>14</sup>Rank correlation of urban net migration rates and the rates of change of non-agricultural labor force for 24 <u>departements</u> important in in-migration areas give values for tau of +.239 and +.362 for 1896-1901 and 1901-06 respectively. The latter is significant at the .05 level.