

Economic History Association

International Migration and Economic Growth: Australia, 1865-1935

Author(s): Allen C. Kelley

Source: *The Journal of Economic History*, Vol. 25, No. 3 (Sep., 1965), pp. 333-354

Published by: Cambridge University Press on behalf of the Economic History Association

Stable URL: <http://www.jstor.org/stable/2116174>

Accessed: 18/08/2009 15:00

Your use of the JSTOR archive indicates your acceptance of JSTOR's Terms and Conditions of Use, available at <http://www.jstor.org/page/info/about/policies/terms.jsp>. JSTOR's Terms and Conditions of Use provides, in part, that unless you have obtained prior permission, you may not download an entire issue of a journal or multiple copies of articles, and you may use content in the JSTOR archive only for your personal, non-commercial use.

Please contact the publisher regarding any further use of this work. Publisher contact information may be obtained at <http://www.jstor.org/action/showPublisher?publisherCode=cup>.

Each copy of any part of a JSTOR transmission must contain the same copyright notice that appears on the screen or printed page of such transmission.

JSTOR is a not-for-profit organization founded in 1995 to build trusted digital archives for scholarship. We work with the scholarly community to preserve their work and the materials they rely upon, and to build a common research platform that promotes the discovery and use of these resources. For more information about JSTOR, please contact support@jstor.org.



Cambridge University Press and Economic History Association are collaborating with JSTOR to digitize, preserve and extend access to *The Journal of Economic History*.

*International Migration and Economic Growth:
Australia, 1865-1935**

I

THE nature of migration into Australia in the nineteenth and twentieth centuries provides much valuable material relating to the mechanism of interregional population transfers during one of the most important periods of demographic redistribution in recorded history. Examining this country's experience during the seventy years, 1865-1935, two problems are treated which not only contribute to the understanding of Australian growth but also provide insight into important aspects of American economic development.

First, we offer a theory of migration and test its validity. There is considerable disagreement as to the appropriate model explaining migration flows during this period.¹ The results obtained below

* I have benefited from helpful comments by many persons, including Moses Abramovitz, Richard Easterlin, Alan Hall, J. Kmenta, G. S. Maddala, R. I. McKinnon, Marc Nerlove, Brinley Thomas, and J. G. Williamson. This paper was written at and supported by the Research Center in Economic Growth of Stanford University, originally appearing as Memorandum 29 of the Center. The author assumes all responsibility for any errors remaining.

¹ Compare: Brinley Thomas, *Migration and Economic Growth* (Cambridge, [Engl.]: The University Press, 1954), ch. vii; Simon Kuznets, "Long Secular Swings in the Growth of Population and in Related Economic Variables," *Proceedings of the American Philosophical Society*, CII (1958), pp. 25-52; and Moses Abramovitz, "The Nature and Significance of Kuznets Cycles," *Economic Development and Cultural Change*, IX (Apr. 1961), pp. 225-48; Richard Easterlin, "Influences in European Overseas Emigration Before World War I," *ibid.*, pp. 331-51; Belton Fleisher, "Some Economic Aspects of Puerto Rican Migration to the United States," *The Review of Economics and Statistics*, XLV (Aug. 1963), pp. 245-53; Harry Jerome, *Migration and Business Cycles* (New York: National Bureau of Economic Research, 1926), chs. iii-iv; Melvin W. Reder, "The Economic Consequences of Increased Immigration," *The Review of Economics and Statistics*, XLV (Aug. 1963), pp. 221-30.

are significant in that they lend support to one particular group of theories and that they assess this framework over the very period within which these models have generally been applied, employing an essentially independent test.

Secondly, Australian demographic experience might be viewed as reflecting Kuznets cycles or long-swing, wavelike movements of approximately twenty years duration, whose apparent pervasiveness and importance in many countries, including the United States, has attracted considerable attention. The basis of this observation is illustrated in Chart I and can be summarized by C. H. Wicken's vivid characterization of Australian immigration, noting that "like the boa-constrictor, we are in the habit of bolting our immigrants and then resting until we have digested them."² The bolting, or long-swing expansions, may be taken as roughly 1872-1888, 1909-1914, and 1920-1927.³ The chart also indicates that the pronounced waves in total population change are primarily the result of similar movements in net migration,⁴ although it is of interest that additions through natural increase trace out swings of a somewhat smaller amplitude.⁵

For the present purposes, Kuznets cycles are not postulated as existing in Australia; rather, our interest lies in the desire to recognize possible long-swing characteristics of migration in addition to the trend and the short-term influences.⁶ The implications of

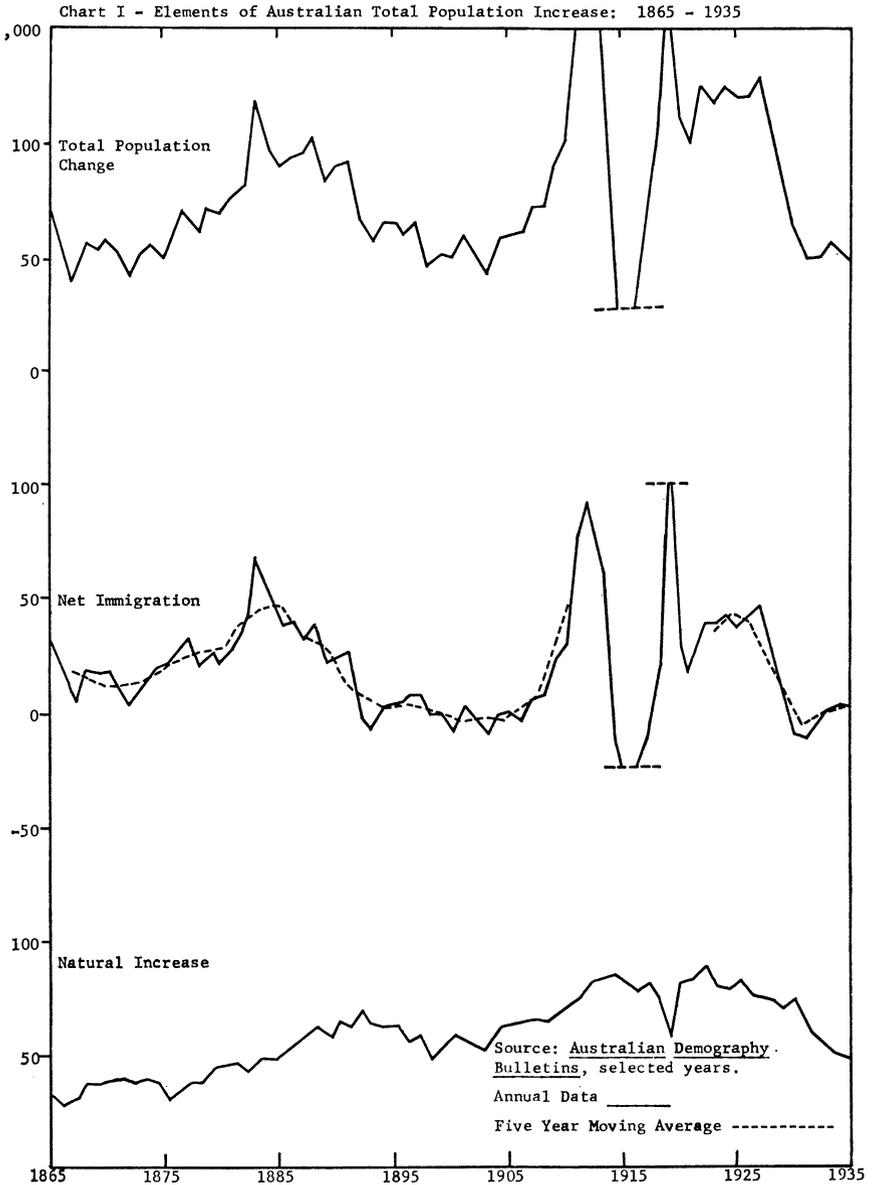
² P. D. Phillips and G. L. Wood, *The Peopling of Australia* (Melbourne: Macmillan, 1930), p. 54.

³ The migration statistics are recorded net overseas arrivals into Australia and include the expeditionary forces during the war. This period, although graphed in Chart I, is excluded from all statistical computations.

⁴ Over the entire period, approximately 25 per cent of total population increase was the result of net overseas additions. During long-swing expansions, however, this share increased to almost 40 per cent.

⁵ The long waves in natural population increase are plausibly associated with those of migration. The connection, however, may be more complex than the simple expected relationship. Namely, the large influx of migrants in the 1850's resulted not only in a skewed age distribution of the population but also provided the basis of subsequent echo-like waves in household formation and birth rates. Whether this influence was reinforced by, or whether it indirectly initiated, long waves in net migration is an unsettled issue. See A. R. Hall, "Some Long Period Effects of the Kinked Age Distribution of the Population of Australia, 1861-1961," *The Economic Record*, XLIX (Mar. 1963), pp. 43-52.

⁶ A related question arises whether the results obtained below derive mainly from short-run variations in the time series (i.e., random, or business-cycle influences) or from major movements which might individually be identified and denoted as long swings. The model of migration developed in Section III does not provide the guide lines for separating these various fluctuating elements, and thus such



an exercise is not formally undertaken here. Some preliminary impressions regarding the significance of long swings may be formed, however, by visually filtering out short-run influences with the assistance of an arbitrary statistical measure, a five-year moving average. To this end, Chart I presents both the annual and the smoothed data of Australian net migration. Examination of these series clearly suggests that much of the correlation between Australian net migration and appropriate explanatory variables is to be found in the very wide swings in the series.

this approach, as applied to Australia and elsewhere, are developed in Section V.

II

Throughout the period under study, over 80 per cent of Australian immigrants were of British origin.⁷ The present problem can thus be simplified by focusing on a single country in assessing the nature of the source area's influence on the pattern of Australian net overseas arrivals. On the other hand, the British selecting Australia were a small fraction of the total migrant population leaving the United Kingdom, averaging only 10 per cent.⁸ It is thus clear that an inquiry into British migration to Australia cannot be divorced from factors operative on the decision to migrate elsewhere.

Two interrelated decisions confronted every migrant: the selection of a country of destination and the choice of a time to emigrate. In considering the first of these, Brinley Thomas persuasively argues that from 1861 through the first decade of the next century, North America provided a much more attractive alternative than Australasia. This hypothesis is consistent with the fact that during this period British migrants chose the United States and Canada over Australia by an average margin of 7:1.

Of the factors responsible for this result, several of the more important include American advantages in land policies, in social improvement, and in transportation costs. The latter encompass not only the direct monetary expenses of the trip, but also foregone earnings, personal discomfort, and risks resulting from the voyage, each of these varying directly with the length of the passage.⁹

In the decade before the First World War, the relative preference of British migrants switched from the United States to the Dominion. Thomas attributes this to the increasing scarcity of good American land, the large influx into the U. S. of immigrants from

⁷ *Census of New South Wales* (Sydney, 1891), pp. 183-87; *Official Yearbook of the Commonwealth of Australia* (Melbourne: McCarron, Bird & Company, 1917 and 1934), pp. 108 and 783 respectively.

⁸ Imre Ferenczi and W. Willcox, *International Migration* (New York: National Bureau of Economic Research, 1929), pp. 628-29; Great Britain, *Parliamentary Papers*, XXVI, 1933-34, p. 9; Thomas, p. 305.

⁹ T. Brassey, M. P., has vividly delineated two of these issues in 1872, noting: "New South Wales alone contains 375,000 square miles; and a large proportion of this unoccupied territory possesses every natural advantage for agricultural development. But so long as the price of land in our Australian colonies remains at £ 1 an acre, when 160 acres can be obtained in America for nothing, it is not likely that an English tenant farmer, with only a small capital at his command, will undertake a much longer and more expensive voyage to Australia, in preference to the shorter and infinitely cheaper passage across the Atlantic to America." T. Brassey, M. P., *Work and Wages* (London, 1872), p. 208; quoted in Thomas, p. 204.

southeastern Europe, and the rising demand for primary products in which Canada and Australasia had a comparative advantage.¹⁰

The trend toward Empire settlement was given further impetus during the 1920's as a result of the Empire Settlement Act of 1922. In this Act, cooperation was encouraged between the Dominion countries and the United Kingdom whereby both the source and the receiving areas would financially underwrite a program to populate the Empire. Australia was given special inducement through the "£34 Million Agreement" of 1925, in which the British Government was committed to provide half the interest on Australian state public-works loans. The Australian obligation for this concession was to settle an immigrant for each £75 borrowed for investment purposes. Only 20 per cent of the full amount potentially available under this scheme was expended.

Australian immigration policies have traditionally been formulated and implemented at the state level. While free immigration¹¹ has never been actively discouraged as a Government position, the extent to which migrants have been welcomed and encouraged has varied both with the political party in power and with the economic climate of the period. Labor governments, as distinct from the opposition party, have traditionally taken a more cautious stand in encouraging net overseas arrivals through state plans.¹² Both political parties have pursued their general positions with a vigor which has been directly related to the economic conditions of the time, particularly to the state of the labor market.

Australian immigrants can be divided into two general categories: those who obtained financial assistance from the states, and those who arrived without Government support. The proportion of assisted overseas arrivals varied substantially throughout the period, ranging from 50 per cent in the 1870's to 10 per cent in the 1890's.¹³

¹⁰ *Ibid.*, p. 205.

¹¹ This refers to limitation of "white" settlers only; Australia's strong opposition to and restriction of nonwhite migrants is well known.

¹² In several instances, the immigrant issue provided the main theme of political encounters. In 1877, for example, the New South Wales Government voted a large sum for migrant assistance, an event which drew strong opposition from labor groups (Trades and Labour Council, Working Men's Defense Association, etc.). This was enough to dissolve Parliament, topple the Government, and bring about a reduction in the size of the immigrant fund. See T. A. Coghlan, *Labour and Industry in Australia* (London: Oxford University Press, 1918), p. 1285.

¹³ Commonwealth Bureau of Census and Statistics, *Demography Bulletin*, XLIV (Melbourne: Government Printer, 1926), p. 726; Thomas, p. 305.

Typically, candidates for assistance were either nominated by Australian residents or selected by agents in Britain. While the nomination schemes placed no major restrictions on the nature of the immigrant, the selection program by Government agents usually discriminated by age, sex, and occupation.¹⁴ The state of the labor market appeared to be of primary importance in determining both the size and the nature of the assistance programs.

In practice, the assistance schemes were implemented by disbursing voted funds for the purpose of subsidizing transportation costs to Australia. The moneys ultimately went to private shipping companies in compensation for the transport of passengers, whose fares varied according to Government schedules. State encouragement of migrants involved three distinct avenues of action: the size of the annual fund made available, the general level of the transport subsidy, and the encouragement of particular classes of individuals through differential passage fares. In all three areas of policy, state programs remained very flexible and sensitive to labor market conditions.¹⁵

An additional link of assisted immigration and Australian economic climate relates to the ability of the Government to finance the project. This is because Government revenues, derived in part from land sales, import tariffs, and so forth, fluctuated with the condition of Australian prosperity.¹⁶

Throughout most of the period, high priority was placed on immigrants with an ability and interest to undertake rural pursuits. Victoria, for example, offered the following passage-fare schedule in 1912: "Domestic servants, £3; experienced farm labourers, £8; British lads for farm training, £7; inexperienced farm labourers (limited number), £10; other approved persons, £14 per adult fare."¹⁷ Not only was there a relatively small proportion of migrants of farming background, but the majority of overseas arrivals settled in urban areas. Australia, as noted above, was not competitive in

¹⁴ In at least one instance (N.S.W.), religious preferences also entered indirectly as a criterion for state assistance. See Coghlan, p. 1280.

¹⁵ On the flexibility of Government action in this area, see Coghlan's interpretation of the immigration policies of Victoria and Queensland, pp. 907-21, 1281, 1285.

¹⁶ At one point in Victorian experience, 25 per cent of the land revenue was set aside for encouraging immigration, as provided in the 1862 Land Act. "The automatic provision of funds for immigration purposes was opposed by many persons for it took no account of the labour market in Melbourne, whose condition, whether of prosperity or depression, was no wise indicated by land revenue." *Ibid.*, p. 921.

¹⁷ *Victorian Year Book* (Melbourne: Albert G. Mallet, 1912-13), p. 188.

rural opportunities with the United States, resulting in a composition of migrants from urban background who generally desired to maintain this living pattern in their new home.¹⁸ This influence may have played an important role in the rapid and early urban development in Australia. Furthermore, it facilitated sensitive response of organized labor groups to the impact of new arrivals, unions being relatively strong in urban areas.

III

As a point of departure, it is assumed that migration is the result of individuals responding to opportunities for economic improvement.¹⁹ These benefits, reflected largely in interregional income differentials, can be obtained only at a cost. The latter includes, among other things, transportation expenses, foregone earnings during the transition from one job to another, and certain nonpecuniary elements, such as risks and discomfort of travel, severing friendships, and so forth. The rate of emigration is, therefore, supposed to be associated positively with the expected long-term economic benefits and negatively with the expense of moving, both as evaluated by the migrant.

Of the two factors in this calculation, expected income differences between regions are likely to remain relatively stable in the short run. In contrast are the costs of moving, particularly those of lost income during the transition. This element moves inversely with the rate of home unemployment and directly with that of foreign.²⁰ When considering fluctuations in migration, unemployment rates are the main focus of attention, since these reflect factors governing variation in the timing of population movements, whereas long-term economic considerations, such as comparisons of expected lifetime earnings between regions, are more important in determining the direction and general size of the flow (trend elements).

From Australia's point of view, the annual number of overseas

¹⁸ W. F. Willcox, *International Migrations* (New York: National Bureau of Economic Research, 1931), Vol. II, ch. vi.

¹⁹ This basic model was proposed to me by Moses Abramovitz. For an analysis based on a similar approach, see Fleisher (cited in n. 1).

²⁰ In the case of Australia, passage fares also fluctuated in the short run. But as argued above, these rate changes are related to the nature of disequilibrium in the labor market, the manifestation of which is implicitly examined by the analysis of unemployment rates.

arrivals from the United Kingdom depends, not only on the cost of moving and on comparative long-run earnings, but also on an assessment of similar variables with respect to each of the other potential areas of destination. Thus, given the costs of moving and the long-run comparisons of earning power of Australia and the United Kingdom, net immigration to Australia from Britain will rise with either an increase in moving costs to, or with a decrease in the estimated lifetime earning differentials of, alternative migrant-receiving countries. The greater the share of British emigrants destined for third countries, *ceteris paribus*, the more important is the influence of these countries on the flow of overseas arrivals to Australia.

An interesting question arises as to the relative sensitivity of population movements to changes in the unemployment rates of the source and of the receiving countries. On a priori grounds, five considerations suggest that labor market conditions in the receiving area may weigh more heavily than the unemployment rate of the home country.

First, consider the group of potential migrants that possesses an average unemployment rate typically greater than the general population—that is, they are the marginal or expendable workers when times are slack. If individuals in this category realize their situation and have acted accordingly by preparing financially for the periods of slack conditions, fluctuations in home employment may have been anticipated and, as a result, are less an indicator of the stimulus to move than if they were unexpected.

Second, another group of migrants may consist of those whose earnings and employment status are relatively invariant to the domestic economic situation. It is thus an assessment of economic conditions abroad which is most relevant in selecting the time to emigrate.

Third, the new immigrant is a marginal worker in the receiving country. If the liability to a given unemployment rate is greater abroad than at home, changes in labor market conditions will solicit a proportionately greater response in the receiving area.

Fourth, the ability to sustain a period of unemployment is greater at home than in the new country of settlement. As a result, the potential migrant is likely to be more sensitive to unemployment rates abroad, since the discomfort for such a period is relatively greater in the country of destination.

And finally, if the migrant class is relatively poor, it can plausibly be assumed that moving costs may pose an absolute constraint on emigration.²¹ Even though the magnitude of foregone earnings is minimized, *ceteris paribus*, when unemployment rates are high in the home country, the *ability* to respond to this incentive varies inversely with the unemployment rates in both the source and the receiving countries. When labor market conditions are favorable at home, it is not only easier to borrow but also short-run purchasing power is relatively high; similarly, the receipt of gifts and loans from friends and relatives abroad is likely to be associated with periods of prosperity in the receiving countries.²²

Clearly, the theory of migration formulated above implicitly assumes that there is not absolute financial constraint to movement—that is, the elasticity of response to varying cost conditions is always positive. This is a realistic assumption for a sizable portion of the population. On the other hand, the existence of a class whose financial capacity may inhibit movement implies that *total* migration, the usual dependent variable, may appear insensitive to the domestic unemployment rate. The relative importance of this group may in large part determine the relationship of total emigration to employment conditions in the source country.²³

IV

We begin the examination of the factors accounting for Australian net immigration by first considering the importance of economic influences in Australia and in Britain. Even though the theo-

²¹ There is ample evidence to support this position. Migration societies, formed to pool funds for the purpose of supporting individuals desiring to move, were a common phenomenon in Britain throughout the period. Similar groups were organized in receiving countries. See, for example, Coghlan, pp. 599-600, on the activities of the Family Loan and Colonization Society, Sidney Herbert's Female Emigration Society, and the Highland and Island Emigration Society.

²² Harry Jerome places considerable emphasis on this point to explain the sensitivity of migration to American business conditions. He estimates that prior to 1890, approximately one third of the immigrants had their passage paid by relatives. Jerome (cited in n. 1), p. 77.

²³ One implication of this line of reasoning is that our basic model of migration takes on increasing relevance, other things equal, the smaller the costs of movement. This observation applies, not only to an explanation of total British emigration to *all* receiving areas, but also to the understanding of the differential elasticity of response both to alternative destinations and to a given country as costs change through time. Tests supporting these propositions would reveal that, *ceteris paribus*, the degree of positive association of British emigration to the domestic unemployment rate is higher (1) for countries with relatively low transport costs and (2) in a given country as the costs of passage decrease through time.

retical model presented above admits a wider range of influences (that is, the relative attractiveness of alternative areas to which the British were migrating), lack of comparable data prohibits identification of these factors at this point. Several measures of economic activity are available for the U. S. and for other areas, however, which will subsequently be examined with the object of identifying their impact on the flow of migrants to Australia. As a result, one of the problems of the present inquiry will be to ascertain those periods when British and Australian conditions appear to offer a relatively poor explanation of migration flows; these dates will then be compared with the occurrence of other influences which may be useful in providing greater insight into the course of events.

The relative ease of obtaining employment has been postulated as the most important factor accounting for fluctuations in net migration. In an attempt to measure this relationship as it concerns Australia and Britain during the period 1865-1935, annual net immigration is initially compared with unemployment rates in both countries.²⁴ Equation (1), estimated by the least-squares procedure, represents the results of this inquiry.

$$(1) \quad M_t = 303.48 - 2.88U_t^a + 1.15U_t^{uk} \quad r^2 = .35$$

(.53) (.56)

Australian employment opportunities, as reflected in the unemployment rate, appear to be a promising explanatory variable. This is in contrast to a similar measure for Britain which, although significant at the 95 per cent level, contributes much less to the explanation of migration flows.²⁵ These results are consistent with the argument of Section III relating to the relative significance of Australian and British economic conditions. The Australian unemployment rate, however, accounts for a disappointingly low

²⁴ Because this study focuses on fluctuations in migration, as distinct from long-run trend considerations, the series on net migration should be trend adjusted. Several postulated relationships, however, failed to yield evidence of a statistically significant trend. We thus can conclude that the fluctuating characteristic of this series is indeed the main temporal feature of Australian migration experience.

²⁵ The relative importance of U^a and U^{uk} is ascertained by reference to the following relationships:

$$\begin{array}{rcll} \text{Total} & = & (2.88)^2 \text{Var}(U^a) + (1.15)^2 \text{Var}(U^{uk}) - & \\ \text{Variation} & & 2(2.88)(1.15) \text{Cov}(U^a, U^{uk}) & + \text{Error} \\ & & & \text{Variance} \\ & = & 801 & + \\ & & 278 & - \\ & & & 492 \\ & & & + \text{Error} \\ & & & \text{Variance.} \end{array}$$

share of the total variance in immigration. This may be due to several factors, including the possibility that: (1) the "tightness" of the labor market may not be appropriately represented by the unemployment rate, (2) the migrant's decision to move may follow a lagged response to job opportunities, and (3) influences may be omitted from the analysis.

The hypothesis that net immigration into Australia may lag behind changes in labor market conditions is supported by several considerations.²⁶ As noted above, the stimulus to migrate varies, in part, with the nature and vigor of the Government assistance schemes, and these programs were altered largely in response to the needs of the labor market. Lags are involved in ascertaining, with reasonable certainty, the trend in job requirements, in responding through legislative procedures (formation of bills), and in implementing formal programs (disbursing funds, communication of assistance plans to potential recipients, and so forth). Even for unassisted passengers, a main source of information on Australian opportunities has historically been from Government agents in Britain.

Apart from these largely institutional considerations, it might be proposed that the migrant's assessment of expected Australian conditions on arrival is formulated on the basis of more than existing employment opportunities; a distributed lag response may be a better description of the decision-making procedure.²⁷

²⁶ A purely statistical matter may also result in a bias toward an apparent lagged relationship. The data on both net overseas arrivals and employment conditions are recorded annually in Australia. There is a time lag, however, of two to three months during which migrants make the voyage. Even if the migrant's response were contemporaneous with Australian conditions, a slight lag of recorded overseas arrivals would be expected.

²⁷ A test of this hypothesis is basically different from most of the other considerations developed here. With respect to institutional delays, the general form $M_t = f(U_{t-n})$, where n represents an approximation to the lag, is appropriate. The object is to identify, both theoretically and statistically, the size of n .

On the other hand, a distributed lag response is interpreted here as a behavioral reaction pattern, and calls for a variant of the following formulation:

$$M_t = \sum_{i=1}^k \sum_{j=1}^i \beta_{t-j}^i X_{t-j}^i .$$

Assumptions on the nature of the weights are crucial to the model. Employing a moving average as the explanatory variable, for example, explicitly establishes fixed weights through the averaging procedure. Compare E. J. Working, *The Demand for Meat* (Chicago: Institute of Meat Packing, 1954) and L. M. Koyck, *Distributed Lags and Investment Analysis* (Amsterdam: North Holland Publishing Co., 1954). See also M. Nerlove, *Distributed Lags and Demand Analysis for Agricultural and Other*

Section III proposes that the timing of migration is most sensitive to expected employment opportunities, but the precise nature of the migrant's decision function is unspecified.³¹ To ascertain whether a more complex decision-making process might improve upon (2), two additional relationships have been postulated and their parameters estimated in (3a) and (3b).

$$(3a) \quad M_t = -47.74 + .95 \left[.5 \sum_{t-1}^t (1/U_t^a) \right] \quad r^2 = .59$$

(.10) t-1

$$(3b) \quad M_t = -39.89 + .29(1/U_t^a) + .56(1/U_{t-1}^a) \quad r^2 = .61$$

(.10) (.11)

The results indicate that taking into account more than a single year's labor market conditions is an improvement over (2). Furthermore, the regression coefficients of (3b) confirm the previous findings relating to the relative importance of job opportunities in periods T and T-1.

On the other hand, both (3a) and (3b) possess considerable serial correlation, which suggests that additional variables and/or a different formulation of the adjustment process might be appropriate.³² Considering the latter possibility, the parameters of a general distributed lag model have been estimated and are presented in (3c).³³

$$(3c) \quad M_t = -24.32 + .63M_{t-1} + .36(1/U_{t-1}^a) \quad r^2 = .77$$

(.08) (.08)

This formulation, which assumes that the weight which migrants attach to subsequent unemployment rates in assessing expected labor market conditions declines geometrically through time, accords with a priori expectations and is, in certain respects, an improvement over (3a) and (3b).³⁴ The migrant's response to Australia

³¹ A similar observation applies to the Australian Government's decisions on assistance schemes.

³² The Durbin-Watson statistics are .62 and .84 respectively. These models are not rejected, however, since our theoretical explanation clearly would admit autocorrelation of residuals. An example of one such systematic element might be the effect of American (or other) long swings on the flow of migrants to Australia.

The selection of (3c) for more intensive study is thus somewhat arbitrary. This procedure is partially justified in noting that the general conclusions of this study are largely invariant to the specific choice of the distributed lag formulation explored above.

³³ This equation was fitted by individually employing $1/U_{t-n}^a$, $n = 0, \dots, 2$. A one-period lag was best statistically, a result which is consistent with both theoretical and previous empirical findings.

³⁴ Equation (3c) resulted in a Durbin-Watson statistic of 1.67. The long-run coefficient of $1/U_{t-1}^a$ is $.36/(1.00-.63)$ or .97.

lian conditions is plausible, with 37 per cent in the first period and over 75 per cent within three years.³⁵

Even though the results of (1) through (3) support the position that the state of the Australian labor market has an important influence on net overseas arrivals, the significance of these findings can better be assessed by examining alternative explanatory variables. Of the many possibilities available, we have chosen to consider an aggregate measure of long-term economic welfare in Australia and in Great Britain. It is argued in Section III that the immediate decision to move is rather insensitive to long-term economic considerations. To evaluate this premise, net migration is postulated as a function of the long-term growth of real per capita output in Australia and in Great Britain.³⁶ Other things equal, an expansion of Australian performance is taken to vary positively with Australian net immigration, and a contraction to vary negatively; the opposite relationship is expected with the growth of British output per head. To approximate changes in expected long-term well-being, the real gross national product figures of Australia and Britain have been smoothed by a five-year moving average before computing the growth rates. The growth rates, denoted ΔY_t^a and Δ^{uk}_t , are then aligned so that migration is effectively related to the output performance of the previous six years. Equation (4) presents estimates of these relationships.

$$(4) \quad M_t = -12.07 + .62M_{t-1} + .35(1/U_{t-1}^a) - 5.28\Delta Y_t^a - 8.10\Delta^{uk}_t$$

(.09)	(.09)	(12.46)	(58.07)
r ² = .79			

³⁵ It must be recalled that this is the average speed of response over approximately seventy years. This model admits the possibility of the decision function (or reaction pattern) changing through time, but investigating the significance and nature of this possibility is outside the present objectives.

³⁶ The output estimates are those of N. G. Butlin, *Australian Domestic Product, Investment, and Foreign Borrowing, 1861-1938/39* (Cambridge [Engl.]: The University Press, 1963), pp. 460-61; C. H. Feinstein, "Income and Investment in the United Kingdom, 1856-1914," *Economic Journal*, LXXI (June 1961), pp. 367-85; and A. R. Prest, "National Income of the United Kingdom, 1870-1948," *Economic Journal*, LVIII (Mar. 1948), pp. 31-62.

This measure is similar to that which Simon Kuznets has used to explain American immigration. He notes that the "flow of goods to consumers, total and per capita, is perhaps the best aggregate measure of changes in economic well-being—which would affect . . . particularly, migration from abroad." In the final analysis, *changes* in the flow of goods per capita are postulated as the main stimulus to migration. He found that peaks and troughs of long swings in migration lagged those in the independent variable by several years. See Kuznets (cited in n. 1), pp. 26-27.

The coefficients of ΔY^a and ΔY^{uk} are statistically insignificant, indicating that variations in real per capita output in the source and in the receiving countries do not appear to contribute materially to the explanation of changes in the flow of overseas arrivals.³⁷ On the other hand, the parameters of the remaining independent variables are remarkably stable and are virtually identical to those of (3c), a feature which lends some support to the appropriateness of the latter formulation.

In order to identify additional influences on Australian immigration, Chart II presents both the residuals of equation (3c) and several variables which are subsequently examined in conjunction with these error terms. The apparent absence of a trend in the latter series suggests that the influences which may be omitted from the model are, in the aggregate, uncorrelated with time.³⁸ Consequently, initial attention is focused on the nature of the major deviations from the regression line.

Considering those years in which migration subsequently deviates from the predicted relationship of (3c), the question arises whether these dates are associated with exceptional circumstances in the other major receiving areas of British emigrants.³⁹ Chart II, which presents the flow of British migrants to Canada, to the United States, and to South Africa, provides the basis of several observations relating to this query.

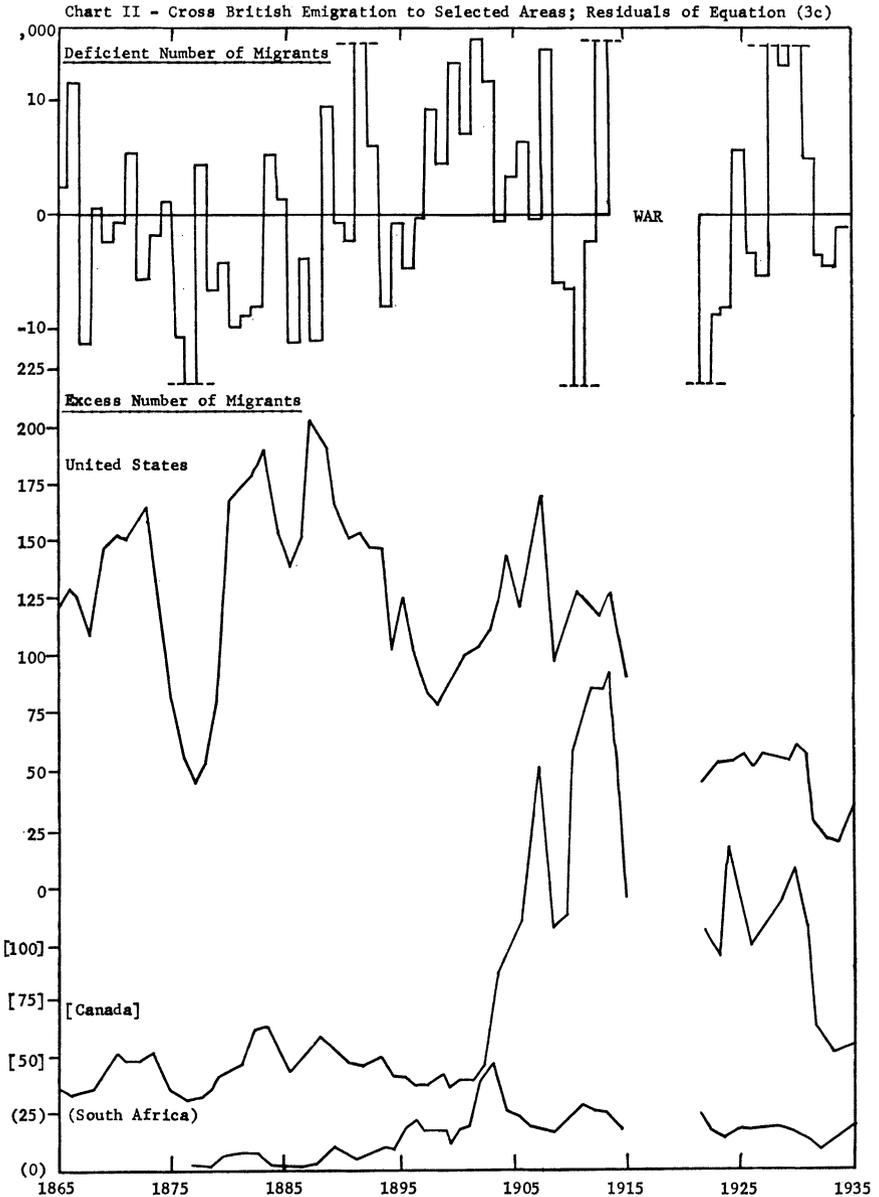
The years 1868, 1876-1878, and 1886-1888 are, in addition to being periods when actual migration exceeded the predicted re-

³⁷ We have additionally estimated the parameters of the above distributed lag model, employing levels of long-run per capita output in place of the formulation of (4). The general conclusions relating to the importance of these proxies of expected long-run income potentials in explaining fluctuations in migration are basically the same as was found using ΔY^a_t and ΔY^{uk}_t .

³⁸ An example of a variable positively correlated with time is presented by Belton Fleisher. He argues that, with respect to Puerto Rican immigration into the United States, a major influence is to be found in the active encouragement and assistance of the resident Puerto Ricans in the U. S. Given the relatively large number of the new Puerto Rican arrivals as compared with the existing population in the U. S., one might expect this influence to display a significant positive trend. This hypothesis was found to be consistent with the facts. See Fleisher, p. 251.

A corollary of the argument is that the importance of these influences should diminish as the share of migrants to the total resident-migrant population in the country of destination increases. In the Australian case, we would thus expect this factor to be relatively insignificant in explaining variations in emigration from Britain.

³⁹ We have arbitrarily chosen years in which the deviations from the predicted relationship exceed 10,000 to identify "exceptional" circumstances.



relationship, contemporaneous with or slightly lagging major troughs in the flow of British arrivals to the United States. Similarly, the dates of relatively low immigration after the turn of the century can be associated both with Canada's major period of British immigration and with the two years when South African arrivals

from the United Kingdom recorded an all-time high. On the other hand, the major reversals in the flow of migrants to Canada and to the United States in 1908-1909 may have partly accounted for the exceptionally rapid increase to Australia during and subsequent to this period.

Turning to the postwar episode, it is found that the excess number of arrivals to Australia in the early 1920's coincides with the highest level of British unemployment to date, an event which partially motivated the Empire Settlement Act in the "£34 Million Agreement."⁴⁰ And finally, the end of the decade witnessed a steady decline in Australian net immigration in response to diminished job opportunities, a trend which was virtually the opposite of that experienced in Canada, the United States, and South Africa.

The overall relationship between periods of American prosperity and stagnation and the proportion of British migrants selecting Australia is summarized in Table 1. The dates indicating American

TABLE 1
AUSTRALIAN SHARE OF BRITISH GROSS EMIGRATION DURING PERIODS
OF PROSPERITY AND STAGNATION IN THE UNITED STATES

<i>Period of</i>	<i>The Share (Percentage) of Emigrants Going to Australia^a</i>
Prosperity (1863-73)	7.8
Stagnation (1873-78)	14.1
Prosperity (1878-82)	10.9
Stagnation (1882-85)	16.9
Prosperity (1885-92)	10.7
Stagnation (1892-96)	4.5
Prosperity (1896-07)	5.7
Stagnation (1907-14)	13.2

^a The emigration statistics are found in Thomas, p. 231.

economic conditions are Moses Abramovitz' chronology of long swings. In all but two instances, American prosperity corresponds with a period when Australia received a relatively small share of British emigrants, and the reverse. The exceptions occur when *both* countries were undergoing severe depression or when Australia was experiencing drought conditions unequalled in recorded history.

The Australian drought undoubtedly played a significant role in explaining migration during the first decade of the century. A convincing case can be made for the hypothesis that after the

⁴⁰ See above, p. 337.

occurrence of such an unusually severe drought, individuals would be exceptionally cautious in evaluating job opportunities before migrating; alternatively, the reaction lag increases. This line of reasoning is consistent with the course of events during the period.⁴¹

It is very difficult to assess the relative importance of these general influences on Australian immigration. With respect to foreign considerations, data on job market conditions are scarce. This difficulty is overcome only partially by examining those periods when "exceptional" circumstances are clearly noted in the historical record. Similarly, much more research is required to ascertain the relevance of the drought on migrant decisions. Enough evidence has been introduced, however, to build a *prima facie* case that both foreign influences and the drought are important factors and that accounting for their impact is likely to improve greatly upon (3c).

V

The factors underlying the pattern of population transfer to Australia pose several interesting implications.

To begin, our theoretical and empirical results are consistent with the widely held position that "immigration from the British Isles had almost established a conditioned national reflex: ask (and provide some money for passage assistance) and ye shall receive."⁴² In the context of the push-pull controversy, another observation is thus added in support of the pull hypothesis as appropriate to explaining migration flows from the "Old World" to the "Lands of Recent Settlement" during this period. Two qualifications and extensions are in order, however.

First, an improved explanation of Australian migration is obtained by considering a broader framework than that of solely an

⁴¹ From the business recovery in the early 1890's, Australia experienced in mid decade the longest drought of its history. During this period, unemployment was high and net migration predictably low or negative. Even though 1900-01 witnessed a decisive recovery in labor market conditions, potential migrants were hesitant to commit themselves without further confirmation that conditions had definitely been reversed; those years found net overseas arrivals low with reference to the long-term relationship of (3c). The years 1902-03 evidenced one of the most severe droughts in Australia's history—the migrant's previous caution was justified. Even though the labor market had begun to improve by 1906, it was not until 1908-09 that the trend was sufficiently established to again bring the rate of migration into line with our model.

⁴² W. D. Borrie, "The Peopling of Australia," in *The Australian Economy*, ed. H. W. Arndt and W. M. Corden (Melbourne: Specialty Press, 1963), p. 104.

interaction of source and of receiving countries. Australian population growth was indeed influenced by events in other British migrant receiving areas. Whether the timing and the magnitude of these developments are related or largely external to Australian conditions thus raises an interesting and important set of problems, bearing not only on the course of events in Australia, but also on the possibility of extending the analysis of Thomas' Atlantic Community to include participants in the Southern Hemisphere.⁴³

Secondly, the role of the Australian Government in stimulating migration, although important, requires close scrutiny. Our model is consistent with the hypothesis, for example, that Government action in this area might be considered as a passive response to labor market conditions and that the latter variable should, as a result, be the primary focus of attention. The "explanation" of migration thus lies, not in the records of Government assistance schemes (as is frequently implied or stated in the literature), but in the factors accounting for their formation.

Employing a model which treats migration as a result of inter-regional labor market disequilibria possesses far-reaching implications, concerning both Australian long-run development and that experienced by the United States and Canada. The fact that migration occurred in large surges and lapses, responding to similar movements in labor market conditions, raises the possibility that these episodes are connected, not only with the factors controlling the growth of aggregate supply, but also with internal swings in demand as reflected in utilization rates.

An interesting examination of this hypothesis is presented by Moses Abramovitz in his analysis of long swings in the United States.⁴⁴ He finds that long swings in American output growth are the result of a systematic interaction of long-run supply and demand. Net migration—deriving from movements in aggregate demand (the unemployment rate) and resulting in an expansion of aggregate supply (labor force growth)—poses as an important element in the balance of these two forces.

In contrast to this interpretation of American long swings is that offered by Simon Kuznets in which more emphasis is placed

⁴³ Thomas, ch. vii. For a review of Australian net capital imports which is formulated within a broad analytical framework similar to that employed in this paper, see A. R. Hall, *The London Capital Market and Australia, 1870-1914* (Canberra: The University Press, 1963).

⁴⁴ Abramovitz (cited in n. 1).

on supply considerations, with migration being one important element in the growth of economic capacity. His approach follows largely from the theory of migration which, as noted above, postulates the growth of real per capita output for consumption as the motivating force.

Given the crucial role of migration to these two important interpretations of American long-run economic development, can Australian experience be utilized in lending insight into this problem?⁴⁵ With respect to the appropriate theory of migration, our results support using labor market conditions as the explanatory variable.

Another question arises as to the relationship of our findings to existing accounts of Australian long-run growth. For the most part, Australian economic historians have not incorporated a model of migration into their discussion of growth, relying largely on the "ask and ye shall receive" approach. Even though the general conclusions derived from this interpretation are in accord with the present results, clearly an explicit theory of migration is of assistance in focusing more precisely on this important aspect of the growth process. Attention thus shifts from describing the size and timing of migration flows to explaining the relationship between labor market fluctuations and other developments in the economy. The theoretical possibilities are numerous and it is outside the present objectives to delineate them.⁴⁶ The results of this study suggest, however, that such an undertaking would greatly extend the understanding of Australian economic development.

ALLEN C. KELLEY, *University of Wisconsin*

APPENDIX

The measure of British unemployment is compiled from records submitted by trade unions and as a result is biased toward urban, secondary industries, particularly capital and export goods. Even though the sample is relatively small in size, the correspondence of year-to-year movements between unemployment rates of the different unions lends credibility to the series.⁴⁷

⁴⁵ America obtained the bulk of British migrants throughout the period, but this feature is related largely to trend considerations; our observations and analysis are concerned with long fluctuations in this flow and as a result are relevant to the long-swing problem.

⁴⁶ The literature of American Kuznets cycles is an example of current research into this set of relationships.

⁴⁷ According to the official view of the Ministry of Labour in 1926, from 1881-

With reference to the objectives of ascertaining the long-run fluctuating characteristics of labor market conditions, it should be noted that on both a priori and theoretical grounds, one would expect cyclical features to be exaggerated in the British index. Among the excluded industries were transportation, services, and agriculture, all of which are relatively stable over the business cycle, whereas the sample is strongly represented by capital goods, one of the more important industries involved in the cyclical process. Given the heavy concentration of Australian immigrants from urban areas, however, this index may be appropriate to the present inquiry.

Representing Australian unemployment, two series are available over all or part of the period: the Official Commonwealth series from 1906 and the Butlin Engineering Unemployment Index from 1852.⁴⁸ Both are compiled from trade union returns and thus are similar in nature to the British series, although the Butlin index represents a single, but important, union.⁴⁹ The usefulness of the Commonwealth series in accurately reflecting the general level of unemployment is suggested by a comparison of this index with census returns. Appendix Table I presents these results.

APPENDIX TABLE I
A COMPARISON OF UNEMPLOYMENT RATES OF CENSUS RETURNS
AND TRADE UNION DATA

	<i>Unemployment Percentages in</i>		
	1891	1901	1911
Trade Union Returns	9.29	6.59	4.67
Census Results ^a	7.46	6.50	4.53

^a All male wage earners, excluding professional occupations.
Source: *Labour and Industrial Branch Report*, p. 18.

Given the longer period covered by the Butlin series, it would be useful to ascertain the extent to which it can be used as a proxy of Australian unemployment. From 1906 to 1935, a comparison has been made with the Commonwealth series, yielding a correlation coefficient of .985.⁵⁰ If the Common-

1925 "the general percentages provided a valuable guide to the direction of the changes in unemployment and a rough indication of the comparative state of employment at different periods, although they cannot be relied upon as an absolute measure of the total amount of unemployment in all industries at any particular date." *British Historical Statistics* (Cambridge [Engl.]: The University Press, 1962), p. 57.

⁴⁸ Commonwealth of Australia, *Official Year Book* (Canberra: Commonwealth Government Printer, 1936), pp. 543, 565-67; N. G. Butlin, "An Index of Engineering Unemployment, 1852-1943," *Economic Record*, XXII (Dec. 1946), pp. 241-60.

⁴⁹ The same general comments made above on the characteristics of British unemployment rates thus apply to the Australian series. For a critical discussion of the Commonwealth Series, see *Labour and Industrial Branch Report*, No. 2 (Melbourne: McCarron, Bird, and Co., 1913), pp. 16-19. Commenting on the bias toward short-run employment fluctuations, this report notes: "It is not unlikely, however, that particulars of unemployment are, on the whole, more generally available for those trades in which liability to unemployment is above the average of skilled occupations" (p. 18).

⁵⁰ In adding to the sample the three remaining years when the official index

wealth series is accepted as a useful indicator of the general tightness of the labor market from 1906 to 1933, then there is fairly strong support for accepting the Butlin estimates as reflecting a similar phenomenon from approximately 1891.

Before 1889, the Butlin series becomes increasingly tenuous, due primarily to the substantially smaller sample underlying the estimates. Fluctuations in this series do, however, correspond in dating and rough amplitude to well-known business cycles in Australia. On the other hand, the relatively high level of unemployment from 1860 to 1890 is not supported by qualitative accounts of the period.⁵¹

was calculated—1901, 1896, and 1891—the high degree of correlation remains at .984.

⁵¹ For example, Brian Fitzpatrick proposed that “1860-1890 was a generation during which children grew to middle age without personal experience of economic depression. . . .” *The British Empire in Australia* (Melbourne: Melbourne University Press, 1949), p. 272.